Response to Comments for the Federal Register Notice for the Texas and Oklahoma Regional Haze State Implementation Plans; Interstate Visibility Transport State Implementation Plan to Address Pollution Affecting Visibility and Regional Haze; and Federal Implementation Plan for Regional Haze

Docket No. EPA-R06-OAR-2014-0754

12/9/2015

Table of Contents

List of Public Comments

Docket ID Number (EPA-R06-OAR-2014-0754-xxxx)	Document title number (TX166.xxx)	Commenter Affiliation
0043	TX166.043	The Honorable Marc A. Veasey, Member of Congress, 33rd District, Texas
0044	TX166.044	Anonymous comment
0046	TX166.046	Anonymous comment
0047	TX166.047	Anonymous comment
0048	TX166.048	Citizen comment
0049	TX166.049	Arlington Urban Ministries
0050	TX166.050	Citizen comment
0051	TX166.051	The Honorable Beto O'Rourke, Member of Congress, 16th District, Texas
0052	TX166.052	U.S. Fish and Wildlife Service
0053	TX166.053	Transcript of Public Hearing 1 in Austin, Texas, January 13, 2015
0054	TX166.054	Transcript of Public Hearing 2 in Oklahoma City, Oklahoma, January 15, 2015
0055	TX166.055	American Electric Power Company, Inc. (AEP) on behalf of Southwestern Electric Power Company (SWEPCO) and Public Service Company of Oklahoma (PSO)
0056	TX166.056	Public Utility Commission of Texas (PUCT) and Texas Commission on Environmental Quality (TCEQ) - Includes ERCOT attachment
0057	TX166.057	Oklahoma Gas and Electric Company (OG&E)
0058	TX166.058	Nucor Steel - Arkansas and Nucor-Yamato Steel Company (Nucor Steel)

Docket ID Number (EPA-R06-OAR-2014-0754-xxxx)	Document title number (TX166.xxx)	Commenter Affiliation
0059	TX166.059	American Chemistry Council, American Coalition for Clean Coal Electricity, American Coke and Coal Chemicals Institute, American Forest & Paper Association, American Fuel & Petrochemical Manufacturers, American Iron and Steel Institute, American Petroleum Institute, American Wood Council, Brick Industry Association, Council of Industrial Boiler Owners, Electricity Consumers Resource Council, Independent Petroleum Association of America, Industrial Energy Consumers of America, International Liquid Terminals Association, National Association of Manufacturers, National Lime Association, National Mining Association, National Oilseed Processors Association, Portland Cement Association, Texas Cotton Ginners' Association, Aluminum Association, and U.S. Chamber of Commerce (collectively, the "Associations")
0060	TX166.060	San Miguel Electric Cooperative (San Miguel)
0061	TX166.061	Luminant Generation Company. Includes reports prepared for Luminant by: -Sargent & Lundy (S&L) (App A) -AECOM (App B) -NERA Economic Consulting (App C)
0062	TX166.062	AECOM: Spreadsheet attachments to AECOM report prepared for Luminant Generation Company (Attachments to App B to 0061)
0063	TX166.063	Gulf Coast Lignite Coalition (GCLC)
0064	TX166.064	Southwestern Public Service Company (SPS) doing business as Xcel Energy
0065	TX166.065	Utility Air Regulatory Group (UARG)

Docket ID Number (EPA-R06-OAR-2014-0754-xxxx)	Document title number (TX166.xxx)	Commenter Affiliation
0066	TX166.066	The Honorable Greg Abbott, Governor of Texas (Texas Governor)
0067	TX166.067	Earthjustice, National Parks Conservation Association, and Sierra Club (Earthjustice at al.)
0068	TX166.068	Report of Vicki Stamper, along with Exhibits 1-69 (in 32 separate files), which together accompany the comments of Earthjustice, National Parks Conservation Association, and Sierra Club
0070	TX166.070	Report of Dr. H Andrew Gray, along with Exhibit 1, which together accompany the comments of Earthjustice, National Parks Conservation Association, and Sierra Club
0071	TX166.071	Report of Dr. George Thurston (with Exhibits T1-T3), which accompanies the comments of Earthjustice, National Parks Conservation Association, and Sierra Club
0072	TX166.072	Sierra Club (4,500 form letter emails)
0073	TX166.073	Forty individual e-mails and ten late form-letter e-mails from members of Sierra Club
0074	TX166.074	Association of Electric Companies of Texas (AECT)
0075	TX166.075	Coleto Creek Power LP --AECOM (nearly identical attachment as Luminant 0061 App B) --AECOM Analysis of Visibility Impacts from Coleto Creek Unit 1 Using CALPUFF
0076	TX166.076	Edison Electric Institute (EEI)
0077	TX166.077	National Park Service (NPS)
0078	TX166.078	NRG Texas Power LLC --Alpine Geophysics attachment
0079	TX166.079	Oklahoma Department of Environmental Quality (ODEQ)

Docket ID Number (EPA-R06-OAR-2014-0754-xxxx)	Document title number (TX166.xxx)	Commenter Affiliation
0080	TX166.080	The Honorable Jeannie McDaniel, Representative, Oklahoma House of Representatives, 78th District
0081	TX166.081	Citizen comments
0082	TX166.082	Citizen comments
0083	TX166.083	USDA Forest Service

Notes:

1. The following public submissions were requests for extensions of the public comment period that are not summarized in this document: EPA-R06-OAR-2014-0754-0037, 0038, 0039, 0040, 0041, and 0042.

2. Docket item 0071 is a corrected version that supersedes item 0069.

1. General and Miscellaneous

Comment: We received over 4,500 comments via email communications in support of our rulemaking that were similar in content and format. The Commenters noted that reducing haze causing pollution from Texas power plants will not only preserve and protect our national parks and wilderness areas for future generations, but will directly benefit public health by requiring a more than 60% statewide reduction in harmful sulfur dioxide emissions.

Response: We acknowledge the commenters for their support of this action. While the purpose of the action is to reduce regional haze, we agree that reductions in air pollution can have other, ancillary benefits, including improving public health.

Comment: We received many individual comments in support of our rulemaking, specifically regarding the requirements that Texas coal plants reduce SO_2 emissions. These comments were from members representing various organizations, members of Congress and other government agencies, and members of the general public. At the public hearings in Austin, Texas and Oklahoma City, Oklahoma, over 100 people expressed general support for the plan. The speakers at the public hearings included members of various organizations and members of the general public.

Response: We acknowledge these commenters for their support of our proposal, including the proposed requirements for SO_2 emission reductions within Texas. We thank those who attended and participated at our public hearings.

Comment: Some of the above individual commenters, e-mail commenters and several other commenters who generally supported our action had also requested that we also consider the addition of controls on several large coal plants in Texas (Welsh, Pirkey, and NRG Parish) and include the reduction of NOx pollution from all Texas coal plants in the plan, many referring to NOx BART reductions in New Mexico.

Response: We respond to specific comments concerning additional controls on Welsh, Pirkey, and Parish, as well as comments on NOx reductions elsewhere in this document. Please refer to the sections of this document where we discuss cost, cost versus visibility, and modeling.

Comment: We received three letters from Federal Land Managers[1] in support of this rulemaking. The National Park Service stated its support for the proposed reductions of SO_2 emissions, which will improve visibility at Big Bend, Carlsbad Caverns, and Guadalupe Mountains National Parks. The U.S. Department of Agriculture Forest Service stated its support of the FIP and the additional controls on fifteen Texas sources which will benefit visibility in the Class I areas of Upper Buffalo and Caney Creek in Arkansas, which it manages. The U.S. Fish and Wildlife Service stated its support for our effort to review SO_2 pollution controls and to

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[1] The Clean Air Act at 42 U.S. Code Section 7602 (i) states that he term “Federal land manager” means, with respect to any lands in the United States, the Secretary of the department with authority over such lands.

determine reasonable levels of air quality emissions that ensure reasonable progress toward our nation's visibility goal at the Wichita Mountains.

Response: We acknowledge these Federal Land Managers for their support of this action.

Comment: The TCEQ supported the EPA's proposal to approve TCEQ's BART determinations.

Response: We acknowledge the TCEQ for its support for this component of our proposed action. We discuss issues regarding BART requirements in Texas in greater detail in our responses to specific comments elsewhere in this document.

Comment: One commenter at the public hearing in Austin, Texas, stated general support for the EPA's proposal and expressed concern about mercury exposure from power plants.

Response: We acknowledge the commenters support. Our action on the Texas SIP and our promulgation of the FIP is in accordance with the Clean Air Act requirements for addressing the problem of regional haze. The Act and the regional haze rule prohibits us from addressing mercury emissions in the review of a regional haze SIP submittal.

Comment: One commenter at the public hearing in Austin, Texas, stated general support of the EPA's proposal and wondered why Arkansas was left out of the rule.

Response: We note that the EPA previously acted on the Arkansas Regional Haze SIP with a partial approval and partial disapproval of the State plan (77 FR 14604, March 12, 2012). For those components of the State plan that we disapproved, we proposed a rule to establish a FIP to address regional haze and visibility transport requirements that was published on April 8, 2015 (80 FR 18944). The comment period for the proposal ended on July 15, 2015, and was subsequently reopened for 15 days, ending on August 7, 2015. You may view the docket for this proposal at the Federal e-Rulemaking Portal: http://www.regulations.gov; Docket No. EPA-R06-OAR-2015-0189.

Comment: One commenter stated that she was part of a contingent that met with senior EPA officials in October 2011, and later addressed a letter to the Administrator in December 2011, that objected to the Texas SIP not reducing pollution or imposing BART on 117 sources and asserted a need for agency resources to address the problem. The commenter received a response letter affirming EPA's commitment to act on the SIP according to earlier applicable consent decree deadlines. The Commenter asked EPA to remember this past representation when considering the perpetual lack of action by the TCEQ on SO_2 and NOx.

Response: Our consent decree was later extended to December 9, 2015. Except for Texas EGU BART, we are completing our consent decree obligation for final action on the Texas Regional Haze SIP in accordance with that deadline. Due to the CSAPR remand, we are unable to act on

Texas EGU BART, and will complete that part of our obligation in a future action. To the extent the comment suggests that changed deadlines and related assurances would change our substantive review obligations, we disagree. Our review is based on whether the submitted SIP meets the applicable requirements of the Clean Air Act.

Comment. We received five letters and e-mails which stated general opposition to the EPA's proposed rulemaking from citizens and a representative of one organization. The Commenters expressed concerns that less Federal regulation of the power industry is better and, that in general, the EPA's proposal would cause problems with electric power grid reliability and electricity affordability.

Response: The power industry, and individual facilities that are part of that industry, may be subject to requirements of the Clean Air Act to address regional haze, as specified by Congress. Elsewhere in our response to comments, we provide substantial explanations and reasons for our authority to regulate these sources, disapproving elements of the Texas SIP, and finalizing our FIP. We note that we received specific comments on aspects of electrical generation, including a report on alleged grid reliability issues from ERCOT. We discuss this issue in greater detail in the sections which deal with electric reliability in this document.

Comment: AECT stated that the EPA has not supported its proposal. Thus, AECT requested that the EPA withdraw its proposal and re-evaluate the Texas Regional Haze SIP using the corrected process, criteria, and information discussed by AECT and AECT member companies in their comments.

Response: We direct AECT to the detailed responses to specific comments provided elsewhere in this document for the reasons we are disapproving elements of the Texas SIP and finalizing our FIP.

Comment: AEP supported the EPA's approval of the TCEQ's BART rules; however AEP urges and requests that the EPA withdraw its proposed disapproval of the Texas and Oklahoma SIP provisions and fully approve the Texas and Oklahoma regional haze SIP provisions. AEP states that the EPA must withdraw its proposed FIP because the proposal departs from past practices and precedent; is outside the scope of the requirements of the CAA, Regional Haze Rule, and reasonable progress guidance; is arbitrary and capricious; and is an abuse of discretion.

Response: We appreciate the Commenter's support of the EPA's approval of the TCEQ's BART rules, and direct AEP to the detailed responses to specific comments provided elsewhere in this document for the reasons we are disapproving elements of the Texas and Oklahoma SIPs and finalizing our FIPs.

Comment: NRG stated that it supports the EPA's proposed findings that Texas has met requirements for identifying the baseline conditions at Big Bend and the Guadalupe Mountains, addressing "reasonably attributable visibility impairment," mitigating the impacts of construction activities on visibility impairment, considering source retirement and replacement schedules as part of the State's long-term visibility strategy, implementing smoke management techniques, providing enforcement authority, quantifying visibility changes that may result from emission changes over the term of the long-term strategy, and implementing a regional haze monitoring strategy, emissions inventory, and appropriate federal land manager consultations.

NRG also stated that it does not support the EPA's proposed disapproval of various plan elements or promulgation of a FIP, and that the EPA should also approve all other aspects of the Texas regional haze plan, and not implement a FIP.

Response: We appreciate NRG's support of our findings and direct it to the detailed responses to specific comments provided elsewhere in this document for the reasons we are disapproving elements of the Texas SIP and finalizing our FIP.

Comment: UARG stated that because EPA has no basis for disapproving the Texas and Oklahoma regional haze SIPs, its proposed FIPs are by definition unlawful. But even assuming for the sake of argument that EPA's SIP disapprovals were valid, the proposed FIPs would violate the CAA and the regional haze rule. The FIPs are based on a flawed and incomplete reasonable progress analysis and would require emission reductions that are beyond EPA's authority to impose in this rulemaking.

Response: We direct UARG to the detailed responses to specific comments provided elsewhere in this document for the reasons we are disapproving elements of the Texas and Oklahoma SIPs and finalizing our FIPs.

Comment: Commenter 0053-60 questioned if there is a way to institute the regulation and at the same time prevent the energy companies from passing the cost onto their customers. The commenter suggested that companies be fined instead of having customers pay for their problems.

Response: It is an unfortunate consequence that the costs associated with controlling the emissions from power plants often result in increasing the cost of electricity. Because of the competitive nature of the ERCOT grid, we cannot speculate on how much an average person's electric bill will increase. However, we are very sensitive to the ramifications of our actions and we seek to select the most cost-effective option when we propose and finalize these controls.

Comment: The Regional Haze Process Must Be Implemented Reasonably Going Forward. [EEI (0076) p. 2-4]

According to EEI, the Clean Air Act (CAA) regional haze program tasks states with determining what is reasonable progress toward elimination of man-made visibility impairment, for which EPA has set a goal of 2064, along with specific progress milestones (10-year planning and SIP revisions, with program reviews in the middle of the 10-year planning periods).[2] The regional haze program contemplates gradual visibility improvements along a "glide path" that considers the 2064 goal, and does not require immediate reductions that exceed making "reasonable progress", as determined by the state based on four statutory factors,[3] in the first planning period through 2018 or in any subsequent planning period. Thus, it neither requires nor authorizes the frontloading of extensive control requirements. Instead, the regional haze program should be implemented in a manner that allows states, through state environmental and electric utility regulators and in conjunction with power companies, to plan the optimal timing of emission control projects. This planning process is vital in order to minimize impacts on the cost and reliable provision of electric power and to allow investment decisions to be made over suitable planning horizons. It is additionally justified given the, at best, minimal visibility benefits EPA claims would be achieved in the proposed rulemaking.

Thus, as EPA and the states begin to implement the next rounds of the regional haze program to continue reasonable progress, EEI suggested that EPA should allow states to consider the timing and scope of additional control activities, consistent with effective long-term utility planning. EPA also must take into consideration the progress already made through the installation of controls to satisfy Best Achievable Retrofit Technology (BART) requirements and BART-equivalent measures such as the Cross-State Air Pollution Rule (CSAPR) and through other CAA regulations that can result in reduced emissions that may contribute to visibility impairment.

Footnotes:

[2] The first 10-year planning period began in 2009 and ends in 2018. The next runs from 2019-2028, with SIPs due in 2018.

[3] Cost of compliance, time necessary for compliance, energy and non-air quality impacts of compliance, and remaining useful life of any existing source subject to such requirements.

Response: We agree with EEI that the regional haze program contemplates gradual visibility improvements. We do not consider the controls we have proposed and those we finalize in this action as being extensive or frontloading. We believe the regional haze process set up by us through the regional planning organizations provided states with an opportunity to implement the program “in a manner that allows states, through state environmental and electric utility regulators and in conjunction with power companies, to plan the optimal timing of emission control projects.” We believe that Texas had an opportunity to “minimize impacts on the cost and reliable provision of electric power and to allow investment decisions to be made over suitable planning horizons,” while satisfying our regulations. However, as we have outlined in our proposal and our final rulemaking, Texas failed to comply with certain aspects of the Regional Haze Rule and thus portions of its regional haze plan are not approvable. We disagree with EEI that the visibility benefits that we proposed are minimal. As we have done in the first round of regional haze SIPs, we will allow states to consider the timing and scope of additional control activities, consistent with effective long-term utility planning, as the states begin to develop future SIPs.

Comment: [CCP (0075) p. 2] CCP incorporated the comments of the Association of Electric Companies of Texas (AECT) (comment 0074) by reference.

Response: The EPA acknowledges CCP's support of the comments submitted by AEC.

Comment: [AEP (0055) p. 2] AEP stated that they support and incorporate by reference the industry member association comments of the Edison Electric Institute (EEI) (comment 0076), Utility Air Resources Group (UARG) (comment 0065), Association of Electric Companies of Texas (AECT) (comment 0074) and Gulf Coast Lignite Coalition (GCLC) (comment 0063) all of which AEP is a member.

Response: The EPA acknowledges AEP's support of the comments submitted by EEI, UARG, AECT, and GCLC.

Comment: [EEI (0076) p. 11] EEI urged EPA to consider the technical comments of both Southwestern Public Service (0064) and Luminant (0061) regarding unit-specific and other concerns.

Response: The EPA acknowledges EEI's support of the comments submitted by SPS (Xcel Energy) and Luminant.

Comment: [San Miguel (0060) p. 5] San Miguel is an active member of the Gulf Coast Lignite Coalition (GCLC). San Miguel refers to, and fully supports the more expansive comments submitted by GCLC in this rulemaking. San Miguel stated that GCLC comment letter explains why the EPA's proposed disapproval of key components of Texas' SIP, and its proposal of a FIP is without basis, is without prior precedent, and unfairly targets and burdens Texas sources. Specific topics covered in the GCLC comments are:

- EPA may not supplant Texas' SIP with what EPA believes is a more reasonable FIP
- EPA is unlawfully attempting to double-burden sources already complying with BART requirements and attempts to apply beyond-BART requirements to sources that are explicitly exempted from single-source BART requirements
- Texas' reasonable progress analysis and associated SIP submission complies with all CAA requirements and must be approved
- Texas' long-term strategy and associated SIP submission complies with all CAA requirements and must be approved
- Every factor of EPA's proposed reasonable progress analysis fails
- EPA has violated its regional consistency regulations by applying different and more stringent standards on Texas units compared to other states and regions
- EPA may not issue this FIP prior to providing Texas the opportunity to submit a SIP responsive to EPA's determination that Texas' 2009 SIP submission was inadequate
- EPA's Regional Haze FIP is not a rule of "nationwide scope and effect."

Response: The EPA acknowledges San Miguel's support of the comments submitted by the GCLC. Our responses to GCLC's specific comments are provided throughout this document.

Comment: [Earthjustice (0067) p.1, 61] Earthjustice et al., incorporated by reference and attached the comments submitted by Earthjustice, National Parks Conservation Association, and the Sierra Club regarding prior actions taken in the development of the Texas regional haze plan. Earthjustice et al., also attached several references cited in their comment. These attachments include the following:

- ODEQ Aug. 3, 2007 Letter to TCEQ; TCEQ Oct. 15, 2007 Letter to ODEQ; TCEQ Mar. 25, 2008 letter to ODEQ; ODEQ May 12, 2008 Letter to TCEQ.
- Letter from McCrystie Adams & Michael Hiatt, Earthjustice, to EPA (Feb. 28, 2012), Docket ID No. EPA-HQ-OAR-2011-0729 Re: Proposed Partial Regional Haze FIP for Texas Exempting BART-Eligible Texas EGUs from BART Based on EPA's Determination that the Cross-State Air Pollution Rule is "Better than BART."
- Conservation Organizations' October 26, 2011comments to EPA Re: Texas Regional Haze Plan – Efficacy in the Face of the Anticipated "Better than BART" Rulemaking for the Cross-State Air Pollution Rule.
- Letter from McCrystie Adams & Michael Hiatt, Earthjustice, to Margaret Earnest, Texas Commission on Environmental Quality (Oct. 1, 2013), Re: 2014 Five-Year Regional Haze SIP Revision—Project No. 2013-013-SIP-NR.
- U.S. Fish and Wildlife Service and National Park Service Comments Regarding Texas Proposed Regional Haze Rule State Implementation Plan.
- Benchmarking Air Emissions of the 100 Largest Electric Power Producers in the United States (May 2014).
- Daniel Cohan, Addressing pollution from legacy coal power plants in Texas (June 2013).
- Summary of Oil and Gas Sector TSD: Significant Stationary Source of NOx Emissions, October 2012.
- Conservation Organizations' August 2, 2012 comments to EPA Re: Docket ID No. EPA-R08-OAR-2012-0026, comments on EPA Proposed Approval, Disapproval, and 2 Promulgation of Implementation Plans; State of Wyoming; Regional Haze State Implementation Plan; Federal Implementation Plan for Regional Haze.
- Texas 2014 Five-Year Regional Haze State Implementation Plan Revision, Proposal, June 18, 2013.
- Texas 2014 Five-Year Regional Haze State Implementation Plan Revision, February 26, 2014.
- 2011 Oil and Gas Emission Inventory Enhancement Project for CenSARA States.
- Conservation Organization's August 26, 2013 comments to EPA Re: Docket ID No. EPA–R08–OAR–2012–0026, Comments on EPA's Re-Proposed Approval, Disapproval, and Promulgation of Implementation Plans; State of Wyoming; Regional Haze State Implementation Plan; Federal Implementation Plan for Regional Haze, 78 Fed. Reg. 34,738 (June 10, 2013).
- Environmental Commenters' August 20, 2014 comments to EPA Re: Comments of Clean Air Task Force, National Parks Conservation Association, Earthjustice, WildEarth Guardians, and Southern Utah Wilderness Alliance on Managing Emissions From Oil and Natural Gas Production in Indian Country: Advanced Notice of Proposed Rulemaking, 79 Fed. Reg. 32,502 (June 5, 2014).

Response: We acknowledge and appreciate receipt of the supplemental documents submitted by Earthjustice et al. We take no position in this action regarding these documents beyond our responses to any comments specifically referencing the documents.

Comment: [Stamper (0068) p.57] Ms. Stamper submitted 69 files as exhibits attached to her comments. These files were used as references in her review of the proposed rule and analyses.

List of Exhibits submitted with Stamper (0068)

Exhibit Number	Title/Description
1	November 3, 2010 letter from David C. Foerter, ICAC to Senator Carper.
2	U.S. EPA, An Assessment of the Feasibility of Retrofits for the Toxics Rule, March 9, 2011.
3	Direct Testimony of Mr. Chad Teply, PacifiCorp, before the Wyoming Public Service Commission.
4A	August 3, 2011 "B&W gets contract for dry scrubber project at Karn coal plant."
4B	December 17, 2014 Extension Request for Consumers Energy Company's D.E. Karn Plant (SRN B2840) Units 1 & 2 for Compliance with the Mercury and Air Toxics Standard (40 CFR 63 Subpart UUUUU) and the Michigan Mercury Rule (R336.2501)
5	July 9, 2014 TVA – Gallatin Fossil Plant (GAF) – Request for Compliance Extension - Mercury and Air Toxics (MATS).
6	November 5, 2013 Request for One-Year Extension of the Compliance Deadline for the Mercury and Air Toxics Standards and of the Expiration Date of the Plan Approval for the Installation of Flue Gas Desulfurization Units
7	October 4, 2012 Construction Extension for Consumers Energy Company's JH Campbell Facility Pursuant to the Mercury and Air Toxics Standard (40 CFR 63 Subpart UUUUU, also known as MATS) as well as the Michigan Mercury Rule (R336.2501, *et seq*)
8A	Hitachi Power Systems America Awarded Contract to Supply Pollution Controls Equipment for KCP&L."
8B	June 22, 2012 Request for Extension of the Mercury and Air Toxics Standards (MATS) Compliance Deadline KCP&L La Cygne, Source ID No. 1070005
9	Sargent & Lundy, IPM Model – Updates to Cost and Performance for APC Technologies, Wet FGD Cost Development Methodology, Final March 2013.
10A	EPA's Cost Effectiveness Spreadsheet for SDA at the Corette Power Plant.
10B	EPA's Cost Effectiveness Spreadsheet for wet FGD at the Corette Power Plant.
10C	EPA's Cost Effectiveness Spreadsheet for DSI at the Corette Power Plant.
11	January 30, 2013 NIPSCO – Michigan City and R.M. Schahfer Generation Stations Request for Extension of Time to Comply with the Utility MATS NESHAP
12	EPA's NOx Cost Effectiveness Analyses for Jim Bridger Power Plant, EPA-R08-OAR-2012-0026-0085.
13	OMB Circular A-94.
14	Black & Veatch vendor brochure on CT-121.

15	Yasuhiko Shimogama, Hirokazu Yasuda, Naohiro Kaji, Fumiaki Tanaka, and David K. Harris, Commercial Experience of the CT-121 FGD Plant for 700 MW Shinko-Kobe Electric Power Plant, Paper No. 27, presented at MEGA Symposium, Air & Waste Management Association, May 19-22, 2003.
16	CT-121 FGD Process – Jet Bubbling Reactor.
17	Jonas S. Klingspor, Kiyoshi Okazoe, Tetsu Ushiku, and George Munson, High Efficiency Double Contact Flow Scrubber for the U.S. FGD Market, Paper No. 135 presented at MEGA Symposium, Air & Waste Management Association, May 19-22, 2003.
18	Yoshio Nakayama, Tetsu Ushiku, and Takeo Shinoda, Commercial Experience and Actual-Plant-Scale Test Facility of MHI Single Tower FGD.
19	Mitsubishi High SO_2 Removal Experience.
20	White Bluff Station Units 1 and 2 Evaluation of Wet vs Dry FGD Technologies, Rev. 3, October 28, 2008, prepared by Sargent & Lundy.
21	Wet FGD Actual SO_2 Emission Rates from CAMD data.
22	SDA Actual SO_2 Emission Rates from CAMD data.
23	Sargent & Lundy, IPM Model – Updates to Cost and Performance for APC Technologies, Dry Sorbent Injection for SO_2 Control Cost Development Methodology, March 2013.
24	Fischer, Diane and Preston Tempero, Black&Veatch, Early Lessons Learned from Implementation of Dry Sorbent Injection Systems, 2012.
25	Sargent & Lundy, IPM Model – Updates to Cost and Performance for APC Technologies, SDA FGD Cost Development Methodology, Final March 2013.
26	Lawrence Gatton, Alstom Power, Next Generation NID for PC Market, Coal-Gen, August 17-19, 2011.
27	Black & Veatch, LG&E/KU – Mill Creek Station, Phase II Air Quality Control Study, Air Quality Control Validation Report, March 4, 2011, Revision D – Issued for Project Use.
28	Alstom Brochure, NID™ Flue Gas Desulfurization System for the Power Industry.
29	February 8, 2012 Direct Testimony of Christian T. Beam on behalf of Southwestern Electric Power Company, In the Matter of Southwestern Electric Power Company's Petition for a Declaratory Order Finding that Installation of Environmental Controls at the Flint Creek Power Plant is in the Public Interest, Before the Arkansas Public Utilities Commission, Docket 12-008-U.
30	Technical Support Document to Comments of Conservation Organizations, Proposed Montana Regional Haze FIP – June 15, 2012.
31	Sargent & Lundy, Big Sandy Plant Unit 2, Order-of-Magnitude FGD Cost Estimate, Volume 1 – Summary Report, September 29, 2010.
32	Spreadsheet with data on EGUs with wet scrubbers in arid areas.
33	Xcel Energy, We are energized, Texas and New Mexico.
34	Wet_FGD_Cost_IPM_TX_Sources_Revised_VS_Mar 27_2015.xlsx.
35	NID CDS_Cost_IPM_TX_Sources_VS_Mar 27_2015.xlsx.
36	SDA_Cost_IPM_TX_Sources_Revised_VS_Mar 27_2015.xlsx.
37	DSI_Cost_IPM_TX_Sources_Revised_VS_Mar 27_2015.xlsx.
38	Tolk Costs for Water Rights Purchase for SO_2 Scrubbers.xlsx.

39	March 2011 National Park Service spreadsheet "EGUs with Proposed BART Controls."
40	May 28, 2009 Wyoming Department of Environmental Quality BART Application Analysis, Dave Johnston Plant.
41	May 28, 2009 Wyoming Department of Environmental Quality BART Application Analysis, Naughton Plant.
42	Letter from Arizona Department of Environmental Quality to Steve Fry, EPA Region IX, Re: Consultation Regarding Best Available Retrofit Technology Analyses for the Four Corners Power Plant and Navajo Generating Station, May 12, 2008.
43	URS, Assessment of Technology Options Available to Achieve Reductions of Hazardous Air Pollutants, 4/5/11.
44	Babcock Power Environmental, Wet Flue Gas Desulfurization Scrubber Upgrades, 2009.
45	Moretti, Albert L., State-of-the-Art Upgrades to Existing Wet FGD Systems to Improve SO_2 Removal, Reduce Operating Costs and Improve Reliability, Presented to Power-Gen Europe, Cologne, Germany, June 3-5, 2014.
46	Frazer, C., A. Jayaprakash, S.M. Katzberger, Y.J. Lee, B.R. Tielsch, presented to EPRI Power Plant Air Pollutant Control Mega Symposium, August 30 – September 2, 2010, Baltimore, MD.
47	February 2011, Babcock Power, LG&E Services Company Contract No. 501654, Mill Creek FGD Performance Upgrade Study.
48	SO_2 Scrubber Upgrade Costs Data.
49	May 28, 2009 Wyoming Department of Environmental Quality BART Application Analysis for Jim Bridger Power Plant.
50	December 12, 2007 Coal Creek Station Units 1 and 2 Best Available Retrofit Technology Analysis.
51	January 2008 BART Analysis for Cholla Unit 4.
52	Colorado Department of Public Health and Environment, Best Available Retrofit Technology (BART) Analysis of Control Options for Public Service Company-Hayden Station.
53	Hayden BART Cost Analysis.
54	EPA's Colstrip Unit 1 SO_2 Emissions and Costs Summary.
55	EPA's Colstrip Unit 2 SO_2 Emissions and Costs Summary.
56	See Permit Amendment, Source Analysis & Technical Review, Public Service Company of Oklahoma, Oklaunion Power Station, Permit Number 9015/PSDTX325M2.
57	Emission Sources – Maximum Allowable Emission Rates, Permit Numbers 9015 and PSDTX325M2, dated February 3, 2012.
58	Worksheet entitled "Pirkey and Oklaunion Coal Info."
59	Worksheet entitled Oklaunion and HW Pirkey CAMD 2000 to 2014.
60	Federal Operation Permit, H.W. Pirkey Power Plant, November 22, 2010.
61	TCEQ, Construction Permit Amendment, Review Analysis & Technical Review, Big Spring Carbon Black Manufacturing Plant, Permit No. 6580.
62	September 25, 2012 Federal Operating Permit for Sid Richardson Carbon Big Spring Facility.

63	Statement of Basis of the Federal Operating Permit for Sid Richardson Carbon Company Big Spring Facility.
64	Clean Air Markets Database Emission Data for Twin Oaks (TNP One Steam Electric Station).
65	Statement of Basis of the Federal Operating Permit, Optim Energy Twin Oaks, LP.
66	Federal Operating Permit for Optim Energy Twin Oaks, LP, April 4, 2011.
67	Burns & McDonnell, Utility FGD Design Trends, which provides, among other things, the year each FGD system at an EGU began operation.
68	Jianmin Wang, et. al., Leaching Behavior of Coal Combustion Products and the Environmental Implication in Road Construction, A National University Transportation Center at Missouri University of Science and Technology, NUTC R214, April 2011.
69	Spreadsheet with TX EGUs 2012 to 2014 CAMD Data Ranked for SO_2.

Response: We acknowledge and appreciate receipt of the supplemental reference documents submitted by Ms. Stamper. We take no position in this action regarding these documents beyond our responses to any comments specifically referencing the documents.

Comment: Commenter 0053-37 supported the proposed rule, and referred to a report produced by Dr. Scott Nystrom of Regional Economic Modeling Incorporated (REMI) on behalf of Citizens Climate Lobby. The report modeled carbon pricing legislation and has been used by energy producers in the natural gas and nuclear arenas. It was beneficial in every way in terms of economic growth, in terms of job growth, and had all the ancillary benefits of haze reduction and the reduction of other pollutants in the environment. The commenter asked that state and federal legislatures to take an opportunity to look at the report.

Response: Because the report was not attached to the comment letter, it was not loaded in the docket. We believe the referenced report is available here:

https://citizensclimatelobby.org/remi-report/]

The REMI report examined the impact of a steadily-rising fee on carbon-based fuels with revenue from that fee returned to households in equal shares. While we appreciate the commenter bringing this report to our attention, we note that carbon pricing is outside the scope of our proposed action with respect to regional haze implementation plans.

Comment: A commenter suggested that 2064 is too long for Texas polluters to improve air quality to natural conditions.

Response: Our federal regulations require that states attempt to meet the established national goal of natural visibility conditions by 2064, or demonstrate why that goal cannot be met. See 40 CFR 51.308(d)(1).

Comment: [TCEQ/PUCT (0056) p. 16] The TCEQ noted the statute requires the regulating entity to consider "the energy and non-air quality environmental impacts of compliance" when developing the RPG. Nowhere in the EPA's proposal is this factor further defined. The EPA provides guidance to states on how to consider this factor, but ignores a crucial part of the term. The EPA cites only one element of its BART guidance as the basis of its analysis of this factor, but ignores another more important element: the impact to energy reliability and costs due to compliance with the RPG controls in the proposed FIP that are developed for a large segment of the electric energy production in Texas.

Response: The TCEQ/PUCT is incorrect in its assertion that we did not consider the energy and non-air quality environmental impacts of compliance. This factor is specifically evaluated in our FIP TSD:[2]

> Regarding the analysis of energy impacts, the BART Guidelines advise, "You should examine the energy requirements of the control technology and determine whether the use of that technology results in energy penalties or benefits."[3] As discussed below in our cost analyses for Dry Sorbent Injection (DSI) and Spray Dryer Absorber (SDA) SO_2 scrubbers, our cost model allows for the inclusion or exclusion of the cost of the additional auxiliary power required for the pollution controls we considered to be included in the variable operating costs. We chose to include this additional auxiliary power in all cases. Consequently, we believe that any energy impacts of compliance have been adequately considered in our analyses.
>
> Regarding the analysis of non-air quality environmental impacts, the BART Guidelines advise:[4]
>
>> Such environmental impacts include solid or hazardous waste generation and discharges of polluted water from a control device. You should identify any significant or unusual environmental impacts associated with a control alternative that have the potential to affect the selection or elimination of a control alternative. Some control technologies may have potentially significant secondary environmental impacts. Scrubber effluent, for example, may affect water quality and land use. Alternatively, water availability may affect the feasibility and costs of wet scrubbers. Other examples of secondary environmental impacts could include hazardous waste discharges, such as spent catalysts or contaminated carbon. Generally, these types of environmental concerns become important when sensitive site-specific receptors exist or when the incremental emissions reductions potential of the more stringent control is only marginally greater than the next most-effective option. However, the fact that a control device creates liquid and

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[2] See discussion beginning on page 6 of our FIP TSD.
[3] 70 FR 39168 (July 6, 2005).
[4] 70 FR 39169 (July 6, 2005).

> solid waste that must be disposed of does not necessarily argue against selection of that technology as BART, particularly if the control device has been applied to similar facilities elsewhere and the solid or liquid waste is similar to those other applications. On the other hand, where you or the source owner can show that unusual circumstances at the proposed facility create greater problems than experienced elsewhere, this may provide a basis for the elimination of that control alternative as BART.

> The SO_2 control technologies we considered in our analysis – DSI and scrubbers – are in wide use in the coal-fired electricity generation industry. Both technologies add spent reagent to the waste stream already generated by the facilities we analyzed, but do not present any unusual environmental impacts. As discussed below in our cost analyses for DSI and SDA SO_2 scrubbers, our cost model includes waste disposal costs in the variable operating costs. Consequently, we believe that with one possible exception, any non-air quality environmental impacts have been adequately considered in our analyses. An examination of the aerial photo of the Tolk facility, which we present in section 5.4, does not reveal any obvious source of surface water. We therefore assume that well water is used. In light of this and its potential relationship to the energy and non-air quality environmental impacts of compliance, we limit our SO_2 control analysis for Tolk to DSI and dry scrubbers.

As can be seen from the above discussion regarding this factor, the TCEQ/PUCT is also incorrect that this factor should also involve a consideration of grid reliability. The "energy" part of this factor involves considerations of potential energy penalties due to the control technology at the facility in question, not on the grid. Nevertheless, we did evaluate the potential impact our proposed controls would have on grid reliability in a response to another comment.

Comment: Earthjustice provided background on the Clean Air Act's Regional Haze Program. [Earthjustice (0067) p.5]

Earthjustice[5] explained that since the nation's founding, the United States has valued its diverse and stunning natural scenery. See, e.g., John Copeland Nagle, The Scenic Protections of the Clean Air Act, 87 N.D. L. Rev. 571, 576 (2011). In what has been lauded as "America's best idea," Congress first set aside national parks in the 19th century to preserve and celebrate some of the nation's most spectacular scenery. Id. With the nation's rapid industrialization, however, these remarkable scenic views have become increasingly marred by air pollution. See Id. at 573. Today, air pollution is "perhaps the greatest threat to national parks," and pollution all too often degrades visibility in these iconic scenic areas. Id.

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[5] When we refer to Earthjustice, we also mean the National Parks Conservation Association (NPCA) and the Sierra Club as these groups collectively submitted comments. These groups also contracted with independent technical experts including Ms. Victoria Stamper, Dr. H. Andrew Gray, and Dr. George D. Thurston.

Recognizing the "intrinsic beauty and historical and archaeological treasures" of the national parks and wilderness areas,[1] Congress established "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." 42 U.S.C. § 7491(a)(1). In 1990, after finding that the U.S. Environmental Protection Agency ("EPA") and the States had not made adequate progress toward reducing visibility impairment in the nation's Class I areas,[2] Congress amended the Clean Air Act to curb emissions that may reasonably be anticipated to cause or contribute to visibility impairment at national parks and wilderness areas. Id. § 7492.

Earthjustice explained that Congress delegated implementation of the Clean Air Act's visibility program to EPA. In 1999, EPA promulgated the Regional Haze Rule, which requires the States (or EPA where a State fails to act) to make incremental, "reasonable progress" toward eliminating human-caused visibility impairment at each Class I area by 2064. 40 C.F.R. § 51.308(d)(1), (d)(3). In the 1999 regulations, EPA recognized that visibility impairing pollution was a regional problem that required regional solutions; the regulations create the necessary region-wide scheme to restore Class I areas to natural conditions. Furthermore, the regional haze regulations require evaluation of all sources of visibility impairment.

Earthjustice et al., noted that in order to achieve the goal of natural visibility in Class I areas, implementation plans must contain "emission limits, schedules of compliance and other measures as may be necessary to make reasonable progress toward the national goal." 42 U.S.C. § 7491(b)(2). The Regional Haze Rule includes several interlocking measures designed to make "reasonable progress" towards achieving the 2064 natural visibility goal. These measures include requirements to (1) develop reasonable progress goals based on the evaluation of any and all sources contributing to visibility impairment; (2) determine baseline and natural visibility conditions; (3) create a long- term strategy for making reasonable progress; and (4) implement the best available retrofit technology (BART) for some of the oldest and dirtiest sources of haze-causing pollutants. Id.; 40 C.F.R. § 51.308(d), (e).

<u>Footnotes</u>:
[1] H.R. Rep. No. 95-294, at 203-04 (1977), reprinted in 1977 U.S.C.C.A.N 1077, 1282.
[2] Areas designated as mandatory Class I Federal areas (or Class I for short) consist of national parks exceeding 6,000 acres, national wilderness areas and national memorial parks exceeding 5,000 acres, and all international parks that were in existence on August 7, 1977. See 42 U.S.C. § 7472(a).

Response: We acknowledge the background information provided by the commenter. We take no position with respect to the commenter's synopsis.

Comment: Luminant provided background information on establishing reasonable progress goals. [Luminant (0061) p.7]

Luminant explained that under EPA's regulations, when a State has a Class I area within its borders, that State must establish a reasonable progress goal ("RPG") for the Class I area. EPA's regulations provide: "For each mandatory Class I Federal area located within the State, the State must establish goals (expressed in deciviews) that provide for reasonable progress towards achieving natural visibility conditions."[36] As directed by the statute, and reiterated in the regulations, the State must evaluate four-factors to establish the reasonable progress goal for the in-State Class I area.[37] These factors are: (1) "costs of compliance;" (2) "the time necessary for compliance"; (3) "the energy and non-air quality environmental impacts of compliance"; and (4) "the remaining useful life of any potentially affected sources."[38] EPA's guidance explains that "[i]n this context we believe that the cost of compliance factor can be interpreted to encompass the cost of compliance for individual sources or source categories…."[39] Notably, while the visibility improvement or benefit of any particular control measure is included as a factor in a BART determination, it is not one of the statutory factors to be considered in establishing an RPG. The BART requirements (as discussed below) are source-specific and intended to be applied at individual sources, while the RPG addresses regional haze from a broad group of sources analyzed using the four statutory factors.

Luminant Stated that the CAA does not mandate any specific rate of progress as "reasonable progress" towards meeting the goal.[40] Instead, in its regulations, EPA established an analytical requirement for measuring reasonable progress towards attainment of the national goal by the year 2064.[41] Reasonable progress goals are not enforceable measures in a State's SIP,[42] but rather "interim goals that represent incremental visibility improvement over time."[43] Ultimately, States have discretion and considerable flexibility in setting their reasonable progress goals.[44]

Luminant Stated that EPA guidance explains the analytical process States should follow in establishing their reasonable progress goals. States must first "[i]dentify the key pollutants and sources ***and/or*** source categories that are contributing to visibility impairment at each Class I area," and then "identify the control measures and associated emission reductions that are expected to result from compliance with existing rules and other available measures."[45] Importantly, EPA explains that "[g]iven the significant emissions reductions that we anticipate to result from BART, . . . and the implementation of other CAA programs, ... for many States this will be an important step in determining [the reasonable progress goal], ***and it may be all that is necessary to achieve reasonable progress in the first planning period*** for some States."[46]

Next, Luminant noted that States are to "[a]nalyze and determine the rate of progress needed to attain natural visibility conditions by the year 2064[,]" which is known as the "uniform rate of progress" or "URP."[47] The URP simply serves as an analytical benchmark that defines the rate of progress that would achieve natural visibility by 2064. EPA's regulations provide that the URP need not be achieved in practice and that a "reasonable" rate of progress may achieve natural conditions at a slower rate, well past 2064. Under the regulations, "if the State establishes a reasonable progress goal that provides for a slower rate of improvement in visibility than the [uniform rate of progress]," EPA's regulations provide that the State "demonstrate, based on the [four-factors], that the [uniform rate of progress] is not reasonable; and that the progress goal adopted by the State is reasonable."[48]

Luminant Stated that the regulations further define how reasonable progress goals are measured. Reasonable progress goals "must 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."[49] The term "most impaired days" is defined as "the average visibility impairment (measured in deciviews) for the twenty percent of monitored days in a calendar year with the highest amount of visibility impairment," and the term "least impaired days" is defined as "the average visibility impairment (measured in deciviews) for the twenty percent of monitored days in a calendar year with the lowest amount of visibility impairment."[50] Thus, the regulations require that the reasonable progress goal must provide improvement on the 20 percent worst days and no degradation on the 20 percent best days.

According to Luminant, States' "RPGs are ***interim*** goals that represent incremental visibility improvement over time."[51] Thus, unlike BART determinations for individual sources (discussed below), which are one-time determinations, States submit their reasonable progress SIPs in phases. The first submittal covers the "first planning period" from 2008 to 2018. States then update their reasonable progress goals and long-term strategies in the form of SIP revisions at ten-year intervals thereafter (thus, the first update is due on July 31, 2018).[52] For each revision for the applicable planning period, the State "must evaluate and reassess all of the elements required [by § 51.308(d)], taking into account improvements in monitoring data collection and analysis techniques, control technologies, and other relevant factors."[53] A State's revision must address the following: (1) "[c]urrent visibility conditions" and "actual progress made towards natural conditions"; (2) the "effectiveness of the long-term strategy"; and (3) "[a]ffirmation of, or revision to, the reasonable progress goal," including an evaluation of the reasonableness of the goal if a "slower rate of progress" had originally been adopted.[54] The time period for the Texas SIP submission under review here is the first planning period—2008 to 2018—although, as explained below, EPA's proposed FIP erroneously and unlawfully seeks to reach outside the first planning period to 2020.

In addition to 10-year SIP revisions, Luminant noted that each State must submit a progress report to EPA at five-year intervals beginning Five-years after the submission of the initial regional haze SIP, evaluating the State's progress towards meeting the reasonable progress goals for each Class I area within the State and each affected out-of-State Class I area.[55] Depending on the conclusions in the progress report, the State may need to revise its SIP or take other action.[56]

Footnotes:
[36] 40 C.F.R. § 51.308(d)(1).
[37] 42 U.S.C. § 7491(g)(1); 40 C.F.R. § 51.308(d)(1)(i)(A).
[38] 40 C.F.R. § 51.308(d)(1)(i)(A); see also 42 U.S.C. § 7491(g)(1).
[39] EPA Reasonable Progress Guidance at 5-1 (emphasis added); EPA, Additional Regional Haze Questions 9 (Sept. 27, 2006) ("Reasonable progress is not required to be demonstrated on a source-by-source basis.").
[40] 42 U.S.C. § 7491(b)(2).
[41] See 40 C.F.R. § 51.308(d)(1)(ii).
[42] Id. § 51.308(d)(1)(v).
[43] EPA Reasonable Progress Guidance at 1-2.
[44] The legislative history of the regional haze program also supports this flexible approach. For instance, in the conference committee that reconciled the House and Senate versions of the 1977 amendments the term "reasonable progress" was specifically changed from term "maximum feasible progress." See 1 Legislative History of the Clean Air Act Amendments 1977 Pub. L. No. 95-
95 155 (1977) ("The term 'maximum feasible progress' is changed to read 'reasonable progress' whenever it appears in the section.").
[45] EPA Reasonable Progress Guidance at 2-3.
[46] Id. at 4-1 (emphasis added).
[47] 40 C.F.R. § 51.308(d)(1)(i)(B).
[48] Id. § 51.308(d)(1)(ii).
[49] Id. § 51.308(d)(1) (emphasis added).

[50] Id. § 51.301.
[51] EPA Reasonable Progress Guidance at 1-2 (emphasis added).
[52] 40 C.F.R. § 51.308(f).
[53] Id.
[54] Id. § 51.308(f)(1)–(3).
[55] Id. § 51.308(g).
[56] Id. § 51.308(h).

Response: We acknowledge the background information provided by the commenter. We take no position with respect to the commenter's synopsis. Consideration of visibility, our basis for promulgating a FIP that includes source specific controls under reasonable progress, and our authority to require installation of controls beyond the first planning period are discussed elsewhere in this document.

Comment: Earthjustice et al., provided background on BART. [Earthjustice (0067) p.7]

Earthjustice et al., explained that, as one element of making progress towards the natural visibility goal, BART controls are required at fossil fuel-fired power plants and other major stationary sources that "may reasonably be anticipated to cause or contribute to any impairment of visibility in any mandatory Class I Federal area," and were in existence in 1977, but were not in operation before 1962. 42 U.S.C. § 7491(b)(2)(A); 40 C.F.R. § 51.308(e). The term "major stationary source" is defined to include any source that has the potential to emit 250 tons per year or more of any pollutant, and falls within one of 26 categories of industrial sources defined by the Act. 42 U.S.C. § 7491(g)(7). BART is defined as "an emission limitation based on the degree of reduction achievable through the application of the *best* system of continuous emission reduction for each pollutant which is emitted by an existing stationary facility." 40 C.F.R. § 51.301 (emphasis added).

When determining BART, the States and EPA must analyze "the best system of continuous emission control technology available" by taking into consideration five factors: (1) the costs of compliance, (2) the energy and non-air quality environmental impacts of compliance, (3) existing pollution controls at the source, (4) the remaining useful life of the source, and (5) the degree of visibility improvement from pollution controls. *Id.* § 51.308(e)(1)(ii)(A). BART is an essential component of the regional haze program because Congress largely grandfathered these antiquated sources into many of the Clean Air Act's requirements. *See* 70 Fed. Reg. 39,104, 39,111 (July 6, 2005). BART compels these older, disproportionately-polluting sources to install up-to-date and cost-effective pollution controls.

BART is a mandatory measure that must be implemented to achieve reasonable progress toward restoration of natural visibility conditions. The Clean Air Act expressly requires States to adopt SIPs that contain "emission limits, schedules of compliance and other measures as may be necessary to make reasonable progress toward meeting the national goal . . . *including*" the installation and operation of BART at eligible sources that emit any air pollutant which may reasonably be anticipated to cause or contribute to visibility impairment in any Class I area. 42 U.S.C. § 7491(b)(2) (emphasis added). The only permissible exemption from BART is when EPA, by rule promulgated with sufficient notice and opportunity for public comment, determines that (1) the source does not "by itself or in combination with other sources" cause or contribute to significant visibility impairment at a Class I area; (2) if the power plant has a design capacity of 750 megawatts or greater, the owner or operator must demonstrate to EPA that the plant is located at such a distance from all Class I areas that it does not "by itself or in combination with other sources" emit pollution that may reasonably be anticipated to cause or contribute to significant visibility impairment at a Class I area; and (3) the affected Federal Land Managers concur with the BART exemption. *Id.* § 7491(c).[4]

Footnote:
[4] *See also* 40 C.F.R. § 51.308(e) (requiring BART for each eligible source "that may reasonably be anticipated to cause or contribute to any impairment of visibility in any mandatory Class I Federal area, unless the State demonstrates that an emissions trading program or other alternative will achieve greater reasonable progress toward natural visibility conditions.").

Response: We acknowledge the background information provided by the commenter. We take no position with respect to the commenter's synopsis.

Comment: Luminant provided background information on the process for determining BART. [Luminant (0061) p.10]

According to Luminant, under the BART requirement, States must develop "emission limitations representing BART" for certain major stationary sources of air emissions.[63] A State's BART determination "must be based on an analysis of the best system of continuous emission control technology available and associated emission reductions achievable for each BART-eligible source that is subject to BART within the State."[64] The State evaluates five factors when making a BART determination: (1) "the costs of compliance"; (2) "the energy and non-air quality environmental impacts of compliance"; (3) "any existing pollution control technology in use at the source"; (4) "the remaining useful life of the source"; and (5) "the degree of improvement in visibility which may reasonably be anticipated to result from the use of such technology."[65] This fifth factor distinguishes the BART analysis from the reasonable progress analysis, which does not contain visibility improvement as a factor.

Luminant explained that BART-eligible sources are those that "were 'in existence' on August 7, 1977 but were not 'in operation' before August 7, 1962" and "have potential emissions greater than 250 tons per year."[66] As required by the statute, EPA has developed BART guidelines to assist States in making BART determinations.[67] For fossil fuel units that have a "total generating capacity greater than 750 megawatts," the State is required to follow EPA's BART guidelines.[68]

According to Luminant, in lieu of source-specific BART, EPA's regulations specifically authorize participation by States in a regional trading program instead of requiring "sources subject to BART to install, operate, and maintain BART."[69] The regulations provide that the emissions trading program "must achieve greater reasonable progress than would be achieved through the installation and operation of BART."[70] As discussed more fully below, EPA has found that both the Clean Air Interstate Rule ("CAIR") and the replacement Cross State Air Pollution Rule ("CSAPR"), which limit SO_2 and NO_x emissions from EGUs, are "better-than-BART" and operate as BART alternatives for States subject to those programs, including Texas.

Footnotes:
[65] 42 U.S.C. § 7491(g)(2); see 40 C.F.R. § 51.308(e)(1)(ii)(A).
[66] 40 C.F.R. pt. 51, app. Y.
[67] See id.
[68] Id. § 51.308(e)(1)(ii)(B).
[69] Id. § 51.308(e)(2); see 70 Fed. Reg. 39,104, 39,138–43 (July 6, 2005); Util. Air Regulatory Grp. v. EPA, 471 F.3d 1333, 1339–41 (D.C. Cir. 2006) (upholding "EPA's substitution of CAIR for BART").
[70] 40 C.F.R. § 51.308(e)(2).

Response: We acknowledge the background information provided by the commenter. We take no position with respect to the commenter's synopsis. For comments relating to visibility as a consideration, we have addressed those specific comments elsewhere.

Comment: [Earthjustice (0067) p.1]. EPA must finalize these disapprovals in order to fulfill its statutory responsibility to review State implementation plan ("SIP") submittals and disapprove proposed plans that do not comply with Clean Air Act requirements. Earthjustice et al., stated that EPA must also finalize a Federal implementation plan ("FIP") to remedy the deficiencies EPA is disapproving in the Texas and Oklahoma plans.

Response: We are finalizing the majority of our SIP disapproval and FIP in this action as detailed in our final rule. As discussed in the final action and other parts of our responses to comments, given the uncertainty arising from the remand of Texas' CSAPR budgets, we have concluded that it would not be appropriate to finalize our proposed determination to rely on CSAPR as an alternative to SO_2 and NO_X BART for EGUs in Texas at this time. Because of the CASPR remand and resulting uncertainty regarding SO_2 and NO_X BART for EGUs, we have also decided not to finalize our proposed approval of Texas' PM BART determination. Finally, today's action does not finalize the portion of our proposed FIP addressing Texas' interstate visibility transport obligations because that portion of the FIP would have partially relied on CSAPR.

Comment: [Earthjustice (0067) p.19] Earthjustice et al., stated that Texas' do-nothing approach does not comply with applicable Clean Air Act requirements, and EPA has no choice but to disapprove it. We explain in detail below why EPA must disapprove Texas' regional haze SIP and Oklahoma's reasonable progress goals (which unreasonably failed to account for any emission reductions from Texas sources that impact Class I Areas in Oklahoma) and why the SO_2 emissions limits EPA proposes are reasonable, as are the revised reasonable progress goals for Texas and Oklahoma.

Response: While we generally agree with the necessity to disapprove the Texas and Oklahoma SIPs, we take no position as to specific statements made in this comment. We appreciate commenters support with regards to the FIP SO_2 limits and revised reasonable progress goals.

Comment: EPA Must Disapprove Texas' Inadequate Regional Haze SIP. [Earthjustice (0067) p.19, 59] The Texas SIP failed to satisfy the haze requirements in the Clean Air Act on multiple grounds, and EPA's proposed disapproval of the Texas SIP is therefore proper.

Earthjustice et al., urged EPA to finalize a strong regional haze plan for Texas, which is vital to restoring clean air for the people and iconic national parks and wilderness areas in Texas and the region.

Response: We appreciate commenters' support of our finalization of the disapproval and the FIP. We take no position on any other specific statements made in the comment.

Comment: [Earthjustice (0067) p. 1-2]. **EPA's proposed measures are actually conservative in light of the fact that it could – and should – have disapproved additional sections of Texas' SIP and required pollutant reductions from additional sources under the proposed FIP**.
As discussed in the accompanying report by Victoria Stamper (0068), EPA's proposed controls are even more cost-effective than EPA has calculated. Earthjustice et al., stated that the EPA's proposed SO_2 emission limits on 15 Texas sources is a critically important, albeit conservative measure, and EPA should finalize the proposed reduction requirements and evaluate additional measures to make greater gains in visibility at the effected in and out of State Class I areas. The proposed FIP represents a critically important, minimum set of controls necessary for Texas to make reasonable progress toward eliminating haze at its own and out-of-State parks and wilderness areas. These controls would not only fulfill the statutory mandate to clean up our national parks and wilderness areas [sic]. As discussed in the accompanying report by Dr. George Thurston, the proposed controls would yield billions of dollars in public health benefits by avoiding the premature deaths, respiratory conditions, and other health problems caused by the emissions that also contribute to haze.

Response: We agree with commenters that we have the authority to finalize a FIP where our review of a SIP merits a disapproval. We appreciate commenters support regarding our FIP. We address the general issues concerning the costs of our controls and the ancillary health benefits of our final action elsewhere.

Comment: EPA Should Clarify that Each Flaw in Texas' Haze SIP Provides an Independent Basis for EPA's SIP Disapproval. [Earthjustice (0067) p.5]

Earthjustice et al., stated that the EPA properly proposes to disapprove Texas' regional haze SIP because (1) Texas did not accurately calculate natural visibility conditions at Big Bend and Guadalupe Mountains, (2) Texas' statewide reasonable progress analysis is not supported by the record, is not well-reasoned, and does not comply with Clean Air Act requirements, (3) Texas' reasonable progress goals for Big Bend and the Guadalupe Mountains violated the Clean Air Act and the regional haze regulations, and (4) Texas' long-term strategy was based on a technically inadequate consultation with Oklahoma and did not require the control measures needed for reasonable progress at the Wichita Mountains. Each of these significant flaws in Texas' haze SIP is fatal and each flaw provides an independent ground for EPA to disapprove the SIP. In the final rule, EPA should clarify this fact and make clear that each flaw provides an independent basis for EPA's SIP disapproval. For example, even if EPA had approved Texas' calculation of natural visibility conditions, EPA would still be required to disapprove the SIP's inadequate RPGs and long-term strategy.

Response: We thank commenters for the support. We also agree with the comment that items one through four listed above provide separate bases for disapproval. We have addressed those comments elsewhere in this document.

2. State and Federal Roles in the Regional Haze Program

Comment: Commenters argue that EPA's proposal to disapprove Texas and Oklahoma regional haze SIPs disregards the primary role of the States under the CAA, the Regional Haze Rule, and relevant case law, therefore, EPA acted outside its authority. Some commenters argue that the Clean Air Act is based on principles of cooperative Federalism that require EPA to defer to their States in development of implementation plans, so long as necessary statutory requirements are met. Commenters stated that EPA's proposal ignores such limits and would impose FIPs that ignore the primary implementation role given to Texas and Oklahoma

Response: We do not agree. Our action does accord with the CAA. Congress crafted the CAA to provide for States to take the lead in developing implementation plans, but also required EPA to review SIPs for compliance with statutory and regulatory requirements. We recognize that States have the primary responsibility of drafting an implementation plan to address the requirements of the regional haze program. We also recognize that we have the responsibility of ensuring that the State plans, including Regional Haze (RH) SIPs, conform to the CAA requirements. We have determined that the Texas and Oklahoma SIPs do not meet certain elements of the Federal regional haze requirements, and we discuss in our final actions those portions of the SIP that we will disapprove.

Additionally, our review of SIPs is not limited to a ministerial review and approval of a State's submittal. We disagree with the commenters arguments regarding cooperative Federalism. Under this framework, the CAA directs us to act if a State fails to submit a SIP, submits an incomplete SIP, or submits a SIP that does not meet the Federal requirements. Thus, the CAA provides us with a critical oversight role in ensuring that SIPs meet the Act's requirements.

Comment: Commenters Stated that Texas' plan was complete by operation of law, met all requirements, and that EPA had no authority to impose a FIP.

Response: We disagree. The commenters confuse the actions of merely submitting a SIP and having it deemed complete, with the process of reviewing that SIP for compliance with the applicable Federal requirements. We agree that the States are given flexibility in developing a SIP, but in doing so, they are required to adopt SIPs that meet Federal requirements. EPA must review a State's submittal and determine whether it meets Federal requirements. If it does not, EPA has authority to impose a FIP to fill in the gaps. In this instance, we determined that portions of the State's submittal did not meet many of our regional haze requirements. These determinations are discussed elsewhere in this document and final action.

Comment: Some commenters argued that the EPA's Regional Haze Rule (RHR) established the remedy for a substantially inadequate plan as periodic updates, not a Federal plan.

Response: We do not agree with commenters' asserted position that the remedy for an unapprovable Regional Haze SIP is periodic updates. The Regional Haze Rule's requirements for comprehensive periodic revisions (see 40 CFR 51.308(f)) and periodic progress reports (see 40 CFR 51.308(g)) are very different from the authority to impose a FIP when there is a determination that a SIP is not approvable. As we have stated elsewhere, we have the authority and obligation to impose a FIP to fill in such gaps. The provisions of the Regional Haze Rule regarding States' ongoing responsibility to periodically revise their RH SIPs do not override this responsibility.

Comment: Earthjustice provided background on EPA's authority regarding regional haze. [Earthjustice (0067) p.10]

Earthjustice Stated that the Clean Air Act's regional haze program provides States with the initial opportunity to develop regional haze SIPs that clean up the air in our nation's national parks and wilderness areas in accordance with the Regional Haze Rule and EPA guidance. *See* 40 C.F.R. § 51.308. Where a State's regional haze plan fails to establish a haze program that complies with the applicable legal requirements, the Clean Air Act's cooperative Federalism provisions require EPA to exercise Federal oversight by disapproving the State plan and issuing a Federal implementation plan ("FIP") in its place. 42 U.S.C. § 7410(c)(1); *Oklahoma v. EPA*, 723 F.3d 1201, 1207-10 (10th Cir. 2013).

According to Earthjustice, Congress gave EPA the final say on whether a State's regional haze SIP complies with the Clean Air Act. 42 U.S.C. §§ 7410(c)(1), (k)(3), (l), 7491. As the courts have recognized, EPA has broad oversight authority over the regional haze program and is obligated to disapprove State haze SIPs that fail to comply with the Act. *North Dakota v. EPA*, 730 F.3d 750, 760-62 (8th Cir. 2013); *Oklahoma v. EPA*, 723 F.3d at 1207-10. Congress gave EPA this broad oversight authority to prevent recalcitrant States from undermining the purposes of the Clean Air Act through inadequate SIPs. *See, e.g.*, *Alaska Dep't of Envtl. Conservation v. EPA*, 298 F.3d 814, 819-20 (9th Cir. 2002) (Congress gave EPA oversight authority because of "disappointing State response[s] to air pollution concerns" and its recognition that "States experience[] internal industry 'pressure . . . to relax their standards'"), *aff'd*, 540 U.S. 461 (2004).

Response: We acknowledge the background information provided by the commenter. We take no position with respect to the commenter's synopsis.

Comment: EPA's proposal unlawfully ignores the primary role and flexibility that the clean air act gives to States to determine reasonable progress. [Luminant (0061) p. 56]

Luminant Stated that the EPA's proposal to disapprove the Texas and Oklahoma regional haze SIPs disregards the primary role of the States under the Clean Air Act generally and under the

Regional Haze Rule in particular and is thus outside of EPA's authority. EPA "is a creature of statute" and "has no power to act unless and until Congress confers power upon it."[398] EPA's proposal, and the underlying methodology and criteria that EPA employs, are not authorized by either the statute or the regulations, and thus EPA's proposal is unlawful.

According to Luminant, the Clean Air Act gives the States the primary role and substantial discretion in formulating plans for meeting the statutory goals and requirements, including in particular in the regional haze program. The Clean Air Act "establishes a comprehensive program for controlling and improving the nation's air quality through State and Federal regulation."[399] Congress chose a "cooperative Federalism" structure to implement the statute, dividing authority between the Federal government and the States.[400] Within this division, "air pollution prevention . . . is the primary responsibility of States and local governments."[401]

Luminant Stated, consistent with this structure, as to visibility protection, EPA's job is to "promulgate regulations to assure . . . reasonable progress toward meeting the national goal" of preventing future and remedying existing visibility impairment in Class I areas, but it is the SIP that contains the "measures" "necessary to make reasonable progress."[402] EPA's role in reviewing SIP provisions developed by States to make reasonable progress is limited. As the Fifth Circuit has explained: "The great flexibility accorded the States under the Clean Air Act is . . . illustrated by the sharply contrasting, narrow role to be played by EPA."[403] In that narrow role, where a SIP meets the basic requirements ***of the statute***, EPA must approve it.[404] "With regard to implementation, the Act confines the EPA to the ministerial function of reviewing SIPs for consistency with ***the Act's*** requirements."[405] Indeed, "the EPA has no authority to question the wisdom of a State's choices of emission limitations if they are part of a SIP that otherwise satisfies the standards set forth in 42 U.S.C. § 7410(a)(2)."[406] The Clean Air Act "supplies the goals and basic requirements of [SIPs], but the States have broad authority to determine the methods and particular control strategies they will use to achieve the statutory requirements."[407] EPA's regional haze regulations and guidance confirm the States' primary role in determining "reasonable progress." EPA's implementing regulations "call[] for States to play the lead role in designing and implementing regional haze programs…."[408] And the regulations, EPA explained at the time of their adoption, are "based on the principle that States should have considerable flexibility in adopting visibility improvement goals and in choosing the associated emission reduction strategies for making 'reasonable progress' toward the national visibility goal."[409]

Accordingly, Luminant noted "[t]he final regional haze rule . . . provide[s] the States considerable discretion in establishing reasonable progress goals for improving visibility in the Class I areas."[410] "The State must address regional haze" by "establishing a reasonable progress goal" for each Class I area in the State.[411] In doing so, "the State must . . . [c]onsider" the 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…."[412] As EPA has recently explained, States have discretion and considerable flexibility in setting their reasonable progress goals based on these factors:

> The RHR does not mandate specific milestones or rates of progress, but instead calls for States to establish goals that provide for "reasonable progress" toward achieving natural (i.e., "background") visibility conditions . . . States have

> significant discretion in establishing RPGs, but are required to consider the [four] factors established in section 169A of the CAA and in EPA's RHR at 40 CFR 51.308(d)(1)(i)(A) . . . States have considerable flexibility in how they take these factors into consideration….[413]

EPA, by contrast, is not given authority to consider these factors independently, but instead "[i]n determining whether the State's goal for visibility improvement provides for reasonable progress . . . the Administrator will evaluate the demonstrations developed by the State…."[414] Indeed, EPA itself has explained that, "[a]s long as this evaluation is done adequately and the States provide a reasoned basis for their decisions, ***EPA will defer to the State***" in its reasonable progress determinations.[415] As we discuss below, EPA has abandoned that approach—the approach it has taken with respect to every other State's regional haze SIP—in its review of the Texas SIP, without explanation or justification.

Luminant explained that EPA guidance has consistently confirmed the discretion and flexibility given to States that is inherent in determining reasonable progress. EPA explained when issuing its regional haze regulations: "The final rule provides States flexibility in ***determining the amount of progress that is 'reasonable'*** in light of the statutory factors, and also provides flexibility to determine the best mix of strategies to meet the reasonable progress goal they select."[416] And in its regional haze guidance to the States for developing their SIPs for the first planning period, EPA again emphasized that the regulations "give[] States wide latitude to determine additional control requirements" and, in applying the four statutory factors, States "have flexibility in how to take into consideration these statutory factors and any other factors that you have determined to be relevant."[417] A State's discretion extends to all aspects of the reasonable progress determination, including "whether given emission reduction measures are reasonable" and whether "the uniform glide path is not reasonable based on the application of the factors."[418]

Luminant asserted that the EPA's proposed disapproval thus flies in the face of the CAA, Texas' primary role, and substantial flexibility States are given in determining reasonable progress, even by EPA's own admission and guidelines. EPA does not dispute that Texas applied the four statutory factors, and did so in a manner consistent with EPA's regulations and guidance. EPA does not dispute that, following multi-year planning and consultation among CENRAP States, Texas and the other States ***agreed on*** coordinated goals and strategies for improving visibility at the Class I areas. But EPA's proposal credits none of that. Instead, EPA simply asserts that Texas and Oklahoma should have conducted their analysis and State coordination differently. The Clean Air Act, however, does not authorize EPA to second-guess the States' choices, so long as the statutory standards are met, as they are here.[419] The nature of the reasonable progress test is to allow the regulator to exercise discretion.[420] TCEQ here exercised such judgment and discretion. The facts were presented and TCEQ reached its conclusions, which were made based not just on the cost of compliance, but with consideration of the four-factors along with additional information that was pertinent. EPA may not like the result, but that is irrelevant when, as here, the State is given discretion by the Clean Air Act, the regional haze rule, and EPA's reasonable progress guidance, and its exercise of that discretion was reasonable and adequately explained. EPA may believe its goals and analysis are *more* reasonable than Texas's.

But, even if that were true (and, as we show below, it is not), “the CAA requires only that a State establish reasonable progress, not the most reasonable progress.”[421]

Footnotes:
[398] Elec. Power Supply Ass’n v. FERC, 753 F.3d 216, 220 (D.C. Cir. 2014).
[399] BCCA Appeal Grp. v. EPA, 355 F.3d 817, 821–22 (5th Cir. 2003).
[400] Michigan v. EPA, 268 F.3d 1075, 1083 (D.C. Cir. 2001); see also Fla. Power & Light Co. v. Costle, 650 F.2d 579, 581 (5th Cir. 1981) (“Congress chose a balanced scheme of State-Federal interaction to implement the goals of the [Clean Air] Act.”).
[401] 42 U.S.C. § 7401(a)(3). See also North Dakota, 730 F.3d at 760–6 (“[T]he CAA grants States the primary role of determining the appropriate pollution controls within their borders . . . .”).
[402] 42 U.S.C. § 7491(b).
[403] Fla. Power & Light Co., 650 F.2d at 587.
[404] See, e.g., 42 U.S.C. § 7410(k)(3) (“[T]he Administrator shall approve [a SIP or SIP revision] as a whole if it meets all of the applicable requirements of this Act.”).
[405] Luminant Generation Co. LLC, 675 F.3d at 921 (emphasis added) (citing § 7410(k)(3)) (“[T]he [EPA] Administrator shall approve [a SIP or SIP revision] as a whole if it meets all of the applicable requirements of this Act.” (emphasis added))); Fla. Power &
Light Co., 650 F.2d at 587 (“The great flexibility accorded the States under the Clean Air Act is . . . illustrated by the sharply contrasting, narrow role to be played by EPA.”).
[406] CleanCOALition v. TXU Power, 536 F.3d 469, 472 n.3 (5th Cir. 2008).
[407] BCCA Appeal Grp., 355 F.3d at 822.
[408] Am. Corn Growers Ass’n., 291 F.3d at 2.
[409] EPA, Response to Petitions for Reconsideration of Regional Haze Rule 11 (Jan. 10, 2001) (“Response to Petitions”).
[410] Id. at 12 (Jan. 10, 2001).
[411] 40 C.F.R. § 51.308(d)(1)(i).
[412] Id. § 51.308(d)(1)(i)(A) (emphasis added). See also 64 Fed. Reg. at 35,731 (“Today’s final rule requires the States to determine the rate of progress for remedying existing impairment that is reasonable, taking into consideration the statutory factors, and informed input from all stakeholders.”).
[413] 77 Fed. Reg. at 30,251 (emphasis added).
[414] 40 C.F.R. § 51.308(d)(1)(iii) (emphasis added).
[415] 77 Fed. Reg. 40,150, 40,156 (July 6, 2012) (emphasis added).
[416] 64 Fed. Reg. at 35,736 (emphasis added).
[417] EPA Reasonable Progress Guidance at 4-2, 5-1.
[418] EPA, Additional Regional Haze Questions 10 (Sept. 27, 2006).
[419] See Luminant Generation, 675 F.3d at 921; Cf. Alaska Dep’t of Envtl. Conservation v. EPA, 540 U.S. 461, 491 (2004) (“Only when a State agency's BACT determination is ‘not based on a reasoned analysis may EPA step in to ensure that the statutory requirements are honored.” (internal citations omitted)).
[420] Reasonable Progress Guidance at 5-1.
[421] North Dakota, 730 F.3d at 768.

Response: We do not agree that our partial disapproval of the Texas Regional Haze SIP is contrary to the CAA, the Regional Haze Rule, or relevant case law. Congress crafted the CAA to provide for States to take the lead in developing implementation plans, but balanced that decision by requiring us to review the plans to determine whether a SIP meets the requirements of the CAA. EPA's review of SIPs is not limited to a ministerial review and approval of a State's decisions. EPA must review the State’s SIP submittal and determine whether its meets the requisite Federal requirements. If it does not, the CAA grants EPA authority to impose a Federal plan to fill in such gaps.

Nothing in the CAA indicates that EPA's role is less important in the context of the regional haze program than under other CAA programs. On the contrary, CAA Section 110(a)(2)(J) explicitly requires that SIPs "meet the applicable requirements" of Part C of Title I of the CAA including the requirements for visibility protection set forth in sections 169A and 169B.[6] Pursuant to Section 169A(b), EPA is required to promulgate visibility protection regulations that apply to "each applicable implementation plan" (i.e., each SIP or FIP)[7] for each State containing one or more Class I areas and each State "emissions from which may reasonably be anticipated to cause or contribute to any impairment of visibility in any [Class I area]." [8] The CAA specifies that these regulations (including the Regional Haze Rule) must require each such SIP or FIP to "contain such emission limits, schedules of compliance and other measures as may be necessary to make reasonable progress toward meeting the national goal," as determined by the State (or by us in the case of a FIP).[9] Thus, we have an undiminished obligation to review State plan submissions for compliance with Regional Haze Rule requirements. As with all other cases of our action on plan submissions, we are bound to follow the statutory direction set forth in CAA Section 110(k).

Pursuant to CAA Section 110, States must submit SIPs to us for review and we must review SIPs for compliance with the Act's requirements and may not approve any SIP revision that "would interfere with any applicable requirement" of the Act.[10] Furthermore, the Act mandates that we promulgate a FIP when we find that a State has failed to submit a required SIP to the Agency, failed to submit a complete SIP, or where we disapprove a SIP in whole or in part.[11] Thus, the CAA provides us with a critical oversight role in ensuring that SIPs meet the Act's requirements.

The cases cited by Luminant do not support an argument that our role as a reviewer is any less critical in the regional haze context than it is in reviewing other SIP components. We agree that the CAA places the requirements for developing Regional Haze plans and determining RPGs on States. As discussed above, our role is to review the Regional Haze SIP submittal including the RPG determinations and determine if the State met the applicable statutory and regulatory requirements. While the court in *American Corn Growers* found that we had impermissibly constrained State authority, it did so because it found that we forced States to require BART controls without first assessing a source's particular contribution to visibility impairment. This is not the case with our action. EPA must ensure that Regional Haze SIPs comply with the applicable statutory and regulatory provisions. *Oklahoma v. EPA*, 723 F.3d 1201, 1208 (10th Cir. 2013). Likewise, in the present action, we are disapproving portions of the Texas and Oklahoma RH SIPs because those pieces did not meet the requirements of the Regional Haze Rule, and our detailed responses to those portions of our disapproval are explained elsewhere.

[6] CAA sections 110(a)(2)(J), 169A and 169B 42 U.S.C. 7410(a)(2)(J), 7491 and 7492.
[7] Under the CAA, "applicable implementation plan" is defined as "the portion (or portions) of the implementation plan, or most recent revision thereof, which has been approved under [CAA section 110], or promulgated under [CAA section 110](c) * * * and which implements the relevant requirements of [the CAA]." CAA section 302(q), 42 U.S.C. 7602(q). In other words, an "applicable implementation plan" is an EPA-approved SIP or Tribal Implementation Plan, or an EPA-promulgated FIP.
[8] 42 U.S.C. 7491(b)(2). In promulgating the Regional Haze Rule, EPA determined that "all States contain sources whose emissions are reasonably anticipated to contribute to regional haze in a Class I area and, therefore, must submit regional haze SIPs."64 FR 35720; see also 40 CFR 51.300(b)(3).
[9] 42 U.S.C. 7491(b)(2).
[10] CAA section 110(a)(1), (k)(3) and (l), 42 U.S.C. 7410(a)(1), (k)(3) and (l).
[11] See id. Section 7410(c)(1).

We have the authority to issue a FIP either when we have made a finding that the State has failed to timely submit a SIP or where we have found a SIP deficient. Here, we have authority on the latter grounds, and we have approved those pieces of the SIP that meet Federal regional haze requirements and adopted a FIP to fill the remaining gaps. Our action today is consistent with the statute.

Several cases are cited by Luminant asserting that the State has the primary role in air pollution prevention and that CAA confines us to the ministerial function of reviewing SIPs for consistency with the Act's requirements, including *Luminant Generation v. EPA*, 675 F.3d 917 (5th Cir. 2012), *Florida Power & Light Co. v. Costle*, 650 F.2d 579 (5th Cir. 1981), and *N.D. v. United States EPA*, 730 F.3d 750 (8th Cir. 2013).

Luminant Generation v. EPA involved our disapprovals of SIP revisions involving Texas' minor new source review (NSR) program. As noted by the Luminant court, "because 'the Act includes no specifics regarding the structure or functioning of minor NSR programs' and because the implementing regulations are 'very general [,] . . . SIP-approved minor NSR programs can vary quite widely from State to State.'"[12] By contrast, Regional Haze SIPs are subject to detailed requirements set forth in CAA sections 169A and the Regional Haze Rule. In *Luminant*, the Fifth Circuit found that we failed to tie our disapproval to any requirement of the CAA or our implementing regulations. [13] In *Florida Power & Light Co. v. Costle*, the court held that we must approve a SIP that "meets statutory criteria." In this case, our partial disapproval is based on the SIP's failure to comply with portions of the Federal regional haze requirements as detailed elsewhere in our responses to comments and in our final action.

In *N.D. v. EPA*, Luminant quoted the court as stating, "[T]he CAA grants States the primary role of determining the appropriate pollution controls within their borders…" However, this quote is not fully reproduced, leading to an inaccurate characterization of the court's opinion. The full sentence of the court Stated, "*Although* the CAA grants States the primary role of determining the appropriate pollution controls within their borders, *EPA is left with more than the ministerial task of routinely approving SIP submissions*."(emphasis added) [14]

The court in *North Dakota* also held that the CAA and the States operate under a framework of "cooperative Federalism."[15] Under this framework, the court stated that the CAA left the individual States to make pollution restriction for particular emitters within that State. "But, if a State fails to submit a SIP, submits an incomplete SIP, or submits a SIP that does not meet the statutory requirements, EPA is obligated to implement its own FIP to correct the deficiency in the SIP, unless the State can correct the deficiency itself and EPA can approve that correction within two years. 42 U.S.C. 7410(c). This is commonly referred to as cooperative Federalism, and both Section 169A and Section 110 operate under this framework."[16]

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[12] *Luminant Generation Co. LLC v. EPA*, 675 F.3d 917, 921 (5th Cir. 2012) (citing 74 FR 51418, 51421 (Oct. 6, 2009).

[13] Id. at 924, 929; 690 F.3d at 679, 682, 686.

[14] 730 F.3d at 760-61.

[15] *Id. at* 57.

[16] *Id*.

Luminant also places emphasis on our prior Statements. These Statements are not as supportive of Luminant's position as it suggests. For example, "some flexibility" does not suggest unfettered flexibility; a report's suggestion that a cooperative approach would make sense does not suggest that we will or must approve unilateral decision-making by a State no matter what.

We agree that the States are given flexibility in establishing reasonable progress goals, but they are required by the CAA to consider certain factors. Whether one characterizes our role as limited or not limited in reviewing RH SIPs, we must determine if the State's SIP meets the applicable statutory and regulatory requirements. The States' analyses and determinations were not approvable for reasons discussed elsewhere in this notice and the proposed rulemaking. While States have the authority to exercise different choices in setting RPGs, such decisions must be reasonable and consistent with statutory and regulatory requirements. Here, the States' errors were such that we cannot conclude that each State's decision met this standard. Our disapproval of portions of the Regional Haze SIP has an appropriate basis in our CAA authority.

With regard to the comment that our guidance only requires a four-factor analysis for potentially affected sources, we note that our RPG Guidance States the following:

> In determining reasonable progress, CAA § 169A(g)(1) requires States to take into consideration a number of factors. However, you have flexibility in how to take into consideration these statutory factors and any other factors that you have determined to be relevant. For example, the factors could be used to select which sources or activities should or should not be regulated, or they could be used to determine the level or stringency of control, if any, for selected sources or activities, or some combination of both. [17]

Our guidance for setting RPGs also provides that:

> The RHR gives States wide latitude to determine additional control requirements, and there are many ways to approach identifying additional reasonable measures; however, you must at a minimum, consider the four statutory factors. Based on the contribution from certain source categories and the magnitude of their emissions you may determine that little additional analysis is required to determine further controls are not warranted for that category. [18]

Although the State has flexibility in how to consider the four statutory factors, it must do so in a reasonable manner. As we discuss in our proposal,[19] and elsewhere in this response to comments we do not believe that Texas complied with these requirements. Thus, we disagree with Luminant's assertion that, "EPA does not dispute that Texas applied the four statutory factors, and did so in a manner consistent with EPA's regulations and guidance." We also disagree with Luminant that the Regional Haze Rule confers approval as long as the State addresses the

[17] See EPA's Guidance for Setting Reasonable Progress Goals Under the Regional Haze Program (June 1, 2007), Section 5.0.
[18] See EPA's Guidance for Setting Reasonable Progress Goals Under the Regional Haze Program (June 1, 2007), Section 4.2.
[19] See discussion beginning on 79 FR 74838.

requirements in some form or fashion. A State's reasonable progress demonstration must satisfy the Act and our regulations, and Texas' demonstration failed to do so.

Luminant also stated that EPA's proposal did not credit the consultation and coordination among the CENRAP States regarding visibility improvement strategies. We disagree with this assertion. Please see our responses to commenters regarding consultation elsewhere in this document.

Comment: [Associations (0059) p. 2-4, 21] The Associations Stated that the EPA, in this proposal, seeks to dramatically increase its own authority over the regional haze program at the expense of the States and Tribes to whom Congress gave a primary role in implementing the regional haze program.

The Associations Stated that the EPA's proposal to disapprove of Texas' and Oklahoma's State Implementation Plans ("SIPs") and impose Federal Implementation Plans ("FIPs") in their place far exceeds EPA's legal authority under the Clean Air Act and would fundamentally transform the structure of the regional haze program from a State-driven program based on cooperative Federalism to a centralized, Federal program with little real input from States or regulated entities. Nothing in the Clean Air Act or the administrative record supports EPA's determination to supersede the States' judgment in mandating $2 billion in new emission controls that will have no perceptible impact on visibility. If finalized, EPA's proposal could create dangerous precedent that could be used by EPA in the future to disregard the decisions made by other States under the regional haze program, impose requirements found nowhere in the Clean Air Act or EPA's own regulations, and require States and industry to undertake significant and costly regulatory burdens disproportionate to any visibility benefit.

The Associations noted, in recognition of diminished visibility at national parks and other scenic areas, Congress enacted the Clean Air Act's regional haze provisions with a long-term goal of returning these areas to a State of natural visibility. At the same time, however, Congress realized such changes could not be fully realized immediately and adopted an approach by which States would make incremental improvements over time. Texas and Oklahoma have invested significant time and resources to understand the sources of regional haze related to their States, the effect of existing Federal and State programs to reduce emissions from such sources, and to cooperate with each other and other nearby States to improve visibility. These efforts have been successful, and measured improvements in visibility conditions at the Big Bend, Guadalupe Mountain, and Wichita Mountain Class I areas have exceeded the proposed reasonable progress goals EPA would set for these three areas.

The Associations Stated, despite the fact that real-world, measured air quality demonstrates that the States are on track to meet the visibility improvements contemplated by Congress and EPA, EPA has unreasonably proposed to disapprove their SIPs and impose FIPs in their place. The FIPs would impose emission control requirements on a handful of sources in Texas at significant cost, based on counterfactual projections that regional haze will somehow get worse, notwithstanding expected further emissions reductions from levels that have achieved the desired target today. And even then, EPA projects that these costly emissions controls would achieve only *de minimis* visibility improvements in 2018 that would not be perceptible to the human eye and, under EPA's own standards, would round to *zero*.

The Associations Stated that the EPA's proposal, which, in essence, second guesses the reasoned decisions made by Oklahoma and Texas in their SIPs, is both unlawful and flatly inconsistent with EPA's prior administration of the regional haze program where it has routinely approved SIPs that were functionally equivalent to those of Texas and Oklahoma without subjecting them to the same level of scrutiny. The Clean Air Act gives States primacy in implementing the regional haze program and limits EPA's review of regional haze SIPs to an analysis of whether or not the State has complied with statutory and regulatory requirements. Despite the fact that Texas and Oklahoma followed all applicable regulatory requirements for developing regional haze SIPs, EPA here proposes unlawfully to second-guess the States' decisions and to substitute its own judgment for that of the States. EPA compounds this error by applying an unlawful methodology that focuses on emission controls at individual sources rather than source categories and that places undue reliance on visibility benefits to the detriment of the statutory factors mandated by Congress.

Response: We take no position of the Associations' characterization of the intent of Congress. The role of States in the regional haze context, disapproval of SIPs, and cooperative Federalism has already been addressed above. We disagree with the Associations that our proposal was "based on counterfactual projections that regional haze will somehow get worse, notwithstanding expected further emissions reductions from levels that have achieved the desired target today." Our modeling does not project that visibility will worsen. In addition, the intent of the Regional Haze Rule is not limited to the maintenance of visibility. As we state in the Regional Haze Rule,[20] "The reasonable progress goals must 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." We determined (among other things) that Texas' reasonable progress and long-term strategy demonstration was flawed. Our FIP corrects these and other flaws in Texas' demonstration and will result in additional visibility improvement at the Class I areas in Texas and Oklahoma.

We address the issues of perceptibility, the significance of the anticipated visibility benefits, and source versus source category impact analysis in our responses to comments that raise these issues in more detail.

Comment: EPA's proposal unlawfully ignores State primacy in developing regional haze plans. [Associations (0059) p. 7-9, 12-13]

The Associations Stated that the EPA's proposal to disapprove Texas and Oklahoma's regional haze SIPs is unlawful because it disregards the primary role given to States in implementing the regional haze program. The Clean Air Act is built on principles of cooperative Federalism that require EPA to defer to States in developing implementation plans so long as necessary statutory requirements are met. EPA's proposal ignores those limits and would impose FIPs that ignore the primary implementation role given to Texas and Oklahoma. Not only is this approach

[20] 64 FR 35766.

inconsistent with the Clean Air Act and EPA's past practice, it would give EPA unprecedented power arbitrarily to substitute its own judgment for that of the States at virtually any stage of the implementation process.

The Associations noted that, as courts have recognized, the Clean Air Act was intended by Congress to be "a model of cooperative Federalism." *Sierra Club v. Korleski*, 681 F.3d 342, 343 (6th Cir. 2012); *see also Michigan v. EPA*, 268 F.3d 1075, 1083 (D.C. Cir. 2001); *Florida Power & Light Co. v. Costle*, 650 F.2d 579, 581 (5th Cir. 1981). Under this structure, Congress specifically found that "air pollution prevention … is the primary responsibility of States and local governments." 42 U.S.C. § 7401(a)(3). Relying on that finding, the Eighth Circuit recently noted that "the [Clean Air Act] grants States the primary role in determining the appropriate pollution controls within their borders." *North Dakota*, 730 F.3d at 760-61. Within that context, "States have broad authority to determine the methods and particular control strategies they will use to achieve the statutory requirements." *BCCA Appeal Group v. EPA*, 355 F.3d 817, 822 (5th Cir. 2003).

In contrast, after it has established broad emission standards, the Associations asserted that the EPA's role is limited to ensuring that the States' implementation of those standards is consistent with the Act. *See Florida Power & Light*, 650 F.2d at 587 ("The great flexibility accorded the States under the Clean Air Act is … illustrated by the sharply contrasting, narrow role to be played by EPA."). In that narrow role, EPA is confined to "the ministerial function of reviewing SIPs for consistency with the Act's requirements." *Luminant Generation Company LLC v. U.S. EPA*, 675 F.3d 917, 921 (5th Cir. 2012). In other words, EPA cannot second-guess the States, but must approve any SIP that complies with basic statutory requirements. *See* 42 U.S.C. § 7410(k)(3) ("The Administrator *shall* approve [a SIP or SIP revision] as a whole if it meets all of the applicable requirements of this chapter.") (emphasis added). When, as here, an agency is given a mandatory command (*e.g.*, "shall") to base its decision on a limited set of factors prescribed by statute, it cannot depart from Congress' direction by considering additional factors not listed in the statute. *See National Ass'n of Home Builders v. Defenders of Wildlife*, 551 U.S. 644 (2007) (rejecting interpretation of Clean Water Act that would have allowed EPA to deny transfer of permitting authority to State agencies based on additional factors when the statute Stated that EPA "shall approve" transfer where "nine specified criteria are satisfied").

The Associations Stated that the EPA has previously recognized its limited role in implementing the regional haze program and explained that "[t]he final regional haze rule … provide[s] States considerable discretion in establishing reasonable progress goals for improving visibility in Class I areas." EPA, *Response to Petition for Reconsideration of Regional Haze Rule* 11 (Jan. 10, 2001). Thus, rather than establishing strict implementation requirements, EPA's rule "requires States to determine the rate of progress for remedying existing impairment that is reasonable, taking into consideration the statutory factors, and the informed input from all stakeholders." 64 Fed. Reg. at 35,731; *see also* 40 C.F.R. § 51.308(d)(1)(i)(A). In its guidance to States, EPA further emphasized that the regional haze rule "gives States wide latitude to determine additional control requirements" and, in applying the required statutory factors, the States "have flexibility in how to take into consideration these statutory factors and any other factors that you have determined to be relevant." EPA, *Guidance for Setting Reasonable Progress Goals Under the Regional Haze Program* 4-2, 5-1 (June 1, 2007). Thus, EPA has explained that "[a]s long as this evaluation is done adequately and the States provide a reasoned basis for their decision, EPA will defer to the State" with respect to reasonable progress determinations. 77 Fed. Reg. 40,150, 40,156 (July 6, 2012).

In this proposal, however, the Associations noted that the EPA ignores these well-established principles of cooperative Federalism, disregards the reasoned judgment of Texas and Oklahoma, and seeks to impose a radically different implementation plan based on its own independent analysis. This is contrary to the Clean Air Act and unlawful. In the absence of any showing that Texas and Oklahoma failed to comply with the statutory and regulatory requirements for developing reasonable progress goals and long- term strategies, EPA has no choice under the Clean Air Act but to approve these SIPs.

The Associations Stated that by going beyond its limited authority under the Clean Air Act strictly to review States' compliance with applicable statutory and regulatory requirements in establishing reasonable progress goals and long-term strategies, EPA would fundamentally transform the regional haze program into a Federal program over which State decisions could be vetoed for virtually any reason by EPA. Given the nature of regional haze issues, States spend significant resources modeling and tracking emissions from a wide variety of sources and consulting with neighboring States prior to developing SIPs to address regional haze. Those efforts will be largely futile if EPA can later substitute its own judgment for that of a State's decision by conducting what is in essence a *de novo* review of a State's reasonable progress goals and long-term strategy. Such an approach deprives States of any certainty in implementing the regional haze program and is in direct contradiction to the cooperative Federalism principles upon which the regional haze program was based. If EPA proceeds to disapprove Texas and Oklahoma's SIPs, it will set a dangerous precedent that will threaten the primacy of all States to use their judgment to establish reasonable progress goals and long-term strategies that will improve visibility over time while respecting other State interests that are recognized by the Clean Air Act.

Response: The cases cited in this comment regarding cooperative Federalism, EPA's role in reviewing SIP submittals and approving SIPs, and EPA's Regional Haze guidance have already been addressed elsewhere.

Comment: [TCEQ/PUCT (0056) p. 1-3] The TCEQ opposed the proposed partial disapproval of Texas' 2009 Regional Haze (RH) SIP or adoption of the proposed FIP. The EPA's proposed partial SIP disapproval and FIP ignores the flexibility the Clean Air Act (CAA) provides to States in crafting regional haze plans and thus is arbitrary, capricious, and an abuse of discretion. The EPA should withdraw this proposal and propose to approve the TCEQ's 2009 RH SIP as meeting the statutory and regulatory requirements for regional haze.

The TCEQ submitted a RH SIP that meets all requirements of the CAA and the regional haze rule (RHR). The 2009 RH SIP includes a detailed analysis of each requirement of a regional haze plan, as identified in CAA section 169A(b)(2) including: a determination of which sources are subject to Best Available Retrofit Technology (BART); reasonable progress goals for the State's Class I areas, based on the four statutory factors; calculations of baseline and natural visibility conditions; consultations with States; and a long-term strategy and a monitoring strategy.

The TCEQ argued that EPA bears the burden to show Texas' judgment was unreasonable or does not meet the statutory requirements. As the U.S. Supreme Court opined in *Alaska Dept. of Environmental Conservation v. EPA* (540 U.S. 461, 484-89 *(ADEC)):* in reviewing an EPA disapproval of a State's exercise of discretion, courts must defer to State judgments, and the EPA bears the burden of establishing that those judgments were unreasonable. States are due even greater deference under CAA, section 169A (USC 7491) than under the standard articulated under the Supreme Court's decision in *ADEC*.[1] The RHR and EPA guidance suggest that States have a large degree of flexibility in crafting regional haze plans.

The TCEQ stated that the EPA's determination that the TCEQ did not meet all applicable requirements of the CAA regarding regional haze is flawed. The State plan submitted in 2009 followed all the EPA rules and guidance and contains a thorough analysis and justification for its conclusions for each statutorily required element. The EPA States that the TCEQ did not 'reasonably consider' the four statutory factors in developing the reasonable progress goals (RPG) for its Class I areas, Big Bend and Guadalupe Mountains National Parks. The CAA requires States to develop RPGs "tak[ing] into consideration" the factors listed in section 169A(g)(1). Texas' plan does this. The EPA's complaint is that it would have considered these factors differently than Texas. This is not a valid basis for disapproval of the Texas plan. The EPA proposes to find that it would have developed certain elements of the visibility plan differently, thus holding Texas to a different standard of compliance than what is provided for in statute and rule. This is the very nature of an arbitrary and capricious action. The EPA also proposed that the Texas uniform rate of progress (URP) is faulty because it assumes the TCEQ's natural visibility conditions estimate is incorrect.[2] This is an estimate that was developed by the TCEQ following the EPA's own guidance and rules that provide the States broad flexibility and discretion in their calculation. Again, it appears the EPA prefers a different outcome than that of the Texas plan. The EPA's proposed disapproval of the long-term strategy for Wichita Mountains in Oklahoma is based on new and unfounded interpretations without basis in the CAA or its rules. First, the EPA claims that the four statutory factors for RPGs apply to the long-term strategy. This is not found in the statute and is not supported by the RHR. The EPA also proposes disapproval of the long-term strategy and State consultations - in which both States agreed with the reductions calculated for sources in Texas that impacted the Wichita Mountains- because Oklahoma's 'progress goal' established for Wichita Mountains must be "approved or approvable" in order for Texas to rely on it in its own plan.

It appears that the EPA has carried out the process of developing its proposed partial SIP disapproval and proposed partial FIP in the following sequence: First, the EPA decided to find a way to impose additional control requirements beyond those in Clean Air InterState Rule (CAIR) on multiple electric generating units (EGU) in Texas. The EPA then analyzed the Texas 2009 RH SIP using new approval criteria that were not in place in either the RHR or in the EPA's guidance when it was submitted in 2009. Again, the EPA's proposed partial SIP disapproval and FIP is an attempt to force its preferred outcome for specific sources in Texas. This is arbitrary and capricious and does not comport with the CAA.

Footnotes:

[1] See American Corn Growers Assn. v. EPA, 291 F3d. 1 (2002).
[2] "… we propose to find the TCEQ has calculated this rate of progress on the basis of, and compared baseline visibility conditions to, a flawed estimation of natural visibility conditions for the Big Bend and Guadalupe Mountains, as we describe above. Therefore, we propose to disapprove the TCEQ's calculation of the URP needed to attain natural visibility conditions by 2064." 79 FR 74818, 74833

Response: Section 169A and EPA guidance have already been addressed above. Commenter cites to *Alaska Dept. of Environmental Conservation v. EPA* (540 U.S. 461 at 502 *(ADEC)*) to support the contention that Congress structured the CAA to limit our authority and that EPA disapprovals or partial disapprovals are arbitrary and capricious. At issue in the *ADEC* case was the State's "new source" permitting SIP, not its Regional Haze SIP, and a special statutory provision concerning oversight of State permitting decisions made pursuant to its SIP[21]. This case is not relevant to our approval of a Regional Haze SIP. Here, our disapproval is based on the State's failure to satisfy several regional haze requirements as detailed elsewhere in our responses to comments. Our role in the SIP review process has already been addressed at length above.

We disagree with the TCEQ's apparent suggestion that we disapproved parts of the Texas SIP merely because we preferred something different. The bases for our disapproval were determined by our substantive review of the SIP submittal against the requirements specified by the CAA and our regulations, not from arbitrary preferences. The specific bases for disapproval were identified in our proposal and have been further explained at length in responding to comments and in our final action. To take one example that we elaborate on more fully elsewhere, we disagree that Texas' natural conditions calculation followed our guidance. The core reason we proposed to disapprove Texas' natural conditions calculation was because it failed to adequately support the assumption that 100% of the fine soil and coarse mass that contributed to visibility impairment during the baseline period at its Class I areas was entirely natural.[22] We disagree with the TCEQ that we analyzed the Texas SIP with new approval criteria that was not in place at the time Texas submitted its SIP. We explained our rationale and why we believe our proposal comports with the CAA and our Regional Haze Rule beginning in Section IV of our proposal.[23]

EPA deference to the State in developing regional haze SIPs has already been addressed in this section above. We disagree with TCEQ regarding our disapproval of Texas' reasonable progress goals and its reasonable progress four-factor analysis for the reasons we have detailed in our proposal, final and as further discussed in our responses to other more detailed comments concerning these issues. We have explained in detail elsewhere how the four-factor analyses,

[21] The Court held recognized that while States have wide discretion in formulating their plans; SIPs must include certain measures Congress specified to assure that national ambient air quality standards are achieved. Id. at 470. The Court also held that the EPA has supervisory authority over the reasonableness of State permitting authorities and may issue stop construction orders if a BACT selection is not reasonable. Id. at 502. The Court also held that EPA's stop construction orders were neither arbitrary nor capricious. Id.
[22] "States are free to develop alternative approaches that will provide natural visibility conditions estimates that are technically and scientifically supportable. Any refined approach should be based on accurate, complete, and unbiased information and should be developed using a high degree of scientific rigor." Guidance for Estimating Natural Visibility Conditions Under the Regional Haze Rule, U.S. EPA, September 2003, pg 1-11.
[23] 79 FR 74823.

reasonable progress goals, and long-term strategies are inextricably linked. With regard to the consultation, we also discuss that elsewhere in the responses to comments.

Comment: [TCEQ/PUCT (0056) p. 16] The TCEQ Stated that the EPA's proposed FIP is contrary to authority provided in the CAA. The statute provides the EPA with authority to address State plans that it believes are substantially inadequate to comply with the Act's requirements. The EPA Regional Haze Rule identifies periodic reviews and plan updates as the remedy for addressing RH SIPs that are inadequate.

The TCEQ noted that in order to promulgate a FIP, the CAA requires that the EPA disapprove a State plan in whole or in part for not meeting the applicable requirements of §110(k). Texas' plan was complete by operation of law and met all requirements. The EPA has no authority to impose a FIP that merely replaces the EPA's judgment for Texas' but does not correct an error or is not based on a failure of Texas' plan to meet the requirements of the Regional Haze Rule or CAA.[13]

The TCEQ Stated that the EPA's Regional Haze Rule established the remedy for a substantially inadequate plan as periodic updates, not a Federal plan.[14] The nature of regional haze and the statutory requirement for reasonable progress and *long-term* solutions to visibility impairment require regular updates and reviews of State plans by the States themselves. Thus, the very nature of regional haze planning recognizes that the solution to plans that don't make adequate progress towards the natural visibility condition goal is an update of the plan, not a FIP.

<u>Footnotes:</u>
[13] See *Train*, 421 U.S. 60, 79 "The CAA gives the [EPA] no authority to question the wisdom of a State's choice of emission limitations if such choices are part of a plan which satisfies the standards of 110(a)(2)."
[14] See 64 FR 3574S: " ... section 110(a)(2)(F) of the CAA provides that SIPs are to require 'periodic reports on the nature and amounts of emissions and emissions-related data' and 'correlation of such reports .... with any emission limitations or standards establish pursuant to this chapter.' Moreover, section 110(a)(2)(H) requires SIPs to provide for revision when found to be substantially inadequate to 'comply with any additional requirements established under ... [the CAA].'"

Response: In this seminal case, the Supreme Court recognized the basic principle that we must review SIP revision submittals for compliance with the requirements of CAA Section 110(a)(2).[24]

Our action does not contradict the Supreme Court's decision in *Train*. States have significant responsibilities in implementation of the CAA and meeting the requirements of the Regional Haze Rule. We recognize that States have the primary responsibility of drafting an implementation plan to address the requirements of the Federal regional haze program. We also recognize that we have the responsibility of ensuring that the State plans, including RH SIPs,

[24] See *Train*, 421 U.S. 60, 79 ("Under §110(a)(2), the Agency is required to approve a State plan which provides for the timely attainment and subsequent maintenance of ambient air standards, *and which also satisfies that section's other general requirements*. The Act gives the Agency no authority to question the wisdom of a State's choices of emission limitations *if they are part of a plan which satisfies the standards of section 110(a)(2)* . . ." (emphasis added)).

conform to the CAA requirements. We cannot approve a RH SIP that fails to address adequately several elements of the Federal regional haze program.

Contrary to commenter's assertion, we have not destroyed the State's primacy. In fact, we have approved those portions of the State's submittal that we believe meet our Federal regional haze requirements. We are only disapproving the portions of the Texas' submittal that do not meet the Act and EPA rules. As explained in a comment response above, we do not agree with commenters' asserted position that the remedy for an unapprovable RH SIP is periodic updates. The RHR's requirements for comprehensive periodic revisions (see 40 CFR 51.308(f)) and periodic progress reports (see 40 CFR 51.308(g)) are very different from the authority to impose a FIP when there is a determination that a SIP is not approvable. As we have stated elsewhere, EPA has the authority and obligation to impose a FIP to fill in such gaps. The provisions of the RHR do not override this responsibility.

As explained in our proposal, we identified several deficiencies in the Texas and Oklahoma SIP submittals and proposed to disapprove those. As such, we have a FIP obligation to cure such deficiencies with a Federal plan to fill in those gaps.

We agree with the TCEQ the plan was complete by operation of law. We disagree with the TCEQ that just because the Texas' plan was complete by operation of law, this means we are no longer allowed to review it to ensure it has met all requirements, and that we have no authority to impose a FIP. The TCEQ confuses the action of merely submitting a SIP and having it deemed complete, with the process of reviewing that SIP for compliance with the applicable Federal requirements.

Texas submitted a Regional Haze SIP revision on March 31, 2009, which later became complete by operation of law. However, this only means the Texas SIP was deemed "an official submission for purposes of review." This determination has no bearing on whether the SIP met the requirements of the Regional Haze Rule. As we explain in our proposal in detail, the Texas SIP failed to do so in a number of areas.

Furthermore, while we agree that the procedural requirements for promulgation of a FIP under 110(c) are set forth in CAA Section 307(d), we do not agree that our action violates that provision in any way. We have in fact met those requirements, as explained in our proposed notice and comment rulemaking. Consistent with the requirements of that section, our proposal included a summary of the factual data on which our proposed FIP was based, as well as the methodology used in obtaining the data and in analyzing the data and the major legal interpretations and policy considerations underlying the proposed action and FIP. [25] In addition, we provided a detailed evaluation of the Texas and Oklahoma RH SIPs' analyses for the relevant units, which formed the basis for our proposed action on those portions of the Texas and Oklahoma Regional Haze SIPs. [26] This final rulemaking includes similar information with respect to the SIP and the FIP, as well as "an explanation of the reasons for any major changes in

[25] See CAA section 307(d)(3), 42 U.S.C. 7607(d)(3).
[26] The SIP portion of our action is subject to the procedural requirements of section 553(b) of Administrative Procedure Act (APA), 5 U.S.C. 553(b), rather than the requirements of CAA subsection 307(d), 42 U.S.C. 7607(d).

the promulgated rule from the proposed rule" and "a response to each of the significant comments, criticisms, and new data submitted in written or oral presentations during the comment period."[27] Therefore, our action complies with the applicable procedural requirements of the CAA.

Comment: [TCEQ/PUCT (0056) p. 16-17] The TCEQ Stated that the CAA gives States authority to develop regional haze plans that reflect State needs. The EPA should not get deference for its own choices in its FIP over those of Texas.

The TCEQ Stated that the EPA's interpretation of its authority to review regional haze submissions under CAA, §169A is flawed. While the EPA review and State revision of regional haze SIPs is a component of §110, the CAA also provides an independent grant of authority to States, and specific language identifying the EPA authority to establish goals and guidance for regional haze. The use of the word "guideline" in the in §169A evidences a clear congressional intent that States be granted wide latitude in decision-making here. CAA, §169A inherently limits the EPA's SIP approval and review authority in §110.

The TCEQ Stated that the EPA's only complaint regarding the 2009 Texas SIP is that it would have taken a different approach to meet the statutory and regulatory requirements. The EPA's suggested reliance on the NCII default values in estimating natural visibility conditions at Big Bend and Guadalupe Mountains rather than the FLM's 80% approach was not adequately justified and therefore is unreasonable.

Response: The issue of States' latitude in decision making under CAA Section 169A has already been addressed above.

We agree that the CAA places the requirements for developing Regional Haze plans on States. As discussed above, EPA's role is then to review the Regional Haze SIP submittal for compliance with the applicable statutory and regulatory requirements. While the court in *American Corn Growers* found that EPA had impermissibly constrained State authority, it did so because it found that EPA forced States to require BART controls without first assessing a source's particular contribution to visibility impairment. This is not the case with our action. We are not forcing Texas to adopt a particular measure or to weigh the statutory factors in a particular way. Rather, we are disapproving portions of Texas' Regional Haze SIP because the State's analysis and conclusions were flawed for those portions and failed to support their final determinations. *See Oklahoma v. EPA*, 723 F.3d 1201, 1210 (10th Cir. 2013) (holding that the CAA requires that the BART determination complies with the guidelines, and because the EPA monitors SIPs for compliance with the statute, it must monitor BART determinations for compliance with the guidelines). In this situation we are obligated to promulgate a FIP that addresses the deficiencies in the SIP to fill those gaps.

We disagree with the TCEQ's assertion that our "reliance on the NCII default values in estimating natural visibility conditions at Big Bend and the Guadalupe Mountains rather than the FLM's 80% approach was not adequately justified and therefore is unreasonable." First, Texas

[27] CAA section 307(d)(6)(A) & (B), 42 U.S.C. 7607(d)(6)(A) and (B).

did not rely on an "80% approach" in calculating its natural conditions. Texas relied on an approach in which 100% of fine soil and coarse mass was assumed to be natural. That assumption was not supported or adequately documented. The FLMs suggested to Texas that a value of 80% of fine soil and coarse mass was natural may be more reasonable, but the SIP submittal persisted with TCEQ's "own refined estimates" that contain the 100% assumption. We respond at length to comments on default values in responding to other comments on the estimation of natural visibility conditions.

Comment: [CCP (0075) p. 1-2] CCP Stated that the Proposed Rule unreasonably concludes that Coleto Creek Unit 1 must be retrofitted with a wet Flue Gas Desulfurization (WFGD) scrubber to control emissions of SO_2 to meet EPA goals for reasonable progress toward controlling regional haze in three Class I areas in Texas and Oklahoma. The Proposed Rule is arbitrary and unreasonable because it rejects a reasonable regional haze SIP developed by the Texas Commission on Environmental Quality (TCEQ) and Oklahoma that is fully compliant with Federal CAA requirements without giving the States the deference they are due in developing regional haze programs. In proposing to disapprove aspects of the regional haze SIPs, EPA arbitrarily disregards substantial progress made on actual visibility conditions in Class I areas; wholly ignores significant contributions to haze from natural conditions and foreign sources; and impermissibly substitutes its judgment for that of the States in establishing reasonable progress goals (RPGS) inconsistent with its own rules, guidance, and prior SIP actions. While EPA recognizes that the Uniform Rate of Progress (URP) glide path need not be met for this planning period, EPA proposes to reject the States' proposed RPGs in favor of more aggressive EPA calculated RPGs as justification for the controls it seeks. EPA's actions usurp State authority and impose costly controls totaling nearly $2 billion despite the fact that the monitoring data now available demonstrates that EPA's RPGs have already been attained.

Response: For responses that include the referenced State deference issue and substituting EPA or State judgment for establishing RPGs, please see above responses. We address CCP's comments on monitoring data and its assertion that Coleto Creek should not install a SO_2 scrubber, in our responses to its more detailed comments on these issues elsewhere.

Comment: States have wide discretion to develop their own Regional Haze SIPs. [CCP (0075) p. 2-3]

CCP Stated that, under the CAA, "air pollution prevention . . . and air pollution control . . . is the primary responsibility of States and local governments." 42 U.S.C. § 7401(a)(3); see also 42 U.S.C. § 7407(a) ("Each State shall have the primary responsibility for assuring air quality within the entire geographic area comprising such State. . . ."). States have "wide discretion" in formulating a SIP. Union Elec. Co. v. EPA, 427 U.S. 246, 250 (1976). Once a State submits a SIP, EPA's role is limited to determining whether the plan satisfies the applicable statutory and regulatory criteria. 42 U.S.C. § 7410(k)(3). If a SIP satisfies these requirements, the CAA mandates EPA approval. Id. ("[T]he Administrator shall approve such submittal as a whole if it meets all of the applicable requirements of this chapter."); see also Train v. Natural Res. Def. Council, Inc., 421 U.S. 60, 79 (1975) (EPA has "no authority to question the wisdom of a State's choices of emission limitations if they are part of a plan which satisfies the [Act's] standards."); Luminant Generation Co., LLC v. EPA, 675 F.3d 917, 926 (5th Cir. 2012) ("EPA may consider only the requirements of the [CAA] when reviewing SIP submissions. . . . [T]he agency [has] no discretion to do anything other than ensure that a State's submission meets the CAA's requirements and, if it does, approve it before the passage of [EPA's] statutory deadline.").

CCP Stated that Congress emphasized the primary role of States in CAA regional haze provisions. For example, Congress directed EPA to "provide guidelines to the States" so that States, not EPA, could develop SIPs to implement the program. 42 U.S.C. § 7491(b)(1) (emphasis added); see also American Corn Growers Ass'n v. EPA, 291 F.3d 1 (D.C. Cir. 2002) (the regional haze rule "calls for States to play the lead role in designing and implementing regional haze programs").

CCP stated that, under this framework, it falls primarily on the States to make the determinations required under the program. For each Class I area within a State, these determinations include the identification of baseline and natural visibility conditions, a calculation of a Uniform Rate of Progress ("URP") required to achieve those conditions, and a calculation of Reasonable Progress Goals ("RPGs") for meeting natural visibility conditions. 40 C.F.R. § 51.308(d)(1). If the States conclude that it is not reasonable to attain the URP within the planning period, the State must demonstrate why meeting the URP is "not reasonable" and establish an alternative RPG that is "reasonable." Id. at § 51.308(d)(1)(ii).

CCP stated that the EPA has consistently recognized the States' wide discretion in implementing the regional haze program and making the required or available determinations:

- "If the State determines that the amount of progress identified through the analysis is reasonable . . . the State should identify this amount of progress as its reasonable progress goal for the first long-term strategy . . ." 64 Fed. Reg. 35,732 (July 1, 1999) (EPA Regional Haze Rule ("RHR")) (emphasis added);

- "As noted in EPA's Reasonable Progress Guidance, the States have wide latitude to determine appropriate additional control requirements for ensuring reasonable progress, and there are many ways for a State to approach identification of additional reasonable measures." 77 Fed. Reg. 11,468 (Feb. 27, 2012) ("Georgia SIP Approval") (emphasis added);

- "States have significant discretion in establishing RPGs." 76 Fed. Reg. 78,197 (Dec. 16, 2011) ("Kentucky SIP Approval").

CCP stated that the EPA may not simply disapprove the Texas and Oklahoma SIPs because it disagrees with the States. Rather, courts recognize that EPA has limited discretion when rejecting a SIP. See Oklahoma v. EPA, 723 F.3d 1201, 1213 n.7 (10th Cir. 2013) ("[w]e recognize that the EPA has less discretion when it takes actions to reject a SIP than it does when it promulgates a [Federal Implementation Plan ("FIP")])."

Response: Our SIP approval authority and Congressional intent have already been addressed above.

Comment: EPA failed to afford the States appropriate discretion to develop their own reasonable URPs and RPGs. [CCP (0075) p. 3]

CCP Stated, despite the substantial deference owed to the States in developing regional haze SIPs, EPA repeatedly and unreasonably rejected the States' reasonable determinations in the Proposed Rule simply because it disagreed with their approach. This was impermissible under the CAA. In particular, while EPA agreed with the States that meeting the URPs for this planning period was "not reasonable," it disagreed with the "reasonable" URPs and alternative RPGs developed by the States in order to impose substantial and costly new controls.

CCP Stated that the EPA's rejection of the States' URPs and RPGs is unreasonable for three fundamental reasons: (1) EPA provides no justification for rejecting TCEQ's refined assumptions regarding natural conditions for setting its URPs and EPA's reversion back to the unsupported use of "default" values; (2) the RPGs developed by the States were reasonable, as confirmed by recent actual monitoring data supporting the attainment of the States' RPGs; and (3) EPA arbitrarily rejects the States' four-factor analysis in determining RPGS in favor of its own flawed approach.

Response: Our deference to the State in developing regional haze SIPs and progress determinations has already been addressed above. We disagree with CCP regarding our disapproval of Texas' natural conditions, Texas' reasonable progress goals, and its reasonable progress four-factor analysis for the reasons we have detailed in our proposal and as further discussed in our response to other more detailed comments concerning these issues.

Comment: [Xcel Energy (0064) p. 6] Xcel Energy stated that the CAA does not allow EPA to simply substitute its judgment for Texas in establishing a regional haze program. Particularly where, as here, EPA's Proposal fails to meet the statutory obligations, imposes dramatically higher costs on Texas sources and electric consumers, and produces admittedly imperceptible, meaningless visibility improvement in Texas' two Class I areas, EPA cannot justify rejecting Texas' well-reasoned regional haze plan. EPA should rescind its rejection of the Texas SIP and approve major portions of the SIP.

Response: The scope of our authority under the CAA has already been addressed above. Further, we disagree with Xcel that our proposal failed to meet our statutory obligations. Environmental regulatory measures, including measures to reduce air pollution, do not necessarily increase the cost of electricity, but even assuming that they may in this case, such an effect would provide no exemption from CAA requirements. We disagree that our proposal resulted in meaningless visibility improvement. The controls in our final rule will result in visibility improvement at the Wichita Mountains and other Class I areas and assist those Class I areas in attaining the national goal Congress has established for a return to natural visibility conditions.

Comment: EPA is required to accord appropriate deference to Texas in reviewing its Regional Haze SIP [Xcel Energy (0064) p. 7-9]

Xcel Energy Stated that in developing a "cooperative Federalism" framework under the CAA, Congress purposely limited EPA's authority by creating a statute in which "air pollution prevention ... and air pollution control ... is the primary responsibility of States and local governments." 42 U.S.C. § 7401(a)(3); *see also* 42 U.S.C. § 7407(a) ("Each State shall have the primary responsibility for assuring air quality within the entire geographic area comprising such State .... ").

Xcel Energy stated that the primary avenue for States to implement their responsibility under the CAA is the promulgation of a SIP. States have "wide discretion" in formulating a SIP. *Union Elec. Co. v. EPA,* 427 U.S. 246,250 (1976). Once a State submits a SIP, EPA's role is limited to determining whether the plan satisfies the applicable statutory and regulatory criteria. 42 U.S.C. § 7410(k)(3). If a SIP satisfies these requirements, the CAA mandates EPA approval. *!d.* ("[T]he Administrator shall approve such submittal as a whole if it meets all of the applicable requirements of this chapter."); *see also Train v. Natural Res. Def Council, Inc.,* 421 U.S. 60, 79 (1975) (EPA has "no authority to question the wisdom of a State's choices of emission limitations if they are part of a plan which satisfies the [Act's] standards."); *Luminant Generation Co., LLC v. EPA,* 675 F.3d 917, 926 (5th Cir. 2012) ("EPA may consider only the requirements of the [CAA] when reviewing SIP submissions ... [T]he agency [has] no discretion to do anything other than ensure that a State's submission meets the CAA's requirements and, if it does, approve it before the passage of [EPA's] statutory deadline.").

Xcel Energy Stated that the CAA's grant of authority to States under Section 169 A is even broader than in other parts of the CAA, so EPA's deference to the States should be even greater in the context of regional haze SIPs. Section 169 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, where the impairment is the result of manmade air pollution. 42 U.S.C. § 7491(a)(1). But Congress placed extra emphasis on the primary role of States in CAA regional haze provisions. Congress directed EPA to "provide guidelines *to the States"* so that States, not EPA, could develop SIPs to implement the program. 42 U.S.C. § 7491(b)(1) (emphasis added); *see also American Corn Growers Ass'n v. EPA,* 291 F.3d 1 (D.C. Cir. 2002) (the regional haze rule "calls for States to play the lead role in designing and implementing regional haze programs").

Xcel Energy stated that the legislative history of the CAA confirms Congress's intent to emphasize State primacy in the regional haze context. Two of the primary sponsors of the visibility provisions, Senator McClure (R-ID) and Senator Muskie (D-ME), addressed the issue directly during the legislative debate over passage of the Clean Air Act Amendments of 1977:

> Mr. McClure: Under the conference agreement, does the State retain *sole authority* for identification of sources for the purpose of visibility issues under this section?

> Mr. Muskie: Yes; *the State, not the Administrator,* identifies a source that may impair visibility....

A Legislative History of the Clean Air Act Amendments Of 1977, at 374-75 (1979) (emphasis added); *see also* H.R. REP. No. 95-564, at 155 (1977).

Xcel Energy Stated that the EPA also has repeatedly reaffirmed that States have wide discretion to make regional haze reasonable progress goal ("RPG") determinations and that States have the primary role in identifying and addressing RPGs:

- "If the *State determines* that the amount of progress identified through the analysis is reasonable ... *the State should identify* this amount of progress as its reasonable progress goal for the first long-term strategy .... " EPA Regional Haze Rule, 64 Fed. Reg. 35,714, 35,732 (July 1, 1999) ("RHR") (emphasis added);

- "As noted in EPA's Reasonable Progress Guidance, the States have *wide latitude* to determine appropriate additional control requirements for ensuring reasonable progress, and there are many ways for a State to approach identification of additional reasonable measures." Proposed Georgia SIP Approval, 77 Fed. Reg. 11,452, 11,468 (Feb. 27, 2012) (emphasis added);

- EPA has recognized the problems of a rigid requirement to meet a long-term goal. "EPA made clear in the RHR that the RPG is not a mandatory standard which must be achieved by a particular date." *Id.* at 11,473; *see* RHR, 64 Fed. Reg. at 35,733 ("[T]he [RPG] is a *goal* and not a mandatory standard which must be achieved by a particular date.");

- "States have significant discretion in establishing RPGs." Kentucky SIP Approval, 76 Fed. Reg. 78,194, 78,197 (Dec. 16, 2011).[1]

To be consistent with the CAA and EPA's prior SIP determinations under the regional haze program, Xcel Energy stated that the EPA must review Texas' SIP with appropriate deference and not simply disapprove the SIP because EPA disagrees with Texas' assumptions, methodologies, or long-term strategy. Indeed, courts have recognized the distinction between EPA's limited authority to reject a SIP and its authority to promulgate a FIP. *See Oklahoma v. EPA,* 723 F.3d 1201, 1213 n.7 (10th Cir. 2013) ("[w]e recognize that the EPA has less discretion when it takes actions to reject a SIP than it does when it promulgates a [FIP]"). EPA should be cautious when it unreasonably rejects a State's first, reasonable, detailed technical conclusion. *Id.* at 1225 (J. Kelly, dissenting) (citing *Lockheed Martin Corp. v. Admin. Review Bd., US. Dep't of Labor,* 717 F.3d 1121, 1128-29 (10th Cir. 2013)). Such actions are ripe for judicial review and challenge. EPA has repeatedly and unreasonably rejected Texas' well-reasoned technical conclusions in the Proposal. Accordingly, EPA should withdraw its FIP and approve Texas' SIP.

Footnotes:

[1] The emphasis on State primacy also is evident in the Best Available Retrofit Technology ("BART") context of regional haze programs. *See* BART Rule, 70 Fed. Reg. 39,104, 39,137 (July 6, 2005) ("[T]he Act and legislative history indicate that Congress evinced a special concern with insuring that States would be the decision makers").

Response: Cooperative Federalism and State discretion in the CAA's regional haze program have already been addressed above.

Xcel expressed its view that its arguments were reinforced by legislative history of the 1977 CAA amendments. The commenter referred to Statements of Senator Edmund Muskie regarding the conference agreement on the provisions for visibility protection in those amendments. This issue was also argued in the Tenth Circuit Court of Appeals in *Oklahoma v. EPA*, 723 F.3d 1201, and similarly, the full text of Senator Muskie's Statements was not reproduced. We reproduce it here, along with Judge Briscoe's ruling:

> The Senate discussion about the Conference Report also highlighted the role that the guidelines play in BART determinations for large power plants:
>
> [Senator] McClure. And while those existing sources are limited to the 28 major sources contained in the Senate bill's definition of major emitting facilities, exempting any such source which has the maximum potential to emit less than 250 tons per year, Federal guidelines apply only to fossil-fuel fired generating plants in excess of 750 megawatts?
>
> [Senator] Muskie. That is correct.
>
> [Senator] McClure. Under the conference agreement, does the State retain sole authority for identification of sources for the purpose of visibility issues under this section?
>
> [Senator] Muskie. Yes; the State, not the Administrator, identifies a source that may impair visibility and thereby falls within the requirement of section 128.
>
> [Senator] McClure. And does this also hold true for determination of "Best Available Retrofit Technology"?
>
> [Senator] Muskie. Yes; here again it is the State which determines what constitutes "Best Available Retrofit Technology," as defined in section 128. The Federal guidelines apply only to the large power plants we have described.
>
> 123 Cong. Rec. S26, 854 (daily ed. Aug. 4, 1977) (emphasis added). The last sentence — omitted by petitioners in their brief — makes clear that the statute requires that the BART determination here comply with the guidelines. See Pet. Opening Br. at 15. And because the EPA monitors SIPs for compliance with the statute, it must monitor BART determinations for compliance with the guidelines. To be sure, the guidelines themselves might somehow conflict with the statute. But the petitioners have not argued that any conflict exists here. We therefore hold that

> the EPA had the authority to review Oklahoma's BART determination with respect to these two power plants.

As discussed above, the CAA requires the States to follow our BART Guidelines[28] when proposing BART determinations. When States fail to do so, we have authority to disapprove the BART determinations and promulgate a FIP to cure the deficiency. Similarly, because we have determined that the Texas and Oklahoma SIPs do not conform with Section 51.308(d) and are not approvable, we are authorized and at this time required to promulgate a FIP.

Comment: EPA may not supplant Texas' SIP with what EPA believes is a more reasonable FIP. [GCLC (0063) p. 2-3]

GCLC Stated that Texas' SIP submission meets all statutory and regulatory regional haze requirements. EPA's analysis of Texas' submission is based on an inappropriate and unsupported interpretation of the CAA and associated regulations that ignores State primacy and flexibility provided to the States in the CAA and in the regional haze program in particular.

According to GCLC, Congress delegated to the States the primary responsibility of air pollution control in the CAA.[3] When a SIP meets the basic requirements of the CAA, EPA is required to approve the SIP submission.[4] Section 169A of the CAA specifically places the burden of developing SIPs and leaves determining whether "reasonable progress" has been achieved to the States. For example, regarding the four-factor analysis that is central to a State establishing reasonable progress, EPA itself has recognized that "States have considerable flexibility in how they take these factors into consideration, as noted in EPA's Guidance for Setting Reasonable Progress Goals under the Regional Haze Program." [5] EPA has further noted in the recent regional haze SIP rulemaking for Nebraska that regarding the visibility benefit, best available retrofit technology ("BART"), and reasonable progress determinations of the State in its SIP, "[a]s long as this evaluation is done adequately and the States provide a reasoned basis for their decisions, EPA will defer to the State. " [6] EPA regional haze regulations reinforce this deference to State authority, including (as explained by EPA when issuing those regulations) that "[t]he final [regional haze] rule provides States flexibility in determining the amount of progress that is 'reasonable' in light of the statutory factors, and also provides flexibility to determine the best mix of strategies to meet the reasonable progress goal they select." [7]

GCLC noted that it is the clear intent of the CAA to provide States flexibility, which has long been recognized by EPA. This is apparently completely forgotten by EPA in this Proposed FIP. Reviewing EPA's rule preamble and its Technical Support Documents ("TSD"), including its Texas Regional Haze State Implementation Plan ("TX TSD"), [8] Oklahoma and Texas Regional Haze Federal Implementation Plans TSD ("FIP TSD"),[9] and other supporting documents, it is immediately apparent that EPA's decision to disapprove Texas' SIP is not because Texas' SIP has not demonstrated reasonable progress, but rather, it is because EPA believes its FIP will achieve more reasonable progress than Texas. [10]

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[28] 70 FR 39104. See BART Guidelines, Appendix Y to Part 51, beginning on page 39156; *Oklahoma v. EPA*, 723 F.3d 1201, 1210 (10th Cir. 2013).

GCLC asserted that EPA's approach in this rulemaking, to supplant Texas' SIP with one that it believes is more reasonable, is a direct affront to the cooperative Federalism central to the CAA, undermines the purpose behind the lead role that States take in the actual implementation of CAA requirements, and conflicts with Federal court precedent. As Stated by the 8th Circuit Court of Appeals, "the CAA requires only that a State establish reasonable progress, not the most reasonable progress." [11] EPA's critiques of the Texas reasonable progress analysis are limited to questions of the reasoned judgment of the State, and EPA attempts to apply standards that are simply not supported by the CAA or EPA's implementing regulations. Therefore, EPA should recognize Texas' primacy, withdraw its FIP, and approve Texas' SIP submission.

Footnotes:
[3] See 42 USC§ 7401(a)(3), which States that "Congress finds ... that air pollution prevention (that is, the reduction or elimination, through any measures, of the amount of pollutants produced or created at the source) and air pollution control at its source is the primary responsibility of States and local governments ... " (emphasis added).
[4] 42 USC § 7 41 O(k)(3), which States that "the Administrator shall approve [a SIP] submittal as a whole if it meets all of the applicable requirements of' the CAA.
[5] See Approval and Promulgation of Implementation Plans; State of Idaho; Regional Haze State Implementation Plan, Proposed Rule, 77 Fed. Reg. 30248, 30251 (May 22, 2012).
[6] See Approval, Disapproval and Promulgation of Implementation Plans; State of Nebraska; Regional Haze State Implementation Plan; Federal Implementation Plan for Best Available Retrofit Technology Determination, Final Rule, 77 Fed. Reg. 40150,40156 (July 6, 2012) ("Nebraska SIP Final Rule").
[7] Regional Haze Regulations, Final Rule, 64 Fed. Reg. 35714, 35736 (July I, 1999).
[8] U.S. EPA, Technical Support Document for the Texas Regional Haze State Implementation Plan (Nov. 2014) ("TX TSD").
[9] U.S. EPA, Technical Support Document for the Oklahoma and Texas Regional Haze Federal Implementation Plans (Nov. 2014) ("FIP TSD").
[10] Once example of EPA's approach can be found in its TX TSD, in which EPA Stated: "We believe that in performing its control analysis, the TCEQ should have given **greater** consideration to the flexibility in the CAIR trading program and the resulting uncertainty in the projected emissions. In other words, the TCEQ **could have** recognized that implementation of reasonable controls under the Regional Haze Rule would likely not be in addition to anticipated reductions due to CAIR predicted by IPM, but would replace or complement any controls predicted by IPM." TX TSD at 22. (emphasis added).
[11] See North Dakota v. EPA, 730 F.3d 750, 768 (8th Cir. 2013).

Response: EPA guidance, reasonable progress, and State flexibility have already been addressed above.

Comment: EPA may not issue this FIP prior to providing Texas the opportunity to submit a SIP responsive to EPA's determination that Texas' 2009 SIP submission was inadequate. [GCLC (0063) p. 19]

GCLC noted, in contravention of the language and intent of the CAA, EPA is attempting to disapprove the SIP and immediately move to a FIP. The CAA provides opportunities to States to correct deficiencies in SIPs, providing the Administrator up to two years to promulgate a FIP in response to a finding that a SIP was inadequate. [75] This is particularly relevant in this FIP, as EPA has taken numerous novel steps, including new and unprecedented interpretations of existing regulations, in order to disapprove this SIP. While EPA's proposed disapproval of Texas' SIP and its proposed FIP lack merit, Texas still must be given the opportunity to respond-and if appropriate- revise elements of its SIP prior to EPA issuing this FIP. [76] To do otherwise violates the CAA and unfairly burdens Texas EGUs.

Further, GCLC noted that EPA in its recent rulemaking regarding Arkansas' regional haze SIP submittal "elect[ed] to not promulgate a FIP" at the time it issued its partial SIP approval/disapproval "in order to provide Arkansas time to correct [the] deficiencies" indicated by EPA. This is another example of the unfair and unequal treatment of Texas.

Footnotes:
[75] 42 USC 7410(c).
[76] EPA provided such opportunity to Arkansas regarding its regional haze SIP submittal, where EPA "elect[ed] to not promulgate a FIP" at the time it issued its partial SIP approval/disapproval "in order to provide Arkansas time to correct [the] deficiencies" indicated by EPA In fact, it took over three years for EPA to proceed with a FIP. See Approval and Promulgation of Implementation Plans; Arkansas; Regional Haze State Implementation Plan; InterState Transport State Implementation Plan To Address Pollution Affecting Visibility and Regional Haze, Final Rule 77 Fed. Reg. 14604, 14672 (Mar. 12, 2012); see also Promulgation of Air Quality Implementation Plans; State of Arkansas; Regional Haze and InterState Visibility Transport Federal Implementation Plan, 80 Fed. Reg. 18944 (Apr. 8, 2015).

Response: We disagree with this comment. As explained in our TSD and elsewhere in this document and final action, we cannot approve the portions of a State's Regional Haze submittal that do not meet the CAA and EPA RHR. Therefore, we are obligated to promulgate a FIP to address these requirements, and we are doing so in today's action.

The requirement for FIP promulgation was triggered because of our 2005 finding that Texas did not make a timely SIP submission, and the expiration of the 24-month "FIP clock" under CAA Section 110(c). We may disapprove the SIP and promulgate a FIP in the same action. In *Oklahoma v. EPA*, we finalized a rule that partially approved and partially disapproved Oklahoma's SIP, and in the same action, we promulgated a FIP.[29] The Court held that "[o]nce the EPA issued the finding that Oklahoma failed to submit the required SIP under the Regional Haze Rule, EPA had an obligation to promulgate a FIP."[30] Additionally, the court agreed with us that a rule requiring us to delay its promulgation of a FIP until it rules on a proposed SIP "would essentially nullify any time limits the EPA placed on States. States could forestall the promulgation of a FIP by submitting one inadequate SIP after another."[31]

This action is distinguishable from the Arkansas regional haze SIP in that the "FIP clock" has already expired for the Texas Regional Haze plan. We are required to promulgate a FIP for any disapproved portion of the SIP. Our action fulfills this duty.

Comment: The proposal does not appropriately recognize State primacy under the CAA. [EEI (0076) p. 7-8]

EEI stated that EPA's proposal raises serious State primacy concerns with its proposed partial disapproval of Texas' and Oklahoma's SIPs and the imposition of its own FIPs. As a general

[29] Oklahoma v. EPA, 723 F.3d 1201.
[30] *Id. at* 62.
[31] *Id*.

matter, EPA must respect the role of the States in the regional haze process as authorized by the CAA, and properly submitted State SIPs have primacy over EPA's FIPs. In this instance, EPA's proposal does not reflect the flexibility and discretion that States are granted as part of the regional haze SIP process; instead, the proposed FIP is inflexible by comparison, with unreasonably tight timelines and strict emissions limitations. As EPA recognizes in its regional haze guidance to the States, the regulations "give[] States wide latitude to determine additional control requirements" and, in applying the four statutory factors, States "have flexibility in how to take into consideration these statutory factors and any other factors that you have determined to be relevant."[4] Indeed, EPA itself has explained that, "[a]s long as this evaluation is done adequately and the States provide a reasoned basis for their decisions, EPA will defer to the State" in its reasonable progress determinations. See 77 Fed. Reg. at 40,150, 40,156. EPA's proposed FIPs depart from the Agency's still-effective guidance.

EEI noted that Texas' and Oklahoma's SIPs were well considered and EPA should approve such State-led regulatory processes. In support of its proposed FIP, EPA's main rationale is that Texas and Oklahoma did not properly confer regarding RPGs. This forms the basis for the Agency's disapproval of Texas' and Oklahoma's SIPs and the imposition of its own FIP. Id. at 74,823. However, Texas and Oklahoma's conferral regarding the RPGs was fully consistent with the CAA and the regional haze regulations, and, during that process, the States agreed on which regulatory programs were needed for reasonable progress. [5] EPA must respect this decision and recognize that the Agency's imposition of a FIP is unreasonable and unauthorized under the CAA given these State actions.

Footnotes:
[4] EPA, Guidance for Setting Reasonable Progress Goals Under the Regional Haze Program, June 1, 2007 at 4-2, 5-l.
[5] See March 25, 2008 letter from Susana M. Hildebrand, Air Quality Division, Texas Commission on Environmental Quality to Eddie Terrill, Air Quality Division, Oklahoma Department of Environmental Quality; and May 12, 2008 letter from Eddie Terrill, Air Quality Division, Oklahoma Department of Environmental Quality to Susana M. Hildebrand, Air Quality Division, Texas Commission on Environmental Quality.

Response: State latitude to determine control requirements, State flexibility regarding consideration statutory factors, and our remedies available to address an insufficient SIP have already been addressed above.

Comment: [Nucor Steel (0058) p. 2] Nucor Steel Stated that EPA's interpretation is contrary to the Clean Air Act's clear direction that each State is to determine its own emission limits, schedules of compliance and other measures for sources in that State for purposes of visibility protection under §169A. EPA's interpretation would effectively give one State the power to control another State's regional haze SIP decisions, including its BART determinations. Moreover, in this case, EPA improperly overrides the SIP decisions by both States involved, Texas and Oklahoma.

Response: We explain in our responses elsewhere the roles and obligations of upwind and downwind States in conducting and establishing their four-factor analyses, reasonable progress goals, and long-term strategies, as well as consultation. We also explain this interrelationship in detail in our proposal and today's final action.[32]

Comment: EPA's Proposal disregards the primacy and considerable flexibility and discretion that Texas is supposed to have under the CAA, and the EPA Regional Haze rules and guidance, in determining what constitutes reasonable progress [AECT (0074) p. 2]

AECT Stated that EPA's Regional Haze rules and guidance clearly provide that each State has the primary role in determining what constitutes reasonable progress and that EPA is supposed to provide - each State considerable flexibility and discretion in making that determination. EPA's Regional Haze rules "call for States to play the lead role in designing and implementing regional haze" SIPs.[33] Further, EPA previously stated that under its Regional Haze rules, each State has considerable flexibility and discretion in determining what constitutes reasonable progress.[34] Moreover, EPA previously stated that it will defer to a State's determination as to what constitutes reasonable progress if such determination has a reasoned basis.[35]

AECT noted, notwithstanding the foregoing, in developing its Proposal, EPA usurped Texas' primary role in determining what constitutes reasonable progress, did not allow Texas any flexibility or discretion in making that determination, and provided Texas with no deference regarding that determination. EPA does not dispute that in determining what constitutes reasonable progress, Texas applied the four reasonable progress factors specified in the CAA and EPA's Regional Haze rules or that Texas had consultations with Oklahoma in accordance with EPA's Regional Haze rules and guidance. EPA merely determined that it would have conducted the reasonable progress analysis differently and made a different reasonable progress determination than Texas made, and based on those determinations, EPA issued its Proposal. Doing so is contrary to EPA's Regional Haze rules and guidance since they clearly provide that EPA is supposed to provide Texas with considerable flexibility, discretion, and deference in determining what constitutes reasonable progress, and EPA is not supposed to second guess Texas' reasonable progress determination and replace Texas' determination with its own reasonable progress determination.

In light of the foregoing, AECT requested that EPA defer to Texas' reasonable progress determination that is specified in its Regional Haze SIP.

Response: State flexibility, discretion, and deference in determining what constitutes reasonable progress has already been addressed above and is discussed in detail elsewhere in the responses to comments on those issues.

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[32] See our discussion regarding this, in Section IV, beginning on 79 FR 74823.
[33] American Corn Growers Ass'n. v. EPA 291F.3d 1, 2 (D.C. Cir. 2002).
[34] EPA's Response to Petition for Reconsideration of Regional Haze Rule, at 11-12 (Jan. 10, 2001) (The Regional Haze rules are "based on the principle that States should have considerable flexibility in adopting visibility improvement goals and in choosing the associated emission reduction strategies for making 'reasonable progress' toward the national visibility goal", and those rules "provide each State with considerable discretion in establishing reasonable progress goals for improving visibility in the Class I areas.").
[35] 77 Fed. Reg. 40150, 40156 (July 6, 2012) ("... as long as a State's reasonable progress determination "is done adequately and the State provides a reasoned basis for [it], EPA will defer to the State.")

3. Our Clarified Interpretation of the Reasonable Progress and Long-Term Strategy Requirements

Comment: EPA's Interpretation is the Best Reading of 40 C.F.R. Section 51.308(d)(3).
[Earthjustice (0067) p.32]

Earthjustice et al., stated that if the "progress goal" in Section 51.308(d)(3)(ii) is not an "approved or approvable" one, it is, almost by definition, a progress goal that does not comply with the requirements of the Clean Air Act. In essence, the agency's interpretation does nothing more than restate what the rule already requires—namely, that the respective states' reasonable progress goals comply with all applicable requirements of the Act and its implementing regulations.[39]

The contrary interpretation of the regulations[40] would be that a state may lawfully develop its long-term strategy to meet a reasonable progress goal proposed by another state even if the progress goal does not comply with the Clean Air Act and cannot be approved by EPA. This interpretation of the existing regulations cannot be reconciled with the overall regulatory and statutory scheme in which SIPs must be reviewed and approved by EPA before becoming valid as federal law, and EPA can approve a SIP only if it complies with all Clean Air Act requirements. *See* 42 U.S.C. § 7410(c), (k), (l). If EPA must disapprove a progress goal that does not meet the requirements of the Act, then EPA must also disapprove a long-term strategy that is designed to meet an unapprovable progress goal. Where, as here, one state contributes significantly to visibility impairment in another state's Class I area, and both states fail to properly evaluate and include in their respective SIPs "all measures necessary" to achieve a *reasonable* (*i.e.*, approvable and lawful) progress goal at a downwind state Class I area, neither SIP can be approved.[41]

According to Earthjustice et al., that EPA applied the requirements of the Regional Haze Rule and the Clean Air Act in the context of a SIP disapproval does not undermine EPA's interpretation, or require the agency to give the states an opportunity to revise their own implementation plans before disapproving them and issuing federal plans to replace them. *See EPA v. EME Homer City Generation, L.P.*, 134 S. Ct. 1584, 1601 (2014) ("A SIP's failure to satisfy" the Act's requirements "without more, triggers EPA's obligation to issue a federal plan within two years," and "EPA is not obliged to wait two years or postpone its action even a single day" before issuing a federal plan). Indeed, Congress gave EPA, not the states, authority to determine what the Clean Air Act requires, and whether a SIP fully complies with the Act and its implementing regulations. 42 U.S.C. § 7410(c), (l); *Oklahoma*, 723 F.3d at 1204, 1207-10. That is exactly what EPA proposes to do.

Footnotes:
[39] *Cf.* 42 U.S.C. § 7410(l) (EPA may not approve any plan that "would interfere with any applicable requirement" of the Act).
[40] Even if EPA's interpretation of its existing regulations could be characterized as issuance of a new rule, which it is not, EPA's action would be proper. EPA may break "new ground" in notice-and-comment rulemaking, so long as the agency "display awareness" and provides notice of the new position. *See FCC v. Fox Television Stations, Inc.*,

556 U.S. 502, 515-517 (2009). EPA has provided notice and an opportunity to comment on its interpretation of the existing regulations. Furthermore, EPA's proposal thoughtfully and carefully explains how the Regional Haze Rule's consultation and transport provisions fit together to achieve the core purpose of the rule and the Clean Air Act's visibility provisions.
[41] 40 C.F.R. § 51.308(d)(3)(ii).

Response: We generally agree with this comment, but take no position as to specific statements.

Comment: EPA's interpretation of 40 C.F.R. § 51.308(d)(3)(ii) is plainly erroneous and cannot support EPA's proposal [Luminant (0061) p. 87]

Luminant stated that EPA's regional haze regulations provide that a state's "long-term strategy must include enforceable emissions limitations, compliance schedules, and other measures as necessary to achieve the reasonable progress goals ***established by States*** having mandatory Class I Federal areas."[588] EPA does not dispute that Texas' long-term strategy includes enforceable emissions limitations, compliance schedules, and other measures as necessary to achieve the reasonable progress goal established by Oklahoma for Wichita Mountains through the CENRAP process. Nor does EPA assert that Oklahoma requested, and Texas refused, to include any such measures.[589] Instead, EPA concludes, as the basis for its proposed disapproval and FIP, that Texas' long-term strategy was flawed and violates the regulations because it was not "sufficient to obtain [Texas'] share of reductions needed to meet an approved, or approvable, progress goal" for Wichita Mountains—i.e., the one that EPA is proposing in its FIP for Oklahoma.[590] This is not a requirement of the statute or the regulations and, thus, cannot support EPA's disapproval.

Luminant noted, contrary to EPA's assertion, the phrase "progress goal" in 40 C.F.R. § 51.308(d)(3)(ii) plainly refers to "the reasonable progress goals established by States having mandatory Class I Federal areas," not to goals that have been approved by EPA or may be approved in the future (and certainly not to a reasonable progress goal proposed by EPA itself).[591] Thus, in developing its long-term strategy "for each mandatory Class I Federal area located outside the State which may be affected by emissions from the State," as Texas has done here for Wichita Mountains, a state is only required to include "enforceable emissions imitations, compliance schedules, and other measures as necessary to achieve the reasonable progress goals established by States having mandatory Class I Federal areas."[592] EPA's interpretation of the phrase "progress goal" in a subsequent sentence in § 51.308(d)(3)(ii) ignores the plain language of the preceding provisions that define the "progress goal" that a state must consider in developing its long-term strategy—i.e., the one "established by" Oklahoma. Thus, EPA's proposal to disapprove Texas' long-term strategy because it relies on the reasonable progress goal established by Oklahoma for the Wichita Mountains[593]—and not some other progress goal that EPA now claims is reasonable or that Texas developed on its own—is unlawful and contrary to the plain meaning of the regulations. There is no dispute that Texas consulted with Oklahoma, participated with Oklahoma in an approved RPO, and developed a long-term strategy to meet the reasonable progress goal for Wichita Mountains that was established by Oklahoma. That is all the regulations require for Texas' submission, and EPA must approve it.

Nor does EPA's novel interpretation of § 51.308(d)(3)(ii) and its application of that interpretation here make logical sense. EPA does not, in this proposal, claim that Oklahoma substantively erred in setting the RPG for Wichita Mountains. Instead, EPA is simply claiming to "reset Oklahoma's RPGs based on our [Texas small group] analysis."[594] In other words, EPA is proposing to disapprove Oklahoma's RPG based on the long-term strategy that EPA claims Texas should have adopted. EPA's logic is thus circular and assumes what it seeks to prove: EPA claims Oklahoma's RPG for Wichita Mountains is not approvable because it doesn't consider EPA's proposed FIP for Texas' long-term strategy, but EPA justifies that FIP for Texas' long-term strategy on its conclusion that the Oklahoma RPG is not approvable. EPA meets itself coming and going. The truth is that EPA would interpret the regulations to give it plenary authority over any aspect of a state's regional haze SIP at any time it suits EPA. But that is not how the regulations are written, nor is it how they have been implemented up until today.

Footnotes:
[588] 40 C.F.R. § 51.308(d)(3) (emphasis added).
[589] 79 Fed. Reg. at 74,856.
[590] TX SIP TSD at 49 (emphasis added).
[591] 40 C.F.R. § 51.308(d)(3).
[592] Id. (emphasis added).
[593] 79 Fed. Reg. at 74,857.
[594] Id. at 74,889.

Response: We disagree with this comment. Under the commenter's interpretation of 40 CFR 51.308(d)(3)(ii), the obligation of an upwind State is merely to include in its long-term strategy the emission limitations necessary to achieve the reasonable progress goal set by a downwind State, irrespective of whether we have approved or could approve that goal. If we disapproved the downwind State's reasonable progress goal because it did not provide for reasonable progress, but were powerless to disapprove the upwind State's four-factor analysis and long-term strategy on which the downwind State unreasonably relied, then the downwind State would be left without recourse. The commenter seeks support for its interpretation by pointing to language that says reasonable progress goals are "established by States," not by the EPA. This language, like similar language throughout the CAA and our implementing regulations, merely reflects that States are tasked with developing SIPs in the first instance. It is black-letter law that where a State fails to meet applicable CAA requirements, we are required to step into the shoes of the State by promulgating a FIP.

The commenter also alleges that we have used circular logic, but this is not the case. The fact is that four-factor analyses, reasonable progress goals, and long-term strategies are inextricably linked. Congress created this paradigm when it required us to promulgate regulations that required both upwind and downwind States to include emission limitations in their SIPs to achieve reasonable progress, defined reasonable progress as a four-factor analysis, and required US to develop criteria to measure reasonable progress. See CAA Sections 169A(b)(2) and 169B(e). The scheme that we developed in the Regional Haze Rule (RHR) operates in three steps: (1) upwind and downwind States conduct four-factor analyses to determine what control measures are reasonable; (2) States with Class I areas calculate reasonable progress goals (i.e., criteria for measuring reasonable progress), measured in deciviews, that reflect the level of visibility improvement that will result once the controls measures are implemented; and (3) upwind and downwind States include enforceable emission limitations in their long-term strategies to ensure that the reasonable progress goals are achieved. In this instance, Texas failed to conduct a reasonable four-factor analysis at Step 1. As a result, Oklahoma set a reasonable progress goal that did not reflect a reasoned consideration of available controls in Texas at Step 2, and Texas developed a long-term strategy that did not include sufficient emission limitations to achieve reasonable progress at Wichita Mountains at Step 3. We acknowledge that the States were developing their SIPs simultaneously, which complicated their ability to proceed in an orderly step-wised fashion, but this does not excuse the States from having to satisfy the applicable requirements of the CAA and the Regional Haze Rule.

Comment: EPA's interpretation of 40 C.F.R. § 51.308(d)(3)(iii) is plainly erroneous and cannot support EPA's proposal [Luminant (0061) p. 88]

Luminant stated that EPA further proposes "to find that the technical basis on which Texas relied to determine its apportionment of emission reduction obligations necessary for achieving reasonable progress in the Wichita Mountains was inadequate" and thus Texas' long-term strategy does not meet the requirements of 40 C.F.R. § 51.308(d)(3)(iii).[595] That provision provides that "the State must document the technical basis, including modeling, monitoring and emissions information, on which the State is relying to determine ***its apportionment*** of emission reduction obligations necessary for achieving reasonable progress in each mandatory Class I Federal area it affects."[596] It further provides: "The State may meet this requirement by relying on technical analyses developed by the regional planning organization and approved by all State participants."[597]

Luminant noted, EPA concedes that Texas' long-term strategy "rel[ied] on technical analyses developed by CENRAP and approved by all state participants" and further that Texas "performed an additional analysis building upon the work of the regional planning organization in order to evaluate additional controls."[598] Nevertheless, EPA contends that Texas should have done more and independently "consider[ed] the four-factors used in determining reasonable progress [in § 51.308(d)(1)(i)(A)] in developing the technical basis for . . . downwind [i.e., out-of-state] Class I areas," including Wichita Mountains.[599] In other words, EPA concludes that Texas' long-term strategy, in addressing Wichita Mountains, ***should not*** have considered the reasonable progress goal for the area as established by Oklahoma using the four statutory factors, ***but instead*** Texas should have itself conducted a four-factor analysis for Wichita Mountains to determine what was reasonable progress for the area.

Luminant asserted that this interpretation is wrong and backwards. EPA's claim that a state must conduct an analysis of the four statutory factors for "both their own Class I areas and downwind Class I areas" is plainly erroneous and contrary to the statute and regulations.[600] The statute and the regulations plainly provide that states must only analyze the four-factors for their own Class I areas and only in setting the reasonable progress goal for the area. The statute provides that "in determining reasonable progress there shall be taken into consideration the costs of compliance, the time necessary for compliance, and the energy and nonair quality environmental impacts of compliance, and the remaining useful like of any existing source subject to such requirements."[601] And EPA's implementing regulations only reference the four-factors in § 51.308(d)(1), which provides that a state must consider these factors "[i]n establishing a reasonable progress goal for any mandatory Class I Federal area within the State . . . ."[602] In stark contrast, § 51.308(d)(3), which contains the requirements for a state's long-term strategy that addresses Class I areas "outside the State," contains seven (not four) entirely different factors that "[t]he State must consider" "in developing its long-term strategy."[603] Indeed, the long-term strategy regulations do not speak in terms of establishing reasonable progress goals (as EPA's interpretation would have it), but instead of "***apportionment*** of emission reduction obligations" needed to meet the goals already established.[604]

Luminant stated that EPA's interpretation is nonsensical. Texas, in developing its long-term strategy, is not required to determine what is reasonable progress for Class I areas outside of Texas but only to ensure that its plan includes the measures necessary to achieve its share of emission reductions needed to meet the reasonable progress goals established by the states in which such areas are located.[605] Thus, Texas is not required to consider whether additional cost-effective controls on its sources could achieve more progress than is deemed reasonable at areas outside of the state, as EPA's proposal would require.[606] The regulations—in defining the "technical basis" for the state's demonstration of "apportionment"—do not include cost information as among the documentation that the state must provide and thus clearly do not contemplate a review of the four reasonable progress factors. Indeed, in issuing its final regional haze regulations, EPA specifically rejected the idea of applying the four statutory factors (including cost-effectiveness) to the long-term strategy requirements.[607] EPA cannot disapprove Texas' SIP on the basis of an "interpretation" that is plainly erroneous and inconsistent with the agency's binding regulations.[608]

Further, Luminant noted that EPA's regulations plainly provide that a state may meet the requirement in § 51.308(d)(3)(iii) to "document the technical basis" of its long-term strategy by "relying on technical analyses developed by the regional planning organization and approved by all State participants."[609] This is exactly what Texas did here. Texas participated with Oklahoma and other states in CENRAP regional haze planning over a multi-year period. CENRAP developed air quality modeling, including point source apportionment modeling (by ENVIRON), and data on the availability and Cost-effective ness of additional SO_2 controls on Texas sources (by Alpine Geophysics). EPA finds no error in CENRAP's data development[610] and, indeed, relies on CENRAP's technical analysis in its own proposal. EPA completely ignores this provision of its regulation in its proposal here. And there is no qualifier in § 51.308(d)(3)(iii) that would limit a state's ability to rely on an RPO's technical analyses, other than that it be approved by all State participants,"[611] as was the case here. Indeed, such incorporation of and reliance on the technical work of CENRAP is expressly encouraged and permitted in the Regional Haze Rule. As the Tenth Circuit has recently held, under EPA's regulations, a state may "base their determination of reasonable progress on the [regional planning organization's] assessments," as Texas did here.[612] Thus, EPA's attempt to limit Texas' ability to rely on CENRAP's air quality modeling and Cost-effective ness data is contrary to the plain language of the regulations and cannot support EPA's proposed disapproval.[613]

<u>Footnotes:</u>
[595] Id. at 74,822.
[596] 40 C.F.R. § 51.308(d)(3)(iii) (emphasis added).
[597] Id.
[598] 79 Fed. Reg. at 74,857.

599 Id. at 74,861; TX SIP TSD at 65.
600 79 Fed. Reg. at 74,829.
601 42 U.S.C. § 7491(g)(1) (emphasis added).
602 40 C.F.R. § 51.308(d)(1)(i) (emphasis added). EPA has explained that § 51.308(d)(1) contains the requirements "for States to establish 'reasonable progress goals' for each Class I area within the State." 64 Fed. Reg. at 35,730 (emphasis added).
603 40 C.F.R. § 51.308(d)(3)(v)(A)–(G); see also 64 Fed. Reg. at 35,737 ("In their regional haze SIP submissions, States must describe how each of these seven factors is taken into account in developing long-term strategies.").
604 40 C.F.R. § 51.308(d)(3)(iii) (emphasis added).
605 Id. § 51.308(d)(3).
606 For this same reason, EPA's interpretation of 40 C.F.R. § 51.308(d)(3)(v)(C) is plainly erroneous as well. EPA contends, TX SIP TSD at 71, that Texas' long-term strategy did not meet the requirements of 40 C.F.R. § 51.308(d)(3)(v)(C), which provides: "The State must consider, at a minimum, the following factors in developing its long-term strategy: . . . (C) Emission limitations and schedules for compliance to achieve the reasonable progress goal . . . ." EPA's basis for this contention is that "Texas did not adequately consider the emissions limitations and schedules for compliance needed to achieve reasonable progress in Big Bend, Guadalupe Mountains, or Wichita Mountains." 79 Fed. Reg. at 74,822; TX SIP TSD at 71. However, the plain language of § 51.308(d)(3)(v)(C) only requires the state to consider "the reasonable progress goal" already established by the state, not to independently determine what is reasonable progress as part of its long-term strategy. EPA's disapproval of Texas' long-term strategy is unlawful for this reason as well.
607 64 Fed. Reg. at 35,736–37 ("We have decided not to include the five proposed items that are derived from section 51.306(g) [RAVI] [as factors to consider for long-term strategies], because four of these items are included on the list of 'reasonable progress' factors in section 51.308(d)(1)(i)(A) of the final rule . . . .") (emphasis added).
608 For these same reasons, EPA's proposed FIP is unlawful and contrary to the statute and regulations. EPA's FIP "simultaneously conduct[s] RP and LTS analyses using the 'four-factor analysis' outlined in 40 C.F.R § 51.308(d)(1)(A) . . . ." FIP TSD at 12. But, as explained above, the reasonable progress "four-factors" are not appropriately used in developing a long-term strategy. EPA's FIP thus relies on factors that Congress did not intend the agency to consider and is unlawful. Luminant Generation, 675 F.3d at 925.
609 40 C.F.R. § 51.308(d)(3)(iii).
610 Indeed, EPA concedes that "[t]he CENRAP states' modeling . . . was developed consistent with our guidance." TX SIP TSD at 55.
611 40 C.F.R. § 51.308(d)(3)(iii).
612 WildEarth Guardians, 770 F.3d at 944.
613 79 Fed. Reg. at 74,857.

Response: We disagree with this comment. The commenter's interpretation of 40 CFR 51.308(d)(3)(iii) is not only in conflict with that provision's plain language, it also contradicts the statute and the process that Texas itself followed when developing its SIP. 40 CFR 51.308(d)(3)(iii) states that "the State must document the technical basis, including modeling, monitoring and emissions information, on which the State is relying to determine its apportionment of emission reduction obligations necessary for achieving *reasonable progress in each mandatory Class I Federal area it affects*." (emphasis added). CAA Section 169A(g)(1) defines "reasonable progress" to be a consideration of the four-factors. Thus, the plain language of 40 CFR 51.308(d)(3) requires States to conduct a four-factor analysis and document the technical basis for that analysis for both upwind and downwind Class I areas. Even if the regulation were unclear, the statute is not. CAA Section 169A(b)(2) plainly requires both upwind and downwind States to include emission limits in their SIPs that are necessary to achieve reasonable progress. Under the commenter's interpretation, a State without a Class I area would have no obligation to conduct a four-factor analysis for its sources at all. This is not what Congress intended. The commenter attempts to bolster its position by citing to the preamble of the Regional Haze Rule, where we explained that we chose not to include the four-factors in 40 CFR 51.308(d)(3)(v). However, we explained that our reason for doing this was to avoid redundancy, not to absolve upwind States of an obligation to consider the four-factors. In any event, commentary on 40 CFR 51.308(d)(3)(v) says nothing about the plain language of 40 CFR 51.308(d)(3)(iii).

While the commenter correctly points out that a State can rely on technical analyses performed by RPOs to satisfy the requirement in 40 CFR 51.308(d)(3)(iii), the commenter fails to account for situations where these analyses are limited in scope because the participating states wished to perform for themselves certain of the required analyses, particularly the LTS analysis for whether there additional reasonable controls were available. The Tenth Circuit decision cited by the commenter merely stands for the proposition that States can pool their resources with neighbor States to conduct a multi-state analysis in lieu of conducting independent analyses, not that every multi-state analysis will be *per se* sufficient for every State. Tellingly, the commenter's cramped theory does not even square with reality. Texas itself recognized the need for additional information and supplemented the CENRAP analysis by conducting a four-factor analysis that included both upwind and downwind Class I areas.[36] Texas stated several times in its response to comment document for its SIP that this four-factor analysis was required by the Regional Haze Rule.[37]

At bottom, the commenter's views are premised on a fundamental misunderstanding of the regional haze planning process. The commenter seems to suggest that downwind States first set reasonable progress goals and that upwind States then develop a long-term strategy to ensure that they achieve their apportionment of emission reductions. On the contrary, the first step in the process is the four-factor analysis, the results of which determine the suite of reasonable control measures each State will adopt. Reasonable progress goals are criteria for measuring the amount of visibility improvement that is projected to result from the installation of these controls, not a random number that States generate in a knowledge vacuum that then becomes the lodestar for later control determinations.

Comment: EPA's new interpretations, taken together, create a distortion of the regional haze program [Luminant (0061) p. 91]

Luminant stated, taken together, EPA's new interpretations of these provisions [40 CFR 51.308(d)(3)(ii) and (iii)] reflect a fundamental overreach of authority by EPA and, if finalized, would alter the entire nature and intent of the reasonable progress and long-term strategy requirements. EPA's regulations and EPA guidance encourage states to develop their reasonable progress goals and long-term strategies in close coordination with each other and through participation in RPOs, as Texas and Oklahoma did.[614] Yet, through its new and unfounded regulatory interpretations, EPA would discourage coordination, encourage conflict among the

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[36] *See, e.g.*, the Texas Regional Haze SIP at 10-5 ("The TCEQ used the CENRAP modeling to estimate the impact that the control strategy would have on the Class I areas impacted by Texas' emissions."). Following this statement, Texas presents Table 10-6, which summarizes its calculations of the improvements from its control suite at its Class I areas, plus Breton Isle in Louisiana, Caney Creek in Arkansas, and Carlsbad Caverns in New Mexico.

[37] *See, e.g.*, Appendix 2-2 to the Texas Regional Haze SIP at 24 ("Further, a four factor analysis is *necessary* for the set of sources in the respective areas of influence that impact *each* of the Class I areas that Texas' emissions impact.") (emphases added) ("The TCEQ has used the four factor analysis, *as required*, for the set of Texas sources impacting Class I areas, to determine whether all reasonable reductions have been required.") (emphasis added).

states, and disregard years of regional planning and consultation—all performed at EPA's urging.

Luminant asserted that EPA's interpretation of these provisions—which would require Texas to divine EPA's views on Oklahoma's reasonable progress goals before those goals are even submitted to EPA—is also inconsistent with the structure and intent of EPA's regional haze regulations and makes no sense as a practical matter. The regulations establish a coordinated and step-wise process in which states set their reasonable progress goals based on modeling "performed early in the [regional planning] process," and then other contributing states develop their long-term strategies to meet those goals.[615] And, even where it is later determined that the contributing state's long-term strategy is not, in fact, adequate to meet the established goal, that is "not grounds for disapproving either [states'] SIP" and issuing a FIP, as EPA itself found in approving Nebraska's SIP.[616] Rather, the proper course is for the states "to consider whether other reasonable control measures are appropriate to ensure reasonable progress ***during subsequent periodic progress reports and regional haze SIP revisions***. "[617] Thus, EPA's attempt here to "simultaneously conduct[] reasonable progress and long-term strategy analyses" is fundamentally at odds with the regulations and EPA's prior application of those regulations.[618] EPA's conflating of these two distinct analytical steps is contrary to the plain language of the current regulations and results in an analysis and outcome that are nowhere contemplated by the regulations and exceed EPA's authority.

According to Luminant, EPA has all but conceded that its regional haze regulations would require formal amendment in order to accommodate its new approach. EPA submits these changes here as "interpretations" of its existing regulations, but in fact EPA is simultaneously working to formally amend its regulations to authorize EPA's new approach.[619] Unless and until EPA formally amends its current regulations—the plain text of which do not permit EPA's interpretations—EPA is without authority to enforce its unprecedented interpretations against Texas and affected Texas sources here for the first time.

Footnotes:

[614] 64 Fed. Reg. at 35,735 ("The EPA expects that much of the consultation, apportionment demonstrations, and technical documentation will be facilitated and developed by regional planning organizations. We expect, and encourage, these efforts to develop a common technical basis and apportionment for long-term strategies that could be approved by individual State participants, and translated into regional haze SIPs for submission to EPA.").

[615] 77 Fed. Reg. at 40,155.

[616] Id.

[617] Id. (emphasis added).

[618] FIP TSD at 5.

[619] See EPA, Pre-Meeting Materials for the EPA-FLM-RPO-States-Tribes Meeting on the Future of the Regional Haze Program (Feb. 3, 2015).

Response: We disagree with this comment. Contrary to the commenter's assertion, we are not providing a "new" interpretation of our regulations. As we discuss in our proposal, we are merely clarifying how several complex and interconnected regulatory provisions operate to carry out the Congressional directives in CAA Sections 110(a)(2)(D)(i)(II) and 169A(b)(2). We are not suggesting that States should not coordinate their regional haze SIPs or not participate in RPOs. We are reiterating that States have an obligation to include reasonable controls measures in their SIPs so that sufficient progress toward the national goal is achieved at every Class I area and that upwind States cannot shirk this responsibility for downwind Class I areas.

As we explained in our prior response, the commenter has mischaracterized the regional haze planning process. States do not start by conducting regional modeling and setting their reasonable progress goals. To conduct modeling, States first must identify what controls measures their sources will install. To identify these control measures, the CAA and our implementing regulations require States to conduct four-factor analyses. We understand that many States made rudimentary judgments about what control measures they would require their sources to install before conducting regional modeling, but this reality does not excuse those States from their statutory obligation to include in their SIPs "such emission limits, schedules of compliance and other measures as may be necessary to make reasonable progress toward meeting the national goal." CAA Section 169A(b)(2). If we determine that a State's four-factor analysis failed to properly take into consideration one of the statutory factors or was somehow unreasonable, then the CAA requires that we disapprove the SIP. As we explain in response to a later comment in this section of the document, we have taken a voluntary remand of our action on the Nebraska long-term strategy, so the quote by the commenter is irrelevant.

Finally, the commenter is incorrect that we are amending our regulations "to authorize this approach." We are currently soliciting stakeholder feedback on a number of issues related to the second planning period for regional haze. These issues include whether we should revise portions of the Regional Haze Rule related to SIP submission deadlines, the form of five-year progress reports, the RAVI regulations at 40 CFR 51.300-307, and the calculation of the uniform rate of progress. We have also solicited feedback on new guidance to aid States in conducting the modeling, control assessments, and other technical work that will be needed to make reasonable progress going in future planning periods.

Comment: EPA's new interpretations of regulations found in 40 CFR § 51.308(d)(3) conflict with the plain language of the regulations and are no basis for disapproving Texas' SIP. [GCLC (0063) p. 13-14]

GCLC stated that EPA has proposed new interpretations of the LTS-related regulations, all of which EPA relies on to disapprove certain elements of Texas' SIP. EPA's interpretations, as discussed below, conflict with the plain language of the LTS regulations. EPA is also effectively pulling a bait-and-switch on Texas, redefining regulations that have consistently been applied, in a way that arbitrary and capriciously prejudices Texas. These new and unfounded interpretations are an unlawful basis for EPA's proposal and do not warrant any deference, as claimed by EPA.

Reinterpretation of "Progress Goal." According to GCLC, EPA seeks to reinterpret the requirements found at 40 CFR § 51.3 08(d)(3)(ii) by requiring that Texas' demonstration must be based on progress goals that are "approved or approvable" by EPA. [59] This conflicts with the plain language of the regulations that require the upwind state (Texas) to base its long-term strategy on the "progress goal" "established by" the downwind state (Oklahoma); at no time during the states' coordination process is EPA approval of the progress goal necessary or even possible. Through Texas' coordination with Oklahoma and its agreed upon progress goals, Texas' LTS met the reasonable progress goal established by Oklahoma for the Wichita Mountains. Regardless of the actions that EPA is attempting to take regarding the Oklahoma SIP, Texas' submission fully complies with the requirements of the CAA and associated regulations and must be approved.

Interpretations requiring four-factor analysis for intra and interstate Class I Areas. According to GCLC, EPA's proposal to require Texas to conduct the four-factor analysis for the Wichita Mountains, a Class I area outside of the state, completely contradicts the language and intent of the CAA and implementing regulations. Oklahoma has already conducted that analysis, and EPA is in effect asking for Texas to develop its own reasonable progress goal for the Wichita Mountains. This is a duplicative analysis that is not required by law. There is nothing in 40 CFR § 51.308(d)(3)(ii) that requires a four-factor analysis. The LTS regulations state that: "[t]he State must document the technical basis, including modeling, monitoring and emissions information, on which the State is relying to determine its apportionment of emission reduction obligations necessary for achieving reasonable progress in each mandatory Class I Federal area it affects. The State may meet this requirement by relying on technical analyses developed by the regional planning organization and approved by all State participants."[60] This is exactly what Texas did through its participation with the states in its regional planning organization ("RPO"), and to which EPA has no apparent objection.

GCLC asserted that the regional haze regulations only require a State to conduct a four-factor analysis for Class I areas within the state.[61] The LTS regulations discussing out-of-state impacts to Class I areas, as discussed above, only require the apportionment of emissions reductions obligations to meet other states' RPGs that have already been established.[62] Further, the LTS includes a list of factors for consideration in the LTS for Class I Areas outside the state, but this is a list of seven factors that are completely different, in both language and intent, than the reasonable progress four-factors. [63]

GCLC noted, ultimately, EPA "believe[s] the record supports a finding that [Texas'] analysis is inadequate as it does not provide the information necessary to determine the reasonableness of controls at those sources in Texas that significantly impact visibility at the Wichita Mountains."[64] But as discussed above, Oklahoma has all information necessary to determine the reasonableness of controls and EPA's attempt to reinterpret the rules does not impose any additional burdens. Texas has met its LTS obligations.

Footnotes:
59 79 Fed Reg. at 74,829.
60 40 CFR § 51.308(d)(3)(iii). (emphasis added).
61 See 40 CFR § 51.308(d)(l)(i), which only lists the four-factors in relation to "establishing a reasonable progress goal for any mandatory Class I Federal area within the State." (emphasis added).
62 See 40 CFR § 51.308(d)(3)(iii).
63 40 CFR 51.308(d)(3)(V)(A-G).
64 Id.

Response: We disagree with this comment. See our responses to the comments from Luminant above.

Comment: [Associations (0059) p. 11-12] The Associations stated that, after proposing to disapprove Oklahoma's reasonable progress goals, EPA goes on to propose disapproval of Texas' long-term strategy on the basis that it is not consistent with the modified reasonable progress goals that EPA would impose through a FIP. This is both inconsistent with the Clean Air Act and EPA's implementing regulations and patently unreasonable. Texas' long-term strategy fully complies with the Clean Air Act and EPA's regulations because it meets Texas' obligations with respect to Oklahoma and all other States whose visibility may be impacted by emissions from Texas sources. Under EPA regulations, to satisfy the long-term strategy requirement, a State that "has participated in a regional planning process … must ensure that it has included all measures needed to achieve its apportionment of emissions reduction obligations *agreed upon* through that process." 40 C.F.R. § 51.308(d)(3)(ii) (emphasis added). Texas did so here. EPA concedes that "Oklahoma did not specifically request any additional reductions from Texas sources," 79 Fed. Reg. at 74,856, meaning that the "agreement" between Texas and Oklahoma did not require any new emissions controls to be added to Texas' long-term strategy. Instead, EPA ignores this agreement between the States and proposes to disapprove Texas' long-term strategy because it is not consistent with the additional emission reductions proposed by EPA in its Oklahoma FIP. This conclusion is flatly inconsistent with EPA regulations, which require consistency with reasonable progress goals "established by states" during the SIP process, not with alternative reasonable progress goals developed at a later date by EPA. 40 C.F.R. § 51.308(d)(3)(ii).

The Associations contended that the EPA simply ignores the relevant provision of Section 51.308(d)(3)(ii) and instead bases its proposed disapproval on a supposed "interpretation" of a different portion of that rule, which provides that a State's SIP must "include enforceable emissions limitations, compliance schedules, and other measures as necessary to achieve the reasonable progress goals established by States having mandatory Class I Federal areas." 40 C.F.R. § 51.308(d)(3). Engrafting a requirement nowhere found in the text of the regulation, EPA now proposes to "interpret" the phrase "progress goal" to instead mean a reasonable progress goal that is "approved or approvable" by EPA. 79 Fed. Reg. at 74,829. But no amount of supposed "*Auer* deference" permits EPA to "interpret" a regulation to impose a requirement that is contrary to the regulation itself. EPA simply ignores the fact that the "progress goals" phrase it cites refers to the sentence that precedes it: "the reasonable progress goals established by States having mandatory Class I Federal areas." 40 C.F.R. § 51.308(d)(3).

The Associations argued that the EPA's proposed disapproval is unreasonable. Texas' obligation to develop a long-term strategy must be based on the agreements reached among the States at the time their SIPs are submitted. Texas—and other States—cannot be expected to divine whether EPA will disagree with another State's reasonable progress goals years in the future and then anticipate and preemptively incorporate into its long-term strategy the revised reasonable progress goals EPA may decide to include in a subsequent FIP. Thus, even if EPA were to disapprove a State's reasonable progress goals, it is not reasonable to demand that neighboring States adjust their long-term strategies until the next review period.[3]

Footnotes:
[3] EPA has previously agreed with this position, explaining that when a State's final action with respect to reasonable progress goals "deviate[s] from what was included in the [regional] modeling," the remedy is for affected States to

“consider asking [the contributing state] for additional emission reductions” “during subsequent period progress reports and regional haze SIP revisions.” 77 Fed. Reg. at 41,155-56.

Response: We disagree with this comment. See our responses to the comments from Luminant above.

Comment: [TCEQ/PUCT (0056) p. 5-7] The TCEQ stated that the EPA's interpretation of the RHR is unprecedented, incorrect, and unreasonable. The TCEQ argued that the EPA exceeded its authority in disapproving Texas' long-term strategy.

The TCEQ asserted that the EPA has misinterpreted the requirements in §§51.308(d)(1) and (d)(3) and improperly gives meaning to a phrase in order to fill a perceived gap in their own regulations. The RHR requires upwind states to consult with downwind states and develop coordinated strategies to address the upwind state's share of impairment in the downwind state's Class I areas that are impacted. Texas met these long-term strategy requirements. As the EPA admits on 79 FR 74856, in its evaluation of the consultation with Oklahoma, both states agreed with the 2009 Texas plan. Therefore Texas met its obligation under the RHR for the long-term strategy assessment for Class I areas outside the state, specifically Wichita Mountains. The EPA may be correct that its own rules do not address situations where a downwind state's RPG for an area is not properly set, but that does not give the EPA the authority to arbitrarily revise its rules ad hoc, without the proper notice and comment procedures; nor does the flaw in the EPA's rules mean that the Texas plan addressing the long-term strategy is deficient.

The TCEQ stated that the EPA exceeded its authority in disapproving Texas' long-term strategy. First, the EPA bases its proposed disapproval of the RPG and long-term strategy on a new interpretation of §51.308(d)(3)(ii) that the 'progress goal' established by a downwind state, i.e. Oklahoma, must be "approved or approvable." This new definition in 2014 of the term progress goal in order to justify the proposed disapproval of the 2009 RH SIP is arbitrary and capricious. The EPA is proposing to disapprove Texas' portion of the RPG calculation for Wichita Mountains, not because of a flaw in Texas' analysis, but because the EPA does not agree with Oklahoma's RPG. The EPA maintains that in this case, it must disapprove both Texas and Oklahoma's plans regarding Wichita Mountains. This interpretation is not found in the rule or statute and is not legally valid for reviewing Texas' long-term strategy or RPG. In fact, the, §51.308(d)(1) standard for determining the acceptability of the RPG is "it must 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." The EPA agrees that both Texas' RPGs for Big Bend and Guadalupe Mountains and Oklahoma's RPG for Wichita Mountains meet this requirement (79 FR 74834).[5]

The TCEQ explained that, in developing its long-term strategy for impacts to Wichita Mountains, Texas relied on an agreed upon approach to emission reductions. Oklahoma and Texas both agreed to the Texas SIP long-term strategy during consultation. Texas' long-term strategy was based partly upon meeting the RPG for Wichita Mountains established by Oklahoma. That plan and those consultations are what the EPA must review for compliance with the CAA. The EPA also relies on an incorrect interpretation of the long-term strategy requirements in (d)(3). Texas is not required to consider the four statutory factors for Class I areas outside the state. These factors are considered in the determination of 'reasonable progress' in CAA §169A(g)(1) for Class I areas located in the state. For Class I areas located outside the state, Texas is required to consult with those 'downwind' states in developing coordinated emissions management strategies *as may be necessary* to achieve the RPGs established by the host state[6]. In establishing its long-term strategy, the TCEQ properly relied on its consultation and concurrence with Oklahoma at the time the Texas 2009 RH SIP was developed. That consultation resulted in concurrence that controls - additional to those already required under existing regulations - were not reasonable for Texas sources. The EPA is changing the rules after the fact to give a never before used meaning to 'progress goal' that those goals for Oklahoma must be approved or approvable in order to approve Texas' long-term strategy. The EPA cannot rely on the deference from the courts as this interpretation is inconsistent with the regulation and clearly not found in the RHR.

Footnotes:
[5] Once again, the EPA engages in creative interpretation of its rules that is not based iu the CAA. The EPA maintains that "ODEQ's RPGs for the Wichita Mountains are consistent with minimum requirements of §51.308(d)(1) ..... " (emphasis added) This section of the rule makes no mention of a minimum level of progress and in fact provides all of the requirements for what the RPG must provide.
[6] For Wichita Mountains, the host state is Oklahoma. See 40 CFR §51.308(d)(3).

Response: We disagree with this comment. See our responses to the comments from Luminant above. We also note that the commenter's statement that "Texas is not required to consider the four-factors for Class I areas outside the state," is directly contradicted by the analysis the commenter actually performed and by statements the commenter made in its own response to comment document.[38] Finally, the commenter mischaracterizes the consultation discussions with Oklahoma. On multiple occasions, Oklahoma indicated that Texas' sources had outsized impacts on visibility at Wichita Mountains, that Oklahoma could not meet the glidepath without emission reductions from Texas, and that Oklahoma did not believe it had the authority to require those reductions, but instead had to rely on Texas or the EPA. In this final rule, we have clarified that States should not hesitate to ask their neighbors for additional emission reductions if the evidence suggests that cost-effective controls are available, and, at a minimum, should document their disagreements regarding the proper apportionment of emission reductions with all available evidence so that the we can properly evaluate each State's SIP.

Comment: [TCEQ/PUCT (0056) p. 14-15] The TCEQ disagreed with the EPA's position that Texas did not adequately address the documentation requirements in 40 CFR 51.308(d)(3)(iii) regarding the technical basis for Texas' long-term strategy.

The TCEQ noted that the proposal quotes the RHR:

> The State must document the technical basis, including modeling, monitoring and emissions information, on which the State is relying to determine its apportionment of

[38] See, e.g., Appendix 2-2 to the Texas Regional Haze SIP at 24 ("Further, a four factor analysis is *necessary* for the set of sources in the respective areas of influence that impact each of the Class I areas that Texas' emissions impact.") (emphasis added) ("The TCEQ has used the four factor analysis, *as required*, for the set of Texas sources impacting Class I areas, to determine whether all reasonable reductions have been required.") (emphasis added).

> emission reduction obligations necessary for achieving reasonable progress in each mandatory Class I Federal area it affects. The State may meet this requirement by relying on technical analyses developed by the regional planning organization and approved by all State participants (79 FR 74861).

Texas documented the modeling, the monitoring, and emissions information data used for the 2009 RH SIP. The modeling was completed by CENRAP and available for all states. The monitoring data were available from the IMPROVE monitors and the emissions data had been previously approved by the EPA. The preamble contains a lengthy discussion - over eight *Federal Register* pages, plus the Technical Support Document - of Texas' consultation with Oklahoma, Colorado, Arkansas, and New Mexico, the CENRAP process and modeling and the TCEQ's supplemental analysis of CENRAP's technical analysis. This discussion belies the EPA's claim that the TCEQ did not adequately meet the requirements in 40 CFR 51.308(d)(3)(iii) to document the technical basis for the TCEQ's apportionment determination. The EPA and Oklahoma cannot fairly argue that not all relevant data was available to inform them of Texas source's visibility impact on neighboring Class I areas and the reasoned analysis that additional controls would not be necessary to reduce visibility impairment outside Texas.

Response: As we have discussed in our responses to other comments, the mere fact that Texas addressed a requirement in the Regional Haze Rule does not mean that it did so in a reasonable fashion and therefore satisfied that requirement. Similarly, Texas cannot rely on CENRAP's technical evaluation if that evaluation is limited in scope. Also, the TCEQ should not mistake the length of our documentation of how Texas addressed a particular portion of our regulations as being indicative of our assessment of the quality of those consultations. Furthermore, as we also discuss at length in our proposal and in the response to comments herein, we disagree with the TCEQ's conclusion that Texas provided Oklahoma with enough information with which to make an informed calculation of its reasonable progress goal for Oklahoma. As we state in our proposal:[39]

> Because it only estimated the visibility benefit of all the controls together, the TCEQ was not able to assess the potential benefit of controlling individual sources with significant, and potentially cost-effective, visibility benefits. Also, we believe that individual benefits were masked by the inclusion of those controls with little visibility benefit that only served to increase the total cost figures. Thus, Oklahoma was not armed with adequate information with which to make an informed decision concerning the benefits and costs of controlling sources in Texas.

Comment: [Associations (0059) p. 2-4, 21] The Associations stated the EPA's proposal stands in stark contrast to EPA's prior interpretation of the Clean Air Act and its own regional haze regulations, both in guidance and in its review of prior SIP submissions from other States. If finalized, EPA's new interpretation would dramatically expand EPA's authority while unfairly minimizing the role of the States in determining how to best balance competing interests while improving visibility at national parks. As the Supreme Court recently explained, an agency must "provide more substantial justification when its new policy rests upon factual findings that

[39] 79 FR 74838.

contradict those which underlay its prior policy; or when its prior policy has engendered serious reliance interests that must be taken into account." *Perez v. Mortgage Bankers Ass'n*, Case No. 13-1041 (S. Ct. Mar. 9, 2015), *Slip op.* at 13 (internal citation omitted).

The Associations noted that, here, EPA has failed entirely to address its change in interpretation, let alone provide "substantial justification" for it. Not only would EPA's approach needlessly impose nearly $2 billion in unnecessary costs on Texas utilities despite Texas' reliance on EPA's prior policy when preparing its SIP, it would create harmful precedent that could be used by EPA in the future to ignore States' reasoned judgments and impose significant and excessive costs on the Associations' members. Therefore, we urge EPA to withdraw the proposal and to recognize the reasoned judgment of Texas and Oklahoma by fully approving their regional haze SIPs.

[Associations (0059) p. 21] The Associations concluded that the EPA's proposal to disapprove Texas and Oklahoma's SIPs and impose FIPs to establish reasonable progress goals and long-term strategies is unlawful, arbitrary, and capricious. The Associations urged EPA to approve Texas and Oklahoma's SIPs as consistent with the Clean Air Act and EPA's Regional Haze Rule.

Response: The commenter is incorrect that we are creating a new interpretation or new policy. As we explained in the proposal, after evaluating the Texas and Oklahoma regional haze SIPs, we found it necessary to clarify our interpretation of certain statutory and regulatory provisions, many of which are highly complex and interconnected, in order to provide States with clarity as to their respective roles and obligations when addressing visibility transport.

Comment: EPA cannot disapprove the plans on the basis of a new interpretation that is contrary to the plain language of EPA regulations on state consultations. [NRG (0078) p. 7]

NRG stated that the EPA has proposed to interpret its rules at 40 C.F.R. §§ 51.308(d)(3) to effectively require states such as Texas to guess correctly as to whether EPA will in the future disagree with another state's long-term strategy. 24 This proposed interpretation is also part of the basis for EPA's proposed disapproval of Texas' plan.

NRG disagreed with this interpretation, as it is contrary to the plain language of the regulations, as described in the following table:

Rule	Plain Meaning	EPA Proposed Interpretation

40 C.F.R. 51.308(d)(1)(iv): "(1) Reasonable progress goals. For each mandatory Class I Federal area located within the State, the State must establish goals (expressed as deciviews) that provide for reasonable progress towards achieving natural visibility conditions…. (iv) In developing each reasonable progress goal, the State must consult with those States which may reasonably be anticipated to cause or contribute to visibility impairment in the mandatory Class I Federal area."	The state containing the Class I area, which is responsible for setting the reasonable progress goal, must consult with upwind states that might affect the Class I area. The regulation that calls for upwind states to initiate consultation in furtherance of "coordinated emission management strategies" (40 C.F.R. § 51.308(d)(3)(i)) only applies once the reasonable progress goal has been set.	"[A]s a corollary to Section 51.308(d)(1)(iv), upwind states must consult with [downwind][25] States(s) in order to develop coordinated management strategies."
40 C.F.R. § 51.308(d)(3)(ii) (emphasis added): "Where other States cause or contribute to impairment in a mandatory Class I Federal area, the State must demonstrate that it has included in its implementation plan all measures necessary to obtain its share of the emission reductions needed to meet the ***progress goal*** for the area."	The term "progress goal" refers to the reasonable progress goal established by the state containing the Class I area, per subsection 51.308(d)(1) which provides that "For each mandatory Class I Federal area located within the State, the State must establish goals (expressed In deciviews) that provide for reasonable progress towards achieving "natural visibility conditions." The statute and regulations do not provide that a state must guess what an "approved or approvable" reasonable progress goal would be beyond the plain meaning of EPA's rules.	"[W]e interpret the term 'progress goal' in Section 51.308(d)(3)(ii) as an *approved or approvable* progress goal."[26]

NRG stated that the proposed interpretations offered by EPA appear calculated to provide a basis for EPA to disregard the Texas-Oklahoma consultations that underlie this action, including the Wichita Mountains reasonable progress goals. However, they are contrary to the plain language of the rules themselves. Notably, EPA can point to no flaw in the consultations between Texas and Oklahoma other than EPA's subjective determination that the consultations did not result in the same suite of emission controls that EPA now plans to impose. The distinguishing feature of such an analysis is the proposed insertion of extra-statutory and extra-regulatory requirements, developed only for the Texas action, such as "coordinated management strategies" and "approved or approvable" goals. In fact, the required consultations occurred, as described in EPA's Federal Register notice. 79 Fed. Reg. at 74,854.Thus, inadequacy of consultation does not provide a basis for EPA's action.

Footnotes:
[25]The "downwind" brackets appear in EPA's preamble.
[26]79 Fed. Reg. at 74,829.

Response: We disagree with this comment. We are not requiring States to guess whether we will approve a State's reasonable progress goal in the future. The Regional Haze Rule requires States to conduct adequate four-factor analyses as the first step in the process of establishing reasonable progress goals and long-term strategies. For the reasons explained in the preamble to this final rule, Texas failed to conduct a proper four-factor analysis for either its own Class I areas or the Wichita Mountains. In addition, we disagree that 40 CFR 51.308(d)(3)(i) requires States to consult concerning coordinated emission management strategies only after their reasonable progress goals have been established. The plain language of that provision contains no such requirement. Rather, the commenter appears to have divined this sequence of events from the mere fact that 40 CFR 51.308(d)(3) follows 40 CFR 51.308(d)(1) in the Code of Federal Regulations. As we have explained elsewhere, four-factor analyses, reasonable progress goals, and long-term strategies are inextricably linked. The consultation requirements in 40 CFR 51.308(d)(1)(iv) and 40 CFR 51.308(d)(3)(i) are two sides of the same coin. In regards to other aspects of the commenter's preferred interpretation of the provisions at 40 CFR 51.308(d), see our responses to the comments from Luminant and others above.

Comment: [TCEQ/PUCT (0056) p. 5] The TCEQ stated that the EPA's action is based not on current law or guidance but rather the agency's preference of what the law and guidance should be. This is apparent from recent meetings the EPA has conducted with regional planning organizations (RPOs), federal land managers (FLMs), and states on possible changes to the RHR and guidance - changes that in many ways would codify the approach that the EPA has taken in proposing disapproval of the Texas and Oklahoma SIPs.

The TCEQ noted that the EPA has indicated intentions to revise the RHR and guidance and is in the process of holding meetings with relevant stakeholders such as states, FLMs, and RPOs to receive feedback and input on what these revisions should entail. This is the correct approach for an agency considering making changes to properly promulgated rules. Several stakeholders have already expressed to the EPA that the agency needs to more clearly articulate expectations in the rule or guidance for how to consider the four statutory factors used in setting RPGs. The EPA has posed a series of questions to stakeholders on how to revise the RHR and guidance, including how states should address each RPG factor. For example, the EPA asks if the RPG analysis should include a presumption that certain controls are needed for reasonable progress. This is precisely what the EPA has done in reviewing the Texas 2009 RH SIP and developing the proposed FIP, an action that is without a basis in the current regulations. If the EPA finds that in its review of state RH plans there are flaws in its own rules, the appropriate mechanism for correcting those flaws is not disapproving those plans; it is through prospective, CAA-compliant rulemaking. The EPA must base its review of the Texas 2009 RH SIP on what the rule and guidance required at the time Texas submitted the plan in 2009. Changes to the law must be properly made through notice and comment rulemaking and not imposed prematurely and without notice to states after plans are submitted. It is arbitrary and capricious, as well as contrary to current case law, to require a state to guess what the EPA may choose to require from a state for an approvable plan. The EPA had appropriate rules and guidance, these were correctly and appropriately followed by the TCEQ in developing the 2009 RH SIP, and the EPA is obligated to follow its own rules and guidance that were in place when the plan was developed as it evaluates the merits of the submission.

Response: We disagree with this comment. We are currently soliciting stakeholder feedback on a number of issues related to the second planning period for regional haze. These issues include whether we should revise portions of the Regional Haze Rule related to SIP submission deadlines, the form of five-year progress reports, the RAVI regulations at 40 CFR 51.300-307, and the calculation of the uniform rate of progress. We have also solicited feedback on new guidance to aid States in conducting the modeling, control assessments, and other technical work that will be needed to make reasonable progress going forward. We have not solicited feedback on revising the regulatory provisions related to four-factor analyses, interstate consultation, or long-term strategies, as the commenter suggests, because we do not believe these provisions require revision. Instead, we have clarified our existing interpretation of these provisions in this rulemaking.

Comment: EPA's "guidance" on interstate consultation is procedurally flawed and inconsistent with the regional haze rule. [UARG (0065) p. 5-9]

UARG stated that the EPA acknowledges that Oklahoma and Texas engaged in the interstate consultation process required by EPA's regional haze rule and that Oklahoma did not request any additional emission reductions from Texas. 79 Fed. Reg. at 74,822-23. EPA suggests, however, that Oklahoma did not understand its right under the regional haze program to seek more emission reductions from Texas or that it failed to properly exercise that right. *Id.* at 74,872. EPA proposes to conclude that it must step in and force the Texas emission reductions that it believes Oklahoma should have requested. *Id.* For the reasons described below, EPA has no basis for doing so. EPA further concludes that because, in its view, Oklahoma did not understand the regional haze program's consultation process, new nationally applicable guidance on interstate consultation, and on how those requirements apply in the "visibility transport" context, is needed. *Id.* at 74,823. EPA's proposed "guidance" on this issue is irretrievably flawed and should be withdrawn.

As an initial matter, UARG stated that the EPA purports to provide nationally applicable guidance with respect to visibility transport and interstate consultation but fails to provide legally adequate notice that this rulemaking addresses issues relevant to any state other than Texas and Oklahoma. *See id*. At 74,828-30 (EPA's interpretation of 40 C.F.R. § 51.308(d)(1) and (d)(3)); *id.* at 74,888 (proposed determination of nationwide scope and effect). The title of the proposed rule does not refer to nationally applicable guidance, and there is no reason to believe that the general public, including other states, have been apprised that this proposed rule includes significant new interpretations of EPA rules that are intended to govern the future implementation of the regional haze program outside of Texas and Oklahoma. For that reason, EPA's proposed rule is procedurally flawed and the proposed nationally applicable visibility transport guidance should be withdrawn.

UARG stated that the guidance EPA proposes is, moreover, inconsistent with EPA's regional haze rule and the Agency's existing guidance on interstate consultation. EPA begins its discussion of its new "interpretation" of 40 C.F.R. § 51.308(d)(1) and (d)(3) by stating that its regulations:

> do not explicitly address situations where the control measures in an upwind state's long-term strategy are sufficient to obtain its share of reductions needed to meet a RPG included in a downwind state's SIP, but the goal itself is flawed precisely because the upwind state never proposed sufficient control measures to ensure reasonable progress in the first place. *Id.* at 74,829.

UARG noted that, in such a circumstance, EPA proposes to conclude that it must "disapprove both the downwind state's goal and the upwind state's long-term strategy." *Id.* But EPA's proposed action proceeds from a false premise. The regional haze rule does not specifically address this situation because that rule is designed in such a way that these circumstances will not arise. Under the rule, states are empowered to establish RPGs and are generally required to do so based on an analysis of the four reasonable progress factors. So long as states undertake that analysis, EPA cannot engage in second-guessing and substitute its own RPGs for those adopted by a state. EPA's novel proposed guidance would eviscerate the state discretion provided under the regional haze rule to establish RPGs and would allow EPA to substitute its own RPG preferences, based on nothing more than an assertion that a downwind state would have set a different RPG if it had been (from EPA's perspective) more assertive in its dealings with an upwind state.

UARG stated that EPA's proposed guidance is erroneous is confirmed by the interstate consultation provisions EPA purports to interpret, which provide no authority for EPA to second-guess state determinations made through the interstate consultation process. The regional haze rule expressly provides that if a downwind state believes an upwind state should do more to reduce its emissions and the upwind state is uncooperative, the downwind state is to document the consultation and inform EPA of the situation. 40 C.F.R. § 51.308(d)(1)(iv). In the absence of a state conclusion that an impasse in interstate consultations has been reached, EPA has no authority to revisit the interstate determinations that have been made. EPA's proposed new interpretation is therefore inconsistent with the regional haze rule.

UARG stated that the EPA's proposed new interpretation is also inconsistent with EPA's existing guidance on these matters. The proposed rule cites and describes a 2006 document, "Additional Regional Haze Questions," in which EPA "encouraged the early identification of any potential disputes to allow all parties ample opportunity to address and document any disagreements" and in which EPA explained that when states disagree over measures necessary to contribute adequately to reasonable progress, the disagreement should be brought to EPA's attention as early as possible. 79 Fed. Reg. at 74,827. This guidance thus makes clear that determinations as to the adequacy of apportionment of emission reduction obligations among upwind and downwind states are for states to make through the interstate consultation process except where states conclude that agreement cannot be reached. Where a state does not invoke the provision of the regional haze rule that authorizes it to inform EPA of a dispute that that state has with other states and where that state uses its discretion under the rules and the CAA to establish an RPG, EPA has no right to assume or conclude that the state meant to or should have invoked that provision but improperly failed to do so for some unarticulated reason.[2] Because EPA's proposed guidance takes the opposite position, it is inconsistent with the CAA and the existing regional haze rule and must be withdrawn.

In addition, UARG noted that the EPA's proposed guidance includes a statement that contradicts the regional haze rule's provisions concerning regional planning organizations ("RPOs"). EPA acknowledges that its rules allow states to satisfy the RPG analysis technical documentation requirement by relying on RPO technical analyses approved by all state participants. *Id.* at 74,829.[3] EPA goes on to state, however, that "[i]n situations where a regional planning organization's analyses are limited, incomplete or do not adequately assess the four-factors … states must fill in any remaining gaps to meet this requirement." *Id*. EPA does not explain what it means by this statement, but the vague assertion that reliance on RPO technical analyses might not be appropriate contradicts the plain language of the regional haze rule (in particular, 40 C.F.R. § 51.308(d)(3)(iii)). Because the proposed guidance is inconsistent with the regional haze rule, it should be withdrawn.

UARG asserted that the EPA in any event cannot apply its novel interpretation – which, in effect, constitutes new SIP requirements – retroactively. *See Bowen v. Georgetown Univ. Hosp.*, 488 U.S. 204, 208-09 (1988). If EPA wants to change the rules to which states must adhere in developing SIPs and discharging their implementation responsibilities under the regional haze program, EPA must conduct national rulemaking – clearly designated as such – and may only make any changes effective on a prospective basis. EPA thus cannot use its proposed new guidance as a basis for disapproving any part of the Texas SIP or the Oklahoma SIP.

Footnotes:

[2] EPA cites the floor statements of three senators to support its argument that, in enacting the regional haze program, "Congress was motivated in part by the dilemma of Vermont and other downwind states." 79 Fed. Reg. at 74,830. By citing Vermont, EPA appears to be referring to its discussion of Vermont v. Thomas, 850 F.2d 99 (2d Cir. 1988), and the dispute between Vermont (the downwind state) and upwind states that, in Vermont's view, were not adequately controlling emissions from their sources. As an initial matter, the floor statements of individual members of Congress do not constitute the views of Congress. See, e.g., Kenna v. U.S. Dist. Court for C.D. Cal., 435 F.3d 1011, 1015 (9th Cir. 2006). Moreover, in Vermont, the downwind state unequivocally stated its opposition to the emission control decisions and policies of upwind states and in fact brought litigation to seek resolution of its dispute. That set of facts bears no resemblance to the facts here.

[3] EPA adds that "regional haze is a regional problem that requires regional solutions." 79 Fed. Reg. at 74,830. This statement would seem to acknowledge the important and legitimate role played by the RPOs and that RPO-developed regional solutions are more appropriate than FIP requirements imposed by EPA.

Response: We disagree with this comment. As an initial matter, we reiterate that we are not providing "new" interpretations or "new" guidance. We are merely clarifying our existing interpretation of various statutory and regulatory requirements because the record in this action revealed the difficulties States can encounter when dealing with visibility transport. We believe that the clarifications provided in the proposed rule and in this final rule may prove useful to other States as they prepare for the second planning period. To the extent that we were required to provide notice of our clarification of existing interpretations, we did so. We published the proposed rule in the Federal Register. The commenter suggests that notice was inadequate due to the title of the proposed rule, but points to no authority for this proposition.

The commenter is also incorrect that we re "second-guessing" States' reasonable progress goals. We evaluated Texas' four-factor analysis and found it to be flawed in several respects. As a result, we proposed to disapprove Texas' four-factor analysis and determination that no new controls were necessary to achieve reasonable progress at any Class I area. At the same time, we proposed our own four-factor analysis and proposed to find that there were cost-effective SO_2 controls available for several large Texas EGUs that have significant visibility impacts, including at the Wichita Mountains. Once we made these findings, we necessarily had to propose to disapprove Oklahoma's reasonable progress goals for the Wichita Mountains because they did not account for the SO_2 reductions that can reasonably be achieved by Texas' EGUs. We have largely confirmed these determinations in the final rule.[40] Therefore, it was our disapproval of Texas' four-factor analysis and control determinations that served as the predicate for our disapproval of Oklahoma's RPGs, not the reverse. We acknowledge, however, that the two are closely intertwined, which is the reason why we provided clarification of these statutory and regulatory requirements in the proposed rule.

The commenter also mischaracterizes our 2006 Q & A document. There, we encouraged States to document their disagreements so that we have a sufficient record to determine the adequacy of each State's SIP and resolve disputes between States. This document does not suggest, however, that so long as States agree on the apportionment of emission reductions, we are powerless to review that apportionment or the underlying analyses. If this were the case, States would be free to collude to do nothing to address visibility impairment in their Class I areas. Similarly, an upwind State could pressure a downwind State to acquiesce to the upwind State's proposal to do nothing to address visibility impairment even though the downwind State had concerns. Neither the CAA nor our implementing regulations contemplate such an unfair system. Instead, States are charged to conduct four-factor analyses to provide a sound factual predicate to their control determinations. If a State fails to conduct a four-factor analysis or fails to do so reasonably, then we are required to disapprove that analysis and step into the shoes of the State. Therefore, while we agree with the commenter that States should work together through the consultation process to determine their apportionment of emission reductions, and we prefer to defer to States' decisions wherever possible, we disagree that we must approve any apportionment of reductions the States agree upon, regardless of whether it is reasonable or not.

Furthermore, the commenter is incorrect that 40 CFR 51.308(d)(3)(iii) provides States with unbridled discretion to rely on an RPO's technical analyses in place of their own. The first sentence of 40 CFR 51.308(d)(3)(iii) makes clear that each State "must" justify its apportionment of emission reductions with a technically supported four-factor analysis. Our regulations allow States to work together in RPOs, which provide for enhanced communication and pooled resources. As a result, the second sentence of 40 CFR 51.308(d)(3)(iii) provides that States

[40] As discussed elsewhere, the D.C. Circuit recently remanded without vacating a number of CSAPR's state emissions budgets. *EME Homer City Generation v. EPA*, 795 F.3d 118 (D.C. Cir 2015). We are in the process of acting on the Court's remand. As a result, at this time we cannot ensure that CSAPR will continue to be an appropriate alternative to BART for Texas EGUs. Given the uncertainty arising from the remand of some of the state CSAPR budgets, we have decided not to finalize that portion of our FIP relying on CSAPR as an alternative to SO_2 and NO_x BART for EGUs in Texas. As the question of how best to address the BART requirements for these significant sources of emissions of visibility impairing pollutants remains undecided, we have also concluded that our proposed action to establish new RPGs for Oklahoma should also be addressed in a future rulemaking.

"may" satisfy the first sentence's requirement by conducting the requisite analysis in coordination with their neighbor States in the RPO process. In other words, the second sentence of 40 CFR 51.308(d)(3)(iii) merely allows States to rely on coordinated analyses instead of a State's own analysis. It does not diminish the requirement that the analyses must be complete and well-reasoned. To the extent that RPO analyses do not address all the RH requirements for a particular State, then the State is required to make up the difference. Finally, the EPA is not applying a novel interpretation or creating new SIP requirements. We are applying existing requirements to a complex factual scenario. Therefore, the commenter's citation to *Bowen* is inapposite.

Comment: EPA must approve Texas' long-term strategy for the same reasons EPA approved Nebraska's. [Luminant (0061) p. 83]

Luminant stated that EPA's actions with respect to Nebraska and South Dakota unravel EPA's new theory of the need and justification for "simultaneous" action on Texas' and Oklahoma's regional haze plans, and its interpretation of 40 C.F.R. § 51.308(d)(3)(ii) that underlies the theory (discussed below). Commenters on EPA's action for Nebraska asserted that, where one state's RPG is determined to be "not sufficient" (i.e., not "approvable"), "each state participating in the regional planning process for the applicable Class I area [must] be required to re-evaluate their LTS and make appropriate revisions to ensure they met their apportionment of emission reduction obligations necessary for achieving reasonable progress."[565] EPA disagreed with this comment, and explained that the process works in a fundamentally different way. EPA explained that states look to "air quality modeling performed by the RPOs" "[t]o set RPGs."[566] EPA further explained that there is "an inherent amount of uncertainty in the assumed emissions from all sources" and that when a state's final action "deviate[s] from what was included in the modeling," the remedy is for affected states to "consider asking [the contributing state] for additional emission reductions" "during subsequent periodic progress reports and regional haze SIP revisions."[567]

Luminant noted that EPA's proposed action here cannot be squared with its actions in connection with the Nebraska and South Dakota SIPs. EPA claims here that "[t]o properly assess whether Oklahoma had satisfied the reasonable progress requirements," it "had to review and evaluate Texas' regional haze SIP before proposing action on Oklahoma's RPGs."[568] But this is fundamentally at odds with EPA's explanation in its Nebraska/South Dakota action that states fulfill their statutory obligations by consulting and making assumptions together to develop their regional haze SIPs, and then make adjustments in future planning periods as necessary. As discussed above, EPA's prior explanation of the correct process is consistent with its regional haze regulations, and its current and novel interpretation is not. Further, while EPA now claims that "[i]n order to address these intricately intertwined issues between Oklahoma and Texas, it is appropriate to review them simultaneously,"[569] Oklahoma and Texas are no more "intertwined" than any other two states that must consult over out-of-state impacts. Indeed, the long distances between Texas sources and Oklahoma's Class I area—and the negligible visibility impacts involved—make Texas and Oklahoma less "intertwined" than most other states. There is no justification for EPA's approach here. And if EPA wants to require states to follow its new approach to regional haze planning, it must amend its regulations to establish a new consultation process, but it cannot impose one by fiat and use it to retroactively judge the Texas and Oklahoma submissions.

Footnotes:
[565] 77 Fed. Reg. at 40,155.
[566] Id.
[567] Id. at 40,155–56 (emphasis added).
[568] 79 Fed. Reg. at 74,821.
[569] Id. at 74,822.

Response: We disagree with this comment. While the commenter is correct that our statements in the Nebraska haze action appear to be inconsistent with our explanation of the regional haze requirements in this rulemaking, the Eighth Circuit granted our request for a voluntary remand of our action on the Nebraska long-term strategy on March 19, 2015. In our motion for a voluntary remand, we explained that "EPA is concerned that its present explanation could potentially be construed in a manner that is inconsistent with EPA's interpretation of the relevant statutory and regulatory requirements. Remand is therefore appropriate so that EPA has the opportunity to amend or further explain its rationale for declining to require additional controls as part of the FIP's long-term strategy, to more fully respond to comments submitted by the public, and to take further action if necessary." Therefore, the statements relied upon by the commenter are no longer relevant. We are currently reconsidering the Nebraska long-term strategy as it relates to the South Dakota reasonable progress goals and will take appropriate action in the future.

While the commenter is correct that we acted on most regional haze SIPs independently, in some instances, we acted on multiple regional haze SIPs simultaneously. *See, e.g.*, 78 FR 59,825 (Sept. 30, 2013) (disapproving Michigan and Minnesota SIPs with respect to taconite facilities); 78 FR 8705 (Feb. 6, 2013) (issuing a FIP for Michigan and Minnesota taconite facilities); 77 FR 33,642 (June 7, 2012) (issuing limited disapprovals for multiple States' SIPs due to reliance on CAIR and promulgating FIPs that relied on CSAPR instead). More importantly, however, even when we take individual action on a single State's SIP, we consider the record developed during the RPO process and other State's SIP submissions in order to fully evaluate the adequacy of the SIP. In this instance, we chose to act on the Oklahoma RPGs and the Texas SIP simultaneously for good reasons. Texas' sources impact the visibility at the Wichita Mountains more than Oklahoma's own sources do, and the consultation record revealed misunderstandings over the relevant roles of upwind and downwind States in addressing visibility transport issues. As a result, we determined that this action provided an appropriate vehicle to clarify to the States our interpretation of various statutory and regulatory requirements.

Comment: [Luminant (0061) p. 147] Luminant concluded that the EPA's proposed disapproval of Texas' and Oklahoma's regional haze SIPs and EPA's proposed FIPs are contrary to the Clean Air Act and EPA's regulations and cannot be finalized. EPA should take final action to approve Texas' and Oklahoma's regional haze SIPs in full. To the extent EPA would have Texas, Oklahoma, and other states address regional haze issues in the new and different manner EPA is now proposing, EPA must first amend its regulations consistent with the statute prior to the second planning period so that all states are subject to the same standards and consistent treatment.

Response: We disagree with this comment for the reasons provided in responses to earlier comments from Luminant above.

Comment: EPA's Interpretation of the Clean Air Act is Reasonable, and Indeed is the Best Reading of the Statute. [Earthjustice (0067) p.33]

Earthjustice et al., stated that, under the Clean Air Act, EPA must ultimately decide, among other things, whether the states' respective SIPs ensure "*reasonable* progress" towards the national visibility goal,[42] and whether those SIPs "contain adequate provisions prohibiting . . . any source or other type of emissions activity within the State from emitting any air pollutant in amounts which will interfere with measures required to be included in the applicable implementation plan for any *other* State." 42 U.S.C. § 7410(a)(2)(D)(i)(II) (emphasis added). In making that determination, EPA evaluates whether any interstate "consultation" regarding the transport of visibility pollution meets the requirements of the rule, and includes "all measures necessary" to achieve each states' respective reasonable progress goals. EPA is not required to rubberstamp a cursory and unreasonable visibility-transport "consultation" that undermines the core purposes and requirements of the haze program. In such circumstances, EPA has the authority—indeed, an obligation—to disapprove an inadequate SIP, and explain what is required to comply with the transport and consultation provisions of the Clean Air Act and its implementing regulations. EPA's interpretation of the Clean Air Act's good neighbor and visibility provisions, as well as the Regional Haze Rule, fits comfortably within that well-established scope of authority.[43]

Earthjustice et al., stated that, even if its implementing regulations did not exist, EPA's proposed clarification of its existing regulations would be a valid interpretation of – indeed, would be compelled by – the text of the Clean Air Act. EPA is not powerless to let states exploit any silences or ambiguities in EPA's own regulations in ways that undermine the statutory text and its purposes. For example, it would be inconsistent with the haze provisions to interpret the statute such that EPA had to approve a consultation simply because Texas proposed the control measures that Oklahoma used as part of the basis for its proposed reasonable progress goal. Such an interpretation would flip the statute on its head and eviscerate the oversight role Congress gave to EPA by allowing states to have the final say on what constitutes reasonable progress. Such an interpretation cannot be reconciled with the statutory scheme in which states submit their haze plans to EPA, and EPA determines whether the plans comply with the Clean Air Act.

Earthjustice et al., stated that if the agency could not take the action it proposes here, states would be free to game the Clean Air Act and issue SIPs that defeat the purposes of the Clean Air Act whenever EPA regulations do not explicitly address every conceivable issue. That is clearly not what Congress intended when it gave EPA the ultimate oversight over state implementation plans. Additionally, such an interpretation would create an incentive—or an obligation—for EPA to issue exceedingly detailed regulations, which would ultimately limit state discretion contrary to the CAA's cooperative federalism structure.[44]

Footnotes:
[42] 40 CFR 51.308(d)(3)(ii)

[43] *Cf. EPA v. EME Homer City Generation, L.P.*, 134 S. Ct. 1584, 1600-01 (2014) (observing that "once EPA has found a SIP inadequate, the Agency has a statutory duty to issue a FIP 'at any time' within two years," and upholding EPA's Transport Rule promulgated in the context of, and subsequent to, disapproving the good neighbor SIP provisions of 23 states, in part, because "nothing in the statute places EPA under an obligation to provide specific metrics to States before they undertake to fulfill their good neighbor obligations.").
[44] We agree with EPA that any petitions for review of the rule must be filed in the D.C. Circuit Court of Appeals. Even if EPA were not clarifying its interpretation of the existing haze rule in this action, EPA's rule takes action on two SIPs, the review of which would normally occur in two separate circuits. For this reason alone, review of the rule must occur in the D.C. Circuit.

Response: We generally agree with this comment, but take no position as to specific statements.

Comment: [TCEQ/PUCT (0056) p. 13] The TCEQ stated that the RHR does not require that a downwind state's RPG must be "approved or approvable" in order to determine if the upwind state's long-term strategy meets the statute or the rule. This is a new and illegal change to the RHR without going through notice and comment rulemaking as required by the Administrative Procedures Act and is thus an arbitrary and capricious determination by the EPA.

The TCEQ stated that the EPA's proposed disapproval of the state consultation requirements is based upon Oklahoma's determination, subsequent to submittal of the Texas 2009 RH SIP, that it required further reductions from Texas. The EPA has not justified its determination that Texas failed to meet the requirements of §51.308(d)(3)(i) and in fact the record shows that the process as laid out in the SIP and as required by the rule was followed by Texas. The EPA's determination is based on a new definition of progress goal in subsection (d)(3)(ii) and a misstatement of the actual rule itself in subparagraph (i).

The TCEQ stated that Texas met the consultation requirements in §51.308(d)(3)(i). Texas determined where emissions were reasonably anticipated to contribute to visibility impairment in Oklahoma. Texas consulted with Oklahoma. The EPA asserts that the TCEQ should have provided information necessary to identify reasonable reductions, which is not required by the RHR. Oklahoma requested information on controls identified by CENRAP. Oklahoma had information on control upgrades contained in the proposed Texas 2009 RH SIP. Yet, it did not request additional controls on Texas sources or disagree with Texas' determination that additional controls were not warranted during the first planning period. It was only after consultation with Texas that Oklahoma argued that it needed controls that they did not have authority to require from Texas sources. Oklahoma's after-the-fact change in position and the EPA's subsequent proposed disapproval of their RPGs for Wichita Mountains does not provide the legal basis for proposed disapproval of Texas' long-term strategy consultations. The RHR does not require that a downwind state's RPG must be "approved or approvable" in order to determine if the upwind state's long-term strategy meets the statute or the rule. This is a new and illegal change to the RHR and is thus an arbitrary and capricious determination by the EPA.

Response: We disagree with this comment. As explained in response to prior comments in this section, we are not making a change to the Regional Haze Rule, nor are we making a "new definition of progress goal." We merely clarified that the progress goal referred to in 40 CFR 51.308(d)(3)(ii) must be approved or, at a minimum, approvable for a State to satisfy that provision. This is sound logic. For example, imagine a provision that required State A to provide half of the emission reductions necessary to achieve natural visibility conditions in a Class I area in State B. Together, State A and State B determined that each State would need to provide 1,000 tons of emissions reductions to achieve this goal. As a result, State A and State B each developed a SIP that required 1,000 tons of emission reductions. When reviewing the SIPs, however, we determined that the States had miscalculated the amount of emission reductions necessary to achieve natural visibility conditions at State B's Class I area. In reality, each State should have provided 2,000 tons of emission reductions. Even though State A thought its SIP was doing enough to achieve natural conditions at State B's Class I area, that conclusion was based on faulty analysis. As a result, State A has not satisfied the provision because State A's SIP does not provide for half of the emission reductions necessary to achieve natural conditions in State B's Class I area. Common sense dictates that we must disapprove State A's SIP. Under the commenter's theory, however, we should approve State A's SIP anyway, even though the SIP was based on faulty analysis, does not satisfy the regulatory provision in question, and will not permit State B's Class I area to achieve natural conditions.

In addition to noting this faulty analysis, we take issue with a statement made by the TCEQ. The TCEQ holds up its statement that it, "determined where emissions were reasonably anticipated to contribute to visibility impairment in Oklahoma," as satisfying section 308(d)(3)(i). First, we note that because Oklahoma has only one Class I area—the Wichita Mountains, there is no question as to the location of the impact of Texas' emissions. Second, merely identifying the location of the impacts, and to the extent the TCEQ meant—the magnitude of these emissions, does not satisfy this regulation. As section 308(d)(3)(i) states, the purpose of the consultations is to " develop coordinated emission management strategies." Consequently, the TCEQ's statement that it need not have, "provided information necessary to identify reasonable reductions" in order to satisfy this regulation, is incorrect. At the heart of any coordinated effort is the exchange of information. In this instance, this exchange of information necessarily required the locations, magnitude, and costs of individual sources controls. As we noted in our proposal, Texas' abbreviated source analysis that it references here, did not provide Oklahoma with the information necessary in order to make an informed decision. Texas' analysis did not include individual source impacts and was missing many source control costs. Our analysis filled that knowledge gap.

Lastly, the TCEQ states that Oklahoma made a post-consultation request for controls, and took the position that it did not have the legal authority to request those controls from Texas. The TCEQ states such a request does not mean that Texas was obligated to supply those controls because the request occurred after the consultation process. The TCEQ does not provide any citation for its analysis. We can only assume it is referring to a number of statements in the Oklahoma SIP acknowledging the magnitude of Texas' emissions on the visibility at the Wichita Mountain and/or the following statements made at the Oklahoma public hearing:

> Western Farmers' Electric Cooperative – In a letter received by DEQ on December 16, 2009, signed by Gerald Butcher.
>
> 25. COMMENT: The DEQ has determined the impact of out-of-state emissions (primarily from the State of Texas) on visibility in the WIMO are significant. Conversely, Texas recently submitted its Regional Haze SIP Revision to EPA and

therein indicated emissions originating from Texas do not impact visibility in the WIMO. Therefore, there appears to be a significant disagreement between the findings from each State. How does the DEQ propose to resolve this issue?

RESPONSE: DEQ stands by its assessment that Texas emissions significantly impair visibility at the Wichita Mountains. EPA can evaluate both SIPs and will be ultimately responsible for determining which findings are supported by the technical demonstrations included in each SIP.

26. COMMENT: Did the DEQ advise Texas that additional emission reductions from Texas sources would not be needed to help Oklahoma meet the WIMO reasonable progress goals, and if so, on what basis was such determination made?

RESPONSE: DEQ advised Texas of its finding during the consultation process that Oklahoma would be unable to meet the uniform rate of progress without additional reductions, including those from Texas sources. However, DEQ does not have the regulatory authority require emissions reductions in other states. Only Texas and EPA can require those reductions.

27. COMMENT: … Based on the above and the fact that "… even the elimination of all anthropogenic sources within Oklahoma is not sufficient to comply with uniform rate of progress", the DEQ concluded "any effective strategy for managing visibility impairment at the Wichita Mountains must address outside sources including regional and international transport." However, the Revision is silent as to how such outside sources will be addressed.

RESPONSE: See response to previous comment.

We disagree with Oklahoma that it did not have authority to request additional controls from Texas. It is required under Section 2.1(c) to secure all the authority it needs to adopt and implement its regional haze SIP, and to provide that authority with its SIP submission, which it did. Also, as we discuss in our proposal, we do not hold Oklahoma blameless in its failed consultations with Texas. On the contrary, we proposed to find:

> We do not agree, however, with the ODEQ's approach to consultation to address impacts from emissions from Texas. At the time that Oklahoma was developing its SIP, it had (1) abundant information showing the impact of Texas sources on visibility at the Wichita Mountains, particularly from EGU sources in northeast Texas, and (2) evidence that cost-effective controls on these sources were likely available. Despite this information, the ODEQ requested neither that the TCEQ further investigate controls at these sources nor did it request additional reductions from Texas sources to address the impacts of emissions from these sources at the Wichita Mountains. The Regional Haze Rule requires states to use the consultation process under Sections 51.308(d)(1)(iv) in the development of RPGs to ensure that all states, including downwind states, take a hard look at what measures are necessary for ensuring reasonable progress towards improving and maintaining

> visibility at Class I areas. Lacking development of critical information during its consultations with Texas, we believe that Oklahoma did not have adequate information to reasonably establish its RPG for the Wichita Mountains, and, as explained below, should have requested that the TCEQ further investigate these sources or requested additional reductions from Texas sources to ensure that all reasonable measures to improve visibility were included in Texas' LTS and incorporated into Oklahoma's RPG for the Wichita Mountains.

4. Consideration of Visibility in the Reasonable Progress Analysis

Comment: [Luminant (0061) p. 1] and [Luminant (0061) p. 62]

Luminant stated that the EPA's proposal is further contrary to law because it attempts to impose a non-statutory factor on Texas. EPA's proposal is not based on an analysis of the four statutory factors for "reasonable progress," but instead hinges on a non-statutory factor—"visibility benefit"—to determine whether additional emission reductions should be required and which sources must incur the costs. Federal Land Managers have recently warned EPA against using "visibility benefit" as "a fifth factor" since EPA has no "statutory mandate to do so." [5] Nevertheless, EPA treats this non-statutory factor as the primary consideration in its analysis here. Thus, "EPA [has] overstepped the bounds of its narrow statutory role in the SIP approval process" and acted "ultra vires" by relying on a "factor [ ] which Congress has not intended [the EPA] to consider." [6]

Luminant Stated that the EPA's only so-called fault with Texas' analysis is "how it analyzed and weighed the four reasonable progress factors,"[439] and specifically the manner in which Texas considered the potential visibility benefits from the control strategies that it examined.[440] EPA contends that Texas should have "separately evaluate[d] the visibility benefit from the implementation of [individual] control[s]." [441] EPA's statutory role does not extend to dictating "how" a State considers the four actors. As EPA itself has explained, "States have considerable flexibility in how they take these factors into consideration . . . ." [442] There is no requirement in the statute, regulations, or guidance that Texas considers the visibility benefit from the implementation of individual controls in the manner EPA would—or even to consider visibility at all in its four-factor analysis. Indeed, EPA has approved other States' four-factor analyses, noting specifically that they did not perform this type of visibility analysis.[443]

Moreover, Luminant asserted that visibility benefit is not even one of the statutory factors required to be considered for reasonable progress, in stark contrast to the statutory factors for source-specific BART, which include visibility benefit as a fifth factor. Texas reviewed the visibility benefits of its proposed control scenario purely as a discretionary matter, and EPA may not disapprove Texas' SIP because Texas did not conduct some different visibility analysis that is not required by either the statute or the regulations. Indeed, even in the BART context where visibility benefit is a statutory factor, EPA's previous attempt to elevate visibility benefits above the other statutory factors was squarely rejected by the D.C. Circuit as contrary to the statute.[444] EPA's attempt here to require a "separate" visibility analysis and use that as an additional factor "in such a dramatically different fashion" than the statutory factors Texas considered is therefore doubly unlawful.[445] In the reasonable progress context, visibility improvement is not one of the statutory factors for reasonable progress, and it certainly is not the determining factor as EPA treats it here. EPA's proposal here is thus contrary to the text and structure of the statute because it "isolates [the visibility] benefit calculation and constrains authority Congress conferred on the States." [446]

Luminant stated that EPA's approach to visibility benefit, which is the only basis for its proposed disapproval and FIP—is thus inconsistent with the statute and regulations. EPA's approach elevates visibility benefit to the determinative factor—above the statutory factors. Indeed, EPA uses its visibility analysis to identify the sources that are then reviewed for costs. This is backwards and plainly not authorized by or consistent with the statute or regulations and is not a proper application of the four statutory factors.

Footnotes:
[5] USDA Forest Serv., Recommendations for Improved Implementation of the Regional Haze Program 5 (May 2014), available at http://tinyurl.com/FederalLandrec.
[6] Luminant Generation Co. LLC v. EPA, 675 F.3d 917, 925, 926 (5th Cir. 2012) (internal citations omitted) (internal quotations omitted).
[439] TX SIP TSD at 18 (emphasis added).
[440] 79 Fed. Reg. at 74,838–39.
[441] Id. at 74,839.
[442] 77 Fed. Reg. at 30,251 (emphasis added).
[443] See, e.g., 78 Fed. Reg. 10,546, 10,553 (Feb. 14, 2013) (approving Alaska's reasonable progress goals and recognizing in response to comments that "the SIP submission does not specifically identify the contribution of coal-combustion sources to visibility impairment in Denali National Park . . . ."); 77 Fed. Reg. 70,693, 70,702 (Nov. 27, 2012) (approving New Mexico's reasonable progress analysis that did not evaluate the contribution from individual EGUs). See also WildEarth Guardians v. EPA, 770 F.3d at 944 (affirming EPA's approval of New Mexico's reasonable progress analysis and holding: "Neither the Clean Air Act nor the Regional Haze Rule requires source-specific analysis in the determination of reasonable progress.").
[444] Am. Corn Growers Ass'n, 291 F.3d at 6 ("The Haze Rule's splitting of the statutory factors is consistent with neither the text nor the structure of the statute.").
[445] Id. at 6.
[46] Id. at 9.

Response: We disagree with this comment. The commenter appears to be stating that States (or EPA when promulgating a FIP) cannot consider visibility in any way in determining reasonable progress and that we must approve a State's reasonable progress goals and long-term strategy as long as all four mandatory reasonable progress factors are analyzed to some degree. This cramped view is at odds with the overarching purpose of the CAA's visibility provisions. Congress declared in CAA Section 169A(a)(1) a national goal of 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 Section 169A(b)(2) required the Administrator to promulgate regulations to assure "reasonable progress toward meeting the national goal." Thus, the entire purpose of the reasonable progress mandate is to achieve the national goal of natural visibility conditions. A reasonable progress analysis that does not take visibility into account in some fashion would be directly at odds with the analysis's core purpose.

CAA Section 169A(g)(1) goes on to state that, in determining "reasonable progress," States must consider four-factor: "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." This consideration is commonly referred to as the "four-factor analysis."[41] The crux of the commenter's argument seems to be that, because this list of factors does not include visibility, States can ignore visibility altogether or, if they choose, consider it in any fashion they want.

While we agree that visibility is not one of the four mandatory factors explicitly listed for consideration in Section 169A(g)(1) or 40 CFR 51.308(d)(1)(i)(A), the term "reasonable progress" itself means reasonable progress towards the national goal of natural visibility conditions. The Supreme Court has stated that, "[i]n determining whether Congress has specifically addressed the question at issue, a reviewing court should not confine itself to examining a particular statutory provision in isolation. The meaning—or ambiguity—of certain words or phrases may only become evident when placed in context. It is a 'fundamental canon of statutory construction that the words of a statute must be read in their context and with a view to their place in the overall statutory scheme.' A court must therefore interpret the statute 'as a symmetrical and coherent regulatory scheme' and 'fit, if possible, all parts into an harmonious whole.'"[42]

To ensure a coherent regulatory scheme, we believe that states (or EPA when promulgating a FIP) can consider visibility when determining reasonable progress in at least two ways. First, states can consider the visibility impacts of sources when determining what sources to analyze under the four-factor framework. CAA Section 169A(b)(2) does not provide any direction regarding which sources or source categories a state should analyze when determining reasonable progress. Similarly, CAA Section 169A(g)(1) refers to "any existing source subject to such requirements," but unlike the BART provisions, does not identify which existing sources or source categories should be subject to reasonable progress requirements. Given this statutory ambiguity, we believe that allowing states to consider visibility impacts when determining the scope of the reasonable progress analysis is a reasonable interpretation of the statute "as a harmonious whole." As such, states can develop screening metrics that target those sources with the greatest visibility impacts for further analysis. Our 2007 guidance advocated this approach, and nearly all states, including Texas, used metrics like Q/d to consider the potential visibility impacts of their sources and screen out those sources with low visibility impacts.[43] We followed

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[41] Correspondingly, under Section 51.308(d)(1) of the Regional Haze Rule, promulgated in response to this mandate, States must "establish goals (expressed in deciviews) that provide for reasonable progress towards achieving natural visibility conditions" for each Class I area within a State. RPGs are interim goals that represent measurable, incremental visibility improvement over time toward the goal of natural visibility conditions. Section 51.308(d)(1)(i)(A) requires States to consider the four statutory factors when establishing their RPGs.

[42] FDA v. Brown & Williamson Tobacco Corp., 529 U.S. 120, 132-33 (2000) (quoting Davis v. Michigan Dept. of Treasury, 489 U.S. 803, 809 (1989), Gustafson v. Alloyd Co., 513 U.S. 561, 569 (1995), and FTC v. Mandel Brothers, Inc., 359 U.S. 385, 389 (1959)). The Court delineated this canon of statutory construction within "step one" of its *Chevron* analysis, recounting that under *Chevron*, a reviewing court must first ask "whether Congress has directly spoken to the precise question at issue," and that if Congress has done so, the inquiry is at an end and the court "must give effect to the unambiguously expressed intent of Congress." Chevron *U.S.A. Inc. v. Natural Resources Defense Council, Inc., 467 U.S. 837*.

[43] For example, in VISTAS states, to select the specific point sources that would be considered for each Class I area, VISTAS first identified the geographic area that was most likely to influence visibility in each Class I area and then identified the major SO_2 point sources in that geographic area. The distance-weighted point source SO_2 emissions (Q/d) were combined with the gridded extinction-weighted back-trajectory residence times. The distance-

this same approach in our FIP by using both Q/d and a second metric based on a source's modeled percent contribution to total visibility impairment at impacted Class I areas. If states or we could not consider visibility impacts as a way of identifying which sources should be considered for additional controls, then states would have no rational way to differentiate between hundreds of sources that vary in distance from Class I areas, emit different visibility impairing pollutants in varying amounts, and are subject to diverse meteorological conditions that affect the transport of visibility-impairing pollutants. The result would be a cumbersome analysis encompassing hundreds of sources (or in the case of Texas, well over a thousand), many of which may have little if any impact on visibility in Class I areas. Congress could not have intended such an incongruous result.

Allowing consideration of visibility improvement is appropriate for several reasons. Most importantly, it aligns with Congress' national goal, which is to remedy existing impairment of visibility in Class I areas. While Section 169A(g)(1) of the CAA contains a list of factors states *must* consider when determining reasonable progress, we do not believe that list is exclusive. As the Eighth Circuit Court acknowledged in *North Dakota v. EPA*, states can take visibility improvement into account when evaluating reasonable progress controls so long as they do so in a reasonable way.[44] We have iterated this position in previous regional haze actions. For example, in our final rule on the Montana regional haze SIP, we stated, "We agree that visibility improvement is not one of the four factors required by CAA Section 169A(g)(1) and 40 CFR 51.308(d)(1)(i)(A), however, it (along with other relevant factors) can be considered when determining controls that should be required for reasonable progress."[45] Similarly, in our final rule on the Arizona regional haze SIP, we concluded that, "while visibility is not an explicitly listed factor to consider when determining whether additional controls are reasonable, the purpose of the four-factor analysis is to determine what degree of progress toward natural visibility conditions is reasonable. Therefore it is appropriate to consider the projected visibility benefit of the controls when determining if the controls are needed to make reasonable progress."

Second, once a universe of sources has been identified for analysis, we believe that States have the option of considering the visibility improvement that will result from potential control options when weighing the four statutory factors. Allowing consideration of visibility improvement is appropriate for several reasons. First, it aligns with Congress' national goal, which is to remedy existing impairment of visibility in Class I areas. Second, while Section 169A(g)(1) of the CAA contains a list of factors States *must* consider when determining reasonable progress, we do not believe that list is exclusive. As the Eighth Circuit acknowledged in *North Dakota v. EPA*, States can take visibility improvement into account when evaluating reasonable progress controls so long as they do so in a reasonable way.[46] We have iterated this position in previous regional haze actions. For example, in our final rule on the Montana regional haze SIP, we stated, "We agree that visibility improvement is not one of the four-factor

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weighted (Q/d) gridded point source SO_2 emissions were then multiplied by the total extinction-weighted back-trajectory residence times on a cell-by-cell basis and then normalized. VISTAS Area of Influence Analyses, 2007, is available in the docket for this action.

[44] North Dakota v. EPA, 730 F.3d 750, 766 (8th Cir. 2013).

[45] 77 FR 57864, 57899, 57901; *see also* Montana Proposed Rule, 77 FR 23988, 24062.

[46] North Dakota v. EPA, 730 F.3d 750, 766 (8th Cir. 2013).

required by CAA Section 169A(g)(1) and 40 CFR 51.308(d)(1)(i)(A), however, it (along with other relevant factors) can be considered when determining controls that should be required for reasonable progress."[47] Similarly, in our final rule on the Arizona regional haze SIP, we concluded that, "while visibility is not an explicitly listed factor to consider when determining whether additional controls are reasonable, the purpose of the four-factor analysis is to determine what degree of progress toward natural visibility conditions is reasonable. Therefore it is appropriate to consider the projected visibility benefit of the controls when determining if the controls are needed to make reasonable progress."[48] Third, allowing States to consider visibility improvement in addition to the four statutory factors ensures that only those cost-effective controls that will achieve sufficient benefits are required. If States were not permitted to consider visibility improvement when conducting their control determinations, then States would have to require all cost-effective controls (assuming no limiting energy or non-air quality environmental impacts) regardless of whether some of those controls would be more beneficial than others. Oddly, the commenter appears to be suggesting that if we had not considered visibility benefits in our analysis, we would not have controlled certain sources. On the contrary, we decided not to require certain cost-effective controls because they would not achieve as much benefit as other controls. If the commenter is correct and the consideration of visibility benefits is impermissible in a four-factor analysis, then we would have required all cost-effective controls, including those at the Parrish and Welsh facilities. Fourth, we note that Congress did not provide any guidance as to how States should consider "the costs of compliance." One possible way a State could "consider" costs is to compare them to prospective benefits. In other words, we believe the first statutory factor is capacious enough to allow for a comparison of cost-effectiveness to visibility improvement. Finally, we note that our 2007 guidance explicitly permits States to consider other relevant factors when conducting a four-factor analysis,[49] and many States, including Texas, did so. In conclusion, we believe that States are permitted, but not required, to consider visibility improvement in addition to the four statutory factors when making their reasonable progress determinations.

The commenter alludes that visibility improvement is irrelevant to a four-factor analysis because Congress did not include it as one of the four-factor but did include it as a factor to be considered in determining BART. We do not find this reasoning to be persuasive. The sources that Congress subjected to the BART requirement (i.e., sources grandfathered from the PSD requirement) were not necessarily sources that would have an impact on visibility impairment. As such, Congress included specific language in CAA Sections 169A(b)(2)(A) and 169A(g)(2) to ensure that only those grandfathered sources that cause or contribute to visibility impairment and that would result in visibility improvement if controlled would be required to install BART. On the other hand, the national goal of achieving natural visibility conditions is central to the notion of reasonable progress, so Congress had no need to include language regarding visibility improvement in CAA section 169A(g)(1).

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[47] 77 FR 57864, 57899, 57901; see also Montana Proposed Rule, 77 FR 23988, 24062.

[48] 79 FR 9318, footnote 137 (finalized based on this same reasoning at 79 FR 52420); TX TSD, at 7, footnote 6; FIP TSD, at 12; 79 FR 74874.

[49] "In determining reasonable progress, CAA §169A(g)(1) requires States to take into consideration a number of factors. However, you have flexibility in how to take into consideration these statutory factors and any other factors that you have determined to be relevant." 2007 Guidance at 5-1.

We also disagree with the commenter that we cannot disapprove a State's SIP where the State has considered visibility improvement in an unreasonable fashion. As the Eighth Circuit explained in *North Dakota*, "[a]lthough 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."[50] Like the State of North Dakota, Texas chose to evaluate visibility improvement alongside the four statutory reasonable progress factors, but did so by using a model that employed degraded background conditions. As a result, Texas' conclusion that the costs of additional controls were not worth the benefits was unreasonable, and we appropriately disapproved this portion of Texas' SIP. The fact that Texas' decision to evaluate visibility improvement was "discretionary" does not mean that Texas was free to exercise that discretion in an unreasonable manner. We discuss several ways that Texas' consideration of visibility improvement in its reasonable progress determinations was unreasonable elsewhere in our proposal, and in our Texas TSD.[51] One point worth mentioning here, however, is that Texas estimated the visibility improvement of potential controls by making comparisons to degraded background conditions instead of to natural background conditions, which is precisely the same mistake that North Dakota made.[52]

We note that the Tenth Circuit's decision in *WildEarth Guardians v. EPA* does not address the issues present in this case.[53] There, the Tenth Circuit merely held that the CAA does not require a State to conduct a source-specific reasonable progress analysis. The Court did not hold that a State is free to conduct any type of analysis irrespective of whether or not the analysis is reasonable. Nor did the Court hold that the CAA prevents States or EPA from conducting a source-specific analysis if that approach is determined to be appropriate.

Finally, we disagree with the commenter that we elevated visibility improvement to a place of primary importance, either in disapproving Texas' SIP or in promulgating our FIP. The flaws with Texas' visibility modeling were only one aspect of our disapproval. Moreover, we stated on multiple occasions in our proposal that we considered all four statutory factors in our analysis. Our analysis does not give greater weight to one factor over another; rather, we considered all four factors fully, revealing that the cost factor, which included visibility improvement consideration, was the most determinative in our decisions and that costs and visibility improvement were the two most important factors in our decisions. The commenter's citation to *American Corn Growers* is also inapposite. There, the D.C. Circuit Court faulted how EPA assessed the statutory fifth factor of visibility improvement in a BART determination (not a reasonable progress determination) by using a regional, multi-source, group approach to assessing the visibility improvement factor, while assessing the other four statutory BART

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[50] *North Dakota*, 730 F.3d at 766.
[51] *See* Section B.2 of the Texas TSD and Section V.C.3 of our proposal (79 FR 74818).
[52] In contrast, Texas conducted a proper visibility analysis using natural background conditions elsewhere in its SIP when the state assessed the visibility impacts of its BART sources. *See* Texas Regional Haze SIP, Appendix 9-5 at 2-11 ("The source's HI [haze index] is compared to natural conditions to assess the significance of the source's visibility impact. EPA guidance lists natural conditions (bnatural) by Class I area in terms of Mm-1 (EPA, 2003b) and assumes clean conditions with no anthropogenic or weather interference. The visibility significance metric for evaluating BART sources is the change in deciview (del-dv) from the source's and natural conditions haze indices.").
[53] WildEarth Guardians v. EPA, 770 F.3d 991, 944 (10th Cir. 2014).

factors on a source-specific basis. Here, not only is the analysis at issue not being performed under BART, but we did not give greater weight to our consideration of visibility improvement within the cost factor, or consider the cost factor in a different fashion from the other three reasonable progress factors.

Comment: [Luminant (0061) p. 68] Luminant Stated, more fundamentally, States are not required to consider visibility benefit as a fifth factor at all, much less with regard to individual controls at individual sources, as EPA's proposal asserts. EPA cannot disapprove a SIP revision for "failing" to consider a factor that is not required by the Clean Air Act.[487] Visibility benefit from individual controls is not one of the four statutory factors that States must consider when evaluating controls for reasonable progress.[488] As EPA has explained, "[t]he final regional haze rule clearly provides the States with the flexibility to establish a reasonable progress goal based on its analysis of the statutory factors." [489] Thus, Texas was not required to "separately evaluate the visibility benefit from the implementation of [] control[s]" either at individual sources or for source categories, as EPA claims. That Texas chose to review the costs of controls in relation to projected benefits was purely discretionary on Texas' part and not a required element of the analysis upon which EPA may base its disapproval.

Footnotes:
[487] See supra note 405.
[488] See 42 U.S.C. § 7491(g)(1).
[489] Response to Petitions at 13.

Response: As we further discussed above, while we agree that the statute and regulations do not include visibility benefit as a mandatory factor for the reasonable progress analysis, or that the statue mandates any inclusion of visibility benefit be on an "individual control at individual source" basis, we note that we do have authority to disapprove a SIP revision for failing to meet the requirements of the CAA, which is the basis of our proposed disapproval and fully explained there. As we have explained above, while the RHR does provide flexibility to the States, and to the EPA, in the "four-factor analysis" to determine reasonable progress, when a State considers visibility benefit in reasonable progress determinations, EPA's review of the State's determinations must ensure the analysis is reasonable within the purpose and explicit national goal established by Congress in CAA Section 169A. We did not compel Texas to consider visibility benefit in its reasonable progress/RPG four-factor analysis; Texas made that determination on its own.[54] We reviewed Texas' reasonable progress four-factor analysis to determine whether the State's determination provides for reasonable progress towards natural visibility conditions, and proposed to find that its determination does not.[55] As we note above, regardless of the approach taken, the State must engage in some rational method for making this assessment that complies with the requirements in the regional haze rule. As we further discuss elsewhere, Texas' approach was highly flawed. Texas' approach effectively had the effect of obscuring the cost-effective and available controls on those sources with the largest visibility impacts, which other approaches would not have done, such as the individual source analysis we chose to perform. This flaw, considered with the other flaws we identified in Texas' four-factor

[54] 79 FR 74837.
[55] 79 FR 74838, 74841, 74843, 74872.

analysis, caused us to conclude that Texas' reasonable progress demonstration under Section 51.308(d)(1)(i)(A) was not approvable.

Comment: [Luminant (006) p. 106] Luminant Stated that neither the visibility impact of a source nor the benefit from an individual emission control at any is one of the statutory factors that States must consider in determining reasonable progress.[1] Unlike in the BART context, visibility improvement is not one of the four statutory factors that States must consider when evaluating controls for reasonable progress and thus is not a lawful basis upon which EPA may disapprove a State's plan.[2] While EPA previously has acknowledged that States may consider visibility improvement (or other factors) as an additional factor when making reasonable progress determinations,[3] such consideration is purely discretionary with the State. Certainly, then, Texas was not required to conduct such modeling of individual controls to determine which are "reasonable" or "feasible," nor was the absence of such modeling valid grounds for EPA to disapprove. EPA's assessment of Texas' RPGs and Texas' decision that additional controls are not reasonable during this planning period must be based on the statutory factors alone, as EPA has previously recognized,[4] and EPA may not disapprove Texas' submission on the basis that Texas did not consider a non-statutory factor in the manner EPA would like.

Further, Luminant noted that EPA's methodology unlawfully elevates visibility benefits (a non-statutory factor) above the statutory factors and uses it as a threshold factor to determine which sources to evaluate under the four statutory factors. At most, visibility benefits are only modeled or estimated by a State after it has determined what control measures or set of controls measures are reasonable by weighing the four statutory factors. As EPA's guidance clearly explains, States should estimate "the improvement in visibility that would result from implementations of the control measures you have found to be reasonable and compare this to the uniform rate of progress." [5] EPA's approach here for Texas is thus backwards and contrary to the statute, and EPA admits there is no "prior precedent" for it.[6] Here, EPA used visibility modeling to identify and select the individual source controls for which it would analyze the costs and other statutory factors.[7] That is not a proper application of the four-factor. Thus, not only did EPA consider a non-statutory factor in its analysis (and fault Texas for not doing so in the same manner as EPA did), it elevated that non-statutory factor to the primary consideration in its analysis and used it as the litmus test for which sources would be further regulated and which would not. EPA's proposal here is contrary to the text and structure of the statute because it "isolates [the visibility] benefit calculation and constrains authority Congress conferred on the States."[8] Further, "EPA [has] overstepped the bounds of its narrow statutory role in the SIP approval process" and acted "ultra vires" by relying on a "factor[ ] which Congress has not intended [the EPA] to consider." [9]

Footnotes:

[1] 79 Fed. Reg. at 74,874 (stating that EPA is "weighing the cost of compliance against the projected visibility benefit," even though visibility benefit is not one of the statutory factors).

[2] Compare 42 U.S.C. § 7491(g)(1) (four reasonable progress factors) with id. § 7491(g)(2) (BART factors including "the degree in improvement in visibility which may reasonably be anticipated to result from the use of such technology"); see also 40 C.F.R. § 51.308(d)(1)(i)(A) (four reasonable progress factors).

[3] See North Dakota, 730 F.3d at 765.

[4] 77 Fed. Reg. 20,894, 20,934 (Apr. 6, 2012) (Under our regulations, we determine whether a State's rejection of reasonable progress controls is reasonable based on the reasonable progress factors.").

[5] EPA Reasonable Progress Guidance at 203 (emphasis added).
[6] Declaration of Sam Coleman, Nat'l Parks Conservation Ass'n v. McCarthy, No. 11-01548, at 5 (D.D.C. 2014).
[7] See 79 Fed. Reg. at 74877—78.
[8] Am. Corn Growers Ass'n, 291 F.3d at 9. Indeed, Federal Land Managers have warned EPA against using visibility benefit as a "fifth" factor in reasonable progress determination since EPA has no "statutory mandate to do so." USDA Forest Serv., Recommendations for Improved Implementation of the Regional Haze Program 6 (May 2014).
[9] Luminant Generation, 675 F.3d at 926 (alteration in original) (internal citations omitted) (internal quotations omitted).

Response: We disagree with this comment, as further discussed above, as we believe our proposal is in conformance with law and Congressional intent, is based on the "four-factor analysis," and does not treat visibility benefit as a factor in the reasonable progress analysis, but as a consideration within the cost factor,. As we further discussed above, we agree that visibility impact of a source or the visibility benefit from an individual source is not a mandatory factor States must consider in determining reasonable progress, or that any inclusion of such must always be on an individual source basis. However, visibility is relevant to the purpose of the statutory subsections and corresponding regulations at issue—assuring reasonable progress towards the national goal of natural visibility conditions.

As we have discussed more fully above, while visibility or visibility benefit is not an explicitly listed factor, we believe consideration of visibility within reasonable progress is a reasonable interpretation of the statute in at least two ways, including when determining scope of the analysis and what cost-effective controls should be required for reasonable progress. Also, as we have discussed above, while States have discretion in evaluating reasonable progress, when a State considers visibility improvement in evaluating control options, as Texas did here, that consideration must still be reasonable in light of the explicit goals established by Congress in CAA Section 169A. The State's discretionary inclusion of other appropriate considerations into the reasonable progress four-factor analysis can only be approvable if the resulting analysis does not subvert the overarching goal and intent of the statutory requirement—otherwise, undertaking analysis of the mandatory factors could be rendered mere lip service to the statutory requirements. As we discussed above, we have considered the Federal Land Managers recommendation regarding visibility benefit, and still find that while the statue does not mandate consideration of visibility benefit as one of the four factors listed in Section 169(g), we, and the State, can consider visibility benefit if we, or the State, finds it relevant to achieving the statutory goal of reasonable progress towards natural visibility conditions.

We agree that Texas was not required by the four-factor analysis to consider visibility or conduct visibility modeling of individual controls to determine which are "reasonable" or "feasible" for reasonable progress. We did not compel Texas to consider visibility impact and visibility benefit in its reasonable progress and RPG four-factor analysis; Texas made that determination on its own, both screening out sources prior to the four-factor analysis based in part on a Q/d analysis, and comparing costs of controls to visibility benefit within the four-factor analysis.[56] We reviewed Texas' reasonable progress and RPG four-factor analysis to determine whether the State's determination provides for reasonable progress towards natural visibility conditions, and

[56] 79 FR 74835, 74837.

proposed to find that its determination does not.[57] As we further discussed above, Texas' approach was highly flawed. Texas' approach effectively had the effect of obscuring the cost-effective and available controls on those sources with the largest visibility impacts, which other approaches would not have done, such as the individual source analysis we chose to perform. This flaw, considered with the other flaws we identified in Texas' four-factor analysis, caused us to conclude that Texas' reasonable progress demonstration under Section 51.308(d)(1)(i)(A) was not approvable. In sum, we did not disapprove Texas' analysis because it did not undertake the same analysis we later determined was appropriate in our own FIP proposal; we proposed disapproval because Texas' analysis, given all flexibility we recognize as appropriate within the four-factor analysis, did not meet the requirements and intent of the statute.

Luminant's assertion that reasonable progress "must be based on the statutory factors alone, as EPA has previously recognized," with citation to our North Dakota RH action is also incompletely reproduced and taken out of context. The full quote is actually:[58]

> As we have noted, our regulations require consideration of four factors in reasonable progress determinations; visibility improvement is not one of the specified factors. As we have indicated, when a state considers visibility improvement as an additional factor in evaluating single-source control options, that consideration must be reasonable in light of the explicit goals established by Congress in CAA section 169A.

Thus, our statement in our North Dakota action actually supports the consideration of visibility.

We disagree with Luminant's interpretation of Sam Coleman's declaration. While we did say that there was no prior precedent, this was in regards to the particular type of modeling undertaken; Luminant takes Coleman's Statement out of context. Coleman's Statement is related to the additional modeling we determined was appropriate due to the large distances involved and the large number of sources being analyzed, which was a unique set of facts not encountered by us in the Regional Haze context before. Luminant conflates this context and over broadens the scope of Coleman's Statement beyond the modeling to our reasonable progress analysis overall, and visibility in particular. Coleman's Statement was not stating there was no prior precedent for our four-factor analysis, nor was it stating there was no prior precedent for consideration of visibility or visibility benefit.

Our analysis neither treats the four factors differently from each other, nor elevates visibility above the four statutory factors. We do not believe the case cited by Luminant, *American Corn Grower*, is applicable to our proposal for the reasons discussed elsewhere, as the analysis at issue is reasonable progress, not BART, and our analysis neither treats the statutory factors differently from each other, nor elevates visibility above the four factors. Our proposal analyzed all four factors in evaluating reasonable progress/RPGs in accordance with the statute. Our proposal did not give greater weight to one factor over another; rather our proposal considered all factors fully, revealing that the cost factor, including the consideration of visibility benefit, was the most

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[57] 79 FR 74838, 74841, 74843, 74872.

[58] 77 FR 20934.

determinative factor, i.e. had the most limiting effect, on the final determination.[59] Thorough analysis revealed that some factors had little to no limiting effect on what controls were available for reasonable progress, while others did have greater effect, and therefore were more determinative. This certainly does not mean consideration of visibility improvement was weighted, or given main or primary status. As further discussed above, our proposal included a reasonable interpretation of the statute, which included visibility in our analysis in two ways: 1) when evaluating to what degree sources/source categories contributed to visibility impacts in Class I areas; and 2) within our analysis of the four statutory factors, specifically comparing the costs of compliance against the projected visibility benefit in Class I areas. As we have discussed elsewhere, the consideration of visibility impact and visibility benefit in the two ways our proposal included them is reasonable given the facts at hand and consistent with previous statements in other State regional haze actions, further underscoring that we disagree that this proposal was backwards from previous statements, guidance, or law. In fact, Texas also screened out sources through a Q/d like analysis, and considered visibility benefit within their four-factor analysis, thereby directly contradicting Luminant's assertion that visibility benefit can and has only been estimated after determination of the four-factor analysis is complete.

Luminant's citation to us allegedly directly contradicting our guidance to support Luminant's assertion that our approach is backwards and contradictory ignores the following paragraph. The cited approach that ends in modeling visibility improvement of controls found reasonable, to compare to the uniform rate of progress, is specifically stated in the guidance as one potential approach. The next potential approach outlined in the guidance begins with dispersion modeling to estimate visibility impacts prior to the four-factor analysis, described in the document as a "back out" approach. The full context of the guidance document supports our approach as consistent and reasonable.

As discussed further elsewhere, Luminant's comparison of reasonable progress and BART regarding visibility in each respective analysis ignores the context of the statute at issue, which disregards a key canon of statutory interpretation. As further elaborated on above, Sections 169(A) and 169(B) require reasonable progress towards the national goal of visibility in Class I Federal areas. Visibility is inherently included overarchingly within the statutory text and intent, and the statute's mandate to establish regulatory criteria for measuring reasonable progress. Our interpretation avoids potentially absurd, in the case of consideration of visibility within scoping of the analysis, or overly burdensome, in the case of consideration of visibility benefits within the cost factor, results, as discussed further above, and is reasonable within the statue's and our regulations' purpose and overarching scheme. Also discussed further above, while differences between reasonable progress and BART are not irrelevant, we have consistently noted that there is substantial overlap in the statutory and regulatory requirements applicable to BART and reasonable progress—the ultimate purpose of requiring controls for both types of sources is to make progress toward the national goal of eliminating man-made visibility impairment. Therefore, we believe it is appropriate for analyses of potential controls for reasonable progress sources to resemble BART analyses in many respects.

As discussed further elsewhere, we disagree with Luminant's application of *Luminant Generation Co. LLC v. EPA* to our proposal. The court in that case found that we had stepped

[59] 79 FR 74874; FIP TSD, at 8, 12-15

outside of our role in the SIP review process because the court found that we had based our disapproval on whether the regulation at issue was in conformance with State law, rather than if it was in conformance with the CAA. As we have explained above, we believe our interpretation of reasonable progress towards the national goal of visibility improvement, including consideration of visibility within the reasonable progress analysis, is in conformance with the statutory language and Congressional intent of the CAA.

Comment: [Associations (0059) p. 16-17]

The Associations stated that the EPA's proposal is also unlawful because it would require States to include visibility benefits as a mandatory, if not preeminent, factor in setting reasonable progress goals. Under the Clean Air Act, States are required to consider the four statutory factors in setting reasonable progress goals: "the costs of compliance, the time necessary for compliance, the energy and nonair quality environmental impacts of compliance, and the remaining useful life of any existing source subject to such requirements." 42 U.S.C. § 7491(g)(1). Visibility benefits are not included among the statutory factors. As EPA has previously explained, "[t]he final regional haze rule clearly provides States with the flexibility to establish a reasonable progress goal *based on its analysis of the statutory factors*." EPA, *Response to Petition for Reconsideration of Regional Haze Rule* 13 (Jan. 10, 2001). Federal land managers have concurred in this conclusion and have urged EPA not to include visibility impacts as a mandatory fifth factor in state reasonable progress goals because EPA has no "clear statutory mandate to do so." *See* U.S. Forest Service, *Recommendations for Improved Implementation of the Regional Haze Program* 5 (May 2014). In this respect, the State's obligations to establish reasonable progress goals are substantially different from those for BART, where visibility benefits play an important role. *See* 42 U.S.C. § 7491(g)(2) (including "the degree of improvement in visibility which may reasonably be anticipated to result from the use of such technology" as a mandatory factor in BART determinations). This difference reflects a clear Congressional intent that States cannot be compelled to include visibility benefits in determining reasonable progress goals and certainly cannot be compelled to consider them in the manner that EPA would require in this proposal.

The Associations noted that, nevertheless, EPA proposes to disapprove Texas' reasonable progress goals based on a failure to consider visibility benefits alongside the required statutory factors. *See, e.g.*, 79 Fed. Reg. at 74,839 (asserting that Texas should have "separately evaluate[d] the visibility benefit from implementation of [emission] control[s]"); *id.* at 74,838 (asserting that "individual benefits were masked by the inclusion of those controls with little visibility benefit that only served to increase the total cost figure"). Simply put, visibility benefits are not mandatory statutory factors that States are compelled to consider when establishing reasonable progress goals. As a result, it is unlawful for EPA to disapprove a State's reasonable progress goals based on a failure to evaluate visibility benefits.

The Associations stated that the EPA's FIP proposal exacerbates the unlawful nature of EPA's action by elevating visibility benefits above the four statutory factors. In applying its individual source-based approach, EPA relies on visibility benefits as a threshold test to determine which individual sources it will review for costs—a statutorily required factor. An approach that focuses first on visibility benefits will unnecessarily constrain States' ability to use their discretion to apply the four statutory factors and establish reasonable progress goals as intended by Congress. In fact, even in the context of BART determinations, where visibility benefits must be considered, courts have rejected EPA's attempts to elevate visibility above the other statutory factors. *See American Corn Growers Ass'n v. EPA*, 291 F.3d 1, 6-7 (D.C. Cir. 2002) ("The Haze Rule's splitting of the statutory factors is consistent with neither the text nor the structure of the statute."). There the court found that EPA's regulation was unlawful because it "isolate[d] [the visibility] benefit calculation and constrain[ed] authority Congress conferred on the States." *Id.* at 8-9.

The Associations further stated that the EPA's undue reliance on visibility benefits in its proposed disapproval of Texas' reasonable progress goals and proposed FIP is unlawful and raises serious concerns regarding the implementation of reasonable progress goals. By elevating visibility benefits to a primary, threshold role in establishing reasonable progress goals, EPA would distort the statutory analysis envisioned by Congress and, contrary to cooperative Federalism principles, would unnecessarily constrain States' ability to use their discretion to consider the four reasonable progress factors that are mandated by Congress. Moreover, if EPA is permitted to disapprove of State reasonable progress goals on the basis of this non-statutory factor, States and regulated entities would face the risk of becoming subject to significant—and potentially disproportionate—emission control costs if EPA perceives that such emission controls would confer some miniscule visibility benefit.

Response: We disagree with this comment, as further discussed above, as we believe our proposal is in conformance with law and Congressional intent, is based on the "four-factor analysis," and does not treat visibility benefit as a "preeminent" or primary factor in our analysis but rather as a consideration within the cost factor. As we further discussed above, we agree that the statute and regulations do not include visibility benefit as a mandatory factor for reasonable progress, or that any inclusion of such be on an individual source basis. We note that we do have authority to disapprove a SIP revision for failing to meet the requirements of the CAA, as discussed further above, which is the basis of our disapproval. Also, as we have discussed above, while States have flexibility in evaluating reasonable progress, when a State considers visibility improvement in evaluating control options, as Texas did here, that consideration must still be reasonable in light of the explicit goals established by Congress in CAA Section 169A.

As discussed further above, while visibility is not an explicitly listed factor to consider when determining whether additional controls are reasonable, visibility is relevant to the purpose of the statutory subsections and corresponding regulations at issue—assuring reasonable progress towards the national goal of natural visibility conditions. As we have discussed more fully above, we believe consideration of visibility benefit within reasonable progress is a reasonable interpretation of the statute, including when determining what controls should be required for reasonable progress. As we discussed above, we have considered the Federal Land Managers[60]

[60] The Commenters cite to one FLM document. The National Park Services comments do support the use of Q/d and state: "We agree with EPA that ' ... based on their visibility impacts, a smaller subset of the facilities that we have initially analyzed should be further evaluated to determine ... if cost-effective controls are available ... '"

recommendation regarding visibility benefit, and still find that while the statute does not mandate consideration of visibility benefit as one of the four factors listed in Section 169(g), we, and the State, can consider visibility benefit if we, or the State, finds it relevant to achieving the statutory goal of reasonable progress. We also note that the Forest Service commented in regards to our proposal that, despite the concern referenced by Associations, it finds "the methodology and metrics that EPA used are the most comprehensive seen to date for any SIP/FIP in the country that we have reviewed, and should serve as a model for future efforts to consider the contribution and/or potential benefits of individual sources to visibility."

We did not compel Texas to consider visibility benefit in its RPG four-factor analysis; Texas made that determination on its own, both considering visibility in its Q/d analysis and in its comparison of costs of controls to visibility benefit.[61] We agree with Texas that, while visibility is not an explicitly listed factor to consider when determining whether additional controls are reasonable, the purpose of the four-factor analysis is to determine what degree of progress toward natural visibility conditions is reasonable.[62] We reviewed Texas' reasonable progress/RPG four-factor analysis to determine whether the State's reasonable progress/RPG determination provides for reasonable progress towards natural visibility conditions, and proposed to find that its determination does not.[63] As we further discuss above, Texas' approach was highly flawed. Texas' approach effectively had the effect of obscuring the cost-effective and available controls on those sources with the largest visibility impacts, which other approaches would not have done, such as the individual source analysis EPA chose to perform. This flaw, considered with the other flaws we identified in Texas' four-factor analysis, caused us to conclude that Texas' reasonable progress demonstration under Section 51.308(d)(1)(i)(A) was not approvable. In sum, we did not disapprove Texas' analysis because it did not undertake the same analysis we later determined was appropriate in our own FIP proposal; we proposed disapproval because Texas' analysis, given all flexibility we recognize as appropriate within the four-factor analysis, did not meet the requirements and intent of the statute. The basis for our disapproval and authority to do so is fully explained in our proposal and supporting documents, final action, and elsewhere in this response to comments document.

As we discussed further above, our proposal analyzed all four statutory factors in evaluating reasonable progress/RPGs in accordance with the statute, regulations, and our guidance.[64] As further discussed above, our proposal included a reasonable interpretation of the statute, which included visibility in our analysis in two ways: 1) when evaluating to what degree sources/source categories contributed to visibility impacts in Class I areas; and 2) within our analysis of the four statutory factors, specifically comparing the costs of compliance against the projected visibility benefit in Class I areas. Our proposal did not give greater weight to one factor over another;

USDA Forest Service states: "In summary, while the USDA Forest Service has expressed concern to EPA that the use of visibility as a factor to be considered within the reasonable progress context may be outside the statutory framework established for RP (see Clean Air Act, Section 169A (g)(1)), the methodology and metrics that EPA used are the most comprehensive seen to date for any SIP/FIP in the country that we have reviewed, and should serve as a model for future efforts to consider the contribution and/or potential benefits of individual sources to visibility."

[61] 79 FR 74837.

[62] 79 FR 74838, 74840; TX TSD, at 18.

[63] 79 FR 74838, 74841, 74843, 74872.

[64] 79 FR 74872-77, 74883, 74886; FIP TSD.

rather our proposal considered all four factors fully, revealing that the cost factor, including consideration of visibility benefit, was the most determinative factor, i.e. had the most limiting effect, on the final determination.[65] Thorough analysis revealed that some factors had little to no limiting effect on what controls were available for reasonable progress, while others did have greater effect, and therefore were more determinative. This certainly does not mean visibility improvement was weighted, or given main or primary status.

The Associations argue that Congress did not intend reasonable progress to include visibility as a factor for consideration, pointing out a difference between those factors and the inclusion of visibility in the listed factors for BART. As discussed further above, we did not include visibility as a factor. Furthermore, we believe the Associations Statement ignores the context of the statute that these terms are used in, which disregards a key canon of statutory interpretation. We do not believe the case cited by the Associations, *American Corn Grower*, is applicable to our proposal for the reasons discussed in greater detail above, as the analysis at issue is reasonable progress, not BART, and our analysis neither treats factors differently from each other, nor elevates visibility above the four statutory factors.

Comment: [CCP (0075) p. 10] CCP Stated that visibility is not a specific statutory factor to consider prior to the establishment of RPGs under CAA Section 169A. See 77 Fed. Reg. 20,894, 20,934 (Apr. 6, 2012) ("Nevada SIP Approval") ("As we have noted, our regulations require consideration of four-factor in reasonable progress determinations; visibility improvement is not one of the specified factors."). Nonetheless, EPA recommends looking at visibility in order to determine whether RPGs "are reasonable." EPA's RPG guidance notes that States need only look at "available measures for the sources and source categories that contribute significantly to visibility impairment." See Guidance for Setting Reasonable Progress Goals Under the Regional Haze Program, at 2-3 (June 1, 2007) ("RPG Guidance"). As discussed above, EPA is statutorily constrained in how much weight it may give visibility and has accorded it far too much weight in its proposed disapproval and FIP. However, even if EPA had properly considered visibility as one component in the statutory cost analysis, as TCEQ did, it failed to show that there will be appreciable visibility benefits. Because no benefit will be derived from a mandate to install controls that will not improve visibility conditions, the proper focus of the States and EPA is on the identification of sources that significantly impair visibility and of controls that may significantly improve visibility conditions.

CCP Stated that visibility may be appropriately considered on a cumulative basis, as TCEQ did for all sources that are candidates for control. Using a cumulative approach, Texas appropriately concluded there were insignificant cumulative visibility benefits, measured in deciviews, from requiring additional controls. See 76 Fed. Reg. 74,387 Table 10 (identifying estimated deciview improvements ranging from 0.16 dv in Big Bend to 0.36 dv in Wichita Mountains). EPA previously rejected similar cumulative visibility improvements of 0.254 dv and 0.273 dv in the New York SIP as too "small" to justify controls. 77 Fed. Reg. 24,818.

Response: We address CCP's allegation of inconsistency with Nevada (actually North Dakota) in a separate response. As we discussed further above, our proposal analyzed all four statutory

[65] 79 FR 74874; FIP TSD, at 8, 12-15

factors in evaluating reasonable progress/RPGs in accordance with the statute, regulations, and our guidance.[66] The portion of our guidance CCP quotes is a portion of step 2 of the suggested approach for State's setting RPGs. In full, step 2 states: "**Identify the control measures and associated emissions reductions that are expected to result** from compliance with existing rules *and* other available measures for the sources and source categories that contribute significantly to visibility impairment"[67] (emphasis added). Step 3 then states "[d]etermine what additional control measures would be reasonable based on the statutory factors and other reasonable factors for the sources and/or source categories you have identified."[68] Step 1, preceding these steps, States, "Identify the key pollutants and sources and/or source categories **that are contributing to visibility impairment**." As further discussed above, our proposal included a reasonable interpretation of the statute, and followed this interpretation, by including visibility in our analysis in two ways: 1) when evaluating to what degree sources/source categories contributed to visibility impacts in Class I areas; and 2) within our analysis of the four statutory factors, specifically comparing the costs of compliance against the projected visibility benefit in Class I areas. As discussed elsewhere, our proposal did not give greater weight to one factor over another; rather our proposal considered all four factors fully, revealing that the cost factor, including consideration of visibility benefit, was the most determinative factor, i.e. had the most limiting effect, on the final determination, but that other factors had impact as well.[69] We believe our proposal properly focuses on a reasonable interpretation of what controls (and corresponding significant visibility improvement) are required for reasonable progress towards the national goal of natural visibility conditions in Class I areas. We agree with the commenter that the proper focus during the first implementation period in a State as geographically large and source-numerous as Texas should be on the identification of sources or groups of sources that significantly impair visibility, and controls on those sources that result in the largest visibility improvement. As we discuss in a separate response to comment, we disagree with the commenter and have demonstrated that the required controls are cost-effective and result in significant visibility benefits towards the goal of reaching natural visibility conditions.

Comment: Texas properly conducted the four-factor analysis required by the CAA; there is no statutory requirement to consider a "fifth" visibility factor. [GCLC (0063) p. 5-7]

GCLC Stated, as an initial matter, EPA does not have the statutory right to dictate "how" a State analyzes the four-factor and, in this instance, has far overstepped its bounds in its questioning of Texas' four-factor analysis. EPA itself has acknowledged, "[s]tates have considerable flexibility in how they take these factors into consideration."[21] There is no required emissions or visibility target, but rather, the requirement that States analyze the four-factors; the statute therefore requires that the EPA approve a State's reasonable progress goals so long as the required analysis was performed. Therefore, under even a strict statutory standard, Texas has fully met this statutory burden, performed the required analysis, [22] and considering the flexibility that the CAA provides to the States (as recognized by EPA), EPA simply has no basis to deny its submission.

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[66] 79 FR 74872-77, 74883, 74886; FIP TSD.
[67] RGP Guidance, at 2-3.
[68] RGP Guidance, at 2-3.
[69] 79 FR 74874; FIP TSD, at 8, 12-15.

GCLC asserted that EPA has no real substantive complaints regarding Texas' analysis of the four-statutory factors. Rather, EPA's denial was based on Texas' alleged failure to analyze a "fifth" factor in its analysis- visibility- in a manner that EPA prefers. As Stated by EPA:

> "While visibility is not an explicitly listed factor to consider when determining whether additional controls are reasonable, the purpose of the four-factor analysis is to determine what degree of progress toward natural visibility conditions is reasonable. Therefore, we consider it appropriate to consider the projected visibility benefit of the controls when determining if the controls are needed to make reasonable progress."[23]

GCLC Stated that EPA's determination that visibility is an "appropriate" consideration is completely without statutory basis. In fact, it contradicts the statutory language itself. The CAA defines the four-factor to be reviewed regarding reasonable progress, which does not include visibility. This is not an oversight or accidental, but rather, an intentional act of omission by the Congress. Immediately following the criteria for determining "reasonable progress" are the criteria for determining 'BART," which includes a fifth visibility factor. [24] If Congress intended the States to consider visibility on par with the other factors, or to provide EPA the authority to impose this consideration on the States as EPA attempts to do here, this fifth factor would have been included in the reasonable progress criteria. Ultimately, "EPA overstepped the bounds of its narrow statutory role in the SIP approval process" and acted "ultra vires" by relying on a "factor[ ] which Congress has not intended [EPA] to consider. " [25]

According to GCLC, while EPA cannot require Texas to consider this fifth factor, Texas, in its discretion, did consider visibility, and thus EPA's proposal is further in error. Regarding the visibility analysis that Texas did conduct as part of its SIP, it is important to note that this was an exercise of a purely discretionary matter. A right afforded to Texas under the flexibility of the CAA, it does not provide EPA a basis to disapprove of a discretionary analysis that is required by neither statute nor regulations.

GCLC noted, even if EPA did have the ability to impose a fifth "visibility factor," Texas' choice of a 0.5 deciview ("dv") threshold as a benchmark for total visibility improvement was entirely reasonable. For example, in recently reviewing and approving Idaho's reasonable progress goals, EPA "independently evaluated whether there are reasonable control measures available for sources located within Idaho's regulatory jurisdiction" and concluded that facilities with visibility impacts of 0.5 dv or less at the nearest Class I area were "relatively small."[26] Therefore, EPA ultimately concluded in Idaho that additional controls for "reasonable progress purposes [were] not reasonable at [that] time, because even though there [were] Cost-effective controls identified, visibility improvement [was] anticipated to be relatively small."[27]

Footnotes:
[21] Idaho SIP Approval Proposal, 77 Fed. Reg. at 30251.
[22] See TX TSD at 55, stating that "[t]he CENRAP States' modeling, described in Section 8 of the Texas Regional Haze SIP, was developed consistent with our guidance."
[23] TX TSD at 22.
[24] Compare language at 42 USC§ 7491(g):

(I) in determining reasonable progress there shall be taken into consideration the costs of compliance, the time necessary for compliance, and the energy and non-air quality environmental impacts of compliance, and the remaining useful life of any existing source subject to such requirements;
(2) in determining best available retrofit technology the State (or the Administrator in determining emission limitations which reflect such technology) shall take into consideration the costs of compliance, the energy and nonair quality environmental impacts of compliance, any existing pollution control technology in use at the source, the remaining useful life of the source, and the degree of improvement in visibility which may reasonably be anticipated to result from the use of such technology;
[25] See Luminant Generation Co. LLC v. EPA, 675 F.3d 917, 925, 926 (5th Cir. 2012) (internal quotations and citations omitted).
[26] Idaho SIP Approval Proposal, 77 Fed. Reg. at 30256.
[27] Id.

Response: We note that we do have authority to disapprove a SIP revision for failing to meet the requirements of the CAA, as discussed further above, which is what our proposed approval did here. As discussed further above, while visibility is not an explicitly listed factor to consider when determining whether additional controls are reasonable, visibility is relevant to the purpose of the statutory subsections and corresponding regulations at issue—assuring reasonable progress towards the national goal of natural visibility conditions. As we have discussed more fully above, we believe consideration of visibility within reasonable progress is a reasonable interpretation of the statute in at least two ways, including when determining what controls should be required for reasonable progress. Also, as we have discussed above, while States have flexibility in evaluating reasonable progress, when a State considers visibility improvement in evaluating control options, as Texas determined to do here, that consideration must still be reasonable in light of the explicit goals established by Congress in CAA Section 169A. We did not require Texas to consider visibility; Texas made that determination on its own. Flexibility does not give States the ability to prepare an analysis in such a way that it obscures reasonable controls through misapplication of reasonable progress factors and considerations, rendering the analysis merely a paperwork exercise. As we noted above, Texas' four-factor analysis was flawed in multiple ways and not consistent with the purpose of the statute, and consequently not reasonable in light of the goals of the regional haze program, thus subject to disapproval by us for not meeting the requirements of the CAA.

GCLC argues that Congress did not intend reasonable progress to include visibility as a factor for consideration, pointing out a difference between those factors and the inclusion of visibility in the listed factors for BART. As discussed further above, we believe GCLC's comment ignores the context of the statute that these terms are used in, which disregards a key canon of statutory interpretation. We do not believe the case cited by the GCLC, *Luminant*, is applicable to our proposal for the reasons discussed above. We address GCLC's allegation of inconsistency with our Idaho action and the choice of a dv threshold in separate responses.

Comment: Selection of sources for reasonable progress analysis [NPS (0077) p. 2-3, 4-5]

The NPS agreed with EPA that "... based on their visibility impacts, a smaller subset of the facilities that we have initially analyzed should be further evaluated to determine ... if cost-effective controls are available ..."

Response: We thank you for your comment and support for this portion of our proposal.

Comment: [NPS (0077) p. 3-4] The NPS agreed that "... the cost of compliance is the dominant factor …" in a reasonable progress four-factor analysis. However, we disagree with EPA's decision to, " ... consider visibility benefits in weighing the factors and to assist in its consideration of the cost of compliance" and consider "their projected visibility benefits [in determining] which, if any controls should be proposed." As EPA notes, "visibility is not an explicitly listed factor to consider when determining whether additional controls are reasonable ..." It is clear from the statute that Congress did not intend that visibility be added as a pseudo-fifth-factor in the reasonable progress analysis. The problem of regional haze is the contribution of numerous emission sources, and any given one may be "insignificant," while their aggregate impact is significant. By using the Q/d screening metric, EPA has already taken potential visibility impacts (and benefits of control) into account. While we agree that it is appropriate to evaluate the overall benefits of the control strategies selected by the four-factor analyses (as EPA did), it is not proper to introduce visibility as a fifth-factor in the decision-making process once a source has been selected for analysis. It is also not proper to create a fifth reasonable progress factor to act solely as an "off-ramp" for sources that would otherwise be controlled.

[NPS (0077) p. 5] The NPS suggested that EPA should conduct four-factor reasonable progress analyses for the 38 facilities identified by EPA for further evaluation in its Q/D analysis. While we agree that it is appropriate to evaluate the overall benefits of the control strategies selected by the four-factor analyses (as EPA did), it is clear from the statute that Congress did not intend that visibility be added as a pseudo-fifth-factor in the reasonable progress analysis once a source has been selected for analysis. If the application of the four statutory factors results in a conclusion that controls are reasonable, those controls should be required.

Response: We disagree with the Park Service's criticism of our use of visibility in proposing which sources to control as reasonable progress. As we discussed above, we believe our reasonable progress analysis is in conformance with the statute, is consistent with Congressional intent, and is a reasonable interpretation of the statute and regulations. As further discussed above, our proposal included a reasonable interpretation of the statute, which is to include visibility in our analysis in two ways: 1) when evaluating to what degree sources/source categories contributed to visibility impacts in Class I areas; and 2) within our analysis of the four statutory factors, specifically comparing the costs of compliance against the projected visibility benefit in Class I areas.

As discussed further above, while visibility benefit is not an explicitly listed factor to consider when determining whether additional controls are reasonable, visibility is relevant to the purpose of the statutory subsections and corresponding regulations at issue—assuring reasonable progress towards the national goal of natural visibility conditions. As further explained elsewhere, once a universe of sources has been identified for analysis, we believe that States, and/or EPA, have the option of considering the visibility improvement that will result from potential control options when weighing the four statutory factors. Allowing consideration of visibility improvement is appropriate for several reasons, including that 1) it aligns with Congress' national goal, which is to remedy existing impairment of visibility in Class I areas; 2) consideration of only the four-factor in a vacuum could also lead to the unwieldy and overly burdensome determination that most or all further controls (beyond those required by non-Regional Haze regulations and BART/CSAPR) must be considered reasonable, or none at all, even within the first planning period;[70] 3) our 2007 guidance permits States to consider visibility improvement when conducting a four-factor analysis, and several States, including Texas, [71] did so. Therefore, we believe consideration of "visibility benefit," potential visibility improvement towards the national goal, in the cost factor of the four-factor analysis for controls is also a reasonable interpretation of the statute as a harmonious whole, resulting in a reasonable progress determination that reasonably splits up controls over the multiple implementation phases into manageable amounts, and focuses on those controls at sources that have the largest visibility benefits. In fact, the Court of Appeals for the Eighth Circuit agrees that visibility improvement can be a consideration in a State's reasonable progress determination.[72]

We agree with the Park Service that regional haze is caused by the contribution of numerous emission sources. We also agree with the Park Service that some sources may have very small visibility impacts, but the aggregate of all these small sources may have a significant visibility impact. However, we disagree with the Park Service's subsequent use of that statement. While there are undoubtedly thousands of sources within Texas that are insignificant or very small contributors to regional haze, there are many sources that have relatively large visibility impacts. In fact, the overall strategy we employed in our reasonable progress and long-term strategy analysis was to identify the most significant sources that impact visibility, determine if cost-effective controls were available, and balance the cost of those controls against their visibility benefits. Adopting the approach implicit in the Park Service's comments would have led to a "control everything" strategy during the first implementation phase (e.g., [consideration of visibility improvement is] "an "off-ramp" for sources that would otherwise be controlled"; or a "divide and exempt approach"). The logistical problems aside, obviously controlling any source in Texas that could be retrofitted or upgraded with controls that we have found to be cost-effective in other actions, regardless of their respective visibility benefits, would lead to an unwieldy and overly burdensome result. As we explained above, our consideration of visibility benefit allows the analysis to remain within the intent and purpose of the CAA, by focusing on those controls that are a reasonable first step towards the national goal, within the first phase. As these sources are controlled, other sources or source categories will be identified as the most significant sources impacting visibility in future planning periods.

The Q/d analysis only considers emissions and distance and does not consider how meteorology, chemistry or stack parameters influence the potential to impact visibility. We used it as a way to initially identify the group of sources that could potentially impact visibility based

[70] We do not consider such a strategy "reasonable in light of the explicit goals established by Congress in CAA section 169A," as this interpretation could completely overly burden the first phase of the multi-phased approach contemplated by the statute and corresponding regulations. We believe that such rigid application was clearly not intended by Congress, in contrast to our interpretation that meets the plain meaning and statutory context of reasonable progress. We therefore consider visibility benefit as a reasonable marker available within the four-factor analysis when determining what was reasonable to control at this time and what was not, to fulfill the statutorily required first step towards the ultimate goal of natural visibility conditions.

[71] 79 FR 74838, 74840; TX TSD, at 18.

[72] North Dakota v. United States EPA, 730 F.3d 750, 766 (8th Cir. 2013).

on their proximity to the Class I area and their emission level. As discussed in a separate response to comment within the modeling section and in the FIP TSD, we determined it was appropriate to use photochemical modeling to assess the visibility impact from those sources identified by our Q/d analysis. After the initial Q/d analysis, we tagged emissions from 38 facilities in order to evaluate the potential of emissions from a facility to impact visibility. This is a more refined approach than the initial Q/d analysis performed by both Texas and EPA because unlike a Q/d analysis that only considers emissions and distance, this accounts for emissions, location, stack parameters, meteorological conditions, and models both chemistry and transport to the Class I areas. The results of this modeling indicated that a subset of the 38 facilities were the primary contributors to visibility impairment at each Class I area. Therefore, we determined it was reasonable to eliminate some of the small impacting sources from a full four-factor analysis for this planning period based on facility-level visibility impacts and consideration of estimated unit level impacts, as described in detail in the FIP TSD and a separate response to comment. As we discuss above, we also considered visibility benefit as a reasonable marker within the four-factor analysis modeling cost-effective controls to determine their visibility impacts.

Comment: [USDA Forest Service (0083) p. 2] While the USDA Forest Service has expressed concern to EPA that the use of visibility as a factor to be considered within the reasonable progress context may be outside the statutory framework established for reasonable progress (see Clean Air Act, Section 169A (g)(1)), the methodology and metrics that EPA used are the most comprehensive seen to date for any SIP/FIP in the country that we have reviewed, and should serve as a model for future efforts to consider the contribution and/or potential benefits of individual sources to visibility.

Response: We disagree with the Forest Service that our consideration of visibility is outside the statutory framework of the CAA for reasonable progress. As we discuss previously, while visibility benefit is not an explicitly listed factor when determining whether additional controls are reasonable, consideration of visibility benefit within the cost factor properly focuses on a reasonable interpretation of what controls (and corresponding significant visibility improvement) are required for reasonable progress towards the national goal of natural visibility conditions in Class I areas. As we have discussed more fully above, we believe consideration of visibility within reasonable progress is a reasonable interpretation of the statute in at least two ways, including when determining what controls should be required for reasonable progress. We thank the Forest Service for its characterization of the thoroughness of the methodology and metrics we used in our analysis.

Comment: [Nucor Steel (0058) p. 3] Nucor Steel Stated that EPA' proposed rule and FIP also is improperly based on a "visibility benefit" factor in determining reasonable progress, a factor that is not one of the four-factor authorized under the Clean Air Act. See, 42 U.S.C. 7491(g)(1); 40 CFR §51.308(d)(1)(i)(A).

Response: As discussed further above, we note that, while visibility benefit is not an explicitly listed factor to consider when determining whether additional controls are reasonable, visibility is relevant to the purpose of the statutory subsections and corresponding regulations at issue—assuring reasonable progress towards the national goal of natural visibility conditions. As we have discussed more fully above, we believe consideration of visibility benefit within reasonable progress is a reasonable interpretation of the statute.

Comment: [AECT (0074) p. 4-5] According to AECT, EPA's proposed requirement that a small number of Texas EGUs use additional and costly SO_2 emissions controls for Texas to meet the reasonable progress requirement is based on a factor-- visibility improvement-- that is not required by the CAA or EPA’s Regional Haze rules. In developing that proposed requirement, to narrow down the number of emissions sources for which EPA might require additional SO_2 emissions controls, EPA considered the visibility improvement that would be predicted to occur if additional SO_2 emissions controls were required for those sources, and it identified the sources, all of which are EGUs, that it would further evaluate to determine if it would require additional SO_2 emissions control. EPA then determined the likely visibility improvements that might occur if different types of additional SO_2 emissions controls were used for each of those EGUs. For each EGU for which EPA determined that a type of additional SO_2 emissions control would provide for a "reasonable" or "significant" visibility improvement,[8] EPA is proposing to require that the EGU use that type of additional SO_2 emissions control.

AECT commented that visibility improvement is not just used as a factor on which EPA based its proposed requirement that a small number of Texas EGUs have to use additional and costly SO_2 emissions controls for Texas to meet its reasonable progress requirement, visibility improvement was the main factor that EPA used as its basis for that proposed requirement. EPA's use of visibility improvement as a factor, much less as the main factor, in developing that proposed requirement is not allowed under the CAA or EPA’s Regional Haze rules. Both the CAA and EPA’s Regional Haze rules specify the factors that States must consider in determining reasonable progress requirements, and visibility improvement is not one of those factors. Congress' inclusion of visibility improvement as one of the factors to be used in determining what constitutes BART in contrast to its non-inclusion of visibility improvement as one of the factors to be used in determining reasonable progress requirements, clearly demonstrates that Congress meant for visibility improvement to not be one of the factors that States must consider in making reasonable progress determinations, and certainly not the main factor. Federal case law supports that conclusion. Federal courts, including the U.S. Supreme Court, have held that it should be assumed that Congress acted intentionally when it included particular language in one section of a statute but omitted it in another section of the same statute.[9] The similar non-inclusion in EPA's Regional Haze rules of visibility improvement as a factor that States must consider in determining reasonable progress requirements further demonstrates that EPA should not have used visibility improvement as factor, much less the main factor, in evaluating Texas' reasonable progress determination and in developing its proposed requirement that a small number of Texas EGUs use additional and costly SO_2 emissions controls for Texas to meet the reasonable progress requirement.

AECT noted, moreover, even if it was appropriate for EPA to have used visibility improvement as a factor in developing that proposed requirement, it would not be appropriate for EPA to base that proposed requirement on whether the visibility improvement that would result from the additional SO_2 emissions controls would be "reasonable" or "significant". That is because neither of those words is used, much less defined, in the CAA Regional Haze provisions or EPA's Regional Haze rules.

Therefore, AECT requested that EPA re-analyze Texas' reasonable progress determination by considering Texas' evaluation of the four-factor specified in the CAA and EPA's Regional Haze rules, and by considering Texas' evaluation of visibility improvement as part of its consideration of the costs of compliance factor, rather than as a separate factor.

Footnotes:
[8] 79 Fed. Reg. 74884 (Dec. 16, 2014)
[9] White Stallion Energy Ctr., LLC v. EPA, 748 F.3d 1222, 1237 (D.C. Cir. 2014) and Barnhart v. Sigmon Coal Co., 534 U.S. 438, 452, 151 L. Ed. 2d 908, 122 S. Ct. 941(2002), both citing Russello v. United States, 464 U.S. 16, 23, 104 S. Ct. 296, 78 L. Ed. 2d 17 (1983)

Response: Our methods and analysis are discussed fully in our proposal. As we discussed further above, our proposal analyzed all four statutory factors in evaluating reasonable progress/RPGs in accordance with the statute, regulations, and our guidance.[73] As discussed further above, while visibility benefit is not an explicitly listed factor to consider when determining whether additional controls are reasonable, visibility is relevant to the purpose of the statutory subsections and corresponding regulations at issue—assuring reasonable progress towards the national goal of natural visibility conditions. As we have discussed more fully above, we believe consideration of visibility within reasonable progress is a reasonable interpretation of the statute and regulations in at least two ways.

As further discussed above, our proposed FIP follows our guidance and includes visibility in our analysis in two ways: 1) when evaluating to what degree sources/source categories contributed to visibility impacts in Class I areas; and 2) within our analysis of the four statutory factors, specifically comparing the costs of compliance against the projected visibility benefit in Class I areas. Our proposal did not give greater weight to one factor over another; rather our proposal considered all four factors fully, revealing that the cost factor, including the consideration of visibility benefit, was the most determinative factor, i.e. had the most limiting effect, on the final determination.[74] Thorough analysis revealed that some factors had little to no limiting effect on what controls were available for reasonable progress, while other did have greater effect, and therefore were more determinative. This certainly does not mean visibility improvement was weighted, or given main or primary status. We believe our proposal properly focuses on a reasonable interpretation of what controls are required for reasonable progress towards the national goal of natural visibility conditions in Class I areas.

AECT argues that Congress did not intend reasonable progress to include visibility as a factor for consideration, pointing out a difference between those factors and the inclusion of visibility in the listed factors for BART. AECT also generally references certain case law, which states "[where] Congress includes particular language in one section of a statute but omits it in another section of the same Act, it is generally presumed that Congress acts intentionally and purposely

[73] 79 FR 74872-77, 74883, 74886; FIP TSD.
[74] 79 FR 74874; FIP TSD, at 8, 12-15

in the disparate inclusion or exclusion."[75] While we agree that the Court's Statement here is an important component of statutory interpretation, the Court specifically says, "it is generally presumed." As discussed further above, we believe AECT's comment ignores the context of the statute that these terms are used in, which disregards a key canon of statutory interpretation. [76] As further elaborated on above, Sections 169(A) and 169(B) require reasonable progress towards the national goal of visibility in Class I Federal areas. Visibility is inherently included overarchingly within the statutory text and intent, and the statute's mandate to establish regulatory criteria for measuring reasonable progress. Our interpretation avoids potentially absurd results from eliminating the purpose of the statute entirely from the scoping of the required analysis, as discussed further above, and is thus reasonable within the statue's and our regulations' purpose and overarching scheme. Also discussed further above, while differences between reasonable progress and BART are not irrelevant, we have consistently noted that there is substantial overlap in the statutory and regulatory requirements applicable to BART and non-BART sources—the ultimate purpose of requiring controls for both types of sources is to achieve reasonable progress toward the national goal of eliminating man-made visibility impairment. Therefore, we interpret the listed factors for each within the context of the statute as a whole.

AECT asserted that we should not have "based"[77] requirement of additional SO_2 emissions controls for reasonable progress on whether they corresponded to "reasonable" or "significant" visibility improvement. We note that use of the term "reasonable" occurs in our proposal either in the context of agency statutory interpretation or as shorthand in determining what controls are required for reasonable progress through the four-factor analysis, i.e. reasonable controls or reasonable progress controls. We do not consider it appropriate to base our proposal or final action on "unreasonable" visibility benefits, as we have an obligation for administrative decisions to be reasonable, and thus we disagree with any suggestion that we are prohibited from using the word reasonable according to its ordinary meaning in the context of administrative decision-making. We also disagree that the word reasonable is extra-statutory, because it is part of the statutory term "reasonable progress," see CAA Section 169A(g). To the extent we used

[75] Russello v. United States, 464 U.S. 16, 23 (1983).

[76] Furthermore, EPA believes that Congress explicitly listed visibility improvements as a required BART factor because CAA 169A(b)(2)(A) otherwise could easily be interpreted to preclude consideration of visibility improvements, given that it brings into the BART process any source (of a specified type and age) that emits any air pollutant anticipated to cause or contribute to any visibility impairment in any Class I area. Moreover, the term "best available" in "best available retrofit technology" does not necessarily indicate consideration of potential visibility improvements, as it could refer to best control efficiency only. Congress therefore made clear its intention by listing visibility improvements as a required factor for BART determinations, so that States would consider the balance between visibility and the other four-factor listed for BART. However, the CAA provision requiring state plans to provide for reasonable progress does not contain such absolute statements, and so Congress did not need to counteract any such absolute Statements by explicitly listing visibility improvements as a factor that must be taken into consideration. When compared to the RP analysis, no specific sources are delineated by the statute for evaluation, meaning we, or the State during the multi-phased RP process need to determine which sources/source categories undergo a more detailed analysis for reasonable controls for each implementation period. We conclude that this nuance between the two programs reveals several reasons why the statute refers to visibility as the overarching goal within the RP analysis statutory subsection while specifically lists visibility under the BART subsection.

[77] We note again that we disagree with this characterization and that our proposal, after undergoing the four-factor analysis, determined that certain cost-effective controls that corresponded with significant visibility benefit were reasonable progress towards the national goal of natural visibility conditions.

the term "significant," we have done so according to its ordinary meaning and consistent with our guidance and previous actions.[78] We consider our use of it as reasonable when determining the scope of sources or source categories to analyze in accordance with the statute, and when determining which controls are necessary for reasonable progress within the first implementation period in a State as geographically large and source numerous as Texas. Moreover, we consider it appropriate to State the FIP will yield significant improvements in visibility, just as it is appropriate to say the improvements will be meaningful, sizeable, not insignificant, or any other fitting synonym. Finally, many Federal register actions, including actions upheld on judicial review, reinforce our expectation that we have used the words that have concerned the commenter in appropriate ways.

Comment: [Stamper (0068) p. 4] Although benefits to visibility are not a specific criteria of the 40 CFR 51.308(d)(1) "four-factor" analysis, the purpose of these measures is the timely attainment of natural background visibility measures in the Class I areas affected by the air emissions from sources within a State.

Response: We thank you for your comment, and agree regarding the purpose of the statutory requirements.

Comment: [Earthjustice (0067) p.5] Congress required States and EPA to consider four-factor in determining the pollution controls and other measures that define reasonable progress. 42 U.S.C. § 7491(g)(1). The statute does not list visibility improvement as a fifth factor in the reasonable progress analysis. *Id*
[Earthjustice (0067) p.21]
30 As discussed previously, visibility is not a fifth factor in reasonable progress analyses. Accordingly, visibility benefits may not be used to screen out reasonable progress controls.

Response: As discussed further above, we note that, while visibility benefit is not an explicitly listed factor to consider when determining whether additional controls are reasonable, visibility is relevant to the purpose of the statutory subsections and corresponding regulations at issue—assuring reasonable progress towards the national goal of natural visibility conditions. As we have discussed more fully above, we believe consideration of visibility benefit within reasonable progress is a reasonable interpretation of the statute. As further explained elsewhere, once a universe of sources has been identified for analysis, we believe that States, and/or EPA, have the option of considering the visibility improvement that will result from potential control options when weighing the four statutory factors. Allowing consideration of visibility improvement is appropriate for several reasons, including that 1) it aligns with Congress' national goal, which is to remedy existing impairment of visibility in Class I areas; 2) consideration of only the four statutory factors in a vacuum could also lead to the unwieldy and overly burdensome determination that most or all further controls (beyond those required by non-Regional Haze regulations and BART/CSAPR) must be considered reasonable, or none at all, even within the first planning period; 3) our 2007 guidance permits States to consider visibility improvement

[78] See, e.g., RPG Guidance at 3-2.

when conducting a four-factor analysis, and several States, including Texas,[79] did so. Therefore, we believe consideration of "visibility benefit," potential visibility improvement towards the national goal, in the cost factor of the four-factor analysis for controls is also a reasonable interpretation of the statute as a harmonious whole, resulting in a reasonable progress determination that reasonably splits up controls over the multiple implementation phases into manageable amounts, and focuses on those controls at sources that have the biggest visibility benefits. In fact, the Court of Appeals for the Eighth Circuit agrees that visibility improvement can be a consideration in a State's reasonable progress determination.[80]

5. Consultation between Oklahoma and Texas

Comment: Earthjustice et al., stated that the EPA properly proposes to disapprove Texas' long-term strategy, in part because Texas failed to consult meaningfully with Oklahoma. [Earthjustice (0067) p.27]

Earthjustice et al., stated that the EPA properly proposes to disapprove Texas' long-term strategy, in part because Texas failed to consult meaningfully with Oklahoma. 79 Fed. Reg. at 74,854-57. The purpose of the regional haze program is to restore natural visibility at all Class I areas in the nation. 42 U.S.C. § 7491(a)(1). As Congress recognized, visibility-impairing air pollution often crosses States lines and out-of-State sources often cause visibility impairment at Class I areas. *See, e.g.*, *id.* § 7492(c). Accordingly, the Regional Haze rule requires States to consult with each other and to implement a long-term strategy containing the emissions limitations and control measures necessary to reduce visibility impairment at both in-State and out-of-State Class I areas. 40 C.F.R. § 51.308(d)(1)(iv), (d)(3); *see also* 64 Fed. Reg. at 35,732 ("Because haze is a regional problem, States are encouraged to work together to develop acceptable approaches for addressing visibility problems to which they jointly contribute.").

Earthjustice et al., stated that Texas sources are the primary cause of visibility impairment at Wichita Mountains Wilderness Area in Oklahoma. 79 Fed. Reg. at 74,856. In fact, Texas sources cause more visibility impairment at Oklahoma's only Class I area than Oklahoma's own sources. *Id.* When Texas developed its regional haze SIP, it "consulted" with Oklahoma and other States with Class I areas impacted by Texas sources. But Texas did so in a cursory manner and without providing Oklahoma and the other States the technical data necessary to identify the worst sources of visibility impairment in Texas and potential pollution controls for these sources. *Id.* Ultimately, Oklahoma informed Texas that Oklahoma's reasonable progress goals for Wichita Mountains would assume no additional pollution reductions from Texas sources, even though Wichita Mountains was far off the 2064 glide path and Texas sources were the primary reason why Wichita Mountains was not on track to restore natural visibility by 2064. *Id.* at 74,855-56.

Earthjustice et al., stated that, as EPA correctly recognizes, Texas' "consultation" with Oklahoma violated both the Regional Haze Rule's consultation provision and the Rule's requirement that States adequately document the technical basis for the emission reductions

[79] 79 FR 74838, 74840; TX TSD, at 18.
[80] North Dakota v. United States EPA, 730 F.3d 750, 766 (8th Cir. 2013).

necessary to achieve reasonable progress in downwind States' Class I areas. *Id.* at 74, 829, 74,856, 74,861. A cursory consultation with another State based on inadequate data is not the kind of consultation required by the Clean Air Act. EPA's conclusion that the regional haze regulations require a meaningful consultation based on sufficient technical analyses is reasonable and consistent with the visibility program's purposes. *See id.* at 74,828-30, 74,856, 74,861.

Earthjustice et al., stated that the EPA also properly disapproved Texas' long-term strategy because Texas did not include the necessary control measures to obtain its share of the pollution reductions needed for Wichita Mountains. 79 Fed. Reg. at 74, 829, 74,856-57, 74,861. As discussed above, Texas sources are the largest contributors to visibility impairment at Wichita Mountains, and "the impact from sources in Texas is several times greater than the impact from Oklahoma's own sources." *Id.* at 74,823. Yet Texas did not require a single source to install any pollution controls. EPA correctly explained that CENRAP's and Texas' technical analyses "did not provide the information needed to evaluate the reasonableness of controls on those sources with the largest potential to impact visibility at the Wichita Mountains." *Id.* at 74,857. For example, although both Oklahoma and Texas knew generally that certain Texas coal plants have large visibility impacts at Wichita Mountains, Texas' technical analysis did not provide sufficient details on the visibility impacts of individual sources or cost-effective pollution controls on these individual sources. *Id. at* 74,861.

Response: Please see our response to comments elsewhere regarding long-term strategy consultation for our general agreement with commenter that the CAA requires consultation between the two States and an exchange of sufficient technical analysis in order to ensure that reasonable progress is achieved at Wichita Mountains.

Comment: EPA Arbitrarily Disapproves the Consultation between Oklahoma and Texas.
[Luminant (0061), p. 2, iii]

Luminant Stated that the regulations require that Texas' long-term strategy reflect the emission reductions requested and agreed to by the other Central Regional Air Planning Association ("CENRAP") States. Texas fully met this obligation with respect to Oklahoma through a cooperative and mutually agreeable process. EPA's unlawful disapproval of that consultation would be the first time in history it has disapproved a State regional haze consultation. [Luminant (0061), p. iii] Luminant Stated that the Clean Air Act's regional haze program requires States to work cooperatively to develop State plans that achieve reasonable progress toward the goal of improved visibility in national parks and other Federally protected areas (called "Class I areas"). To comply, Texas worked with neighboring States over a multi-year period to model and project haze impacts, review State emissions, and develop coordinated plans to achieve reasonable progress.

According to Luminant, Texas and its neighbors, including Oklahoma, consulted on the emission reductions that each would include in its plan to improve visibility in the Federal areas in each State. These plans are working. As confirmed by recent monitoring data, Texas and its neighbors have already achieved substantial progress in improving visibility, and, in fact, visibility improvements have surpassed even the most aggressive projections and goals.

Luminant asserted that yet EPA now brushes aside this cooperation among States and disregards the substantial improvements that have been achieved. Instead of using the same objective criteria and standards applied to every other State's regional haze plan, EPA inexplicably created standards out of whole cloth to review the Texas and Oklahoma plans.

Response: Section 51.308(d)(3)(i) of the Regional Haze Rule requires that Texas must consult with Oklahoma because it has emissions that are reasonably anticipated to cause visibility impairment at Oklahoma's Wichita Mountains. Next, Texas must demonstrate that it has included in its RH SIP submittal all measures necessary to obtain its share of the emission reductions needed to meet the progress goal for Wichita Mountains. In addition, Texas must document the technical basis upon which it is relying to determine its apportionment of emissions reductions obligations necessary for achieving reasonable progress in Wichita Mountains. While we expect that much of the consultation, apportionment demonstrations, and technical documentation will be facilitated and developed by regional planning organizations (RPO), we disagree with Commenters that participation alone in an RPO process (here CENRAP) will always be enough to meet the requirements for consultation under the RHR. The rule does not negate the requirement that a State have a complete and technically adequate analysis so that what results from consultations is well informed.

We believe that the consultation process should start with an exchange of all appropriate technical information so that States can "develop coordinated emissions strategies," and proceed with the required consultation process on an informed basis. Properly informed downwind States then can assess whether any additional upwind emissions reductions are necessary to achieve reasonable progress at their Class I area. The RHR provides that States may meet this requirement by relying on the technical analyses developed by the RPO and approved by all State participants. Thus, States have the option of meeting this requirement by relying on the four-factor analyses and associated technical documentation prepared by a regional planning organization on behalf of its member States to the extent that such analyses and documentation were conducted. On the other hand, CENRAP was not required, nor did it provide, state-specific analyses and information on the cost-effectiveness and visibility benefits of potential control strategies under consideration by each state to address the specific sources or groups of sources within that state that have the largest visibility impacts. Rather, CENRAP provided more general information on overall projected visibility conditions, potential controls and associated costs for some sources and the potential benefit of regional emission reductions to inform the development of potential control strategies that may require additional analysis.[81] For example, while the CENRAP analysis identified that impacts from EGUs in Texas were significant, it did not provide a refined analysis to fully assess the cost-effectiveness and visibility benefits of controlling those sources, including not providing information on the cost-effectiveness of scrubber upgrades for those sources with existing, underperforming scrubbers. As Texas states in its regional haze SIP, "While Texas participates in CENRAP and benefits from the technical

[81] CENRAP conducted a control sensitivity analysis to evaluate the impact of point source emission reductions across all CENRAP states given a maximum dollar per control level of $5,000/ton; however, the results "were intended to be a starting point for control discussions that would require much greater refinement." Technical Support Document for CENRAP Emissions and Air Quality Modeling to Support Regional Haze State Implementation Plans, September 12, 2007 at 2-37).

work coordinated by the RPO, Texas has sole responsibility and authority for the development and content of its Regional Haze SIP."[82] Therefore, participation in a RPO does not automatically satisfy a State's obligation to "[d]emonstrate that it has included all measures necessary to obtain its share of the emissions reductions needed to meet the progress goal" for a Class I area. [74856].

Texas although participating in CENRAP retained the duty to do whatever additional analysis was necessary to address fully the requirements of the RH rule for RPG and LTS. While the LTS requirements say, you may rely on the RPO technical analysis that is true only to the extent that it provides the necessary information. Any gaps in that analysis must be addressed by the State. For a State that has little impact on Class I areas outside of the State, the gap is to evaluate your sources impacts on your own Class I areas (RP analysis). For Texas, the gap existed not only for the RP analysis for Texas Class I areas, but also for the LTS development for addressing large impacts at the Wichita Mountains.

Recognizing that the information made available by CENRAP indicated the significant impact of Texas emissions and potential for cost-effective controls, Texas used the CENRAP analysis as a starting point, and performed supplemental analysis for both its reasonable progress and long-term strategy demonstrations. In short, the control analysis performed by CENRAP was a starting point for identifying reasonable controls and developing the LTS.

Texas therefore using the CENRAP analysis as a starting point, attempted to supplement that analysis, for both its reasonable progress and long-term strategy demonstrations ("[t]he TCEQ used the control strategy analysis as the starting point for the analysis of additional controls." Pg. 10-4 TCEQ SIP). [74857]. However, the additional technical analysis performed by TCEQ was flawed and therefore did not provide the type of information necessary to fully evaluate the reasonableness of controls at Texas sources with the largest potential to impact visibility at the Wichita Mountains.[74861]. Allowing this lack of information to continue was a critical misstep for ODEQ in setting its RPG and a critical misstep for TCEQ when determining its fair share of emissions reductions under the LTS requirement. [74857].

As stated in our proposal, given the plain language of the CAA, this requires States to consider the four-factor used in determining reasonable progress in developing the technical basis for both their own Class I areas and downwind Class I areas. Such documentation is necessary so that interstate consultations can proceed on an informed basis, and so that downwind States can properly assess whether any additional upwind emissions reductions are necessary to achieve reasonable progress at their Class I areas. Therefore, Texas had an obligation to provide appropriate information to Oklahoma so it could establish a proper progress goal for the Wichita Mountains. Further, Texas had an obligation to conduct an appropriate technical analysis, and demonstrate through that analysis (required under (d)(3)(ii)), that it provided its fair share of emissions reductions to Oklahoma. In summary, Texas was required through the RPG and LTS consultations' processes to provide Oklahoma the information it needed to establish the RPG for the Wichita Mountains, and it failed to do so. We address Oklahoma in the next response.

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[82] 2009 Texas Regional Haze SIP at 3-1.

As for comments on consideration of recent monitoring data, we address those comments elsewhere. However, we emphasize here that the glidepath is not a safe-harbor. Favorable monitored conditions will not necessarily correspond with permanent reductions or conditions that can extrapolate forward to all future years; thus, the RHR requires examination of those permanent and enforceable emissions limitations that are reasonable and cost-effective for the first planning period. The feasibility and reasonableness of those controls should not be obscured by a State's analytical approach. Reductions should instead be obtained at the earliest opportunity with an eye toward new, additional candidates in future plan submissions and revisions. The glidepath is not a yardstick to measure progress in any definitive sense, but rather a source of guidance on the suite of controls that may invite closer examination. The outcome of the Texas SIP was to not require new controls on larger sources that were not already and otherwise required by CAA measures. Reasonable controls were not fairly identified even as the technical record for the FIP firmly establishes those controls can be found and that they can and should be required to achieve reasonable progress.

Comment: Texas' long-term strategy meets all statutory and regulatory requirements, and EPA must approve it. Texas and Oklahoma fully met the consultation requirement, and EPA has no authority to second-guess their regional agreement. [Luminant (0061) p. 77]

According to Luminant, Regional consultation among the States is central to the long-term planning process, as provided in EPA's regulations. EPA's regulations specifically provide that, to meet the long-term strategy requirement, "[i]f the State has participated in a regional planning process, the State must ensure it has included all measures needed to achieve its apportionment of emission reduction obligations ***agreed upon through that process***."[526] Texas fully met this obligation with respect to Oklahoma and all other CENRAP States. As EPA concedes, "Oklahoma did not specifically request any additional reductions from Texas sources."[527] Thus, the "agreement" between Oklahoma and Texas is that no further reductions, beyond those required by programs already in place as projected by the CENRAP modeling, would be apportioned to Texas. EPA does not dispute this. Instead, it would look behind the agreement reached by the two States. But there is no requirement or justification that the States agree to any particular amount of reduction, beyond what ***they both*** consider to be reasonable.

Luminant Stated that nor is EPA's underlying and unfounded premise—that Oklahoma was somehow deprived of data about Texas sources, their impacts, and the costs of controls[528]—even remotely correct. In fact, even EPA asserts that during the Texas / Oklahoma consultations, Oklahoma "had (1) abundant information showing the impact of Texas sources on visibility at the Wichita Mountains . . . and (2) evidence that cost-effective controls on these sources were likely available."[529] And EPA further concedes that "the analyses developed by CENRAP [and used by Texas and Oklahoma in their consultations] provide[d] a great deal of information on contributions to visibility impairment and a set of potential add-on controls and cost associated with those controls . . . ."[530] The truth is that Oklahoma possessed more than adequate information about impacts and potential controls but correctly decided it was not reasonable to request any further reductions from Texas sources during the first planning period. EPA may disagree with that choice in hindsight and may wish Oklahoma's and Texas' agreement were different, but that is an unlawful basis for disapproving Texas' long-term strategy.[531]

Luminant asserted that EPA's analogy to a situation where two States disagree about how to apportion impacts and reductions also does not support EPA's proposal.[532] The situation here is not one where EPA must step in to mediate a dispute between two States or where one State is refusing to make reductions requested by another. There was complete agreement between Oklahoma and Texas, and Texas' long-term strategy correctly reflects "all measures needed to achieve its apportionment of emission reduction obligations ***agreed upon*** through [the regional planning] process."[533] And, as discussed elsewhere in these comments, those agreed-to reductions have resulted in more progress than even EPA believes is reasonable by 2018.

Footnotes:
[526] 40 C.F.R. § 51.308(d)(3)(ii) (emphasis added).
[527] 79 Fed. Reg. at 74,856.
[528] Id.
[529] Id. at 74,867.
[530] Id. at 74,872; see also id. at 74,867 (discussing "[c]ontrol cost data developed by Alpine Geophysics, and shared by Oklahoma during consultations").
[531] 40 C.F.R. § 51.308(d)(3)(ii) (requiring only that a State's long-term strategy include "all measures needed to achieve its apportionment of emission reduction obligations agreed upon through that [regional planning] process").
[532] 79 Fed. Reg. at 74,827, 74,872.
[533] 40 C.F.R. § 51.308(d)(3)(ii) (emphasis added).

Response: We describe above our basis for disapproving the Texas long-term strategy consultation for Wichita Mountains. Here, we discuss our basis for disapproving the Oklahoma RPG consultation with Texas for Wichita Mountains. As previously discussed in our clarified interpretation of the RHR category, the four-factor analyses, reasonable progress goals, and long-term strategies are inextricably linked. The consultation requirements in 40 CFR 51.308(d)(1)(iv) and 40 CFR 51.308(d)(3)(i) are two sides of the same coin. The consultation record for Oklahoma revealed misunderstandings over its role in addressing visibility transport issues.

While we agree with the commenter that Oklahoma possessed more than adequate information from the CENRAP analyses about impacts from and potential controls for Texas sources, we do not agree that it was reasonable for Oklahoma to stop at this point. Oklahoma had, based upon the CENRAP analyses, (1) abundant information showing the impact of Texas sources on visibility at the Wichita Mountains, particularly from EGU sources in northeast Texas, and (2) evidence that cost-effective controls on these sources were likely available. Despite this information, however, the ODEQ requested neither that the TCEQ further investigate controls at these sources nor did it explicitly request Texas to obtain additional reductions from Texas sources to address the impacts of emissions from these sources at the Wichita Mountains. The Regional Haze Rule requires Oklahoma to use the consultation process under Section 51.308(d)(1)(iv) in the development of RPGs in tandem with Texas. Oklahoma failed to request specifically that the TCEQ further investigate these sources. It also did not explicitly request from Texas that Texas require additional reductions from Texas sources to ensure that all reasonable measures to improve visibility were included in Texas' LTS and incorporated into Oklahoma's RPG for the Wichita Mountains. Failing to do this resulted in the development of an improper RPG for Wichita Mountains because it did not include the consideration of the Texas impacts.

We address comments concerning recent monitoring data in detail elsewhere.

Comment: [Luminant (0061) p. 79] Luminant noted that EPA's new approach of second-guessing regional agreements—years after they are reached and implemented—would undermine and chill the regional planning process, and discourage States from participating. In issuing its regional haze regulations, EPA actively encouraged States "to work together" in regional planning organizations "to develop a common technical basis and apportionment for long-term strategies that could be approved by individual State participants . . . ."[539] Indeed, Congress provided funding for the development of the RPOs, including CENRAP, and EPA was "actively involved" in the establishment of the RPOs and "participate[d] early and actively in regional planning efforts."[540] Yet, despite its active involvement over the multi-year CENRAP process, in which Texas' and Oklahoma's agreement was evident and well known, EPA never raised any of the concerns it asserts today. And EPA never second-guessed the process or the data that the States were developing—as it does now, years after that process has been completed and on the eve of the next planning period. In truth, Texas and Oklahoma did exactly what EPA encouraged them to do, and EPA has no legitimate basis to reject the States' resulting agreement. Certainly, EPA's regulations do not permit it. And EPA cites no examples (and we have found none) where EPA has similarly disapproved a regional agreement. There is no basis for EPA to do so here, nor should EPA take such an unprecedented approach if it intends for States to continue to work together in subsequent planning periods.

Footnotes:
[539] 64 Fed. Reg. at 35,732, 35,735. See also Response to Petitions at 7 ("The EPA further notes that in addition to the general flexibility of the regional haze rule, EPA has consistently encouraged States and tribes to continue to work together to better understand the regional haze problems in their respective regions and to develop effective emission reduction strategies to address haze.").
[540] Response to Petitions at 7 (internal quotations omitted).

Response: We disagree that this is a new approach on the consultation requirements nor that our position undermines or chills the regional planning process. We agree that Texas and Oklahoma worked together in the CENRAP RPO process. Nevertheless, throughout the consultations, Oklahoma never explicitly asked Texas for reductions even though there was clear evidence from the CENRAP analyses that Texas sources were impacting the Wichita Mountains and cost-effective controls were likely available on some of these sources. Armed with this evidence, Texas performed additional RPG/LTS technical analysis for the two Texas areas and Wichita Mountains but it was flawed. While our regulations allow States to work together in RPOs, like CENRAP, this is not a stopping point for States to fall back on as a rationale not to meet the Act and RH rules. In our Clarified Interpretation of the RHR category, we discuss our interpretation of the Act and the legally required role of these two States during their RPG and LTS consultation with each other. We have not disapproved other States' RPG/LTS consultation processes because the particular facts of Texas and Oklahoma did not arise. These new facts required us to provide our clarification of the Act and the RHR in our proposal. We acknowledge that the States were developing their SIPs simultaneously, which complicated their ability to proceed in an orderly step-wised fashion, but this does not excuse the States from having to satisfy the applicable requirements of the CAA and the Regional Haze Rule.

With regard to the comment that we are only now raising concerns, the commenter is incorrect. In our comment letter to Texas during its public comment period, we said that Texas should update its Oklahoma consultation information. Specifically, we asked that Texas demonstrate it has included in its implementation plan all measures necessary to obtain its share of the emission reductions needed to meet the progress goals for the Class I areas it affects. We also said that Texas should document its technical basis, including modeling, monitoring and emissions information, on which it relies to determine its apportionment of emission reduction obligations necessary for achieving reasonable progress in each area it affects. Furthermore, we said that the Texas RPG/LTS proposed technical analysis raised concerns about whether it appropriately evaluated whether there were additional reasonable controls available to help reduce its impact on the Wichita Mountains in order to achieve progress at the Wichita Mountains.

Finally, in our 2008 comment letter to Texas, we said:

> EPA has submitted these comments on the Texas draft Regional Haze State Implementation Plan (RH SIP) with the intention of addressing the more significant issues that could be identified considering the review time available. Due to time, resource constraints, and the fact that that the TCEQ has elected not to submit a paper copy of the SIP (which consists of approx. 50 separate electronic files), it has not been possible to conduct a completely thorough review, particularly with regard to modeling. It is possible that additional concerns, not discovered during the review of this draft, will surface during the review of the final version of this SIP.

We also sent a 2009 comment letter to Oklahoma during its public comment period stating it does not appear that ODEQ actually requested reductions from Texas and we urged Oklahoma to ensure Texas is aware of its sources' impact and encourage reductions as necessary. Again, as in our comment letter to Texas, we said the same to Oklahoma that additional concerns will surface during the review of the final SIP submittal.

Our job under the Act is to review a SIP submittal and determine if it meets the Act and rules, regardless of whether we commented or not on a State's proposed SIP during its State rulemaking process. There is no requirement in the Act that EPA must review, evaluate, and comment on a State's proposed SIP revision.

Comment: Oklahoma's reasonable progress goal for Wichita Mountains meets all statutory and regulatory requirements, and EPA must approve it. [Luminant (0061) p. 80]

Luminant Stated that EPA also has no legitimate basis for disapproving the reasonable progress goal set by Oklahoma for the Wichita Mountains. As did Texas, Oklahoma relied on modeling and cost data developed by CENRAP, consulted with neighboring States, and analyzed the four statutory factors.[541] EPA does not dispute Oklahoma's modeling or its analysis of the four statutory factors. Instead, EPA cites as its basis for disapproving Oklahoma's RPG "an incomplete consultation with Texas . . . ."[542] But, as discussed above, neither the statute nor EPA's regulations establish any criteria for consultation that Oklahoma and Texas failed to meet, nor do they authorize EPA to judge what is and is not a "complete" consultation. The opposite is true—the regulations only authorize EPA to consider a "disagreement" between States "in determining whether the State's goal for visibility improvement provides for reasonable progress towards natural visibility conditions."[543] Here, Oklahoma and Texas were in agreement on the goal and measures for the Wichita Mountains, and EPA thus has no authority to disapprove Oklahoma's RPG.

Further, Luminant noted that even if EPA's disapproval of Oklahoma's RPG were authorized and supported, that disapproval does not allow EPA to disapprove Texas' long-term strategy. As discussed in Sections III.A and IV, Texas' obligation under the regulations is to include in its SIP those measures necessary "to achieve its apportionment of emission reduction obligations ***agreed upon through [the regional planning] process***."[544] And the benchmark for such apportionment is "the reasonable progress goals ***established by States*** having mandatory Class I Federal areas."[545] Here, regardless of EPA's view of Oklahoma's RPG for Wichita Mountains, it is undisputed that Texas' SIP includes the measures necessary to secure Texas' agreed-to apportionment of emission reductions to meet the RPG for Wichita Mountains established by Oklahoma, and thus Texas' SIP must be approved. Moreover, to the extent that Oklahoma's RPG is adjusted by EPA's FIP or in some other manner, the matter is properly addressed in the second planning period, not by disapproving Texas' long-term strategy. That is the same approach EPA has taken as to other States, and there is no basis for treating Texas and Oklahoma any differently.[546]

Footnotes:
[541] Oklahoma TSD at 9.
[542] Id. at 11.
[543] 40 C.F.R. § 51.308(d)(1)(iv).
[544] Id. § 51.308(d)(3)(ii) (emphasis added).
[545] Id. § 51.308(d)(3) (emphasis added).
[546] See, e.g., 77 Fed. Reg. at 40,155–56 (explaining, in review of Nebraska long-term strategy, that the issue of "whether other reasonable control measures are appropriate to ensure reasonable progress" would be considered "during subsequent periodic progress reports and regional haze SIP revisions," and the downwind South Dakota "may at that time consider asking Nebraska for additional emission reductions").

Response: See our previous responses on why we believe the CAA and RHR provide us with the legal authority to disapprove Oklahoma and Texas for failure to meet the RPG/LTS consultation requirements. As discussed in depth elsewhere, we have determined that Texas' analysis is inadequate because it does not provide the information necessary to determine the reasonableness of controls at those sources in Texas that significantly impact visibility at the Wichita Mountains in Oklahoma, or the Texas Class I areas. Oklahoma and Texas discussed the significant contribution of sources in Texas to visibility impairment at the Wichita Mountains during the interstate consultation process required by the Regional Haze Rule. The results of the CENRAP analysis demonstrated that Texas point sources, and in particular EGUs in northeast Texas, have significant visibility impacts on the Wichita Mountains and that cost-effective controls were potentially available for some of these sources. However, Oklahoma did not pursue the point in its consultations with Texas under Section 51.308(d)(1)(iv). Oklahoma did not have adequate information to establish its reasonable progress goal for the Wichita Mountains, and should have requested that the TCEQ further investigate these sources or requested additional reductions from Texas sources to ensure that all reasonable measures to improve visibility were included in Texas' long-term strategy and incorporated into Oklahoma's reasonable progress goals for the Wichita Mountains. Furthermore, because of the flawed consultations with Texas, Oklahoma did not consider the emission reduction measures necessary to achieve the uniform rate of progress for the Wichita Mountains and did not adequately demonstrate that the reasonable progress goals it established were reasonable based on the four statutory factors under 51.308(d)(1)(ii). [83]

We disagree that disapproval of Oklahoma's RPG for the Wichita Mountains does not allow EPA to disapprove Texas' long-term strategy. Our disapproval of Oklahoma's reasonable progress goal for Wichita Mountains has nothing to do with our disapproval of Texas' LTS. We are disapproving the Texas LTS because the analysis underlying it is technically flawed. Because of these flaws, Texas' SIP submittal does not include all the measures necessary to secure its apportionment of the emission reductions needed to meet the progress goal that should account for all reasonable control measures for the Wichita Mountains, or its own Class I areas. We are disapproving the Oklahoma RPG for the Wichita Mountains not because of the technically flawed Texas LTS but because Oklahoma's consultations with Texas were flawed which prevented it from adequately developing its reasonable progress goals for the Wichita Mountains. Because Oklahoma's consultations with Texas were flawed, Oklahoma did not adequately consider the emission reduction measures necessary to achieve the uniform rate of progress for the Wichita Mountains and did not adequately demonstrate that the reasonable progress goals it established were reasonable based on the four statutory factors.

See our responses on our evaluation of Texas long-term strategy elsewhere. We address Luminant's allegation that we are treating Texas differently in relation to our Nebraska and South Dakota actions in the consistency section of this document.

Comment: The Proposed Rule arbitrarily disapproves of Texas and Oklahoma's consultation efforts. [CCP (0075) p. 14-15]

CCP stated that, under the regional haze program, a State "must consult with those States which may reasonably be anticipated to cause or contribute to visibility impairment in the mandatory Class I Federal area." 40 C.F.R. § 51.308(d)(1)(iv); see also 40 C.F.R. §§ 51.308(d)(3)(i)-(iii) (outlining consultation requirements for the long-term strategy). Interstate consultation requires that States work together and "take a hard look at what measures are necessary" to meet RPGs. 79 Fed. Reg. 74,818.

CCP stated that the following factors support Texas and Oklahoma's consultation process:

- Both States were active participants in the Central Regional Air Planning Association ("CENRAP") regional planning process, and separately coordinated with each other based on CENRAP modeling of visibility impacts between the States.

- Texas and Oklahoma met numerous times, held various phone calls, and exchanged correspondence regularly on the impacts of each State's sources on Class I areas. See 79 Fed. Reg. 74,865-67 (reviewing consultation efforts); Texas SIP App. 4-2.

[83] 79 FR 74871, 74872.

- EPA recognized that Texas went above and beyond the regional planning process for interstate consultation purposes. Id. at 74,857 ("In fact, the TCEQ went beyond the CENRAP analysis by contemplating additional controls, applying a lower Cost-effective ness threshold and estimating the visibility benefit from the identified control set.").

- As part of its consultation discussions, Texas will allow Oklahoma to comment on Texas' evaluation of Best Available Control Technology for new and modified sources. See 79 Fed. Reg. 74,866.

Nonetheless, CCP stated that the EPA arbitrarily disapproved of the consultation process between Oklahoma and Texas without any reference to its rules, guidance and prior SIP approvals. The Proposed Rule never details what information Oklahoma lacked in establishing its RPGs, and EPA must provide a more adequate explanation of how additional information would have changed Oklahoma's ultimate determination that additional controls on Texas sources would not move the Wichita Mountains perceptibly closer to its regional haze goals.

Response: See our previous responses. Moreover, we disagree that we did not provide what information Oklahoma lacked in establishing its RPG for Wichita Mountains. Texas in its flawed analysis tried to provide the lacking information. Our analysis provides the lacking information. We also disagree that Oklahoma ultimately determined no additional controls on Texas sources were necessary.

Finally, the commenter mischaracterizes the consultation discussions with Oklahoma. On multiple occasions, Oklahoma indicated that Texas' sources had outsized impacts on visibility at Wichita Mountains, and that Oklahoma could not meet the glidepath without emission reductions from Texas. Furthermore, Oklahoma indicated in their response to comments that it did not believe it had the authority to require those reductions, but instead had to rely on Texas or the EPA. Oklahoma should not have hesitated to ask Texas outright for additional emission reductions because the evidence available during the consultations clearly suggested that cost-effective controls were available and impacted the Wichita Mountains.

Comment: [Associations (0059) p. 10-11] **The Associations Stated that Oklahoma and Texas fully complied with EPA's consultation requirements for cross-State emissions through participation in a regional planning process**. Based on encouragement from EPA, Texas and Oklahoma worked with nearby States to establish CENRAP to assist the States with technical issues associated with their regional haze SIPs. In particular, CENRAP assisted the States in developing emissions inventories and modeling, including models for a 2002 base case for visibility in Class I areas, projections for 2018 emissions and visibility, estimates of natural conditions, and cost/benefit analyses for emission controls. Through the CENRAP process and subsequent consultation meetings with Oklahoma, Texas shared significant amounts of information with Oklahoma regarding SO_2 and NO_x emissions from Texas that could affect Class I areas in Oklahoma. Texas also responded to several requests from Oklahoma and agreed to make changes to its New Source Review program to ensure that potential visibility impacts in Oklahoma were accounted for. At the conclusion of the consultation period, Texas requested "Oklahoma's concurrence on this assessment and verification that [Oklahoma] is not depending on any additional reductions from Texas sources in order to meet [Oklahoma's] reasonable progress goals." *Letter from Susanna M. Hildebrand, Air Quality Director, TCEQ, to Eddie Terrill, Air Quality Division Director, ODEQ* 2 (Mar. 25, 2008). Oklahoma agreed with Texas' assessment and did not request further reductions from Texas beyond those expected from existing programs agreed to or implemented by Texas. *See Letter from Eddie Terrill to Susanna Hildebrand, supra.* As a result, Oklahoma established reasonable progress goals that did not require additional emissions controls from Texas facilities, and Texas developed a long-term strategy that did not incorporate additional emissions controls to improve visibility in Oklahoma.

Despite the depth of coordination and consultation between Oklahoma and Texas, the Associations noted that the EPA's proposal ignores the reasoned conclusions that these States reached and rejects Oklahoma's reasonable progress goals and Texas' long-term strategy because, in EPA's separate and distinct judgment, Oklahoma should have sought additional information about potential emissions controls from certain sources in Texas. By second-guessing these States, EPA's proposal is unlawful, arbitrary and capricious. EPA does not dispute the quality of Oklahoma's modeling or its analysis of the four statutory factors required by 40 U.S.C. §7419(g)(1). Instead, it relies on what it considers to be "an incomplete consultation with Texas." EPA, *Oklahoma Technical Support Document* at 11. This conclusion is not supported by the record. EPA points to no flaws in the CENRAP regional planning process in which Texas and Oklahoma participated together. Nor does it point to any specific flaws in the subsequent consultation process between the States. In fact, EPA concedes that, as a result of consultations between the States, Oklahoma "had (1) abundant information showing the impact of Texas sources on visibility at the Wichita Mountains [and] (2) evidence that cost-effective controls on these sources were likely available." 79 Fed. Reg. 74,867. EPA goes on to acknowledge that "the analysis developed by CENRAP [and used by Texas and Oklahoma in their consultations] provide[d] a great deal of information on contributions to visibility impairment and a set of potential add-on controls and costs associated with those controls." *Id.* at 74,872.

Although the proposal acknowledges the wealth of information shared between the two States, the Associations noted that the EPA nonetheless asserts that Texas somehow deprived Oklahoma of relevant information about Texas sources and emission reduction options. In doing so, EPA fails to identify any specific information that Texas failed to provide. Instead, EPA simply reinterprets the data and modeling available to Oklahoma while it developed its SIP and reaches a different conclusion— that Oklahoma's reasonable progress goals should require additional emission controls from a handful of Texas sources in order to provide small, imperceptible improvements to visibility in Class I areas in Oklahoma. In doing so, EPA clearly would exceed its statutory authority by putting aside a review of Oklahoma's compliance with statutory and regulatory requirements and instead substituting its own judgment for that of the State. Not only is this an unlawful usurpation of Oklahoma's discretion under the regional haze program to consider the four statutory factors and establish reasonable progress goals, it is also arbitrary, capricious, and unsupported by the record in light of the expansive consultation and information sharing process that took place between Texas and Oklahoma.

Response: In reviewing Oklahoma's SIP, we evaluated whether Oklahoma met the statutory and regulatory requirements of the Regional Haze Rule. Adoption of reasonable progress goals includes evaluation of the four statutory factors, consultation with other States that may reasonably be anticipated to cause or contribute to visibility impairment in the mandatory Class I area, and analyze the rate of progress needed to attain natural visibility conditions. While we agree that Oklahoma possessed more than adequate information from the CENRAP analyses about impacts from Texas sources at a certain level of aggregation, and some knowledge concerning potential controls for some of these sources, we do not agree that it was reasonable for Oklahoma to stop at this point. Despite the information it did have, Oklahoma never explicitly asked Texas for reductions even though there was clear evidence from the CENRAP analyses that Texas sources, particularly EGUs in northeast Texas, were significantly impacting the Wichita Mountains and that cost-effective controls were likely available on some of these sources.

The Regional Haze Rule required that Oklahoma use the consultation process under 40 CFR 51.308(d)(1)(iv) in the development of reasonable progress goals in tandem with Texas. Nevertheless, throughout the consultations, Oklahoma failed to explicitly request that Texas further investigate whether reasonable controls were available or that Texas reduce emissions from these significantly impacting sources to ensure that all reasonable measures to improve visibility were included in Texas' long-term strategy and incorporated into Oklahoma's reasonable progress goals for the Wichita Mountains. This failure resulted in the development of improper reasonable progress goals for the Wichita Mountains

We are disapproving Oklahoma's adoption of its reasonable progress goals for Wichita Mountains because it failed to meet the consultation requirements. Oklahoma did not consult fully with Texas regarding Texas' sources impacts on the Wichita Mountains. As noted in our proposal, at the time that Oklahoma was developing its SIP, it had (1) abundant information showing the impact of Texas sources on visibility at the Wichita Mountains, particularly from EGU sources in northeast Texas, and (2) evidence that cost-effective controls on these sources were likely available. Despite this information, the ODEQ requested neither that the TCEQ further investigate controls at these sources nor did it explicitly request Texas to obtain additional reductions from Texas sources to address the impacts of emissions from these sources at the Wichita Mountains. The Regional Haze Rule requires States to use the consultation process under Sections 51.308(d)(1)(iv) in the development of RPGs to ensure that all States, including downwind States, take a hard look at what measures are necessary for ensuring reasonable progress towards improving and maintaining visibility at Class I areas.

Based upon the above knowledge and without further analysis from Texas, Oklahoma did not have adequate information to establish its RPG for the Wichita Mountains. It therefore should have requested clearly that Texas further investigate these sources or explicitly requested Texas to obtain additional reductions from Texas sources to ensure that all reasonable measures to improve visibility were included in Texas' LTS and incorporated into Oklahoma's RPG for the Wichita Mountains.

Please see the responses regarding state and federal roles in the Regional Haze program for the comment on EPA substituting its judgment for Oklahoma.

Comment: [TCEQ/PUCT (0056) p. 13] **The TCEQ Stated that the EPA's proposed disapproval of the State consultation requirements is based upon Oklahoma's determination, subsequent to submittal of the Texas 2009 RH SIP, that it required further reductions from Texas**.

The EPA has not justified its determination that Texas failed to meet the requirements of §51.308(d)(3)(i) and in fact the record shows that the process as laid out in the SIP and as required by the rule was followed by Texas. The EPA's determination is based on a new definition of progress goal in subsection (d)(3)(ii) and a misstatement of the actual rule itself in subparagraph (i).

The TCEQ stated that Texas met the consultation requirements in §51.308(d)(3)(i). Texas determined where emissions were reasonably anticipated to contribute to visibility impairment in Oklahoma. Texas consulted with Oklahoma. The EPA asserts that the TCEQ should have provided information necessary to identify reasonable reductions, which is not required by the RHR. Oklahoma requested information on controls identified by CENRAP. Oklahoma had information on control upgrades contained in the proposed Texas 2009 RH SIP. Yet, it did not request additional controls on Texas sources or disagree with Texas' determination that additional controls were not warranted during the first planning period. It was only after consultation with Texas that Oklahoma argued that it needed controls that they did not have authority to require from Texas sources. Oklahoma's after-the-fact change in position and the EPA's subsequent proposed disapproval of their RPGs for Wichita Mountains does not provide the legal basis for proposed disapproval of Texas' long-term strategy consultations.

Response: Long-Term Strategy consultation under 51.308(d)(3)(i) provides that where the State has emissions that are reasonably anticipated to contribute to visibility impairment in any mandatory Class I area in another State, the State must consult with the other State in order to develop coordinated emission management strategies. Reasonable Progress Goal consultation under 51.308(d)(1)(iv) requires that a State must consult with those States which may reasonably be anticipated to cause or contribute to visibility impairment in the mandatory Class I areas in establishing its reasonable progress goal. Texas had sufficient evidence that its sources were impacting visibility at the Wichita Mountains area and that cost-effective controls on some of these sources were likely available. Because of this evidence, it performed additional analysis, which was technically flawed.

Although Texas participated in CENRAP, it retained the duty to do whatever additional analysis was necessary to address fully the requirements of the Regional Haze Rule for addressing its long-term strategy and setting its reasonable progress goals. While the long-term strategy requirements allow a state to rely on the RPO technical analysis that is true only to the extent it provides the necessary information. A state must address any gaps in that analysis. For Texas, inadequate information existed not only for the reasonable progress analysis for its own Class I areas, but also for the long-term strategy development for addressing significant impacts at the

Wichita Mountains. CENRAP was not required, nor did it provide state-specific analyses and information on the cost-effectiveness and visibility benefits of potential control strategies under consideration by each state to address the specific sources or groups of sources within that state that have the largest visibility impacts. Rather, CENRAP provided more general information on overall projected visibility conditions, potential controls and associated costs for some sources and the potential benefit of regional emission reductions to inform the development of potential control strategies that may require additional analysis.[84] For example, while the CENRAP analysis identified that impacts from EGUs in Texas were significant, it did not provide a refined analysis to assess fully the cost-effectiveness and visibility benefits of controlling those sources, including not providing information on the cost-effectiveness of scrubber upgrades for those sources with existing, underperforming scrubbers. As Texas states in its regional haze SIP, "While Texas participates in CENRAP and benefits from the technical work coordinated by the RPO, Texas has sole responsibility and authority for the development and content of its Regional Haze SIP."[85]

Recognizing that the information made available by CENRAP indicated the significant impact of Texas emissions and potential for cost-effective controls, Texas used the CENRAP analysis as a starting point, and performed supplemental analysis for both its reasonable progress and long-term strategy demonstrations. However, that additional technical analysis performed by Texas was flawed and therefore did not provide the type of information necessary to fully evaluate the reasonableness of controls at Texas sources with the largest potential to impact visibility at its own Class I areas and the Wichita Mountains. Allowing this lack of adequate information to continue was a critical misstep for ODEQ in setting its reasonable progress goals, and a critical misstep for Texas when determining its fair share of emissions reductions under the long-term strategy requirement. The plain language of the CAA requires that states consider the four factors used in determining reasonable progress in developing the technical basis for the reasonable progress goals both in their own Class I areas and downwind Class I areas. Such documentation is necessary so that interstate consultations can proceed on an informed basis, and so that downwind states can properly assess whether any additional upwind emissions reductions are necessary to achieve reasonable progress at their Class I areas. Therefore, Texas had an obligation to provide appropriate information to Oklahoma so it could establish a proper progress goal for the Wichita Mountains. Further, Texas had an obligation to conduct an appropriate technical analysis, and demonstrate through that analysis (required under (d)(3)(ii)), that it provided its fair share of emissions reductions to Oklahoma. In summary, Texas was required through the consultation process to provide Oklahoma the information it needed to establish its reasonable progress goals for the Wichita Mountains, and it failed to do so.

Comment: [TCEQ/PUCT (0056) p. 14] The TCEQ Stated that the EPA's finding that the TCEQ did not meet the long-term strategy consultation requirements of 40 CFR 51.308(d)(3)(i)

[84] CENRAP conducted a control sensitivity analysis to evaluate the impact of point source emission reductions across all CENRAP states given a maximum dollar per control level of $5,000/ton; however, the results "were intended to be a starting point for control discussions that would require much greater refinement." Technical Support Document for CENRAP Emissions and Air Quality Modeling to Support Regional Haze State Implementation Plans, September 12, 2007 at 2-37).

[85] 2009 Texas Regional Haze SIP at 3-1.

and (ii) ignores the voluminous and detailed consultation record contained in the Texas 2009 RH SIP. The EPA holds Texas to a different standard of review than it has with other similar regional haze SIPs.

The TCEQ noted that §51.308(d)(3) requires, (i) that Texas consult with other States if its emissions are reasonably anticipated to contribute to visibility impairment at that State's Class I areas(s), and (ii) if so, it must demonstrate that it has included in its SIP all measures necessary to obtain its share of emission reductions needed to meet the RPG for that Class I area.

The TCEQ noted, as the EPA acknowledges, that the TCEQ relied on CENRAP source apportionment modeling and its own supplemental analysis, available to all affected States, FLMs, and tribes, to evaluate and identify reasonable controls. The TCEQ did include additional controls or measures in its SIP, beyond those required to meet other programs, and every State in the consultation, including Oklahoma, concurred. For Wichita Mountains, additional controls were not deemed reasonable given that the CENRAP modeling - agreed to by all the States - showed that the visibility impairment contributions from Texas go down during the planning period (2002- 2018). The EPA's preamble, and Table 26 acknowledge this.[12] Most importantly, Oklahoma did not request additional controls from Texas during consultation. The EPA ignores the record and proposes to hold the Texas plan to a standard that is not found in the RHR. The EPA merely disagrees with the TCEQ's conclusions and attempts to apply a 'reasonableness" standard to §51.308(d)(3)(ii) where none exists. That section only requires that the TCEQ demonstrate that all controls necessary to meet the progress goal, for Wichita Mountains, are included. Oklahoma agreed that no additional controls were needed at the time, and the evidence that the contribution to visibility improvement from emission reductions at Texas sources during the planning period is a sufficient basis for these conclusions.

Footnote:
[12] "The contributions from Texas sources on total visibility impairment decreases from 2002 to 2018 at all impacted Class I areas shown in the tables below." 79 FR page 74860.

Response: All of these issues are covered elsewhere in our responses to other comments. In particular, see the consistency portions of this document for our responses to allegations that we have been inconsistent in our treatment of Texas in comparison to our other actions.

Comment: Texas and Oklahoma satisfied the InterState Consultation Requirements, and EPA therefore has no authority to disapprove the SIPs based on EPA's unfounded assertion that the States failed to meet those requirements. [UARG (0065) p. 9]

UARG noted that the EPA's proposed rule describes the interstate consultation undertaken by Texas and Oklahoma. 79 Fed. Reg. at 74,843-44. EPA's proposed determination that Texas and Oklahoma failed to satisfy their interstate consultation obligations with respect to one another is without foundation and cannot serve as a basis for disapproving either State's RPGs or any other part of their regional haze SIPs.

Response: See our previous responses on consultation.

Comment: Texas Satisfied Its Interstate Consultation Obligations. [UARG (0065) p. 9-12]

UARG stated that the EPA correctly proposes to find that Texas fulfilled its consultation obligations under the regional haze rule with respect to States whose emissions affect visibility in Texas Class I areas. *Id.* at 74,844. EPA proposes, however, to disapprove Texas' regional haze SIP, in part, because EPA does not believe that Texas fulfilled its interstate consultation obligations with respect to Oklahoma. The proposed rule describes in considerable detail the consultation between Texas and Oklahoma, *id*. at 74,854-57, and demonstrates that Texas engaged in a comprehensive consultation process that satisfied all of the regional haze rule's applicable requirements, *see id*. at 74,855.

UARG Stated that process concluded with both States agreeing that no emission reductions from Texas in addition to those modeled by the Central Regional Air Planning Association ("CENRAP") would be needed to ensure reasonable progress for Oklahoma. *Id*. Under the regional haze rule, that should be the end of the matter. EPA nevertheless proposes to disapprove Texas' consultation because EPA "believe[s] that the technical analysis developed by Texas did not provide the information necessary to identify reasonable reductions from its sources, and inform consultations in order to develop coordinated management strategies with Oklahoma." *Id.* at 74,856. EPA, however, provides no evidence for any such conclusion and does not and cannot support its proposed determination that Texas failed to satisfy its obligation to consult with Oklahoma and to provide any information needed for consultation. To the contrary, the record demonstrates that both Texas and Oklahoma participated in CENRAP and that both Texas and Oklahoma included in their SIP submissions documentation and emission reduction measures necessary to effectuate the RPO's recommendations. The proposed rule simply asserts that participation in an RPO "does not automatically satisfy a State's obligation to 'demonstrate that it has included in its implementation plan all measures necessary to obtain its share of the emission reductions needed to meet the progress goal' for a Class I area." *Id*. No such Statement appears in the regional haze rule. In fact, the rule refutes EPA's proposed determination here by providing that:

> [w]here other States cause or contribute to impairment in a mandatory Class I Federal area, the State must demonstrate that it has included in its implementation plan all measures necessary to obtain its share of the emission reductions needed to meet the progress goal for the area. *If the State has participated in a regional planning process, the State must ensure it has included all measures needed to achieve its apportionment of emission reduction obligations agreed upon through that process*. 40 C.F.R. § 51.308(d)(3)(ii) (emphasis added).

UARG stated that the same conclusion is supported by the regional haze rule's technical-documentation provision:

> The State must document the technical basis, including modeling, monitoring and emissions information, on which the State is relying to determine its apportionment of emission reduction obligations necessary for achieving reasonable progress in each mandatory Class I Federal area it affects. *The State may meet this requirement by relying*

> *on technical analyses developed by the regional planning organization and approved by all State participants*. *Id.* § 51.308(d)(3)(iii) (emphasis added).

UARG asserted that far from providing or suggesting that emission control measures agreed on through the RPO process are merely a starting point for analysis, the regional haze rule equates adoption of all measures agreed on through the RPO process to the demonstration that a SIP contains all necessary measures. EPA's Statements to the contrary in this proposed rule are inconsistent with its own regulations and cannot support disapproval of the interstate consultation component of the Texas SIP.

UARG Stated, further, as EPA notes, "[i]n fact, the TCEQ [Texas Commission on Environmental Quality] went beyond the CENRAP analysis by contemplating additional controls, applying a lower cost-effectiveness threshold and estimating the visibility benefit from the identified control set." 79 Fed. Reg. at 74,857. Moreover, Texas relied on that supplemental analysis – in addition to CENRAP's analyses and conclusions – "to inform its decision not to control any additional sources, including those that impact the visibility at the Wichita Mountains and other Class I areas in other States." *Id*.

UARG Stated that, ironically, despite the fact that Texas "went beyond" the requirements of the regional haze rule, *id.*, EPA proposes to conclude that Texas did not prepare *enough* analyses to evaluate completely its reasonable progress obligations or to permit Oklahoma to establish in a fully informed way the RPGs for Wichita Mountains. *Id.* at 74,861, 74,862. EPA does not establish a legal basis for disapproving Texas' SIP on these grounds. Indeed, EPA does not explain how the CENRAP modeling was inadequate or how it differed from the modeling conducted by the other RPOs and does not explain how or why Texas' additional modeling was also inadequate. EPA only asserts vaguely that additional "refine[ment] from a high level State" was necessary and that "it [is] necessary to undertake a cost/control and visibility analysis which is presented in our FIP TSD [Technical Support Document]" to support adequate reasonable progress determinations. *Id.* at 74,861. No support exists in the regional haze rule for any such requirements, and EPA never provided Texas with guidance suggesting that refined modeling and additional analyses were necessary components of or prerequisites to an approvable regional haze SIP. A State (or EPA, when it is authorized to promulgate a FIP) may choose to undertake such additional analyses, but they are not legally required of a State. Thus, the absence of such analyses can provide no basis for disapproving Texas' regional haze SIP.

Response: See our previous responses.

Comment: Oklahoma Satisfied Its InterState Consultation Obligations.
[UARG (0065) p. 12-14]

UARG stated that the EPA's proposed disapproval of Oklahoma's RPGs for Wichita Mountains is unsupported and contrary to the CAA and EPA's regional haze rule. As it does with respect to Texas, the proposed rule makes clear that Oklahoma undertook every action required by the regional haze rule, including reliance, as contemplated by the regional haze rule, on CENRAP's modeling. *Id.* at 74,864-65. Oklahoma's consultation, as described in the proposed rule, was extensive. *Id.* at 74,865-67. As a result of the consultation, Oklahoma requested three specific actions from Texas: (1) that Texas require new and modified sources subject to EPA's prevention of significant deterioration ("PSD") program to conduct analyses of their impacts on visibility at Wichita Mountains; (2) that Texas give Oklahoma an opportunity to review and comment on PSD determinations regarding "best available control technology" for proposed projects likely to affect visibility at Wichita Mountains; and (3) that Texas extend evaluations of visibility impacts from within 100 kilometers of Wichita Mountains to within 300 kilometers of Wichita Mountains. *Id.* at 74,866. As EPA's proposed rule explains, Texas agreed to Oklahoma's first two requests and committed to working with the Federal Land Managers ("FLMs") and with Oklahoma to develop a protocol to determine when a proposed PSD source should conduct a Class I area review. *Id*.

UARG noted that the EPA goes on to describe Oklahoma's consideration of the reasonable progress factors and its assessment of the reasonableness of the URP during the first planning period. *Id.* at 74,868- 69. EPA states:

> After considering the URP, the results of the CENRAP modeling and the four reasonable progress factors … [Oklahoma] determined that meeting the URP goal for 2018 was not reasonable. It then adopted the 2018 projected visibility conditions from the CENRAP photochemical modeling as the RPGs for the 20% best days and 20% worst days for the Wichita Mountains. *Id.* at 74,869.

UARG Stated that as a result of the regional consultations and Oklahoma's consideration of the URP and the reasonable progress factors, Oklahoma developed RPGs for Wichita Mountains that comply with the regional haze rule requirements that RPGs "provide for an improvement in visibility for the most impaired days over the period of the SIP and ensure no degradation in visibility for the least impaired days over the same period." *Id.* at 74,865.

UARG stated that, nevertheless, EPA proposes to disapprove the Oklahoma RPGs due to a purported "incomplete consultation" with Texas "that resulted in inadequate reasonable progress towards the national visibility goal." *Id*. The source, nature, meaning, and parameters of EPA's putative "completeness" criterion are utterly unclear and undefined. Ultimately, however, the supposed shortcoming in Oklahoma's consultation efforts, according to EPA, is that "the technical analysis developed by Texas did not provide the information necessary to identify reasonable reductions from its sources, and inform consultations in order to develop coordinated management strategies with Oklahoma." *Id.* at 74,871. Apparently, EPA's theory is that if Texas had provided more analysis, or if Oklahoma had demanded it, Oklahoma would have realized that Texas was not offering emission reductions consistent with reasonable progress requirements and that Oklahoma would have asked EPA to press Texas for additional emission reductions.

According to UARG, this EPA rationale for proposing to disapprove the Oklahoma consultation component of its regional haze SIP and, as a result, its RPGs is fatally flawed for at least two reasons. First, there was no shortcoming in the technical analyses Texas provided to Oklahoma. As noted above, the information Texas provided not only satisfied the regional haze rule's requirements, it exceeded them. Indeed, elsewhere in the proposed rule EPA States that, in its view, information in the record "showed that cost-effective controls on Texas sources were likely available" and that information in the record documented the impact of Texas sources on Wichita Mountains. *Id*. Given those acknowledgements by EPA, EPA cannot logically maintain that Oklahoma lacked the information from Texas that was necessary to apprise Oklahoma that Texas might be able to contribute additional emission reductions. Second, EPA is not empowered to intervene in the interstate consultation component of the regional planning process that the CAA directs. States and RPOs conduct the technical analyses needed to inform decision-making, and then States must decide for themselves whether they believe the consultation process has been successful or whether, instead, to seek EPA resolution of interstate disagreement.

UARG Stated that Oklahoma had all of the information it required, consistent with the regional haze rule, to make appropriate RPG determinations through the interstate consultation process. EPA, accordingly, has no basis for finding that Oklahoma's interstate consultation with Texas was incomplete or that its RPGs for Wichita Mountains fail to represent reasonable progress.

Response: See our previous responses to Luminant and others in this section. We have addressed the comments on the Texas technical analysis elsewhere.

Comment: EPA arbitrarily imposed new, more onerous State consultation requirements in its Proposal than it has applied to other SIP reviews [Xcel Energy (0064) p. 22-24]

Xcel Energy noted, as part of a State's development of RPGs, a State "must consult with those States which may reasonably be anticipated to cause or contribute to visibility impairment in the mandatory Class I Federal area." 40 C.F.R. § 51.308(d)(l)(iv); *see also* 40 C.F.R. §§ 51.308(d)(3)(i)-(iii) (outlining consultation requirements for the long-term strategy). As EPA notes, all that is required for interstate consultation is that States work together and "take a hard look at what measures are necessary" to meet RPGs. 79 Fed. Reg. at 74,867.

Xcel Energy stated that it is undeniable that Texas and Oklahoma took the requisite "hard look" required as part of interstate consultation on regional haze. Most importantly, both States were active participants in the CENRAP regional planning process. Because CENRAP modeling showed Texas and Oklahoma sources affecting each State's Class I areas, Texas and Oklahoma commenced a separate interstate consultation process. Indeed, Texas and Oklahoma provided substantial documentation of the numerous meetings, phone calls, and correspondence exchanged on the impacts of each State's sources on Class I areas. *See* 79 Fed. Reg. at 74,865-67 (reviewing substantial consultation efforts); Texas SIP, at App. 4- 2. Based on a request from Oklahoma as part of this consultation process, Texas even specifically agreed to allow Oklahoma an opportunity to comment on Texas' evaluation of Best Available Control Technology for new and modified sources. *See* 79 Fed. Reg. at 74,866.

Nonetheless, Xcel Energy noted that the Proposal disapproves of Oklahoma's and Texas' interstate consultation, and concludes that "Oklahoma did not have adequate information to reasonably establish its RPG for the Wichita Mountains, and, as explained below, should have requested that the TCEQ further investigate these sources." *Id.* at 74,867; *see also id.* at 74,857 (disapproving of Texas' consultation under long-term strategy requirements). The Proposal never details what information Oklahoma lacked in establishing its RPGs, nor did EPA provide an adequate explanation of how additional information would have changed Oklahoma's ultimate determination that additional controls on Texas sources would not move the Wichita Mountains perceptibly closer to its regional haze goals.

Xcel Energy Stated that the EPA is requiring significantly more from Oklahoma and Texas with respect to the consultation process than it has previously required via rule, guidance and other SIP approvals. 8 In adopting its regional haze regulatory guidelines, EPA noted that, if States determine that no further controls are needed in a particular planning period, States must merely *document* "any consultations with other States in support of their conclusions." RHR, 64 Fed. Reg. at 35,721-22. Texas and Oklahoma did this. *See* Texas SIP, at App. 4-2.

Xcel Energy stated that the EPA suggests that Texas and Oklahoma are simply relying on their participation in CENRAP to meet their consultation requirements. *See* 79 Fed. Reg. at 74,856 (noting that "[p]articipation in a regional planning organization does not automatically satisfy a State's obligation to" consult). This is inconsistent with the substantial record of consultation between the States. *Id* at 74,865-67. Even EPA acknowledges that Texas went above and beyond the regional planning process that EPA deems sufficient for interstate consultation in the long-term strategy context. *Id* at 74,857 ("In fact, the TCEQ went beyond the CENRAP analysis by contemplating additional controls, applying a lower Cost-effective ness threshold and estimating the visibility benefit from the identified control set."). This was more than what is required in EPA regulations on consultation. 40 C.F.R. § 51.308(d)(iii) (noting that "The State may meet this requirement by relying on technical analyses developed by the regional planning organization and approved by all State participants.").

Xcel Energy noted that the EPA also appears to be arbitrarily taking a harder line in reviewing Texas' and Oklahoma's consultation efforts than it has taken with other States. In other recent regional haze SIP actions, EPA concluded that interstate consultation requirements were met, even though there was substantially less consultation than the discussions between Oklahoma and Texas:

- In Michigan, EPA found adequate consultation even when Michigan did not offer additional controls for a Class I area not meeting its glide path until 2209. *See* Proposed Michigan SIP Approval, 77 Fed. Reg. at 46,917 ("By coordinating with the MRPO and other RPOs, Michigan has worked to ensure that it achieves its fair share of overall emission reductions").

- In Arkansas, EPA concluded that Arkansas met consultation requirements based on three calls with States and concurrence in the conclusion that controls in other States are not necessary. Proposed Arkansas SIP Approval/Disapproval, 76 Fed. Reg. 64,186, 64,196 (Oct. 17, 2011).

- In Kentucky, EPA found that Kentucky adequately addressed the consultation requirements by determining that sources were meeting more stringent requirements than regional MANE-VU recommendations. Kentucky SIP Approval, 76 Fed. Reg. at 78,213.

Xcel Energy argued that the EPA cannot make inconsistent conclusions on the adequacy of the consultation process between Oklahoma and Texas as compared to other States without any reference to its rules, guidance and prior SIP approvals.

Response: Please see our responses to the consistency sections of this document for our responses to allegations that we have been inconsistent in our treatment of Texas in comparison to our other actions.

Comment: Texas and Oklahoma consulted as required on the reasonable progress goals for the Wichita Mountains. [NRG (0078) p. 9]

NRG Stated that Texas and Oklahoma met the consultation requirements of EPA's rules. EPA's preamble documents the communications between the States' agencies, concluding with a succinct description of facts indicating that the States agreed on the key point of the reasonable progress goal for the Wichita Mountains:

> The TCEQ concluded by requesting ODEQ's concurrence on that assessment, and, "that your State is not depending on any additional reductions from Texas sources in order to meet your reasonable progress goal(s)."
>
> On May 12, 2008, the ODEQ responded to that letter and concurred with the "information in that letter." (79 Fed. Reg. at 74,855)

NRG stated that this record makes it clear that Texas and Oklahoma consulted. EPA's regional haze regulations require States to consult with each other, as they did, but do not require the States to consult with EPA:

> In developing each reasonable progress goal, the State must consult with those States which may reasonably be anticipated to cause or contribute to visibility impairment in the mandatory Class I Federal area. In any situation in which the State cannot agree with another such State or group of States that a goal provides for reasonable progress, the State must describe in its submittal the actions taken to resolve the disagreement. In reviewing the State's implementation plan submittal, the Administrator will take this information into account in determining whether the State's goal for visibility improvement provides for reasonable progress towards natural visibility conditions. (40 C.F.R. § 51.308(d)(l)(iv))

By dismissing the States' consultation, NRG stated that the EPA's proposed disapproval of the Wichita Mountains reasonable progress goal is inconsistent with the process described by EPA's own regulations. EPA must accept the reasonable progress goals identified by Texas and Oklahoma for the Wichita Mountains.

Response: Please see our previous responses to Luminant and others in this consultation section.

Comment: Texas has met all consultation requirements found in the regional haze long-term strategy regulations. [GCLC (0063) p. 9]

GCLC noted that the EPA believes that Texas "did not adequately address the requirement in Section 51.308(d)(3)(i) to 'consult with the other State(s) in order to develop coordinated emission management strategies.'"[38] This is largely based on EPA's belief that "the technical analysis developed by Texas to evaluate controls for Texas sources did not provide the information necessary to identify reasonable reductions from its sources, and inform consultations in order to develop coordinated management strategies with Oklahoma." [39] This is simply not true and directly conflicts with the numerous meetings, interactions, and affirmative approvals, between Texas and Oklahoma administrative agencies.

GCLC Stated that Texas has fully complied with the consultation requirements outlined in the LTS regulations[40] with regard to the Central Regional Air Planning Association ("CENRAP") States, including Oklahoma. Texas and Oklahoma engaged in lengthy and detailed consultation in the development of their regional haze SIPs. GCLC listed examples of consultation from 2007 to 2008 (see comment 0063 for details).

[GCLC (0063) p. 11] GCLC asserted that EPA has already recognized the extensive information that was in Oklahoma's possession as it was developing its SIP. In an attempt to disagree with the reasonable decisions made by Oklahoma in developing its SIP, EPA Stated "[a]t the time that Oklahoma was developing its SIP, it had ... abundant information showing the impact of Texas sources on visibility at the Wichita Mountains." [52] While this impact did not warrant additional controls, as reasonably determined by both Texas and Oklahoma cooperatively, EPA's Statement clearly illustrates that Oklahoma was in possession of "abundant information." Further, EPA has admitted that "Oklahoma did not specifically request any additional reductions from Texas sources." [53]

GCLC noted that Oklahoma had all necessary information to develop an appropriate regional haze SIP, and in its reasonable discretion, chose not to request additional controls in Texas beyond those required by existing programs. While EPA may disagree with that choice - though GCLC believes that Oklahoma's choice was valid - it is not a valid legal basis to disapprove Texas' long-term strategy, because the evidence is clear that there was extensive consultation between Oklahoma and Texas. Texas met and exceeded all consultation requirements and all regulatory requirements, and Texas' SIP includes all measures "to achieve its apportionment of emission reduction obligations agreed upon through [the regional planning] process." [54]

Footnotes:
[38] TX TSD at 49.
[39] Id.
[40] 40 CFR § 51.308(d)(93)(ii).
[52] Proposed FIP, 79 Fed. Reg. 74867.
[53] Id. at 74856
[54] 40 CFR § 51.308(d)(3)(ii). (emphasis added).

Response: Please see our previous responses to Luminant and others in this section.

Comment: Legal and Factual Background [UARG (0065) p. 2-5] Finally, States whose emissions may cause visibility impairment in another State's Class I area and States with Class I areas that may experience visibility impairment caused by emissions from other States may be subject to an interstate-consultation requirement. *Id.* § 51.308(d)(1)(iv). The purpose of that requirement is to provide a forum for States to decide collaboratively on reasonable emission reductions and appropriate apportionment of responsibility for reducing emissions during each planning period of the regional haze program.

Response: Please see our previous responses to Luminant and others in this section.

Comment: Earthjustice et al., provided background on developing a long-term strategy. [Earthjustice (0067) p.7]

Earthjustice et al., stated that a regional haze implementation plan must, among other things, include emission limits, schedules of compliance, and "all measures necessary" to make reasonable progress towards achieving natural visibility conditions. 40 C.F.R. § 51.308(d)(3)(ii). In developing a long-term strategy, a State must look beyond major stationary sources to area, mobile, and minor sources, *id.* § 51.308(d)(3)(iv), as well as a number of other sources of impairment such as construction, agricultural, and forestry practices. *Id.* § 51.308(d)(3)(v). The long-term strategy must be sufficient to achieve reasonable progress for both the Class I areas within a State's borders as well as the out-of-State areas affected by the State's emissions. *Id.* § 51.308(d)(3). To ensure that each State does its part to address regional haze, a State that contributes to impairment at another State's Class I area must consult with the State home to the Class I area. *Id.* § 51.308(d)(3)(i).

According to Earthjustice et al., Consultation proceeds based in part on analyses of how much impairment at a given Class I area is due to emissions from each State. Each State then must document the technical basis by which it determines its share of the emissions reductions necessary to make reasonable progress at a Class I area. *Id.* § 51.308(d)(3)(iii). After fulfilling the procedural requirements for consultation, a State must ensure that its haze plan satisfies the primary substantive requirement for a long-term strategy: to include the enforceable measures necessary to meet the reasonable progress goals for each Class I area affected by the State's emissions. *Id.* § 51.308(d)(3).

Response: We acknowledge the background information provided by the commenter. We take no position with respect to the commenter's synopsis.

Comment: Luminant provided background information on establishing a long-term strategy. [Luminant (0061) p. 9]

Luminant explained that in addition to the RPGs, a State must also develop a long-term strategy that addresses visibility impairment for both ***in-State*** Class I areas and ***out-of-State*** Class I areas "which may be affected by emissions from the State."[57] The long-term strategy must "include enforceable emissions limitations, compliance schedules, and other measures as necessary to achieve the reasonable progress goals established by States having mandatory Class I Federal areas."[58]

Luminant noted that in order to develop its long-term strategy, the State must "consult with the other State(s) in order to develop coordinated emission management strategies."[59] And "the State must demonstrate that it has included in its implementation plan all measures necessary to obtain its share of the emission reductions needed to meet the progress goal for the area."[60] In developing the long-term strategy, the State must evaluate seven specific factors that are distinct from the four statutory factors for reasonable progress assessments. Among these factors are "[e]missions limitations and schedules for compliance to achieve the reasonable progress goal," mitigation of construction activities, source retirement and replacement, smoke management techniques, and net changes in visibility projected from changes in point, area, and mobile sources.[61] Thus, the long-term strategy broadly encompasses multiple source types and actions by the State and is not intended to be a source-specific analysis.

According to Luminant, of particular relevance to EPA's proposal here, EPA's regulations specifically provide that, to meet the long-term strategy requirement, "[i]f the State has participated in a regional planning process, the State must ensure it has included all measures needed to achieve its apportionment of emission reduction obligations ***agreed upon through that process.***"[62] As discussed elsewhere, Texas met this requirement by participating in a regional planning organization and including in its long-term strategy all emission reductions agreed upon through that process.

Footnotes:
[57] Id. § 51.308(d)(3)
[58] Id. (emphasis added).
[59] Id. § 51.308(d)(3)(i).
[60] Id. § 51.308(d)(3)(ii).
[61] Id. § 51.308(d)(3)(v).
[62] Id. § 51.308(d)(3)(ii) (emphasis added).

Response: We acknowledge the background information provided by the commenter. We take no position with respect to the commenter's synopsis.

Comment: Luminant provided background information on Texas' approach to establishing the State's long-term strategy. [Luminant (0061) p. 23]

Luminant noted that Texas developed its long-term strategy to address regional haze visibility impairment at each Class I area within the State and at each Class I area outside the State that may be affected by emissions from Texas sources. Consistent with EPA's regulations, Texas used CENRAP's PSAT modeling to determine the "apportioned impact of different areas and pollutants to visibility impairment" for in-State Class I areas (Big Bend and Guadalupe Mountains) and out-of-State Class I areas impacted by emissions from Texas.[177]

Luminant Stated that for the in-State areas (Guadalupe Mountains and Big Bend), the PSAT modeling showed that Kansas, Louisiana, New Mexico, and Oklahoma "contribut[e] to visibility impairment" at these Class I areas.[178] Texas' long-term strategy relies on reductions that these States projected from their sources.[179] Texas concluded that "[b]ased on their plans and commitments elicited through the consultation process, the commission has determined that the emissions reductions these States are projecting are reasonable for contributing to progress in reducing their contributions to visibility impairment at the two Class I areas in Texas."[180]

In regard to Class I areas outside Texas affected by emissions from Texas sources, Luminant noted that Texas and the surrounding States engaged in the required consultation through CENRAP. Texas evaluated its emissions based on the CENRAP PSAT modeling and specifically consulted with Arkansas, Missouri, Oklahoma, New Mexico, Louisiana, and Colorado to determine "whether emission reductions projected in Texas by 2018 are sufficient to meet Texas' apportionment of the impact reduction needed to meet the reasonable progress goal for each Class I area in each State."[181] Based on the consultation process "none of these States ... asked Texas for further emission reductions to help the State meet its reasonable progress goals for its Class I area(s)."[182]

As to the Wichita Mountains, Luminant noted that the consultation process between Oklahoma and Texas specifically acknowledged certain impacts on the Wichita Mountains. Relying on CENRAP modeling, Oklahoma's reasonable progress goal for the Wichita Mountains "reflects visibility improvement resulting from emissions reduction programs associated with the Federal CAA and Oklahoma CAA, including long-term strategies of Oklahoma, Texas, and other States and presumptive emissions reductions from the Oklahoma BART rule."[183]

To set its RPG, Luminant noted that Oklahoma relied on the Alpine modeling that was commissioned by CENRAP. This modeling demonstrated that "[e]ven if all CENRAP member States compelled sources to install and use controls as effectively as this scenario envisions, then the Wichita Mountains still would fall significantly short of meeting the uniform rate of progress glide path for the worst quintile days in 2018."[184] Oklahoma thus conducted the statutory four-factor analysis to determine the reasonable progress goal for Wichita Mountains.[185] Oklahoma established the reasonable progress goal for the Wichita Mountains based on projected visibility of 21.47 deciviews in 2018 for the worst 20 percent days.[186] Using this goal, Oklahoma estimated that "natural conditions will be met circa 2102."[187]

Footnotes:
[177] Id. at 11-1.
[178] Id. at 11-7.
[179-182] Id.
[183] ODEQ, Regional Haze Implementation Plan Revision 104 (Feb. 2, 2010) ("2010 Oklahoma SIP Narrative").
[184] Id. at 109.
[185] Id. at 111–12, 114.
[186] Id.
[187] Id. at 104.

Response: We acknowledge the background information provided by the commenter. We take no position with respect to the commenter's synopsis.

Comment: Luminant provided a summary of EPA's proposed disapproval of Texas' long-term strategy. [Luminant (0061) p. 47]

Luminant noted that the EPA proposes to disapprove Texas' long-term strategy in three respects.[335] First, EPA proposes "to find that Texas' long-term strategy does not include all measures necessary to obtain the State's share of emission reductions needed to make reasonable progress in the Wichita Mountains Class I area in Oklahoma," despite the fact that Texas included all emission reductions that were agreed to in the CENRAP process and Texas / Oklahoma consultations.[336] EPA bases this conclusion on its finding that, although Texas and Oklahoma engaged in extensive consultations through CENRAP, Oklahoma "did not specifically request any additional reductions from Texas sources," and Texas "did not adequately" consult with Oklahoma.[337] EPA further "do[es] not agree . . . with the ODEQ's approach to consultation to address impacts from emissions from Texas."[338] Specifically, even though Oklahoma had "abundant information" about impacts from Texas sources at Wichita Mountains and "evidence [on] Cost-effective controls on these sources," EPA believes that Oklahoma should have requested that Texas "further investigate controls at these sources."[339] For these reasons, EPA concluded that Texas has failed to meet the consultation requirement in 40 C.F.R. § 51.308(d)(3)(i) and (ii).[340]

Second, EPA proposes "to find that the technical basis on which Texas relied to determine its apportionment of emission reduction obligations necessary for achieving reasonable progress in Wichita Mountains was inadequate" and thus Texas' long-term strategy does not meet the requirements of 40 C.F.R. § 51.308(d)(3)(iii).[341] EPA bases this conclusion on its finding that, although Texas' long-term strategy "rel[ied] on technical analyses developed by CENRAP and approved by all State participants" and further "performed an additional analysis building upon the work of the regional planning organization in order to evaluate additional controls," Texas should have independently "consider[ed] the four-factor used in determining reasonable progress [in 51.308(d)(1)(i)(A)] in the developing the technical basis for . . . downwind [i.e., out-of-State] Class I areas," including Wichita Mountains.[342] In other words, EPA contends that Texas should have developed its own reasonable progress goal for Wichita Mountains located in Oklahoma.

Third, EPA proposes "to find that Texas did not adequately consider the emissions limitations and schedules for compliance needed to achieve reasonable progress in Big Bend, Guadalupe Mountains, or Wichita Mountains,"[343] and thus Texas' submission does not meet 40 C.F.R. § 51.308(d)(3)(v)(C) in EPA's view. As to Big Bend and Guadalupe, EPA's finding of inadequacy relies on EPA's finding that Texas 'RPGs are inadequate.[344] As to Wichita Mountains, EPA "believe[s] the record supports a finding that [Texas's] analysis is inadequate as it does not provide the information necessary to determine the reasonableness of controls at those sources in Texas that significantly impact visibility at the Wichita Mountains." [345]

Footnotes:
335 Id. at 74,822.
336 Id.
337 Id. at 74,856.
338 Id. at 74,867.
339 Id.
340 Id. at 74,856; see TX SIP TSD at 48–49.
341 79 Fed. Reg. at 74,822.

[342] Id. at 74,857, 74,861; see TX SIP TSD at 65.
[343] 79 Fed. Reg. at 74,822.
[344] TX SIP TSD at 71.
[345] Id.

Response: We acknowledge the background information provided by the commenter. We take no position with respect to the commenter's synopsis.

6. Source Category and Individual Source Modeling

Comment: EPA is applying an unlawful standard to Texas. [Luminant (0061) p. 1]

Luminant Stated that the EPA proposes to disapprove Texas' regional haze SIP and impose a FIP for the sole reason that, in EPA's view, Texas was required to conduct a source-specific analysis of certain facilities to meet the reasonable progress requirement.[2] But, as the Tenth Circuit has recently held: "Neither the Clean Air Act nor the Regional Haze Rule requires source-specific analysis in the determination of reasonable progress."[3] And EPA's own regional haze guidance provides that "[r]easonable progress is not required to be demonstrated on a source-by-source basis."[4] EPA's proposal thus relies on the wrong legal standard and is contrary to law.

Footnotes:
[2] 79 Fed. Reg. 74,818, 74,839 (Dec. 16, 2014) (explaining that EPA is proposing to disapprove Texas' SIP "[b]ecause individual sources were not considered by the TCEQ").
[3] See WildEarth Guardians v. EPA, 770 F.3d 919, 944 (10th Cir. 2014).
[4] EPA, Additional Regional Haze Questions 9 (Sept. 27, 2006), available at http://tinyurl.com/EPARHquestions.

Response: This comment does not accurately describe the proposed basis for disapproval of Texas' reasonable progress analysis and mischaracterizes what Texas had in fact submitted for EPA review. We reviewed that analysis under the requirements of 40 CFR 51.308(d)(1)(i)(A) mindful also that conducting a proper analysis is critical to meeting requirements in Section 51.308(d)(3). Our disapproval hinges on deficiencies in the provided analysis, but these deficiencies did not specifically or necessarily come about from the SIP not providing source-specific analyses or not demonstrating reasonable progress on a source-by-source basis. For purposes of Texas meeting the requirements, the rule sets forth that reasonable progress goals must be set for each mandatory Class I Federal area within the State of Texas. Notably, the technical record for this FIP does not purport to conduct a source-by-source analysis for all sources in Texas; instead, it identified a group or subset of impactful sources that justified further analysis. In inviting comments on and determining whether controls are appropriate for individual sources, the study of the appropriateness of those controls naturally becomes more "source-specific" in its emphasis. However, even with an appropriate analysis of a group of sources or a study of sector-wide emissions, this is necessarily how the analysis would proceed when controls appear to be warranted on some or all sources. Accordingly, while our FIP does consider and ultimately apply controls to individual sources to assure reasonable progress, this is consistent with our regulations, our case law, and past EPA guidance (including those cited by the commenter).[86]

Our proposal had observed “that individual sources were not considered by the TCEQ,” however, we note this statement concerned the depth, granularity and coherency of the State’s analysis. It would be incorrect to assert that the submitted analysis had no individual source analysis. In fact, our proposal's discussion section bore the title, “The TCEQ's Weighing of the Four-factors for Individual Sources." 79 FR at 74838. Plainly, Texas submitted an analysis that employed a large potential control set consisting of a mix of large and small sources. (See Section 10.4.1 of the SIP submittal). It is apparent from the Texas SIP itself (see, for example, Appendix 10-1: Analysis of Control Strategies and Determination of Reasonable Progress Goals, and accompanying tables) that Texas identified individual sources as possible candidates for controls under reasonable progress. However, Texas used an inappropriate and flawed demonstration to reach its determination that no reasonable controls were required on those sources, and this determination conflicts with the technical record before the State and as further developed for this FIP. We proposed to determine the analysis was deficient and not approvable because the large control set was not appropriately refined, targeted or focused on those sources having significant and potentially cost-effective visibility benefits. Consistent with our proposal, we conclude that control set was over-inclusive. It included controls on sources that would increase total cost figures with little visibility benefit. As was noted in our proposal, the SIP adopted this approach despite evidence in the record of identified cost-effective controls that would result in large emission reductions on certain EGUs and despite source apportionment modeling identifying large impacts from EGU sources in northeast Texas. As was stated in the proposal, this approach had the potential to “mask” benefits that might be obtained. Moreover, as was also noted in our proposal, the submitted analysis failed to study or consider scrubber upgrade candidates, and this proved to be an inappropriate and unreasonable omission that overlooked an important aspect of the regional haze problem and further obscured an accurate picture of the potential for highly cost-effective emission reductions that provide progress toward natural visibility conditions. We find it necessary to disapprove the submitted analysis because these deficiencies materially affected the outcome of the State’s SIP process.

Comment: EPA’s “individual control” and “individual source” requirement for reasonable progress is an unlawful basis for disapproval of Texas’ goals. [Luminant (0061) p. 64]

Luminant Stated that EPA’s proposal is based on an unlawful standard for applying the four statutory factors for “reasonable progress.” EPA’s proposal—including EPA’s proposed disapproval of Texas’ reasonable progress goals and long-term strategy and its proposed Federal Implementation Plan (“FIP”)—is premised on the unfounded assertion that Texas was required to review and analyze the four statutory factors in 42 U.S.C. § 7491(g)(1) on an individual control basis to a small group of facilities and that Texas is prohibited from applying the factors on a source-category basis.[453] EPA would disapprove Texas’ RPGs because, EPA finds,

[86] 40 CFR 51.308(d)(1)(i)(A) expressly sets forth that the analysis will deal with “compliance” time and costs and repercussions for “potentially affected sources.” To the extent this or any other comment would suggest the analysis can or should fully depart from all consideration of source impacts on Class I Federal areas, the analysis—whatever its organizational structure or emphasis—would have no useful content.

"TCEQ's analysis is insufficient to determine the visibility benefit of controlling the source or subset of sources with the most effective controls for improving visibility conditions . . . ."[454] EPA's finding is an unlawful basis for its proposal.

Footnotes:
[453] 79 Fed. Reg. at 74,838 ("[B]ecause the TCEQ did not evaluate controls on a source-by-source basis, source-specific factors related to the evaluation of the reasonable progress four-factor analysis could not be considered."); id. at 74,839 ("Because individual sources were not considered by TCEQ, we found it necessary to conduct an additional analysis . . . .").
[454] Id. at 74,841.

Response: We do not agree with how this comment characterizes the basis of our proposed disapproval. Although we find fault with the State's analysis, which did not precisely engage the four statutory factors on "an individual control basis to a small group of facilities," we do not consider this the core of Texas' flawed approach. Nor are we disapproving the submitted analysis for applying the factors on a source-category basis. Rather, the submitted analysis is faulty for not having or not appropriately considering critical information. The State's analysis had the effect of obscuring achievable visibility benefits. This is no specific consequence of the labeling we would give to the structure of the State's analysis. The submitted analysis did not appropriately define a subset of sources to produce an effective source-category or grouped analysis. The source-category analysis also did not have the proper information to discern obtainable visibility benefits or the most effective controls. These deficiencies do not implicate that we demand uniform application of factors on an individual control basis. However, in the case of this SIP submittal, we are left to conclude that these deficiencies are significant to an extent that they would materially affect the outcome of the State's SIP process, and that this component of the SIP thus warrants disapproval.

Comment: EPA's disapproval is contrary to the clean air act and EPA's implementing regulations. [Luminant (0061) p. 64]

According to Luminant, EPA's basis for disapproval is contrary to the statute, regulations, and guidance. Texas is not required to "determine the visibility benefit of controlling the source or subset of sources with the most effective controls for improving visibility conditions," as EPA contends.[455] The statute, regulations, and EPA guidance all support and permit TCEQ's source-category analysis and its review of costs on a source category basis as a reasonable basis for developing its RPGs. EPA's individual source and individual control analysis of a small group of sources is, by contrast, not required, nor is it the sensible way to evaluate the factors.[456] As the Tenth Circuit has specifically held, "[n]either the Clean Air Act nor the Regional Haze Rule requires source-specific analysis in the determination of reasonable progress."[457] Indeed, until this proposed action, EPA has consistently taken the position that the reasonable progress factors should be applied to "source categories" and that "[r]easonable progress is not required to be demonstrated on a source-by-source basis."[458]

Luminant Stated that EPA's entirely new and unprecedented interpretation and application of the four reasonable progress factors in its review of Texas' SIP submission is inconsistent with the structure of the Clean Air Act. The statute itself speaks of "classes or categories of sources" that impact visibility and directs EPA to issue its regulations taking that approach into account.[459] Structurally, the statute regulates individual sources under the best available retrofit technology ("BART") provisions and the reasonably attributable visibility impairment ("RAVI") provisions, but does not direct regulation of individual sources or the evaluation of individual controls under the reasonable progress provisions.[460] EPA's regulations, likewise, focus the reasonable progress requirements and the four-factor on numerous sources, not individual sources or a small number of sources. For example, the four reasonable progress factors are considered by a State in "address[ing] regional haze,"[461] which is defined as "visibility impairment that is caused by the emission of air pollutants from numerous sources located over a wide geographic area."[462] In contrast, the RAVI provisions of the regulations,[463] which are separate and distinct from the reasonable progress provisions, address "visibility impairment that is caused by the emission of air pollutants from one[] or a small number of sources." [464] EPA's regulations incorporate this important distinction throughout.[465] Thus, EPA's "additional analysis" of "a small number of sources"[466] is an unlawful standard by which to disapprove Texas' reasonable progress analysis and contrary to the statute and regulations. Texas' comprehensive analysis, by contrast, fully met the reasonable progress requirements as contained in the statute and regulations.[467]

Luminant Stated that EPA has repeatedly confirmed that the statute and its implementing regulations allow the four-factor analysis be done on a source category basis. For example, in "guidance to the State air pollution control agencies and the general public on meeting the regional haze SIP requirements," EPA explained in no uncertain terms:

> Unlike the technical demonstration for CAIR or BART, the reasonable progress demonstration involves a test of a strategy. The strategy includes a suite of controls that has been identified through the identification of pollutants and ***source categories*** of pollutants for visibility impairment - the possible controls for these pollutants (and their precursors) and ***source categories*** - the application of four statutory factors and how much progress is made with a potential strategy with respect to the glide path. ***Modeling occurs with a strategy and is not a source-specific demonstration like the BART assessment. . . .***
>
> ***Reasonable progress is not required to be demonstrated on a source-by-source basis.*** It is demonstrated based on a control strategy developed from a suite of controls that has been assessed with the four statutory factors and the uniform rate of progress.[468]

According to Luminant, in other guidance focused on the reasonable progress requirements for SIPs, EPA again explained that States "have flexibility in how to take into consideration these statutory factors and any other factors that you have determined to be relevant."[469] As to the first factor—"costs of compliance"—EPA specifically explained that "we believe that the cost of compliance factor can be interpreted to encompass the cost of compliance for individual sources ***or source categories . . .***"[470] Indeed, EPA repeatedly makes clear in its guidance that States may apply the factors to "sources ***and/or source categories***."[471] And EPA has explained that when "EPA steps into the State's shoes" in issuing a FIP, it has "flexibility to make technical judgments within the bounds of the [regional haze] rule, and . . . ***is not statutorily obligated to***

impose source-specific controls."[472] EPA cannot require of Texas what EPA concedes is not required of itself.

Luminant asserted that this EPA-endorsed approach is exactly what Texas followed in the CENRAP process and in its SIP submission,[473] and it must be approved. Yet, EPA judges Texas' submission by the very standard that it has said does not apply.[474] EPA's new interpretation is not entitled to judicial deference here because, among other things, it squarely conflicts with EPA's prior interpretation and without any explanation.[475] And EPA's new approach is arbitrary and capricious because its prior guidance endorsing a source category approach "has engendered serious reliance interests that must be taken into account."[476] If EPA seeks to change its long-established interpretation of its regulations, which Texas and other States have relied on, EPA may only do so prospectively to future regional haze submissions and not retroactively to Texas'2009 submission.[477]

Footnotes:

[455] Id.

456 Although EPA contends that it conducted an individual source-by-source analysis, Id. at 74,839, EPA in fact did no such thing. Instead, EPA targeted 12 Texas facilities out of more than 1,600 for its "individual source" analysis of costs and potential controls. See Cost TSD at 1. Thus, EPA's four-factor analysis, not TCEQ's, is incomplete and does not adequately consider the four-factor for all Texas sources or even all Texas source categories.

[457] WildEarth Guardians, 770 F.3d at 944.

[458] EPA, Additional Regional Haze Questions 9 (Sept. 27, 2006).

[459] 42 U.S.C. § 7491(a)(3), (b)(1).

[460] Id. § 7491(b)(2)(A), (c).

[461] 40 C.F.R. § 51.308(d).

[462] Id. § 51.301. See also 77 Fed. Reg. 30,248, 30,248 (May 22, 2012) ("[T]he Act and EPA's rules . . . require States to prevent any future and remedy any existing anthropogenic impairment of visibility in mandatory Class I areas caused by emissions of air pollutants from numerous sources located over a wide geographic area (also referred to as the 'regional haze program')."); id. At 30,249 ("Regional haze is impairment of visual range or colorization caused by emission of air pollution produced by numerous sources and activities, located across a broad regional area.").

[463] 40 C.F.R. §§ 51.302–.306.

[464] Id. § 51.301.

[465] Id. § 51.300(a) (explaining that visibility impairment has "two principal forms"—"impairment attributable to a single source/small group of sources" and "regional haze" "from a multitude of sources").

[466] 79 Fed. Reg. at 74,839.

[467] EPA concedes as much by recognizing that "TCEQ constructed a large potential control set consisting of a mix of large and small sources, located at various distances from Class I areas, with a large geographical distribution." Id. at 74,838. And EPA further concedes that Texas and Oklahoma considered the impacts from individual "sources of particular interest to Wichita Mountains." Id. at 74,855.

[468] EPA, Additional Regional Haze Questions 9 (Sept. 27, 2006) (emphasis added).

[469] Reasonable Progress Guidance at 5-1.

[470] Id. (emphasis added).

[471] Id. at 2-3 (emphasis added).

[472] 77 Fed. Reg. at 40,164 (emphasis added).

[473] Texas RH SIP at 10-6 to 10-7.

[474] Compare EPA, Additional Regional Haze Questions 9 (Sept. 27, 2006) ("Reasonable progress is not required to be demonstrated on a source-by-source basis.") with 79 Fed. Reg. at 74,839 ("TCEQ did not separately evaluate the visibility benefit from the implementation of this control [at Big Brown], or appropriately weigh the four reasonable progress factors in determining the reasonableness of this individual control." (emphasis added)).

[475] See Christopher v. SmithKline Beecham Corp., 132 S. Ct. 2156, 2166 (2012) ("Deference is undoubtedly inappropriate, for example, when the agency's interpretation is plainly erroneous or inconsistent with the regulation. And deference is likewise unwarranted when there is reason to suspect that the agency's interpretation does not

reflect the agency's fair and considered judgment on the matter in question. This might occur when the agency's interpretation conflicts with a prior interpretation . . . ." (internal citations omitted) (internal quotations omitted)).
[476] Perez v. Mortgage Bankers Ass'n, 135 S. Ct. 1199, 1209 (2015) (internal quotations omitted).
[477] Indeed, separately, EPA is has "planned" "revisions" to its regional haze regulations that would require consideration of individual sources in the reasonable progress four-factor analysis. See EPA, Pre-Meeting Materials for the EPA-FLM-RPO-States-Tribes Meeting on the Future of the Regional Haze Program, Topic IV: Reasonable Progress and Long Term Strategy (Four-factor) 6 (Feb. 3, 2015) (explaining that "[t]he [current] RHR does not explicitly require a State to consider visibility impacts of individual sources when selecting additional controls for inclusion in its long-term strategy" and soliciting input on regulatory changes that would). But a prospective rulemaking cannot justify EPA's approach to reviewing Texas'2009 regional haze SIP.

Response: Even as it is permissible to conduct a reasonable progress goal analysis according to source categories and groups of sources, mere reliance on this organizational structure for the analysis does not assure it will be approvable. It is our statutory task to review the submitted analysis and the entire submitted SIP to ensure it conforms with the requirements of the Clean Air Act, including—in this case--40 CFR 51.308(d)(1)(I)(A). We proposed to disapprove the submitted analysis for, *inter alia*, being over-inclusive of sources with limited impacts at the pertinent Federal Class I area and over-inclusive of sources that were relatively poor candidates for making progress according to the statutory factors. We do not contend the submitted analysis had to at all conform to the structure or depth of analysis requisite under BART or RAVI rules; different rules address those sources or source requirements. But our acknowledgement of these contrasting requirements does not mean the submitted analysis is shielded from substantive scrutiny or that individual sources cannot permissibly have compliance requirements as an outcome of the analysis to establish RPGs. Whether or not one cites analytical components as being site-specific or generalizable across a source category (and whether or not a factor is applied collectively to a group of sources or applied to an individual source), the submitted analysis missed an important aspect of the problem of regional haze for the Federal Class I areas at issue, specifically Guadalupe Mountains and Big Bend.

We are within the framework of past guidance where we stated that that the factors apply (individually or together) to sources or source categories. In this case, the submitted analysis was overgeneralized and not discerning of the information most important to source category and individual source impacts at the relevant Federal Class I areas. This may have been accomplished in the context of a source category analysis that was open to and discriminating of the most critical and relevant information. However, regardless of how the analysis is classified, the demonstration fails for not giving appropriate focus to the sources or a subset of sources that were most critical to the matter of visibility protection at the Federal Class I areas addressed by our rule.

We acknowledge many of the citations provided by the comment--although several are presented outside their proper context[87]—but the comment begins with the faulty premise that the disapproval is based on the SIP's use of source-category analysis. This is not correct. The

[87] For example, in citing the language of 77 Fed. Reg. at 40,164, the comment erroneously places importance on a stray EPA Statement, made under a FIP obligation in an unrelated rulemaking, that EPA was "not statutorily obligated to impose source-specific controls." However, this Statement was made to emphasize statutory flexibility, not statutory limitations in imposing controls. The cited notice thereafter explained EPA's flexibility to instead require an alternative program under 40 CFR 51.308(e)(3). If anything, the text there undermines the commenter's position.

disapproval instead rests on the SIP's flawed analysis, the State's reliance on which has frustrated the requirement that the State implementation plan "contain emission limits, schedules of compliance, and other measures as may be necessary to make reasonable progress." CAA Section 169A(b)(2). To the extent the comment advocates that emission controls cannot or can never be required to make reasonable progress, the comment is plainly mistaken. By the statute and by regulation, such controls, including "source-specific controls," may be required. Notably, the Texas SIP submission does not argue otherwise; doing so (i.e., agreeing with the commenter that only BART and RAVI sources are subject to controls in the regional haze program) would quite likely have constituted an additional basis for disapproval. Contrary to the positions of many commenters, it is apparent that the Texas, by its submission, presupposes that individual source controls (beyond BART and RAVI controls) can be required to make reasonable progress. Even as we find it necessary to disapprove part of the Texas SIP, we note this area of agreement on an underpinning of the regional haze program.

We believe that in some instances, it is possible for a State to approach reasonable progress on a source category basis. For instance, a State may be able to demonstrate that due to the magnitude of their emissions and distance from any Class I areas, EGUs or some other source category are not significant contributors to regional haze, and thus should not be controlled during this planning period. However, although that was possible and appropriate for other sources categories in Texas, it was not possible for Texas EGUs. The technical record before Texas demonstrated that its EGUs are a very significant contributor to regional haze at a number of Class I areas, and our additions to the technical record reinforce this fact. In fact, both the Texas and Oklahoma regional haze SIPs are suffused with data points and information on these significant contributions. Still, that fact in and of itself did not derail Texas' strategy. Instead, the decision by Texas to effectively ignore (by obscuring or otherwise) this information is what caused its plan to not be approvable.

Once we determined that Texas' submission was not approvable and we were required to propose a Federal plan, it is possible that our plan could have emphasized source categories in lieu of specific sources. For instance, having identified EGUs as the primary contributing source category, and also having identified SO_2 as the primary contributing pollutant, we could have presented a plan that focused on further controlling SO_2 across the EGU source category. However, we believe that approach would have been less satisfactory. In this instance, unless evaluated on a source-by-source basis, we would have had no basis for determining which of these EGUs would be most beneficial to control. We would in fact be in the same place we note in our responses to objections to our consideration of visibility—an "all or nothing" proposition, arguably over-controlling sources or arguably formulating an arbitrary proposal. Our Final Rule is consistent with the Congressional goal set in the Clean Air Act, and ensures that affected sources had the benefit of a thorough study of the appropriateness of controls before those controls were imposed.

Comment: EPA's disapproval ignores that Texas did consider individual sources and found that Individual controls were not reasonable. [Luminant (0061) p. 69]

Luminant Stated that EPA's contention that Texas ignored individual sources and their impacts contradicts the record before EPA. Texas and Oklahoma, as part of the CENRAP process, considered "sources of particular interest to Wichita Mountains," including "their emissions and location with the [areas of impact]" modeled by CENRAP.[495] Contrary to EPA's apparent belief, Texas not only assessed controls for the appropriate source categories consistent with EPA guidance, it also considered and reviewed the costs of compliance for individual units, such as Luminant's Big Brown units, to determine that no additional controls were reasonable.[496] EPA is thus wrong when it asserts that "individual sources were not considered by the TCEQ."[497] Indeed, not only did TCEQ include in its analysis the cost of controls at individual units developed by CENRAP, TCEQ included in its analysis "additional individual sources" that were "not part of the CENRAP AirControlNET dataset,"[498] thus going above and beyond its obligation under the regulations.[499]

Luminant asserted that EPA's conclusions about Texas' process and the information it developed are simply not correct and cannot support EPA's proposal. An agency decision fails to pass legal muster if the administrative record reveals that the agency "offered an explanation for its decision that runs counter to the evidence . . . ." [500] And an agency must demonstrate that it has "examine[d] the relevant data and articulate[d] a satisfactory explanation for its action including a 'rational connection between the facts found and the choice made.'" [501] Here, EPA's proposal fails these standards. Contrary to EPA's apparent belief, the record shows that Texas did in fact identify the sources most likely to contribute to visibility impairment at the Class I areas of interest and reviewed costs of controls for those sources. EPA's contention that it needed to step in and provide its own analysis, to fill in perceived gaps left by Texas, is thus contrary to the record and arbitrary and capricious.

Footnotes:

[495] 79 Fed. Reg. at 74,855.

[496] See, e.g., Texas RH SIP at 10-7; Alpine Geophysics, SO_2 Costs Per Ton, Dock. ID No. EPA-R06-OAR-2014-0754-013-13 (May 9, 2006).

[497] 79 Fed. Reg. at 74,839.

[498] 2009 Texas SIP Narrative at 10-7.

[499] See 40 C.F.R. § 51.308(d)(3)(iii) ("The State may meet this requirement by relying on technical analyses developed by the regional planning organization . . . .").

[500] Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co., 463 U.S. 29, 43 (1983).

[501] Id. (quoting Burlington Truck Lines, Inc. v. United States, 371 U.S. 156, 168 (1962)).

Response: To the extent the comment observes that aspects of an individual source analysis were submitted—and in some ways can even said to be characteristic of the submitted four-factor analysis—we agree. This and many other public comments appear to be fixed on the proposal's Statement that "individual sources were not considered by the TCEQ." This Statement in our proposal follows a paragraph in which we point out that the TCEQ declined to control Big Brown, despite its own finding that Cost-effective controls were available, that these controls could be expected to result in approximately 40,000 tons per year of SO_2 reductions, and that EGUs in east Texas caused large visibility impacts. Consequently, we could have instead referred to the TCEQ's efforts as "individual sources were not *effectively* considered by the TCEQ." Nevertheless, our statement remains accurate in the important sense that the analysis was not conducted with appropriate emphasis on the most important data and the most important sources or subset of sources. To reiterate the example offered in our proposal: TCEQ had record evidence that Big Brown units would be especially promising candidates for controls that would potentially yield visibility improvement benefits through SO_2 reductions and could even do so quite cost-effectively, yet the "TCEQ did not separately evaluate the visibility benefit from the implementation of this control." This omission and related omissions critically undermined the overall analysis and demonstration.

As much as we appreciate Luminant's assertion that the submitted analysis arguably does consider individual sources, this viewpoint only reinforces our role in reviewing the adequacy of the State's consideration or lack of consideration of the factors for establishing reasonable progress goals, an enterprise that inherently requires the assessment and consideration of potential controls for individual sources. (See, e.g., Section 10.4.1 of the SIP submittal: "…pollutants of primary concern were determined to be SO_2 and NO_x from point sources…). Moreover, the comment validates the authority of States to consider and ultimately impose controls where justified on individual sources in establishing reasonable progress goals. We agree with this point and note that it also validates the authority of EPA to impose such controls, when appropriate, when EPA is subject to its obligation to issue a FIP, as it is here.

Comment: EPA's unprecedented approach is bad policy. [Luminant (0061) p. 70]

Luminant stated that EPA's proposed unprecedented approach is not sensible. By relying on a source category analysis—and not just targeting a small number of sources as EPA does—Texas' regional haze and reasonable progress analysis is fully consistent with the statutory and regulatory requirements and provides a comprehensive look at numerous sources.[502] That is the essence and goal of a regional haze/reasonable progress analysis, which should take into account "numerous sources and activities, located across a broad regional area." [503] EPA's focus on only a "small number" of sources, while ignoring others, does not provide for a comprehensive look at all potential contributors and opportunities for improvement.[504] Individual sources, moreover, are expressly considered under other aspects of the regional haze program—namely the RAVI analysis and BART—not the reasonable progress analysis. Texas' reasonable progress analysis, not EPA's, meets the substance, intent, and plain language of the regulations.

Footnotes:
[502] See, e.g., 77 Fed. Reg. at 30,251 ("States should consider all types of anthropogenic sources of visibility impairment in developing their LTS, including stationary, minor, mobile, and area sources.").
[503] Id. at 30,249.
[504] Not only is EPA conducting the wrong analysis for the reasonable progress factors, EPA's conclusions contradict its prior finding "there is no existing visibility impairment [at Big Bend or Guadalupe] that is reasonably attributable to specific sources" in Texas. 54 Fed. Reg. 7,767, 7,769 (Feb. 23, 1989).

Response: We disagree with the comment's suggestion that individual sources are not subject to control as part of the measures necessary to make reasonable progress. The statute and regulation make clear that reasonable progress goals are established and selected in consideration of—to borrow the comment's extra-statutory phrasing—all potential contributors and opportunities for improvement. See CAA Section 169A(b)(2); 40 CFR 51.308(d)(1)(i)(A). It is not happenstance that the final rule focuses on a small number of sources, but is instead and rather the product of the thoughtful application of the factors used to determine reasonable progress. See CAA Section 169A(g). Under a refined and, in fact, comprehensive analysis of numerous sources, these sources are determined to be the key contributors and the key opportunities for improvement that the Texas analysis unreasonably overlooked. Neither Texas, nor we, take the position that these sources are beyond regulation under the regional haze program under the argument that these sources are not presently subject to an applicable RAVI or BART analysis. Texas identified sources through Q/d and cost information, but the state's analysis mistakenly overlooked scrubber upgrades and obscured a realistic picture of the contributors and opportunities for improvement. We also note that even those sources subject to BART or RAVI controls can be subject to new and later assessment (and more effective or stringent future controls) as may be necessary to make reasonable progress. It is not evident that the comment embraces this understanding, even though it is entirely natural to the aims of the regional haze goals set by Congress.

Comment: EPA's proposed individual source-based approach for reasonable progress goals is unlawful. [Associations (0059) p. 13-14]

The Associations Stated that the EPA's proposal to disapprove Texas' reasonable progress goals and long-term strategy and replace them with a FIP is also unlawful because EPA adopts an individual source-based approach to setting reasonable progress goals inconsistent with the Clean Air Act. Unlike other aspects of the regional haze program, reasonable progress goal provisions are intended to address contributions from a wide range of sources that can be best addressed on a source-category basis. In this respect, they are fundamentally different from other provisions such as those for BART and reasonably attributable visibility impairment ("RAVI"), which are specifically designed to address individual sources. Moreover, EPA's adoption of an individual source-based approach is inconsistent with EPA's past practice and with EPA's strict uniformity rule for regional offices.

The Associations Stated that the EPA rejects Texas' source category-based approach for establishing reasonable progress goals in favor of an approach that focuses on potential emissions controls for individual sources. In particular, EPA asserts that "TCEQ's analysis is insufficient to determine the visibility benefit of controlling the source or subset of sources with the most effective controls for improving visibility conditions." 79 Fed. Reg. at 74,841; *see also id.* at 74,838 ("[B]ecause TCEQ did not evaluate controls on a source-by-source basis, source-specific factors related to the evaluation of the reasonable progress four-factor analysis could not be considered."). EPA then determined it was "necessary to conduct an additional analysis" because "individual sources were not considered by the TCEQ." *Id.* at 74,839. After conducting an individual source and individual emission control analysis of a small subset of sources within Texas, EPA concluded that several sources should be required to install additional control technologies. Not only does this approach ignore State primacy in establishing reasonable progress goals, it unlawfully shifts the focus of the reasonable progress goals from source categories to individual sources.

The Associations Stated that the Clean Air Act and EPA's implementing regulations draw a clear line between source category-based reasonable progress goals and other source-specific regional haze provisions. As the Tenth Circuit recently explained, "[n]either the Clean Air Act nor the Regional Haze Rule requires source-specific analysis in the determination of reasonable progress." *WildEarth Guardians v. EPA*, 770 F.3d 919, 944 (10th Cir. 2014). Instead, the Clean Air Act discusses "classes or categories of sources" that "may reasonably be anticipated to cause or contribute significantly to impairment of visibility" and directs EPA to promulgate rules to address them. 42 U.S.C. § 7491(a)(3), (b)(1). In contrast, under the Clean Air Act, BART and RAVI provisions are applied individually to "each major stationary source" meeting certain threshold criteria. *Id.* § 7491(b)(2)(A), (c).

According to the Associations, this structural distinction is maintained in EPA's regulations. For example, under the Regional Haze Rule, SIPs that incorporate reasonable progress goals are intended to address "regional haze." 40 C.F.R. § 51.308(d). Regional haze is defined by EPA as "visibility impairment that is caused by the emission of air pollutants *from numerous sources over a wide geographic area*." *Id.* § 51.301 (emphasis added). In contrast, EPA defines BART as an "emission limitation [that] must be applied on a case-by-case basis …." *Id.* Likewise, EPA explains that its RAVI provisions are designed to address "visibility impairment that is caused by the emission of air pollutants from one or a small number of sources." *Id.* Thus, EPA's regulations draw a stark distinction between reasonable progress goals on the one hand, which address emissions from a broad range of sources, and BART and RAVI provisions, which address individual sources.

The Associations stated that the EPA's own guidance also confirms this interpretation of both the Clean Air Act and EPA's implementing regulations. In defining the reasonableness of controls, EPA expressly contrasts reasonable progress goals with BART:

> Unlike the technical demonstration for CAIR or BART, the reasonable progress demonstration involves a test of a strategy. The strategy includes a suite of controls that has been identified through the identification of pollutants and source categories of pollutants for visibility impairment—the possible controls for these pollutants (and their precursors) and source categories—the application of four statutory factors and how much progress is made with a potential strategy with respect to the glide path. Modeling occurs with a strategy and is not a source-specific demonstration like the BART assessment. EPA, *Additional Regional Haze Questions* 9 (Sept. 27, 2006).

The Associations stated that the EPA goes on to explain more explicitly that "*Reasonable progress is not required to be demonstrated on a source-by-source basis*. It is demonstrated based on a control strategy developed from a suite of controls that has been assessed with the four statutory factors and the uniform rate of progress." *Id.* (emphasis added). In describing its own obligations with respect to establishing reasonable progress goals in FIPs, EPA explained that it has "flexibility to make technical judgments within the bounds of the [regional haze] rule and … *is not statutorily obligated to impose source-specific controls*." 77 Fed. Reg. at 40,164 (emphasis added). When establishing a FIP, "EPA steps into the State's shoes," *id.*, and EPA cannot disapprove a SIP—as it proposes to do here—for failing to conduct an analysis that EPA concedes is not statutorily required. *See* 42 U.S.C. § 7410(k)(3) ("The Administrator *shall* approve [a SIP or SIP revision] as a whole if it meets all of the applicable requirements of this chapter."); *National Ass'n of Home Builders*, 551 U.S. at 664 (finding similar language forbids EPA from denying approval on the basis of non-statutory factors).

Second, EPA fails to provide a reasoned explanation for disapproving Texas' reasonable progress goals based on Texas' failure to conduct a source-by-source analysis of emission controls when EPA has never required an individual source-based approach in the past. In its prior reviews of State reasonable progress goals EPA has uniformly approved States' reliance on source category-based analyses, even in the face of public comments urging a source-based approach. For example, EPA approved Alaska's regional haze SIP in which the State asserted that "it is reasonable to conduct the four-factor analysis on the general source categories rather than on individual sources." Alaska, *SIP Narrative* 9-9 (2011); 78 Fed. Reg. 10,546 (Feb. 14, 2013) (approving Alaska SIP). Likewise, EPA approved Oregon's reasonable progress goals after the State explained that it "looked at key pollutants and certain source categories and the magnitude of their emission in applying the four-factor." Oregon, *SIP Narrative* 163 (2011); 77 Fed. Reg. 50,611 (Aug. 22, 2012) (approving Oregon SIP). EPA also approved Washington's reasonable progress goals after the "State decided to focus its four-factor analyses on … 10 specific industries and emission source categories." Washington, *SIP Narrative* at 9-5 to 9-7 (2010); 79 Fed. Reg. 33.439 (June 11, 2014) (approving Washington SIP).

It is a well-established tenet of administrative law that "[r]easoned decision making … necessarily requires the agency to acknowledge and provide an adequate explanation for its departure from established precedent." *Dillmon v. NTSB*, 588 F.3d 1085, 1089-90 (D.C. Cir. 2009) (citing *FCC v Fox Television Stations, Inc.*, 129 S. Ct. 1800, 1811 (2009)). Indeed, given that the submitting States relied upon EPA's established guidance and precedents in crafting their SIPs, EPA is required to provide a "more substantial justification" for its disapprovals. *Perez v. Mortgage Bankers Ass'n*, *supra*, *slip op.* at 13. In its proposal to disapprove Texas' reasonable progress goals, EPA fails to even acknowledge, let alone provide a reasoned explanation for, its departure from past precedent where it has approved multiple SIPs based on analyses that were, in all relevant respects, identical to that conducted by Texas.

Response: We disagree and observe a significant misunderstanding in the comment. While we (and at least one court) have explained that reasonable progress is not required to be demonstrated on a source-by-source basis (or via "source-specific analysis"), this emphatically does not mean that individual sources are free from any possibility of required new or stricter controls as part of establishing reasonable progress goals or what is necessary as part of a long-term strategy. In other words, an appropriately focused and detailed analysis using a so-called category based approach may (and in some cases manifestly should) result in a determination that source-specific controls are needed to make reasonable progress. To conclude otherwise vitiates the statutory purpose and asks for an entirely ineffectual analysis which could not result in possible emission limitations as expressly envisioned in the statute. See CAA Section 169A(b)(2); 40 CFR 51.308(d)(1) and (3).

In this case, we have determined the Texas analysis submitted to meet the requirements of 40 CFR 51.308(d)(1) was critically flawed, because the demonstration that was made to select the reasonable progress goals was not appropriately focused and had obscured the potential for cost-effective improvements in visibility. It is not inappropriate to apply the factors given by CAA Section 169A(g)(1) to a group of sources on a collective basis, provided that the analysis and the focus of the analysis is technically sound. In this case, on substantive review, it is evident that the analysis is flawed and not consistent with what is required by the CAA. The SIP submission therefore does not, in fact, meet "all of the applicable requirements of the [Clean Air Act]," which puts us in the position of "approv[ing] the plan revision in part and disapprov[ing] the plan revision in part." CAA Section 110(k)(3). Nothing in the disapproval rests on non-statutory factors (or the demands of regulations required by the CAA).

See the consistency section of this document for our responses to allegations that we have been inconsistent in our treatment of Texas in comparison to our other actions.

Comment: [TCEQ/PUCT (0056) p. 10-11] The TCEQ argued that the EPA has no basis to disapprove the State's RPGs because the TCEQ did not examine the four statutory factors on a unit-by-unit basis. The TCEQ's analysis of the statutory factors using a source category approach was consistent with the statute, the RHR, and the existing EPA guidance.

According to the TCEQ, neither CAA §169A, the RHR, nor the guidance available in 2009 required a unit-by-unit four-factor analysis even where the State's RPGs would improve visibility less than the URP. The statute simply provides that in determining reasonable progress, the four statutory factors shall be taken into consideration (§7491(g)(1)). The statute does not direct how. The RHR provides the same in 40 CFR 51.308(d)(1)(i)(A). In addition, the EPA's RPG guidance does not refer to a unit-by-unit four-factor analysis but instead says that States have "flexibility" in how to consider the factors. The EPA has failed to establish that Texas' RPGs do not meet the RHR for improvement in visibility for the most impaired days and no degradation for least impaired days. The EPA also fails to establish that Texas' determination that additional controls are unnecessary and that they would not provide a discernable visibility improvement for the added cost is unreasonable based on the text of the CAA and the EPA regulations.[10] The EPA itself supported the non-source specific four-factor analysis approach in reviewing New Mexico's regional haze plan. In a challenge to New Mexico's plan, the EPA "points out that [§51.308(d)(1)(i)(A)] does not require a source-specific analysis." [11] The 10th circuit agreed that "[N]either the Clean Air Act or the Regional Haze Rule requires source-specific analysis in determination of reasonable progress." *(id)* The EPA has also ignored its own words from the RHR preamble: " .... EPA is not specifying in this final rule what specific control measures a State must implement in its initial SIP for regional haze. That determination can only be made by a State once it has conducted the necessary technical analyses of emission, air quality, and the other factors that go into determining reasonable progress" (64 FR 35721).

Footnotes:

[10] Dissent in *Oklahoma et al v. EPA* (challenges to the EPA's SIP disapproval and FIP of Oklahoma's RH BART determinations.) 10th circuit July 2013, pages 4-5: "Finally, it is worth noting that the EPA's regional haze program is distinct in the amount of power given to the States ...... There are a number of reasons for this approach, not the least of which is that its goals and standards are purely aesthetic rather than directly related to health and safety. The EPA's rule here requires OG&E to make a $1.2 billion investment over the next Five-years that will, even under EPA's estimate, result in no appreciable change in visibility .... Although the EPA has at least some authority to review BART determinations within a State's SIP, it has no authority to condition approval of a SIP based simply on a preference for a particular control measure. *Texas v. EPA* 690 F3d 670,684 (5th Cir. 2012) see *EME Homer City Generation L.P. v. EPA* 696 F3d 7, 29 (D.C. Cir. 2012) (reviewing a different rule and concluding that the CAA 'prohibits EPA from using the SIP process to force States to adopt specific control measures'). Oklahoma considered the cost and resulting benefit of such a large investment in scrubbers, and its conclusion was not unreasonable."

[11] See Wildearth Guardians v. EPA, 770 F3d 919, 944

Response: We agree with the language cited by the comment from the RHR preamble. 40 CFR 51.308 plainly does not dictate specific control measures that a State must implement. A State must first conduct the necessary technical analyses of the factors that go into determining reasonable progress. We have found adequate the analyses of other States that used a so-called source category approach in their SIP submissions, but this does not eliminate our mandated role in reviewing the soundness of the Texas submission. We acknowledge the proclaimed outcome of Texas' analysis, viz. the asserted determination that additional controls are unnecessary and the asserted determination that requiring controls could not provide visibility benefits warranted by the added costs, but this conclusion lacks an appropriate technical foundation and scope. As noted in our proposal, we found that Texas' conclusion for no additional controls was inappropriate because its analysis obscured the benefits that could be realized under a more focused analysis of grouped or individual sources. We acknowledge we stated in our proposal that "individual sources were not considered by the TCEQ."[88] However, this Statement in our proposal follows a paragraph in which we point out that the TCEQ declined to control Big Brown, despite its own finding that cost-effective controls were available, that these controls could be expected to result in approximately 40,000 tons per year of SO_2 reductions, and that EGUs in east Texas caused large visibility impacts. Consequently, we could have instead referred to the TCEQ's efforts as "individual sources were not *effectively* considered by the TCEQ." The core of our objection to Texas' approach to its reasonable progress demonstration lies not in whether it selected an approach based on source category, individual, or some hybrid of the two, but rather in how it judged the information it had, and that armed with that information its decision to not pursue it any further. We have found the submitted analysis to not be tailored to the task of determining reasonable progress; it avoids focus on the most suitable candidates for new measures to make reasonable progress by grouping them with less suitable or entirely not suitable candidates. These circumstances have not been in issue with EPA's approval of RPGs or 40 CFR 51.308(d)(1)(i)(A) analyses submitted by other States, and we necessarily acknowledge that Texas, by its State-specific profile of emissions adding to the problem of regional haze, has an important challenge and responsibility in meeting this requirement. We are required to review the determinations within the SIP and determine that they are supported by the requisite analyses. Upon finding the SIP deficient, we are obliged to determine the requirements of the FIP; our disapproval is not based on or conditioned on a preference for particular control measures.

Comment: [TCEQ/PUCT (0056) p. 11] The TCEQ disagreed with the EPA's assertion that an analysis of controls for a group of sources should not have been performed because this grouped analysis hid potential improvements of smaller-costing controls from individual equipment.

The TCEQ stated that site-specific analyses were not considered necessary because visibility improvements from a group were not perceptible. Thus, a subset of the sources could not result in a better-controlled approach or improvement in the visibility predicted by the larger group. The TCEQ performed a grouped source analysis because it was allowed under the EPA's rule and the guidance available at the time the analysis was performed.

[88] 79 FR 74839.

Response: As we noted in our responses to other comments, Texas did in fact perform some analysis on individual sources, albeit in a flawed manner. As was outlined in our proposal and TSD, the methodology employed in the SIP assumed all emission reductions within a large geographic region would have the same effectiveness in reducing visibility impairment. This contrasts with what was confirmed by our own source apportionment modeling, which found that individual sources had significantly different impacts. As was additionally noted, and expanded upon in our responses to other comments herein, even visibility improvements that are not perceptible may still be determined to be significant and beneficial for purposes of meeting regional haze program requirements, and the threshold Texas applied to its estimated visibility benefits was not appropriate Furthermore, Texas dismisses the visibility benefit in comparison to the overall cost, but as explained elsewhere, the analysis was over-inclusive and included controls that served to increase the total cost but provide little to no visibility benefit.[89] A more focused analysis, identifying a smaller group of sources, would have resulted in an overall more cost-effective control set resulting in significant visibility benefits. Thus, consistent with our proposal, it remains the case that reliance on a flawed analysis materially affected the State's conclusion.

Comment: [TCEQ/PUCT (0056) p. 12] The TCEQ disagreed with the EPA's position that it was unreasonable for Texas not to ask for site-specific data to perform a site-specific analysis because the TCEQ does not have the legal authority to require companies to submit the information necessary to properly evaluate flue gas desulfurization (FGD) scrubber upgrades. It is unreasonable for the EPA to expect the TCEQ to perform an analysis of scrubber upgrades on the specific EGUs when only the EPA has the legal authority to obtain the necessary information to conduct such an analysis.

The TCEQ noted that the EPA Stated in its Cost Technical Support Document and in the *Federal Register* notice that the nature of acceptable scrubber upgrades is site-specific and the data were not publicly available. Under CAA §114(a), the EPA required companies to submit detailed information regarding the facilities' current scrubber systems and any improvements that have been made since initial installation. The EPA indicated the information was necessary in order to properly evaluate the potential for upgrades to the FGD scrubbers (79 FR 74876).

The TCEQ agreed that such extensive knowledge of the existing scrubber systems is necessary to properly evaluate the viability of upgrading an FGD scrubber. However, the TCEQ does not have any authority equivalent to the EPA's authority under CAA §114(a) to require submission of cost data or design requirements for a suite of potential scrubber upgrades at individual sites. The TCEQ cannot require the companies to provide the information that the EPA admits is necessary to evaluate FGD scrubber upgrades. There are many possible control strategies the TCEQ could have considered, but it can only evaluate controls for which it has credible and defensible information to support. Additionally, the TCEQ is not aware if this information was even available at the companies in 2008 when this portion of the SIP was developed.

[89] The analysis was also "under-inclusive," because the potential for scrubber upgrades was not examined, although they prove cost-effective.

According to the TCEQ, it is unreasonable for the EPA to disapprove a SIP submittal on the basis of the State failing to perform an analysis when only the EPA has the legal authority to require submission of the necessary information for such an analysis. The EPA should not hold the States to a standard for SIP approvability that only the EPA is capable of meeting.

Response: As was noted in the TSD, some information that our proposal had used to evaluate controls, including FGD scrubber upgrades, was requested by us with reference to our CAA Section 114 authority. As a side-note, Texas has the ability to request delegation of this authority. See CAA Section 114(b). TCEQ, as the State's air quality planning agency, has other authorities and avenues to request information from sources, develop information of its own, and, if such information is in our possession, from us. TCEQ can and could adequately study FGD scrubber upgrades as a potential control option with other information, e.g., using available records and technical resources. As the Congressional vision of the Clean Air Act operates, the State is charged with primary responsibility for "air pollution control at its source," and by virtue of submitting SIPs, the State affirms its position that it has sufficient legal and technical capacity to meet CAA requirements and address the issue of air pollution, including haze-causing pollution. We disagree with this comment's suggestion that TCEQ could omit or overlook the evaluation of controls based on a proclaimed lack of credible and defensible information. That information can and should be developed under the State's regulatory authority and the SIP process, including by requesting information from sources, developing the information using its own technical resources, and soliciting information in public comments. We are not disapproving the SIP for any standard that the State cannot meet. Even as the State may rightly assert it does not have authority "equivalent" to CAA Section 114(a) authority, the absence of that authority or of precise information gained under that authority is not related to our basis for disapproval.

Comment: [TCEQ/PUCT (0056) p. 12-13] The TCEQ Stated that the EPA's finding that the TCEQ should have considered scrubber upgrades in the 2009 RH SIP is arbitrary and capricious. While the EPA did comment on the TCEQ's proposed 2009 RH SIP, the EPA did not suggest in any way in those comments that the TCEQ should consider scrubber upgrades in the control strategy analysis for reasonable progress goals. The EPA is attempting to hold Texas to a standard created five-years after the TCEQ submitted the 2009 RH SIP.

The TCEQ noted that the EPA states in the proposed FIP that it was "unreasonable" for Texas to not perform an analysis of potential scrubber upgrades on coal-fired units in Texas that were already equipped with FGD scrubbers (79 FR 74841). However, in the comments (dated February 15, 2008) that the EPA submitted on the proposed 2009 RH SIP, the EPA did not suggest the TCEQ consider scrubber upgrades as a possible control strategy or indicate in any manner that not considering this potential measure would be grounds for the EPA proposed disapproval of the SIP. Furthermore, in the agency's comments (dated September 30, 2013) on the proposed 2014 Five-Year Texas RH SIP Revision, the EPA again did not mention the subject of FGD scrubber upgrades. The EPA had multiple opportunities to inform the TCEQ that considering FGD scrubber upgrades was as critical as the EPA now claims it to be; however, the

EPA did not even mention the subject of scrubber upgrades in any of the formal comments it submitted to the TCEQ during the comment period for the 2009 RH SIP.

The TCEQ Stated that the EPA attempts to back-fill its lack of any notice to Texas regarding the consideration of FGD scrubber upgrades by citing Statements made by the EPA in the 2005 final BART rulemaking recommending that States consider scrubber upgrades for BART analysis purposes *(Technical Support Document for the Cost of Controls Calculations for the Texas Regional Haze Federal Implementation Plan,* page 26). However, the EPA's Statements in the final BART rulemaking were made solely in the context of BART analysis (70 FR 39171). As Texas was included in the CAIR in 2008 and the EPA determined that CAIR was better than BART, the EPA's comments regarding scrubber upgrades and BART were not relevant to Texas. Furthermore, the EPA did not mention in the 2005 BART rulemaking that States should also consider scrubber upgrades for reasonable progress purposes even if the State's BART -eligible EGUs were subject to CAIR.

The TCEQ contended that the EPA is attempting to hold Texas to a standard of SIP approvability arbitrarily created by the EPA Five-years after the TCEQ submitted the SIP revision. The EPA is creating impossible standards for SIP approvability by expecting States' SIP revisions to meet requirements created by the EPA after the States are required to submit the SIP revision.

Response: Comment letters provided by EPA staff regarding State agency rules under development are intended to aid rule development; they do not constitute any kind of agency action or purport to review the in-progress SIP provisions under the authority and requirements of CAA Section 110(k). Furthermore, the Act does not require us to provide comments on a State's proposal during its public comment period. Therefore, we disagree with any suggestion that TCEQ can be shielded from a disapproval action for failing to meet an applicable requirement of the Clean Air Act because a point regarding that CAA requirement was not made or emphasized in earlier comment letters to the State. The comment appears to acknowledge that FGD scrubber upgrades are a known way of reducing emissions. This is not a hidden or obscure measure for reducing emissions. Wherever a written reference to it may be located does not change the fact that FGD scrubber upgrades are a control measure known before and after 2005; "notice" or the asserted "creation" of a standard are not in issue. If we in reviewing the SIP had unreasonably overlooked the matter of FGD scrubber upgrades just as TCEQ had overlooked them in its control strategy analysis for reasonable progress, it would not change the fact that the analysis had deficiently overlooked a critical option for controlling emissions—only that we had overlooked another basis for disapproval (at least until we reviewed comments that would have alerted us to the deficiency and the obstacle to approval).

Comment: [UARG (0065) p. 18] As part of their argument that the EPA does not provide any lawful basis for disapproving the RPGs for Big Bend and Guadalupe or the Texas LTS, UARG asserted that States are not required to conduct reasonable progress assessments on a source-by-source basis. This is confirmed by EPA itself in the Reasonable Progress Guidance, which States that the cost factor can be evaluated "for individual sources *or source categories*." Reasonable Progress Guidance at 5-1 (emphasis added). State discretion to conduct a reasonable progress assessment without analyzing controls on a source-by-source basis has been confirmed by the U.S. Court of Appeals for the Tenth Circuit. *WildEarth Guardians v. EPA*, 770 F.3d 919, 944 (10th Cir. 2014) ("Neither the Clean Air Act nor the Regional Haze Rule requires source-specific analysis in the determination of reasonable progress."). EPA fails to acknowledge this established law and cites no support for its conclusion.

Response: Our disapproval is not based on the claim that Texas had to conduct its reasonable progress assessments on a source-by-source basis, but rather on the flaws in the analysis, as discussed in our proposal. Nothing in the sources cited by the comment eliminates our obligation to review the submitted assessment. We are required to review whether the conclusions are technically supported (or supportable). Moreover, nothing in these sources relieves us of our duty to disapprove a part of SIP revision that does not meet the Act and EPA regulations. In this case, the State conducted a flawed evaluation of the factors to establish reasonable progress, which under CAA Section 110(k) has the consequence of the partial disapproval of the SIP revision.

Comment: [Nucor Steel (0058) p. 3] Nucor Steel Stated that EPA's interpretation also is contrary to the CAA because it improperly focuses on case by case, source specific analyses of individual sources located in Texas to achieve Oklahoma's reasonable progress goals which would require more stringent analysis and controls than authorized under the Clean Air Act. *See, WildEarth Guardians v. EPA*, 770 F.3d 919. (10th Cir. 2014).

Response: Individual sources may be subject to controls and source specific analysis when establishing reasonable progress goals. The comment misinterprets the cited 10th Circuit case. Nothing in that decision states that individual source controls cannot be required when establishing reasonable progress goals. When a State conducts the requisite analysis—whether it begins it by analyzing sources individually or by analyzing source categories—it should encompass the possibility of applying individual source controls, when they are warranted and reasonable. If, for example, a source category analysis were supplemented with information showing that one particular point source was a leading obstacle to reasonable progress for a particular Class I areas, then it would be proper for the State to focus its analysis on that source, including with a source-specific assessment. Whatever flexibility is accorded in how the analysis is shaped, it may not be unreasonable. It is not reasonable or a technically adequate analysis if the State ignores or obscures the most promising candidate(s) for establishing reasonable progress, and as our proposal indicated and we now conclude, the Texas analysis was critically flawed in this respect. Incidentally, the cited 10th Circuit case had considered the claim that the State of New Mexico failed to conduct source-specific analyses for its non-BART sources with specific attention to the Escalante plant. However, there was no record evidence that this plant, remote from any relevant Class I areas, had notable impacts for regional haze purposes for this initial planning period. In future regional haze planning periods, depending on technical evidence, that plant (and others in New Mexico) may very well be subject to controls as may be required to meet reasonable progress.

Comment: EPA's use of source-specific analysis treats Texas sources differently from other States. [NRG (0078) p. 4]

NRG stated that the proposal evaluates the reasonable progress goals for the relevant areas on the basis of source-by-source contributions to visibility impairment.

However, NRG contended that this approach exceeds what EPA can require of a State under the statute and regulations. Regional haze regulations establish a process and criteria to be considered in setting reasonable progress goals, but provide no mention of a source-specific analysis. *See generally* 40 C.F.R. § 51.308. By contrast, the regional haze program only calls for source-specific evaluations under the "reasonably attributable visibility impairment" program (for which EPA has proposed to approve Texas' plan) and the Best Available Retrofit Technology ("BART") program.

NRG Stated that source-specific analysis also has not been applied by EPA in practice in the reasonable progress context:

- EPA recently defended a State's reasonable progress goals that did not rely on a source-specific analysis, and prevailed before the court: "[W]e reject the environmental groups' argument that the EPA had to engage in a source-specific analysis for a reasonable-progress determination. Nothing in the Regional Haze Rule or the Clean Air Act required New Mexico to conduct a four-factor analysis of the Escalante plant." *WildEarth Guardians v. EPA*, 770 F.3d 919, 944.

- EPA has repeatedly used interstate emission trading rules such as the Clean Air InterState Rule ("CAIR") and the Cross-State Air Pollution Rule ("CSAPR") to satisfy reasonable progress goals.[11] As EPA is proposing to use CSAPR to satisfy Texas' BART obligations,[12] it would only be logical to also use CSAPR to satisfy Texas' reasonable progress obligations as well.

Footnotes:
[11] 77 Fed. Reg. 38,515 (June 28, 2012) (Alabama); 77 Fed. Reg. 38,501 (June 28, 2012) (Georgia); 77 Fed. Reg. 19,098 (March 30, 2012) (Kentucky); 77 Fed. Reg. 71,533 (Dec. 3, 2012) (Michigan); 77 Fed. Reg. 38,185 (June 27, 2012) (North Carolina); 77 Fed. Reg. 38,509 (June 28, 2012) (South Carolina); 77 Fed. Reg. 24,392 (April 24, 2012) (Tennessee); 77 Fed. Reg. 16,937 (March 23, 2012) West Virginia).
[12] 79 Fed. Reg. at 74,844.

Response: We disagree that source-specific controls to achieve reasonable progress are not contemplated in 40 CFR 51.308. The statutory factors in CAA Section 169A(g) are directed to sources, including individual stationary sources. Those factors can be addressed, on a collective basis, for sources that are subject to a logical grouping. For example, a source category such as sources involved in cement production may have unique considerations as compared to other types of source. Or perhaps a source category or source is not demonstrated to be impactful of relevant Class I areas as was the case for the Escalante Plant. However, even under a grouped or so-called source category approach to analyzing the requisite factors, a State cannot obscure or ignore potential candidates for closer study or potential control options. We have the responsibility to disapprove an unreasonable and flawed analysis, as is the case here. Even though we are required to prepare our own analysis to do a FIP, this does not mean our analysis and conclusions are precisely what Texas was required to follow or itself conclude to meet the

CAA requirements. We address the specific allegations of inconsistency in the consistency section of this document.

Comment: There is no statutory basis to disapprove of Texas' SIP based on "additional analysis" on a "small group" of individual sources. [GCLC (0063) p. 7-9]

GCLC Stated that EPA does not have the authority to disapprove Texas' SIP submission based on an unfounded assertion that Texas was required to conduct a four-factor analysis on an individual-source basis. EPA States in the Proposed FIP that:

> "Because individual sources were not considered by the [Texas Commission on Environmental Quality ("TCEQ")], we found it is necessary to conduct an additional analysis to determine whether this approach materially affected the outcome of the TCEQ analysis. As we demonstrate in detail in our FIP TSD, by analyzing sources individually, we believe we have identified a small number of sources that are responsible for much of Texas' collective visibility impact on the Texas' Class I areas, which if controlled, would provide for visibility benefit at Texas' Class I areas."[28]

EPA goes on to add in its TX TSD that:

> "Because it only estimated the visibility benefit of all the controls together, the TCEQ was not able to assess the potential benefit of controlling individual sources with significant, and potentially cost-effective, visibility benefits."[29]

According to GCLC, EPA contends that Texas should have "separately evaluate[d] the visibility benefit from the implementation of [individual] control[s]."[30] Besides the fact that visibility is not one of the factors that Texas is required to analyze, as discussed above, there is simply no basis for this type of review in statutory law, regulatory provisions, guidance, EPA's recent regional haze SIP submittal decisions, and recent case law.

GCLC asserted, reviewing the statutory structure of the CAA, it is clear that there is no requirement to evaluate and impose individual controls as part of a reasonable progress analysis. This is echoed in EPA's regulations, which focus on reasonable progress requirements viewed as whole from numerous source categories, not individual sources or even a small number of sources. For example, the regulations require States to consider the four-factor to "address regional haze,"[31] which is defined as "visibility impairment that is caused by the emission of air pollutants <u>from numerous sources located over a wide geographic area</u>. Such sources include, but are not limited to, major and minor stationary sources, mobile sources, and area sources."[32]

GCLC noted that EPA's guidance has supported this conclusion that the reasonable progress requirements do not require a source-specific analysis, stating:

> Unlike the technical demonstration for CAIR or BART, the reasonable progress demonstration involves a test of a strategy. The strategy includes a suite of

controls that has been identified through the identification of pollutants and source categories of pollutants for visibility impairment - the possible controls for these pollutants (and their precursors) and source categories – the application of four statutory factors and how much progress is made with a potential strategy with respect to the glide path. Modeling occurs with a strategy and is not a source-specific demonstration like the BART assessment.

….

Reasonable progress is not required to be demonstrated on a source-by-source basis. It is demonstrated based on a control strategy developed from a suite of controls that has been assessed with the four statutory factors and the uniform rate of progress. [33]

GCLC Stated that EPA has also, on numerous recent occasions, approved of SIPs that did not require source-specific requirements, but rather, looked more broadly at source categories. For example, EPA recently approved the reasonable progress goals submitted by Idaho based on the State's "general level of review for the major source categories."[34] Finally, and likely most importantly, EPA's decision to require source-specific analysis and limitations conflicts with the decision of the U.S. Court of Appeals for the Tenth Circuit, which recently held "[n]either the Clean Air Act nor the Regional Haze Rule requires source-specific analysis in the determination of reasonable progress."[35] Ultimately, EPA has no authority to impose source-specific emissions limits for SO_2, or any other pollutant, on any source in Texas. EPA must approve Texas' SIP.

Footnotes:

[28] Proposed FIP, 79 Fed. Reg. at 74839.

[29] TX TSD at 19.

[30] Proposed FIP, 79 Fed. Reg. at 74839.

[31] 40 CFR § 53.308(d).

[32] 40 CFR § 51.301.

[33] See EPA, Additional Regional Haze Questions, 9 (Sept. 27, 2006 Revision). Available at: https:/ /www.tceg. texas.gov/assets/public/implementation/air/sip/bart/EPAQA-Haze.pdf

[34] See Idaho SIP Approval Proposal, 77 Fed. Reg. at 30256; see also Approval and Promulgation of Implementation Plans; State of Idaho; Regional Haze State Implementation Plan, 77 Fed. Reg. at 66929, 66929 (Nov. 8, 2012).

[35] WildEarth Guardians v. EPA, 770 F.3d 919,944 (10th Cir. 2014).

Response: We disagree with GCLC's assertion that we cannot use visibility in our assessment and address this issue in our responses to other comments**.** This comment, as with many others, confuses observations offered in the proposal with the proposed basis for disapproval. Our TSD revealed that Texas' approach was not appropriately refined and left unidentified the few, key sources that were responsible for much of the collective visibility impact at Texas' Class I areas. We proposed that this analysis was technically deficient in several respects such that it materially affected the outcome and the State's conclusions. We did not propose to disapprove it because of an alleged failure to be sufficiently source-specific. As focused on the sources impacting the Class I areas, the TSD also supports our conclusion that controls are warranted to meet reasonable progress. The comment is not correct that such individual controls cannot be required by the Clean Air Act. This argument is contradicted by the terms of the statute and the logic of the Congressional goal for natural visibility, CAA Section 169A(b)(2), and it is notably inconsistent with the underlying assumptions of the SIP itself. To be clear: the State's analysis overtly examines the question of "additional controls" and proposed controls for individual sources. The Tenth Circuit decision cited by the comment speaks to what the Clean Air Act does or does not require for the shape of the analysis, but it does not purport to make unreasoned or technically deficient analyses permissible. Moreover, it manifestly does not state that individual controls cannot be required to be meet reasonable progress. The control strategy needed to demonstrate reasonable progress would necessarily implicate new or additional controls for individual stationary sources. If the CAA's requirements were such that only sources subject to controls for BART or RAVI could be looked to for emission reductions to promote reasonable progress, then States, or EPA acting as necessary in the place of a State, would have little to no room for additional progress and even less need for sequential planning periods to build on past progress. Source-specific emission limitations, as promulgated in our FIP, are manifestly envisioned by the statute. We address comments alleging that we have been inconsistent in in the consistency section of this document.

7. Constitutional Law

Comment: [Texas Governor (0066) p. 3-4] The Texas Governor stated that the EPA's FIP violates the Commerce Clause, U.S. Const. art. I, section 8, cl. 3. The Commerce Clause gives Congress power "[t]o regulate Commerce with foreign Nations, and among the several States, and with the Indian Tribes." Id. According to the commenter, while modern court decisions have expanded that text far beyond its plain or original meanings, the Clause still imposes meaningful limits on what Congress and administrative agencies can do. As the Fifth Circuit has held:

> Neither the plain language of the Commerce Clause, nor judicial decisions construing it, suggest that . . . Congress may regulate activity (here, Cave Species takes) solely because non-regulated conduct (here, commercial development) by the actor engaged in the regulated activity will have some connection to interstate commerce. . . . To accept [such an] analysis would allow application of otherwise unconstitutional statutes to commercial actors, but not to non-commercial actors. There would be no limit to Congress' authority to regulate intrastate activities, so long as those subjected to the regulation were entities which had an otherwise substantial connection to interstate commerce. *GDF Realty Inv., Ltd. v. Norton*, 326 F.3d 622,634 (5th Cir. 2003).

The commenter asserts that this is exactly what EPA has interpreted the Clean Air Act to allow. According to the commenter, EPA concedes that the majority of "regional haze" in Big Bend and the Guadalupe Mountains comes from non-regulated conduct—namely, emissions from Mexico and from natural sources (such as dust storms and fires). See 79 Fed. Reg. al 74,844 ("Approximately half of the 2002 visibility impairment at Big Bend is due to Mexico and other international sources."); Id. at 74,885 ("We agree that dust storms and other blown dust from deserts are a significant contributor to visibility impairment at the Texas Class I areas that may not be captured accurately by our default method."). The commenter contends that, having made such concessions, EPA cannot then regulate "regional haze" on the theory that regulated conduct—like carbon emissions from coal-fired power plants—will have some effect on interstate commerce.

Response: We disagree with this comment. Coal-fired power plants are owned by companies engaged in interstate commerce and that release emissions substantially affecting interstate commerce. Furthermore, modeling confirms that the haze-forming emissions from these coal-fired plants travel to other states; they do not merely remain in Texas.

The U.S. Supreme Court has made clear that, "[w]here economic activity substantially affects interstate commerce, legislation regulating that activity will be sustained." *United States v. Lopez*, 514 U.S. 549 (1995). The Court has further held that, "the power conferred by the Commerce Clause [is] broad enough to permit congressional regulation of activities causing air . . . pollution . . . that may have effects in more than one State." *Hodel v. Va. Surface Mining & Reclamation Ass'n*, 452 U.S. 264, 282 (1981). The owners and operators of the Texas sources subject to this regional haze FIP are engaged in economic activities (the operation of coal-fired power plants) that cause haze-forming air pollution to travels into other states and substantially affect interstate commerce. Accordingly, our regulation of these sources pursuant to the Clean Air Act is squarely within the federal government's Commerce Clause authority.

The Governor's comment seems to suggest that the regulation of emissions from coal-fired power plants is unconstitutional because non-commercial activity (*i.e.*, dust storms) and international commercial activity (*i.e.*, emissions from sources in Mexico) cause and contribute to regional haze. Further, the Governor seems to suggest that, because of the aforementioned contributing factors, it is an abuse of the Commerce Clause to suggest that emissions from coal-fired power plants have an effect on interstate commerce, and goes so far as to suggest that emissions from coal-fired power plants are purely intrastate and outside the stream of interstate commerce.

The U.S. Supreme Court has recognized that the power of Congress over interstate commerce is not confined to the regulation of commerce among the states, but extends to activities that have a substantial effect on interstate commerce. *See NFIB*, 132 S. Ct. 2566, at 2585–56. Congress's power is not limited to regulation of an activity that by itself substantially affects interstate commerce, but also extends to activities that do so only when aggregated with similar activities. *Id.* at 2586 (describing the "expansive scope" of Commerce Clause authority). Accordingly, perhaps unsurprisingly, even the principal case cited by this commenter held that the Commerce Clause extends to putatively "intrastate" activities that have an aggregated effect on interstate commerce. *See GDF Realty Inv., Ltd v. Norton*, 326 F.3d 622, 651 (5th Cir. 2013).

Our regulation of emissions from coal-fired power plants, which cause and contribute to regional haze in multiple states, seeks to fulfill the regional haze provisions of the Clean Air Act, which in turn are constitutional exercises of Congress's power under the Commerce Clause of the U.S. Constitution.

Comment: [Texas Governor (0066) p. 4] The Texas Governor contended that the EPA's "regional haze" rule suffers from a non-delegation problem. The Constitution vests "[a]ll legislative Powers herein granted . . . in a Congress of the United States." U.S. Const. art. I, § 1. The commenter stated that if Congress wants to delegate its power to an administrative agency, then Congress must "lay down by legislative act an intelligible principle to which the person or body authorized to [act] is directed to conform." *J.W. Hampton, Jr., & Co. v. United States*, 276 U.S. 394, 409 (1928). The commenter quoted a law review article in support of the assertion that Congress cannot enact "a statute creating the Goodness and Niceness Commission and giv[e] it power 'to promulgate rules for the promotion of goodness and niceness in all areas within the power of Congress under the Constitution.'" The commenter cited *Whitman v. Am. Trucking Assns*. 531 U.S. 457, 472 (2001), for the proposition that, where Congress violates the non-delegation doctrine, the agency cannot "cure [the] unlawful delegation of legislative power by adopting in its discretion a limiting construction of the statute."

The Texas Governor stated that the EPA has crowned itself the proverbial Goodness and Niceness Commission. In the Clean Air Act, Congress "declare[d] as a national goal the prevention of any future, and the remedying of any existing, impairment of visibility in" places like Big Bend and the Guadalupe Mountains. 42 U.S.C. section 7491(a)(1). That is a vacuous delegation, and EPA has exacerbated it by exercising standardless discretion to approve some SIPs and disapprove others based on illegitimate criteria, inaccurate science, and faulty methods.

Response: We disagree with this comment. In applying the intelligible-principle test to congressional delegations, the courts have been "driven by a practical understanding that in our increasingly complex society, replete with ever-changing and increasingly technical problems, Congress cannot simply do its job absent an ability to delegate power under broad general directives." *Mistretta v. United States*, 488 U.S. 361, 372 (1989). Thus, for example, the Court has explained that it is "constitutionally sufficient if Congress clearly delineates [1] the general policy, [2] the public agency which is to apply it, and [3] the boundaries of this delegated authority." *Id.* at 372–73. In other words, Congress must provide an "intelligible principle" to guide the Executive Branch. *See Whitman*, 531 U.S. at 472 (citing J.*W. Hampton, Jr. & Co. v. United States*, 276 U.S. 394, 409 (1928)).

The U.S. Supreme Court has only twice struck down a federal law for violating the non-delegation doctrine—both times in 1935. *Mistretta*, 488 U.S. at 373–74 (recounting that history). Of the two statutes that have failed this test, one statute "provided literally no guidance for the exercise of discretion, and the other of which conferred authority to regulate the entire economy on the basis of no more precise a standard than stimulating the economy by assuring 'fair competition.'"*Id.* at 474.

By contrast, the Court has rejected all other non-delegation-based challenges, including to provisions of the Clean Air Act. *See, e.g.*, *Whitman v. Am. Trucking Assns.*, 52 U.S. 457 (2001) (unanimous). In *Whitman*, the Supreme Court addressed whether our interpretation of CAA Section 109(b)(1) violated the non-delegation doctrine. That CAA provision requires us to set the primary NAAQS at a level "the attainment and maintenance of which in the judgment of the Administrator, based on such criteria and allowing an adequate margin of safety, are requisite to protect the public health." The Court agreed that section 109(b)(1) at least requires that, "for a discrete set of pollutants and based on published air quality criteria that reflect the latest scientific knowledge," we must set the NAAQS "at a level that is requisite [*i.e.*, sufficient to, but no more than necessary] to protect public health from the adverse effects of that pollutant in the ambient air." *Id.* at 473. The Court held that the scope of discretion provided to us by CAA section 109(b)(1) was “well within the outer limits of [the Court’s] non-delegation precedents.” *Id.* at 474.

Like the provision at issue in *Whitman*, the CAA’s visibility provisions provide extensive intelligible principles that guide our exercise of discretion. In addition to the statement of policy quoted by the Texas Governor, CAA Section 169A required us to promulgate regulations directing the States to revise their SIPs to include emission limits and other measures as necessary to make “reasonable progress.” 42 U.S.C. 7491(b)(2). Congress defined reasonable progress to be the consideration of four statutory factors, including cost and energy impacts. *Id.* at 7491(g)(1). Congress also directed EPA’s regulations to require best available retrofit technology, or BART, for a specific universe of older sources, and again provided a set of statutory factors States must consider when determining what control technology constitutes BART. *Id.* at 7491(b)(2)(A) & (g)(2). These two sets of statutory factors, among several other provisions and definitions in CAA Section 169A that provide specific instructions to EPA and States, clearly constitute intelligible principles under the framework set forth in *Mistretta* and *Whitman*. The Regional Haze Rule, which we promulgated pursuant to the statutory mandate in Section 169A, reflects these same intelligible principles and has been upheld by the D.C. Circuit.

Comment: [Texas Governor (0066) p. 4-5] The Texas Governor explained that the EPA has commandeered the States in violation of the Fifth Amendment. "[T]he question whether the Constitution should permit Congress to employ state governments as regulatory agencies was a topic of lively debate among the Framers" - and the Framers emphatically rejected the idea. *New York v. United States*, 505 U.S. 144, 163 (1992). Thus, in New York, the Court invalidated a statute that purported to give the States "latitude … to implement Congress' plan" for disposing of nuclear waste. Id. at 176. In particular, the statute at issue gave the States a "choice" to either take title to the waste or to enact a series of state regulations. But the Court held that was no "choice" at all because "[n]o matter which path the State chooses, it must follow the direction of Congress." Id. at I77; see also, e.g., *NFIB v. Sebelius*, 132 S. Ct.2566, 2601-05 (2012); *Printz v. United States*, 521 U.S. 898,926(1997).

The Texas Governor explained that, similarly, the EPA has purported to offer the State a "choice" between two unpalatable and federally controlled outcomes. First, the State can submit a SIP that EPA will scrutinize like a teacher grading a pupil's exam answers, approving some and disapproving others. By turning the SIP-FIP process into a paper-grading exercise, EPA has effectively turned the States into subordinate administrative agencies-in direct contravention of the Framers' constitutional design. See New York, 505 U.S. at 163. Second, the State can forgo a SIP and face draconian penalties-including the loss of highway funds, loss of support for air pollution planning and control programs, and so-called "offset penalties." See 42 U.S.C. section 7509. Moreover, if the State chooses to forgo the SIP process, the statute (and EPA's implementation of it) blurs the accountability for clean-air regulations by making it appear that the State is somehow responsible for not staving off EPA's draconian response. See Printz, 521 U.S. at 929-30 (Tenth Amendment forbids statutory schemes that shift costs and perceived responsibilities to the States). That is precisely the sort of coercion that the Tenth Amendment's anti-commandeering principle forbids. See NFIB, 132 S. Ct. at 260l-05.

Response: We disagree with this comment. The U.S. Supreme Court has held that, "the Federal Government may not compel the States to implement federal regulatory programs." *Printz v. United States*, 521 U.S. 898, 925 (1997). The CAA in no way compels a state to implement federal regulatory programs. The CAA, instead, authorizes us to promulgate and administer a FIP if a state fails to submit an adequate SIP. 42 U.S.C. 7410(c)(1)(A). The adequacy of Texas' regional haze SIP is discussed elsewhere in this response to comments.

The Supreme Court has "repeatedly affirm[ed] the constitutionality of federal statutes that allow States to administer federal programs but provide for direct federal administration if a State chooses not to administer it." See *Texas v. EPA*, 726 F.3d 180, 196-7 (D.C. Cir. 2013) (citing *New York v United States*, 505 U.S. 144, 167-8, 173-4 (1992); *Hodel v. Va. Surface Mining & Reclamation Ass'n, Inc.*, 452 U.S. 264m 288 (1981)). If a state chooses not to submit a SIP, the "full regulatory burden will be borne by the Federal Government." *Va. Surface Mining &Reclamation Ass'n*, 452 U.S. at 288.

In *National Federation of Independent Business v. Sebelius (NFIB),* the Court struck down a provision of the Affordable Care Act that expanded the scope of the Medicaid program and increased the number of individuals that the states had to cover. 132 S.Ct. 2566, 2582 (2012). In *NFIB*, states refusing to expand Medicaid risked losing all existing federal Medicaid funds—over 10-percent of some states' budgets. *Id.* at 2604–05. By contrast, in *South Dakota v. Dole*, the Court upheld a federal law that would withhold 5-percent of one state's highway funding unless the state raised its drinking age to 21. *See generally Dole*, 483 U.S. 203 (1987). Unlike the figurative "gun to the head" that was the threat of losing all Medicaid funding in *NFIB*, the Court in *Dole* found the potential loss of federal funds to be merely be "mild encouragement" that the state functionally had a choice to reject. *See NFIB*, 132 S.Ct. at 2604.

Here, we note that we have never imposed sanctions in the regional haze program. Furthermore, the mandatory sanctions set forth in part D of the CAA apply only where a state fails to make a required SIP submittal, we disapprove a SIP submittal applicable to a nonattainment area, or we make a finding of failure to implement any approved part of a SIP. This is not the situation here. Texas made the required SIP submittal; this required RH SIP submittal is not a requirement for nonattainment areas; and we are not finding the Texas RH SIP is not being implemented. *See* 42 U.S.C. 7509(b).

8. Stay of Effective Date, Consolidated Appropriations Act, and Executive Orders

Comment: [GCLC (0063) p. 1-2, 20]
GCLC contests the legality of EPA's proposed action, but should EPA finalize it, it requests that EPA establish a sufficiently delayed effective date for the final rule and its compliance timelines to allow judicial vetting of EPA's novel legal theory that it can compel such extraordinary actions from a class of Texas operators who are BART-compliant, BART-exempt, or both. The irreparable harm that will befall operators and the State of Texas as result of EPA's proposal demands such forbearance.

Response: We understand this comment to request that any final rule imposing controls on Texas sources also set effectiveness and compliance dates far enough into the future to allow for judicial review of any petitions challenging those controls before implementation. We are obliged to give effect to the requirements of the Clean Air Act, and those requirements often—as here—implement controls to carry out the objectives of the Act. Because we have demonstrated all the controls to be cost-effective in this case, and because the comment offers no information that viability of continued operations is in issue for any specific operators, we cannot accede to what the comment asserts regarding "irreparable harm." Ordinarily, having to comply with a government regulation, while it can entail costs, does not equate with irreparable harm.

The comment identifies no specific authority for delaying the effectiveness of our final action outside the customary period. Customarily, EPA rules under the Clean Air Act take effect within 30 to 60 days of publication in the Federal Register. This convention accords with practices as established by the Administrative Procedure Act (5 U.S.C. § 553(d)). Moreover, as provided by Clean Air Act section 307(d)(7)(B), we note that even the Administrator's reconsideration of a rule (according to appropriate procedural formalities) would only allow a stay of effectiveness "not to exceed three months"; this counsels against any exceptional measure to delay effectiveness of the final rule as requested by the comment.

Our timing in finalizing the rule and taking action satisfies a judicially supervised consent decree deadline. Nothing in that consent decree dictates the substance of our action, but we are mindful of our obligation to ensure that the applicable requirements of the CAA are carried into effect. Although the CAA expressly provides an opportunity for judicial review of this particular final rule and action (see CAA section 307(b)), we find no basis of authority for granting the unusual request made in this comment. Given that the filing of a petition for reconsideration of a pending rule does not "affect the finality" or "postpone the effectiveness" of a rule pending judicial review, see CAA section 307(b)(1), it would also appear to be inappropriate to institute a delay at the outset for an identified purpose of "judicial vetting," which we note the comment does not define. Accordingly, we disagree with the comment. As noted in the language of the Federal Register, our action and final rule is effective 30 days from publication. As to the requested extension of the compliance dates for controls, the compliance dates are feasible and reasonable, and we conclude that adjusting those dates to allow for judicial vetting would be irregular and not appropriate.

Comment: [Luminant (0061) p. 147] Luminant contests the legality of EPA's proposal. Should EPA proceed to finalize its proposal, Luminant requests that EPA stay the effective date of its final rule and the compliance dates for Texas sources pending judicial review, given the immense expense and negligible benefit associated with EPA's proposal. Since the Class I areas have already met EPA's visibility goals for 2018 and because new emission limits for these very units are now in place by virtue of EPA's CSAPR and MATS, the public interest weighs heavily in favor of staying EPA's rule pending judicial review of EPA's admittedly new regulatory interpretations.

Response: We understand this comment to request that we delay the effective date of the final rule and the compliance dates for Texas sources until judicial review of any petitions challenging the final rule are complete. We are not aware of any precedent for such an accommodation, and we believe the comment is deficient for not providing or citing any basis of authority and justification for instituting a delay "pending judicial review." We note that even when we grant a petition for administrative reconsideration of a finalized rule, that process does not "postpone the effectiveness of the rule." CAA Section 307(d)(7)(B). Moreover, granting an administrative petition for reconsideration only allows possibility for a stay of the effectiveness of the rule "for a period not to exceed three months." This statutory limitation on staying the effectiveness of the rule applies to both the Administrator and a court, see CAA Section 307(d)(7)(B), and counsels against our ability to find specific authority in the CAA to delay or stay effectiveness of the requirements of the CAA that would be implemented by our final rule and action. We also note that even the Congressional Review Act (5 U.S.C. 801-808), which empowers Congress to overrule certain rules, envisions that those rules would take effect after 60 days absent Congressional action. Accordingly, what the comment requests departs significantly from established and customary practices in carrying out the rulemaking objectives set by Congress.

The request, if granted, would also put into question the finality of our action or, at least, make the applicable regional haze requirements indefinite in a way that is contrary to established air quality planning processes. Of related note, we have previously disapproved part of a SIP provision that purported to take effect upon EPA's disapproval of other SIP-specified controls and after the exhaustion of all administrative and judicial appeals following that disapproval. With that disapproval (incidentally, a disapproval to part of the Oklahoma RH SIP), we explained that the "contingent SIP" was "predicated on speculative actions and outcomes of review by EPA and courts, and [did] not comport with established SIP planning and approval processes under the CAA." 76 FR 81737. Similarly, here, where we consider our final action to carry out certain due, if not overdue, requirements of the CAA, it is not appropriate that we delay the effectiveness of those requirements by a mechanism that incentivizes litigation and perpetuates the specific environmental harms that are directed to be remedied under the CAA. For this reason, even as we note and are aware that 5 U.S.C. 705, may provide a basis for exercising stay authority in certain situations, we would not invoke it here, because 1) there is no pending litigation, and 2) justice does not, in fact, require that we delay the implementation of the applicable requirements of the CAA at issue in our rulemaking. Moreover, to the extent the comment invokes or alludes to the "public interest" or other factors that are conventionally considered by Courts on a judicial application for a stay of an agency action, we disagree that those factors are demonstrated[90] or that it is appropriate that we engage them here and now. Among other things, since we consider our final action to be reasoned and defensible upon our thorough consideration of public comments, we have no known basis to think a legal challenge to our rule would be likely to succeed. We thus believe it is unwarranted and contradictory to make the effectiveness and compliance dates on the rule, at its very outset, subject to postponement and non-effectiveness pending Court review. Accordingly, we disagree with the comment and cannot grant the request sought by the comment.

[90] For example, putting aside any inaccuracy in the commenter's contention about controls that are "in place" for MATS or CSAPR, any such controls would be required by other provisions of the CAA. It is in the public interest that all CAA requirements are carried into effect.

Comment: [Page 4 of Edison Electric Comments] Comment on the Consolidated Appropriations Act of 2014. See H.R. 3547, P.L. 113-76 [comment from EEI]

EEI noted that as EPA and the states begin to implement the next rounds of the regional haze program to continue reasonable progress . . . it will be necessary to use the most up-to-date and accurate implementation tools available as EPA and the states move forward with the regional haze reasonable progress determinations. To that end, EPA should update both its atmospheric modeling platforms as part of the upcoming Appendix W rewrite and the cost manual in order to support reasonable future assessments of visibility impacts and appropriate control strategies. The Agency should do this consistent with the Consolidated Appropriations Act of 2014. See H.R. 3547, P.L. 113-76. EPA also should consider the latest available visibility monitoring data for Class I areas when assessing potential controls needed to meet RPGs.

Response: While not specific to this final action, but rather for future planning and implementation of reasonable progress determinations, we agree that we should use the most up-to-date and accurate implementation tools available for future reasonable progress determinations. And, while not specifically referenced in the comment, we assume updates to the atmospheric modeling platforms and cost control manual relate to the committee report that accompanies the Appropriations Act of 2014, as copied below:

> Regional Haze. -- The process for reviewing State implementation plans is well-served when EPA, States, and industry work collaboratively to ensure that dispersion models are continually improved and updated to ensure the most accurate predictions of visibility impacts, as well as a uniform set of cost estimates. To that end, EPA shall begin development of a seventh edition of the document entitled "EPA Air Pollution Control Cost Manual." The Administrator shall consult, and seek comment from State, local, and tribal departments of environmental quality during development of such seventh edition, and provide opportunity for public comment. In addition, EPA shall publish in the Federal Register a notice to solicit comment on revising the Agency's "Guideline on Air Quality Models" under appendix W to part 51 of title 40, Code of Federal Regulations, to allow flexible modeling approaches and to adopt updates to the CALPUFF modeling system (or portions thereof) or other modeling tools as may be appropriate under such Guideline. Within six months of enactment of this Act, if EPA finds the requirements above cannot be accomplished without causing delay in the approval of State implementation plans, the Agency shall certify such to the Committees. The certification from EPA shall include documentation on how the directives would cause delay in a particular State and also an estimate of when the directives can be carried out without causing delays in the program. 160 Cong. Rec. H475, H979 (Jan. 15, 2014). (Full committee report for 2014: https://www.congress.gov/crec/2014/01/15/CREC-2014-01-15-pt2-PgH475-2.pdf).

As a general matter, wherever possible, EPA intends to follow such committee report instructions even where not specifically incorporated by reference into the Act itself. We are currently working to update the Agency's "Guideline on Air Quality Models" under appendix W to part 51 of title 40, Code of Federal Regulations and as of the date of responding to this comment, we have also proposed updates to chapters with the Control Cost Manual. As to updates to Appendix W, we proposed updates on July 29, 2015[91]

As to the comment regarding consideration of the latest available visibility monitoring data for Class I areas when assessing potential controls needed to meet reasonable progress goals, we address that elsewhere.

Comment: Executive Orders 12898, 12866, and 13045 [Earthjustice (0067) p.17] and Commenter 0053-53

Two commenters focused on the importance of EPA including children, minority, underserved, vulnerable, and low-income populations in those receiving air health benefits. Commenter Earthjustice et al., agrees that the FIP, as proposed, is not subject to either Executive Order 12866 or Executive Order 13045 because it will result in environmental and public health benefits to affected populations. Earthjustice noted that that Executive Order 12898 establishes federal executive policy identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations in the United States. Similarly, Executive Order 13045 establishes a policy of evaluating and addressing any rule that: (1) Is determined to be economically significant as defined under Executive Order 12866; and (2) concerns an environmental health or safety risk that we have reason to believe may have a disproportionate effect on children. Earthjustice stated that if the proposal was changed in the final rule to conclude that the proposed SO_2 reductions at one or more of the affected facilities are not necessary to assure reasonable progress, EPA must conduct an analysis of the impacts of such a reversal on environmental justice populations and children. Citing Dr. Thurston's analysis as demonstrating that emissions from these 14 sources disproportionately impact metropolitan areas throughout the central United States, including Houston, Dallas, Tulsa, Oklahoma City, and even Chicago and St. Louis,[92] and emphasizing that those urban areas are likely to have higher populations of children, minority, and low-income populations, Earthjustice stated that EPA would be required to re-evaluate the impacts to those populations from a less protective rule. Another Commenter (0053-56) suggested that polluters need to reconsider a business model that straps low income communities and, more specifically, low income communities of color with the [air pollution] burdens required for them to profit, and that EPA is accountable to the many communities in Texas that are constantly being ignored, which are usually low income, underserved, and vulnerable communities. Commenter 0053-56 stated that air is a basic human right that does not know class, color, or success.

Response: Thank you for your comments. Since we are finalizing emission limits as proposed at affected facilities to assure reasonable progress, our reasoning remains that Executive Order 13045 does not apply. To the extent this proposed rule will limit emissions of SO_2, the final rule, like the proposed rule, will have a beneficial effect on children's health by reducing air pollution. Executive Order 13045: Protection of Children From Environmental Health Risks and Safety

[91] 80 FR 45340
[92] Thurston Report, Table 4.

Risks applies to any rule that: (1) Is determined to be economically significant as defined under Executive Order 12866; and (2) concerns an environmental health or safety risk that we have reason to believe may have a disproportionate effect on children. This action is not subject to Executive Order 13045 because we do not believe the environmental health or safety risks addressed by this action present a disproportionate risk to children. Moreover, “regulation” or “rule,” is defined in Executive Order 12866 as “an agency statement of general applicability and future effect.” E.O. 12866 does not define “statement of general applicability,” but this term commonly refers to statements that apply to groups or classes, as opposed to statements which apply only to named entities. The proposed FIP therefore is not a rule of general applicability because its requirements apply and are tailored to only eight individually identified facilities. Thus, it is not a “rule” or “regulation” within the meaning of E.O. 12866.

The proposed rule, to the extent it will limit emissions of SO_2, will also increase the level of environmental protection and beneficial effect on human health for all affected populations without having any disproportionately high and adverse human health or environmental effects on any population, including any minority or low-income population.

Comment: [TCEQ/PUCT (0056) p. 20] Commenter (TCEQ) contends that EPA has improperly avoided analyzing and evaluating potential energy impacts of the proposed rule on reliability and prices of electricity in Texas and the ERCOT region, despite Executive Order 13211 requiring such evaluation. The TCEQ contended that the EPA is using a loophole in Executive Order 12866 to avoid evaluating the potential energy impacts of the proposed action as required by Executive Order 13211. TCEQ stated that the proposed FIP affects a significant portion of Texas' base load power generation fleet and the EPA should evaluate and consider the impacts of the proposed FIP on the reliability and price of electricity in Texas.

TCEQ states that the proposed rule is inconsistent in claiming the rule is both of national scope and effect and not of general applicability. The TCEQ takes issue with EPA's determination that the rule is not of general applicability to such that Executive Orders 12866 and 13211 do not apply, while at the same time determining that the rule is of nationwide scope and effect in an effort to have any petitions for review be filed in the United States Court of Appeals for the District of Columbia (79 FR 74888). Specifically, TCEQ contends that EPA determined that the rule is of national scope for purposes of legal challenges, but then also determined that the rule is of limited scope for the purposes of avoiding Executive Orders 12866 and 13211 without any explanation of how this action can have two contradictory scopes. The TCEQ asserts that the scope of the regulatory action proposed by the EPA must be either nationwide or limited to Texas; it cannot be both.

Specifically, the TCEQ disagreed with the EPA's position that the proposed action is of nationwide scope (79 FR 74888). However, the TCEQ also disagreed with the EPA position that the potential impact to the supply, distribution, and use of energy does not need to be considered in this proposed action. According to TCEQ, the annualized cost for the scrubber retrofits portion of the proposal is estimated to be approximately $238 million per year, greatly exceeding the $100 million per year threshold established under Executive Order 12866. Furthermore, the TCEQ asserts that EPA's proposed FIP would meet Executive Order 13211 criteria for being "likely to have a significant adverse effect on the supply, distribution, or use of energy" based on the guidance provided in Office of Management and Budget (OMB) Memoranda 01-27, July 13, 2001 Guidance for Implementing Executive Order 13211. Section 4 of the OMB Memoranda 01- 27 provides a number of examples of adverse effects for the purpose of Executive Order 13211. One of the listed examples is a reduction in electricity production in excess of 1 billion kilowatt-hours or in excess of 500 megawatts (MW) of installed capacity. According to a recent ERCOT report included in Appendix 1 to the TCEQ's comments, ERCOT's modeling indicates that approximately 1,800 MW of capacity from the affected coal-fired EGUs are expected to retire due to the EPA's proposed Regional Haze FIP requirements, exceeding the threshold in the OMB guidance for an adverse effect.[18] Also, with the exception of the San Miguel facility, each of the units subject to the EPA's proposed FIP is greater than 500 MW. If just one of these units is no longer economically viable as a result of the EPA's FIP, it would result in the reduction of more than 500 MW of installed capacity.

The TCEQ stated, according to OMB Memoranda 01-27, the basic purpose of Executive Order 13211 is to ensure that agencies "appropriately weigh and consider the effects of the Federal Government's regulations on the supply, distribution, and use of energy." The EPA's interpretation of Executive Orders 12866 and 13211 would mean that a national rule applying to all coal-fired EGUs in the country with an annualized cost of $100 million per year that might result in the loss of only 500 MW of a capacity would require an energy impact analysis because it may have a significant adverse effect on the supply, distribution, or use of energy. However, according to the EPA's interpretation, a rule costing more than twice that cost threshold and potentially resulting in the loss of more the three times the capacity but focused within a discrete electric reliability region in a single state that has limited connections to the rest of the United States' grid does not require any analysis or consideration of the possible adverse impacts on energy. In other words, the EPA's position is that the Federal Government does not need to concern itself with a potentially severe impact of this proposed rule on the supply, distribution, or use of energy within ERCOT because the impact is limited to a single state. Such an interpretation and outcome is illogical and clearly contrary to the stated intent of Executive Order 13211. The potential for adverse effects from the EPA's proposed rule is actually increased, not lessened, because the costs and impacts of the rule are focused within a smaller region.

Additionally, the TCEQ noted that CAA §169A(g) requires that the State and the Administrator consider the energy and non-air quality environmental impacts of compliance when determining the best available retrofit technology. While the EPA's guidance on evaluating energy impacts for BART analyses does not specifically address considering electrical grid reliability and electricity prices, the guidance does make allowance for considering indirect energy impacts as well as potential impacts such as locally scarce fuels and significant economic disruption or unemployment (70 FR 39169). Furthermore, the EPA recommends that states consider the BART guidelines when evaluating the energy and non-air environmental impacts for reasonable progress goal purposes. [19]

The TCEQ stated that the proposed action affects almost 10,000 MW of generation capacity in Texas and almost 8,8oo MW of that capacity is within the ERCOT region. The affected units in ERCOT represent approximately 11% of region's 2015 total capacity based on ERCOT's *Report on Capacity, Demand, and Reserves for the ERCOT Region, 2015 – 2024.*[20] Based on the significant portion of the Texas electrical grid affected by the EPA proposal and the projected retirements estimated by ERCOT to result from this action, the EPA should analyze and consider the possible impacts of the proposed rule on the reliability and prices of electricity in Texas, regardless of the applicability of Executive Orders 12866 and 13211.

Footnote:
[18] See ERCOT Report Impacts of Environmental Regulations in the ERCOT Region, December 16, 2014, page 27 (Attached to comment 0056).
[19] See Guidance for Setting Reasonable Progress Goals under the Regional Haze Program, June 1, 2007, page 5-3; 79 FR 74874.
[20] See http://www ercot.com/gridiufo/resource; December 1, 2014.

Response: As explained in our final action and below, Executive Order 13211 does not apply as this action is not a rule of general applicability under Executive Order 12866. This is not inconsistent with our determination that the rule is of national scope and effect, as these are different determinations that we fully evaluated under their respective standards, and are not directly comparable. Consequently, we did not "utilize a loophole" in the applicability provisions of Executive Order 12866 to avoid consideration of the concerns raised in this comment.

Specifically, we do not agree that our proposed FIP is avoiding the requirements of any applicable Executive Orders (E.O.s) or statutes, or that the proposed FIP is inconsistent or contradictory in determination of scope. This proposed action is not subject to Executive Order 13211 because it is not a "significant regulatory action" under Executive Order 12866 (58 FR 51735, October 4, 1993). Under E.O. 12866, "Regulatory Action" is defined as "any substantive action by an agency . . . that promulgates or is expected to lead to the promulgation of a final rule or regulation." "Regulation" or "rule," in turn, is defined as "an agency statement of general applicability and future effect." E.O. 12866 does not define "statement of general applicability," but this term commonly refers to statements that apply to groups or classes, as opposed to statements which apply only to named entities. The proposed FIP therefore is not a rule of general applicability because its requirements apply and are tailored to only eight individually identified facilities. Thus, it is not a "rule" or "regulation" within the meaning of E.O. 12866 and this action is not a "regulatory action" subject to 12866. Since E.O. 13211 (79 FR 74890) applies only to "significant regulatory actions" under E.O. 12866, this action is not subject to review under E.O. 13211. Evaluation of the proposal under E.O. 13211's criteria is therefore not required.

A determination of whether the proposal is of "nationwide scope or effect" requires a specific, separate statutory analysis than a determination of whether the proposal is a "rule" or "regulation" of "general applicability" under E.O. 12866. As discussed in detail elsewhere, Section 307(b)(1) of the CAA provides, in part, that petitions for review must be filed in the U.S. Court of Appeals for the District of Columbia Circuit when such action is locally or regionally applicable if ''such action is based on a determination of nationwide scope or effect and if in taking such action the Administrator finds and publishes that such action is based on such a determination.''[93] Section 307(b)(1) reflects Congress's intent that some local and regional actions should be reviewed in the D.C. Circuit only. Additionally, in the 1977 CAA

[93] 42 U.S.C. Section 7607(b)(1).

Amendments that revised CAA Section 307(b)(1), Congress noted that the Administrator's determination that an action is of ''nationwide scope or effect'' would be appropriate for any action that has ''scope or effect beyond a single judicial circuit.''[94] First, this final rule involves two States in two separate judicial circuits and, as the EPA has explained in detail above and elsewhere, the final rule includes statutory and regulatory interpretations that are nationally significant. Second, for judicial review to lie in the D.C. Circuit, the EPA must also make an affirmative determination and publish that finding, which we did here. Consequently, EPA's determination of nationwide scope and effect is ''consistent with the legislative history of the CAA, which evinces a clear congressional intent to 'centralize review of 'national' SIP issues in the D.C. Circuit.'''[95] Contrastingly, as discussed above, the proposed FIP is not a rule of general applicability because its requirements apply and are tailored to only eight individually identified facilities, and thus is not a "rule" or "regulation" within the meaning of E.O. 12866. Accordingly, this proposal is a rulemaking of nationwide scope or effect, while not being a "rule" or "regulation" of "general applicability."

Furthermore, as explained in our final action, while the E.O. 13211 does not apply here, as this action is not a rule of general applicability under Executive Order 12866, EPA did consider TCEQ's concerns regarding grid reliability and price of electricity, as discussed more fully elsewhere and in our final action, so EPA did not utilize a loophole in Executive Order applicability to avoid consideration of the concerns in this comment.

The TCEQ is correct that the BART Guidelines does not require that grid reliability or energy prices be considered, but that energy impacts should be considered. Consideration of "the energy and non-air quality environmental impacts of compliance," also falls under Section 51.308(d)(1)(i), which is within the reasonable progress portion of the Regional Haze Rule that governs the subject cost analysis. Our Reasonable Progress Guidance considers this factor from the standpoint of whether it would cause the reconsideration of the control in question due to energy or non-air quality penalties. In other words, the energy and non-air quality environmental impacts of compliance serve as a potential modifier to the particular control being considered. This modifier does not consider grid reliability or electricity pricing, but rather the potential for additional costs due to energy and non-air quality considerations. The "energy" portion of this factor, refers to potential costs due to the additional consumption of energy or switching to another energy source,[96] not grid reliability or electricity pricing. The only facility in which energy and non-air quality consideration was relevant was Tolk, due to our consideration of potential water limitations (addressed in our response to other comments).

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[94] H.R. Rep. No. 95–294 at 323–24, reprinted in 1977 U.S.C.C.A.N. 1402–03.
[95] Texas v. EPA, 2011 U.S. App. LEXIS 5654 at *15 (5th Cir. Feb. 14, 2011) (citing Admin. Conference of the U.S., Recommendations on Judicial Review Under the Clean Air Act, 41 FR 56767, 56769 (Dec. 30, 1976) (Comments of G. William Frick)).
[96] See our Reasonable Progress Guidance, page 5-2: "The third factor is "energy and non-air environmental impacts." In assessing energy impacts, you may want to consider whether the energy requirements associated with a control technology result in energy penalties. For example, controls on diesel engines may decrease the engine's fuel efficiency, leading to an increase in diesel fuel consumption. Or, a particular control may require a fuel unavailable in the area. To the extent that these considerations are quantifiable they should be included in the engineering analyses supporting compliance cost estimates.

Notwithstanding our Executive Order comments above, we nevertheless fully considered the commenter's concerns regarding grid reliability. As discussed more fully elsewhere, we note that controls achieving the level of control that we are requiring are highly cost-effective, are in wide use in the industry, and thus should not require a source to shut down to comply. However, we contracted with Synapse Energy Economics, Inc., a nationally recognized firm with particular expertise in the subject area to review ERCOT's report. We reviewed and accept our contractor's finding and adopt its conclusion that ERCOT's report contained significant flaws and does not support a determination that there is likely to be any significant, adverse effect on the supply, distribution, or use of energy. During our comment period, we received no, non-speculative information to validate claims that sources would retire rather than install demonstrably cost-effective controls. Commenters who have alleged grid reliability concerns in response to our proposed controls have not provided adequate documentation for their assertions.

9. Controls in Addition to CAIR/CSAPR, and CSAPR Better than BART

Comment: EPA is unlawfully attempting to double-burden sources already complying with BART requirements and attempts to apply beyond-BART requirements to sources that are explicitly exempted from source-specific BART requirements. [GCLC (0063) p. 3-5]

GCLC noted, in the context of BART, there are two types of EGUs in Texas: 1) those EGUs that currently comply with BART requirements and are fully controlled under the BART provisions through compliance with the Cross-State Air Pollution Rule ("CSAPR"), and previously the Clean Air Interstate Rule ("CAIR"); and 2) those EGUs that are excluded from BART criteria due to the specific age exclusions (or other exclusions) found in the CAA.

GCLC stated that EPA has attempted a regulatory end-around in this FIP proposal by attempting to impose overly burdensome beyond-BART requirements via the reasonable progress goal ("RPG") and long-term strategy ("LTS") provisions of the CAA to units that have either already achieved BART compliance through compliance with CAIR and then CSAPR and/or are statutorily excluded from BART requirements.

GCLC noted that Texas' EGUs are currently subject to CSAPR, which EPA has already found to be "better-than-BART."[12] Since these units comply with, and actually exceed, BART limitations, the CAA does not contemplate or require that states impose additional controls on these units as they have already exceeded relevant statutory requirements. [13] This is not just the position of GCLC, but is EPA's own stated position. As stated in the Reasonable Progress Guidance, "it is reasonable to conclude that any control requirements imposed in the BART determination also satisfy the RPG-related requirements for source review in the first RPG planning period. Hence, [a State] may conclude that no additional emissions controls are necessary for these sources in the first planning period." [14] Indeed, we have found no instance where EPA has imposed a FIP for the first planning period requiring additional reasonable progress controls on EGUs that relied on implementation of CAIR or CSAPR to satisfy BART. [15] Therefore, by EPA's own admission and prior regional haze SIP approvals, EPA has already pre-emptively found that Texas' SIP submission regarding BART-subject EGUs is sufficient for the first planning period.

Therefore, EPA is without basis to require additional controls on those units already fully meeting and exceeding BART requirements via CSAPR compliance.

GCLC stated, regarding non-BART units, Congress, acknowledging the specified and burdensome nature of BART requirements, provided EPA the authority to impose those source-specific limitations in only limited instances. Specifically, BART could only be applied to those units that were "in existence on August 7, 1977, but which ha[d] not been in operation for more than fifteen years as of such date." [16] By providing this limitation, Congress was ensuring that unit-specific BART limitations could only be applied to those selected units. Despite this limitation, EPA is proposing a rule that imposes beyond-BART limitations, through source-specific SO_2 emissions limits, on specifically exempted EGUs in direct contravention of the CAA.

Furthermore, GCLC stated that the CAA includes separate definitions for determining what is "reasonable progress" and for determining what is "best available retrofit technology." [17] Though similar, by drafting two different definitions, the intent of the Congress is clear that these terms are to be applied separately and distinctly. If Congress intended the regional haze provisions to be applied in a way to require BART limitations on non-BART units, let alone limitations that are even more strenuous than BART, as EPA's proposal here would do, Congress would have said so. This fact, and the limitations that Congress put on EPA's actions, have been ignored by EPA in this Proposed FIP. EPA must withdraw its proposed emission limits on both the BART and non-BART EGUs.

Footnotes:

[12] Regional Haze: Revisions to Provisions Governing Alternatives to Source-Specific Best A vail able Retrofit Technology (BART) Determinations, Limited SIP Disapprovals, and Federal Implementation Plans, Final Rule, 77 Fed. Reg. 33,642, 33,648 (June 7, 2012). GCLC supports EPA's finding that compliance with CSAPR satisfies the BART requirements but also strongly believes that complying with CAIR adequately satisfied BART, as well. Given still some lingering uncertainties regarding CSAPR, due to legal challenges, if in a future legal action or by EPA's own volition, CSAPR's application is delayed, remanded, or vacated nationally or within Texas, EPA must recognize that compliance with CAIR- or whichever avenue the Court chooses to impose following that decision - automatically be recognized as compliance with BART.

[13] See 42 USC§ 7491(b)(2)(A).

[14] Memorandum from William L. Wehrum, Acting Assistant Administrator to Regional Administrators, EPA Regions 1-10, Guidance for Setting Reasonable Progress Goals under the Regional Haze Program, 4-2-4-3 (June 1, 2007); see also id. at 5-1, stating that "the significant emissions reductions that we anticipate to result from BART, the CAIR, and the implementation of other CAA programs ... may be all that is necessary to achieve reasonable progress in the first planning period for some States."

[15] See 77 Fed. Reg. 38,515 (June 28, 2012) (Alabama); 77 Fed. Reg. 38,501 (June 28, 2012) (Georgia); 77 Fed. Reg. 34,218 (June 11, 2012) (Indiana); 77 Fed. Reg. 38,006 (June 26, 2012) (Iowa); 77 Fed. Reg. 19,098 (March 30, 2012) (Kentucky); 77 Fed. Reg. 71,533 (Dec. 3, 2012) (Michigan); 77 Fed. Reg. 38,007 (June 26, 2012) (Missouri); 77 Fed. Reg. 38,185 (June 27, 2012) (North Carolina); 77 Fed. Reg. 39,177 (July 2, 2012) (Ohio); 79 Fed. Reg. 24,340 (April 30, 2014) (Pennsylvania); 77 Fed. Reg. 38,509 (June 28, 2012) (South Carolina); 77 Fed. Reg. 24,392 (April 24, 2012) (Tennessee); 77 Fed. Reg. 35,287 (June 13, 2012) (Virginia); 77 Fed. Reg. 16,937 (March 23, 2012) (West Virginia).

[16] 42 USC§ 7491(b)(2)(A).

[17] Id. at§ 7491(g)(l-2).

Response: We acknowledge the background information provided by the GCLC, but we take no position with respect to it. We note that BART is a part of reasonable progress but a BART determination is not a shield from additional review under the reasonable progress and long-term strategy provisions of the Regional Haze Rule, specifically CAIR/CSAPR better-than-BART credit:[97]

> Our determination that CAIR makes greater reasonable progress than BART for EGUs is not a determination that CAIR satisfies all reasonable progress requirements in CAIR affected States. Each State, whether in the CAIR region or not, is required to set reasonable progress goals for each Class I area within the State as required in regional haze rule section 308(d)(1), and to develop long term strategies, considering all anthropogenic sources of visibility impairing pollutants, as required by section 308(d)(3).

GCLC references our Reasonable Progress Guidance. We disagree that this guidance exempts BART sources from being analyzed under reasonable progress. The reasonable progress provisions must still be followed. If a state desires to remove a BART source from consideration under reasonable progress, it must do so according to our regulations. Our Regional Haze Rule itself makes that clear:[98] "After a State has met the requirements for BART or implemented emissions trading program or other alternative measure that achieves more reasonable progress than the installation and operation of BART, BART-eligible sources will be subject to the requirements of paragraph (d) [reasonable progress] this section in the same manner as other sources."

We disagree with GCLC that we are either imposing BART analysis on these sources in question or that we are otherwise attempting to circumvent BART with reasonable progress.

Concerning the legal uncertainties of CSAPR, although we proposed to rely on CSAPR to address the BART requirements for EGUs in Texas, it is not finalizing that proposed action. On July 28, 2015, the D.C. Circuit Court's issued its decision *in EME Homer City Generation v. EPA*, 795 F.3d 118 (D.C. Cir 2015), upholding CSAPR but remanding without vacating a number of the Rule's state emissions budgets. Specifically, the court invalidated a number of the Phase 2 ozone season NO_x budgets and found that the SO_2 budgets as to four states resulted in overcontrol for purposes of Section 110(a)(2)(D). Texas' ozone season NO_x budget and its SO_2 budget are both implicated in this remand. EPA is in the process of acting on the Court's remand. As a result, at this time we cannot ensure that CSAPR will continue to be an appropriate alternative to BART for Texas EGUs. However, in the absence of CSAPR, compliance with CAIR is not compliance with BART. EPA has already issued a limited disapproval of the Texas regional haze SIP in 2012 because of Texas' reliance on CAIR to meet certain requirements of the regional haze program. 77 FR 33642. Given the uncertainty arising from the remand of Texas' CSAPR budgets, we have concluded that it would not be appropriate to finalize our proposed determination to rely on CSAPR as an alternative to SO_2 and NO_x BART for EGUs in Texas at this time. Should we determine in the future that it is necessary to perform source-specific BART determinations for these sources instead of relying on CSAPR, we anticipate that the SO_2 controls we are finalizing today, which are currently the most stringent available, will also be sufficient to satisfy the SO_2 BART requirement.

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[97] 70 FR 39143.

[98] Section 51.308(e)(5).

Concerning the non-BART units, we disagree that the source-specific SO_2 emissions limits we are requiring on non-BART EGUs is in direct contravention of the CAA. The CAA allows for source-specific controls as appropriate to meet the reasonable progress requirements on any source, regardless of its BART eligibility. CAA Section 169A(b)(2). Further, EPA has imposed similar controls in other states as necessary to ensure the reasonable progress requirements are met. *See e.g.* 79 FR 52420 (Arizona); 79 FR 5032 (Wyoming); and 77 FR 20894 (North Dakota).

We address GCLC's allegations of inconsistencies in the consistency section of this document.

Comment: Background on alternatives to BART. [Earthjustice (0067) p.8]

Earthjustice et al., stated that, under the statute and EPA's implementing regulations, the default approach to meeting the BART requirements is for a state to consider the five statutory factors on a case-by-case basis. *See* 42 U.S.C. § 7491(b)(2)(A) (requiring BART "for each major stationary source"); 40 C.F.R. § 51.308(e)(1)(ii)(A) ("[t]he determination of BART must be based on an analysis of the best system of continuous emission control technology available and associated emission reductions achievable for each BART-eligible source"). However, EPA's regulations purport to allow states to waive the BART requirements through "an emissions trading program or other alternative measure" rather than by setting BART limits on a case-by-case basis if the applicable standards for using an alternative are met. 40 C.F.R. § 51.308(e)(2).

According to Earthjustice et al., an alternative to BART "must achieve greater reasonable progress than would be achieved through the installation and operation of BART." 40 C.F.R. § 51.308(e)(2). A state may demonstrate that an alternative program makes greater reasonable progress than BART by proving that under the alternative program (1) visibility does not decline in any Class I area and (2) there is an overall improvement in visibility compared to BART at all affected Class I areas. *Id.* § 51.308(e)(3)(i)-(ii).

Trading programs give sources emission allocations, and then allow sources to trade the allowances. One such trading program is the Cross State Air Pollution Rule ("CSAPR"). EPA issued CSAPR to promote downwind attainment of national health standards for ozone and particulate matter by reducing upwind emissions of NO_x and SO_2. *EPA v. EME Homer City Generation L.P.*, 134 S. Ct. 1584, 1596 (2014). CSAPR sets state budgets for emissions of NO_x and SO_2, then authorizes sources to make intrastate and interstate emission trades to meet compliance obligations. 76 Fed. Reg. 48,208 (Aug. 8, 2011); *see also* EPA, Cross-State Air Pollution Rule (CSAPR)—Basic Information, *available at* http://www.epa.gov/airtransport/CSAPR/basic.html. CSAPR, which was to be fully implemented by 2014, replaced CAIR, which had been remanded following previous litigation, although the D.C. Circuit left the rule in place pending further action by EPA. *EPA v. EME Homer City Generation, L.P.*, 134 S. Ct. at 1595-96 (citing *North Carolina v. EPA*, 550 F.3d 1176, 1178 (D.C. Cir. 2008) (per curiam)).

Earthjustice et al., stated that the EPA later issued a rule finding that CSAPR was "better-than-BART," meaning that EPA concluded it achieved "greater reasonable progress towards the national goal of achieving natural visibility conditions in Class I areas than source-specific [BART] in those states covered by the Transport Rule." 77 Fed. Reg. 33,642, 33,643 (June 7, 2012). To support its conclusion that CSAPR makes greater reasonable progress than BART, EPA compared CSAPR as it existed in 2011 to presumptive BART. However, EPA subsequently made significant changes to both the emission limits and the compliance deadlines for CSAPR. To date, EPA has not updated its "better than BART" analysis to examine whether the revised version of CSAPR makes greater reasonable progress than BART.

Earthjustice et al., stated that BART is a necessary component of establishing progress, but it is just one component and cannot substitute for the other elements of a regional haze plan. In particular, it is not a replacement for the analysis of "any potentially affected sources" required by 40 C.F.R. § 51.308(d)(1)(i)(A). The Regional Haze Rule requires states to look beyond BART for additional emissions reductions that provide for "reasonable progress" toward 2064 natural visibility goal for Class I national parks and wilderness areas. 42 U.S.C. § 7491(b)(2)(B); 40 C.F.R. § 51.308(d).5

Even where, as here, EPA has determined that a nationally applicable "emissions trading program or other alternative will achieve greater reasonable progress toward natural visibility conditions" than BART, that finding does not exempt BART sources from emission control requirements to advance reasonable progress if they continue to cause or contribute to visibility impairment. *Id.* § 51.308(e). In *Util. Air Regulatory Group v. EPA*, 471 F.3d 1333 (D.C. Cir. 2006), the D.C. Circuit upheld EPA's "better than BART" determination for the Cross State Air Pollution Rule's predecessor, but the court in no way reduced the states' or EPA's authority and obligation to require updated pollution controls to ensure reasonable progress at each Class I area. The court stated:

> [U]nless there is some reasonable excuse, [a regional haze plan's reasonable] progress must be sufficient to attain natural visibility conditions at every single Class I area by 2064. Indeed, EPA emphasized in its briefs that because "the regulatory scheme as a whole (and all the regulations promulgated pursuant to it) must be designed to achieve the goal [of reasonable progress] at every Class I area," states must, if CAIR is substituted for BART and is not likely to achieve that goal, take "other measures as necessary to achieve reasonable progress goals including at each Class I area."

Id. at 1340 (internal citations omitted); *see also* 70 Fed. Reg. at 39,138 n.73 ("The reasonable progress test in the Regional Haze Rule remains as a separate test from [CAIR's] better than BART" determination.). The court recognized that BART and "better than BART" alternatives are merely one mechanism for achieving the overarching reasonable progress requirements of the Clean Air Act.

Earthjustice et al., stated that, under a trading program such as CSAPR, some sources may reduce emissions significantly, while others may not reduce emissions at all or may even increase emissions. When EPA originally authorized alternatives to BART, EPA recognized that trading programs can create "hot spots:" areas where emissions fail to decrease, or even increase. 71 Fed. Reg. 60,612, 60,627 (Oct. 13, 2006). To address this problem, EPA inserted a provision whereby states that opt to use an alternative program and waive the BART requirements can supplement the alternative program to address any pollution not adequately controlled by the alternative program. EPA calls this provision a "geographic enhancement." 40 C.F.R. § 51.308(e)(2)(v).

Due to the flexible, market driven nature of a trading program, Earthjustice et al., stated that there is no assurance that benefits in reduced pollution will be realized at the very places intended for restoration under the Clean Air Act's visibility protection mandate. This can lead to visibility hot spots when a source near a Class I area purchases emission allowances from a distant source rather than reduces emissions, or when a group of sources in the same region purchase emission allowances rather than reducing emissions. Reasonable progress controls are particularly important under emission trading programs because those trading programs do not require installation of pollution controls.

Footnotes:

[5] Under Section 51.308(e)(5) of the Regional Haze Rule, "[a]fter a State has met the requirements for BART or implemented emissions trading program or other alternative measure that achieves more reasonable progress than the installation and operation of BART, BART-eligible sources will be subject to the requirements of paragraph (d) of this section in the same manner as other sources."

Response: We acknowledge the background information provided by the commenter. We take no position with respect to the commenter's synopsis. Comments concerning our finding that CSAPR is "better-than-BART" (77 FR 33642) are outside the scope of today's rulemaking.

Comment: EPA Should Reconsider Its Approval of Texas' Exclusion of All BART-Eligible Sources and EPA's Proposed Reliance on CSAPR as an Alternative to BART. [Earthjustice (0067) p.52]

Earthjustice et al., stated that in crafting a program to rid our national parks and wilderness areas of visible air pollution, Congress specified that some of the largest sources of pollution must install and operate the best available pollution controls, or BART. *See* 42 U.S.C. § 7491(b)(2)(A). To ensure that states require the best pollution controls on these sources, Congress prescribed the factors that must be considered when determining BART. *Id.* § 7491(g)(2). Moreover, Congress instructed states to follow EPA Guidelines for determining BART for large power plants. *Id.* § 7491(b)(2). Given that BART sources are responsible for a significant amount of the haze pollution at Class I areas, BART controls are a cornerstone of each haze plan. Texas submitted a haze plan that proposes no controls for any BART-eligible source in the state. Texas reached this result by first taking certain power plants' NO_x and SO_2 emissions off the table, because Texas relied on CAIR in lieu of source-specific BART for power plants subject to BART. SIP at 9-1. Texas then used a variety of methods to conclude that no other source was subject to BART. *Id.* at 9-10. As a result, Texas did not conduct a five-factor BART analysis for a single one of its 126 BART-eligible sources. EPA proposes to approve Texas' determination that a five-factor BART analysis does not need to be completed for any BART eligible source. 79 Fed. Reg. at 74,854. EPA also proposes a FIP that relies on CSAPR as an alternative to BART for Texas power plants. 79 Fed. Reg. at 74,853.[65] EPA should revisit both of these proposed actions.

Earthjustice et al., stated that the EPA should disapprove Texas' determination to exclude all BART-eligible sources from being subject to BART. Texas' screening of BART-eligible sources is based in part on the unsupported assumption that 0.5 deciviews is the threshold for contribution to visibility impairment. Moreover, Texas erred in its analysis excluding certain sources from a five factor BART analysis. Second, for power plants, if EPA does not finalize the SO_2 controls it proposed for reasonable progress in the FIP, then EPA should assess and require them as BART controls. EPA should also conduct source-specific analyses as to the NO_x controls that represent BART for these power plants.

Earthjustice et al., stated that the two Class I areas in Texas, Big Bend and Guadalupe Mountains, are not on track to attain natural visibility in 2064—even if EPA finalizes all of the controls it is proposing. The controls EPA is proposing are critical to making reasonable progress. However, to achieve needed progress beyond that proposed in its FIP, EPA should reverse course, taking a fresh look at BART-eligible source previously exempt from control.

Footnotes:
[65] After the D.C. Circuit remanded CAIR to EPA, the agency disapproved the portion of Texas' SIP that relied on CAIR as a BART alternative. 77 Fed. Reg. at 33,654. However, EPA has not yet finalized a FIP to fill the gap left by disapproving Texas' reliance on CAIR.

Response: We acknowledge the background information provided by Earthjustice. We take no position with respect to the commenter's synopsis. We proposed to approve Texas' screening of BART sources from full BART analysis. We are finalizing our approval of Texas' BART determinations for non-EGUs under Section 51.308(e). The comment does not include any information to support disapproval of this portion of Texas' BART determinations. We find that Texas' assumption that 0.5 deciviews is the threshold for contribution to visibility impairment is in accordance with the BART guidelines. [99] In setting a threshold, states should consider the number of BART-eligible sources within the state and the magnitude of each source's impacts. TCEQ provided an adequate rationale for choosing 0.5 dv as the threshold for determining BART eligibility. We are approving Texas' determination of which non-EGU sources in the state are BART-eligible and the determination that none of the state's BART-eligible non-EGU sources are subject to BART because they are not reasonably anticipated to cause or contribute to visibility impairment at any Class I areas. We reviewed the various modeling techniques utilized by the TCEQ in evaluating and screening out the BART-eligible non-EGU sources and we concur with the results of its analysis.[100]

We also proposed a FIP that relies on CSAPR as an alternative to BART for Texas power plants. We took partial action on Texas' regional haze SIP in 2012 when we partially disapproved Texas' reliance on Clean Air Interstate Rule (CAIR) to meet the SO_2 and NO_x BART requirements

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[99] The BART Guidelines state that "the appropriate threshold for determining whether a source contributes to visibility impairment' may reasonably differ across States," but, "[a]s a general matter, any threshold that you use for determining whether a source contributes' to visibility impairment should not be higher than 0.5 dv." BART Guidelines, 40 CFR part 51, appendix Y, section III.A.1.

[100] 79 FR 74844.

for its EGUs. 77 FR 33642 (June 7, 2012). In our proposal, we stated that we intended to address this deficiency in Texas' plan by relying on CAIR's replacement, CSAPR, which we previously determined would provide for greater reasonable progress than BART. 79 FR at 74821 (Dec. 16, 2014). On July 28, 2015, the D.C. Circuit Court's issued its decision in *EME Homer City Generation v. EPA*, 795 F.3d 118 (D.C. Cir 2015), upholding CSAPR but remanding without vacating a number of the Rule's state emissions budgets. Specifically, the court invalidated a number of the Phase 2[101] ozone season NO_x budgets and found that the SO_2 budgets as to four states resulted in overcontrol for purposes of section 110(a)(2)(D)(i) of the CAA. Texas' ozone season NO_x budget and its SO_2 budget are both implicated in this remand. We are in the process of acting on the Court's remand. As a result, at this time we cannot ensure that CSAPR will continue to be an appropriate alternative to BART for Texas EGUs. Given the uncertainty arising from the remand of some of the state CSAPR budgets, we have decided not to finalize that portion of our FIP relying on CSAPR as an alternative to SO_2 and NO_x BART for EGUs in Texas. We will address the question of appropriate SO_2 and NO_x BART limits for EGUS in Texas in a future rulemaking once EPA has determined how best to respond to the remand of some of the CSAPR state budgets. This analysis may include a review of which EGUs are subject to BART and require a five-factor analysis. We note that a few of the sources for which we are finalizing SO_2 controls as part of the Texas long-term strategy are also BART-eligible. Should we determine in the future that it is necessary to perform source-specific BART determinations for these sources instead of relying on CSAPR, we anticipate that the SO_2 controls we are finalizing today, which are currently the most stringent available, will also be sufficient to satisfy the BART requirements.

Comment: If EPA Does Not Finalize Reasonable Progress Controls for BART Sources, Then EPA Should Impose Source-Specific BART Controls on Those Sources.
[Earthjustice (0067) p.53]

Earthjustice et al., stated that the EPA should finalize the SO_2 controls it has proposed for 15 units as reasonable progress controls. *See* 79 Fed. Reg. at 74,891. However, if EPA does not require those controls as reasonable progress measures in the final rule, then EPA should require the proposed controls as BART.

Earthjustice et al., stated that the five factors that must be considered when establishing BART are the same factors that EPA has used in this rulemaking to evaluate reasonable progress controls. Three of the five BART factors are included in the reasonable progress factors, which EPA used here. *Compare* 42 U.S.C. 7491(b)(2)(A) (requiring BART to be based on cost, energy and nonair quality environmental impacts and remaining useful life) *with* 79 Fed. Reg. at 74,873-84 (considering cost, energy and nonair quality environmental impacts, and remaining useful life). EPA considered the remaining two BART factors—existing pollution controls and the visibility improvement from controls—in its reasonable progress analyses. 79 Fed. Reg. at 74,874 ("we are including in our evaluation a consideration of any control technology that may already be installed at the facility"); *id.* ("we are also considering the projected visibility benefit

[101] CSAPR's effective date was stayed by the D.C. Circuit during a portion of the litigation over the rule. Thus, the Rule's Phase 1 effective date of January 1, 2012 was delayed until January 1, 2015, and the Rule's Phase 2 effective date of January 1, 2014 was delayed until January 1, 2017.

in our analysis"). Thus, in developing the proposed reasonable progress controls, EPA considered all of the factors that are required to be considered when determining BART. Given that EPA evaluated reasonable progress controls using the factors that it would use to set BART limits, EPA's analysis of the proposed SO_2 controls would support finding that these limits represent BART. In other words, the required five-factor BART analysis would include the information EPA developed in support of the proposed reasonable progress controls for Texas sources.

Based on EPA's analysis for the proposed rule, Earthjustice et al., stated that the EPA should find that the limits listed below are BART if the agency does not require the units to meet these limits to satisfy the reasonable progress requirements:

Unit	SO_2 Limit (30-day rolling average, lbs/MMBtu)
Big Brown 1	0.04
Big Brown 2	0.04
Martin Lake 1	0.12
Martin Lake 2	0.12
Martin Lake 3	0.11
Monticello 1	0.04
Monticello 2	0.04
San Miguel	0.60

For the EGUs listed below, Earthjustice et al., noted that the EPA is proposing reasonable progress controls, but it is unclear whether the units are subject to BART for SO_2 and NO_x emissions. Texas did not make publicly available the results of its BART eligibility survey, and Texas did not determine whether EGUs subject to CAIR are subject to BART for SO_2 and NO_x emissions. Thus, for the units listed below, EPA should determine whether the units are subject to BART. If the units are subject to BART, and if EPA does not finalize the proposed reasonable progress controls for these units, then EPA should find that the SO_2 limits EPA is proposing under its reasonable progress authority are BART for all of the following units that EPA finds are subject to BART.

Unit	SO_2 Limit (30-day rolling average, lbs/MMBtu)
Coleto Creek 1	0.04
Limestone 1	0.08
Limestone 2	0.08
Monticello 3	0.06
Sandow 4	0.20
Tolk 171B	0.06
Tolk 172B	0.06

Earthjustice et al., argued that EPA did not conduct a detailed, four-factor analysis for which NO_x controls should be required to achieve reasonable progress. Thus, EPA has no preexisting analysis to use for setting NO_x BART limits. Instead, EPA should conduct source-specific analyses of the NO_x limits that represent BART for the BART units listed above.

Response: We acknowledge the background information provided by the Earthjustice but take no position on it. We acknowledge the similarity of some aspects of our analysis with the type of analysis that is required under our BART Guidelines. However, we disagree that we have the ability to change our proposal to make the SO_2 controls we proposed under the reasonable progress and long-term strategy provisions of the Regional Haze Rule apply to or substitute for BART, without first re-proposing them as such and taking comment. Additionally, we are finalizing controls for reasonable progress as proposed.

Comment: EPA's Proposed Reliance on CSAPR as a BART Alternative is Unlawful.
[Earthjustice (0067) p. 55]

Earthjustice et al., stated that the EPA's proposal to rely on CSAPR as an alternative to BART is unlawful for three reasons. First, EPA's proposal exempts sources from BART requirements without complying with the statutory prerequisites for such an exemption. Second, even if EPA could relieve the sources of the obligation to install BART controls, the "Better than BART" rule upon which EPA relies is flawed. Third, the "Better than BART rule" is no longer valid given the substantial changes in CSAPR allocations and compliance deadlines. We incorporate and resubmit their 2012 comments, which remain relevant to EPA's proposal to rely on CSAPR as a BART alternative. EPA Docket ID EPA-HQ-OAR-2011-0729, Letter from McCrystie Adams & Michael Hiatt, Earthjustice to EPA (Feb. 28, 2012). [This document is attached to comment 0067 - Item 5].

First, Earthjustice et al., stated that EPA's proposal is unlawful because it exempts sources from installing BART controls without going through the exemption process Congress prescribed. The visibility protection provisions of the Clean Air Act include a "requirement" that certain sources "install, and operate" BART controls. 42 U.S.C. § 7491(b)(2)(A). Congress specified the standard by which sources could be exempted from the BART requirements, which is that the source is not "reasonably [] anticipated to cause or contribute to a significant impairment of visibility" in any Class I area. *Id.* § 7491(c)(1). Appropriate federal land managers must concur with any proposed exemption. *Id.* § 7491(c)(3). EPA has not demonstrated that any of the Texas EGUs subject to BART meet the standards for an exemption, nor has EPA obtained the concurrence of federal land managers. Therefore, EPA must require source-specific BART for each power plant subject to BART.

Second, Earthjustice et al., stated that even if EPA could use a BART alternative without going through the statutory exemption process, EPA could not rely on CSAPR because of flaws in the rule that purports to show that CSAPR makes more reasonable progress than BART (the "Better than BART" rule). EPA's regulations purport to allow the use of an alternative program in lieu of source-specific BART only if the alternative makes "greater reasonable progress" than would BART. 40 C.F.R. § 51.308(e)(2). To demonstrate greater reasonable progress, a state or EPA must show that the alternative program does not cause visibility to decline in any Class I area and results in an overall improvement in visibility relative to BART at all affected Class I areas.

Id. § 51.308(e)(3)(i)-(ii). Here, EPA claims that its 2012 "Better than BART" rule demonstrated that CSAPR achieves greater reasonable progress than BART. *See* 77 Fed. Reg. 33,642.

As explained in detail in their 2012 comments, Earthjustice et al., stated that EPA compared CSAPR to BART in the Better than BART rule by using CSAPR allocations that are more stringent than now required as well as by using presumptive BART limits that are less stringent than are actually required under the statute. *See* Letter from McCrystie Adams, Earthjustice to EPA at 13-16 (Feb. 28, 2012). In short, EPA used assumptions that made CSAPR appear more effective than it is, and made BART appear to be less effective than it is, which ultimately tilted the scales in favor of CSAPR. It would be arbitrary and capricious for EPA to rely on such an inaccurate, faulty comparison to conclude that CSAPR will achieve greater reasonable progress than will BART. Even under EPA's skewed comparison, CSAPR achieves barely more visibility improvement than BART at Big Bend and Guadalupe Mountains.

Earthjustice et al., stated that if EPA modeled accurate BART limits and up-to-date CSAPR allocations, then EPA would likely find that CSAPR would lead to less visibility improvement than BART. Indeed, SO_2 emissions allowed under CSAPR for Texas EGUs are *91% higher* than would be allowed under BART. *Id.* at 17. Similarly, the NO_x emissions allowed under CSAPR from Texas EGUs are higher than would be allowed under BART. *Id.* at 17-18. This was true even before EPA revised CSAPR to increase the emissions allocations for all Texas EGUs.

Third, Earthjustice et al., stated that EPA cannot lawfully rely on the "Better than BART" rule because the rule is based on a version of CSAPR that no longer exists. Accordingly, any conclusion that EPA made in the 2012 Better than BART rule regarding whether CSAPR achieves greater reasonable progress than BART is no longer valid. Since 2012, EPA has significantly changed the allocations and the compliance deadlines for CSAPR. Of particular relevance here, after 2012, EPA dramatically increased the CSAPR allocations for every covered EGU in Texas. 77 Fed. Reg. 10,324 (Feb. 21, 2012), Final Revisions Rule State Budgets and New Units Set-Asides TSD at 3. EPA later withdrew the February 21, 2012 rule revision, 77 Fed. Reg. 28,785 (May 16, 2012), but issued a new rule that included both the changes in the February 21, 2012 rule as well as additional changes to state budgets. 77 Fed. Reg. 34,830 (June 12, 2012). By the time that EPA finalized the Better than BART rule in June 2012, EPA had changed the state emissions budgets by tens of thousands of tons, yet EPA proceeded to finalize the Better than BART rule based solely on the emissions budgets in the original, 2011 CSAPR rule.

Earthjustice et al., stated that EPA also extended the compliance deadlines by three years, such that the phase 1 emissions budgets take effect in 2015-2016 and the phase 2 emissions budgets take effect in 2017 and beyond. 79 Fed. Reg. 71,663 (Dec. 3, 2014); *see also* 79 Fed. Reg. at 74,853. And yet more changes may occur as a result of the pending challenges to CSAPR in the D.C. Circuit Court of Appeals. *EME Homer City Generation, LP v. EPA*, No. 11-1302 (D.C. Cir. filed 2011).

In short, Earthjustice et al., concluded that EPA purports to satisfy the regulatory requirements for a BART alternative by relying on its 2012 finding that CSAPR makes more reasonable progress than BART. But EPA's 2012 finding was based on a prior version of CSAPR, not the version that is in effect in 2015 at the time of EPA's proposal and will be in effect at the time of the final Texas rule and in the future. To rely on CSAPR as an alternative to BART, EPA must demonstrate that the version of CSAPR that is now in effect, and will be in effect at the time of the final rule, makes greater reasonable progress than BART. Having failed to make that demonstration, EPA has not met its burden to show that CSAPR will achieve greater reasonable progress than source-specific BART. *See* 40 C.F.R. § 51.308(e)(2), (3).

Response: We took partial action on Texas' regional haze SIP in 2012 when we partially disapproved Texas' reliance on the Clean Air Interstate Rule to meet the SO_2 and NO_x BART requirements for its EGUs. 77 FR 33642 (June 7, 2012). In our proposed FIP, we stated that we intended to address this deficiency in Texas' plan by relying on CAIR's replacement, CSAPR, which we previously determined would provide for greater reasonable progress than BART. 79 FR at 74821 (Dec. 16, 2014). On July 28, 2015, the D.C. Circuit Court's issued its decision in *EME Homer City Generation v. EPA*, 795 F.3d 118 (D.C. Cir 2015), upholding CSAPR but remanding without vacating a number of the Rule's state emissions budgets. Specifically, the court invalidated a number of the Phase 2[102] ozone season NO_x budgets and found that the SO_2 budgets as to four states resulted in overcontrol. Texas' ozone season NO_x budget and its SO_2 budget are both implicated in this remand. We are in the process of acting on the Court's remand. As a result, at this time we cannot ensure that CSAPR will continue to be an appropriate alternative to BART for Texas EGUs. Given the uncertainty arising from the remand of some of the state CSAPR budgets, we have decided not to finalize that portion of our FIP relying on CSAPR as an alternative to SO_2 and NO_x BART for EGUs in Texas. We will address the question of appropriate SO_2 and NO_x BART limits for EGUS in Texas and the remaining issues in a future rulemaking once EPA has determined how best to respond to the remand of some of the CSAPR state budgets. Therefore, these comments are beyond the scope of today's final action. Comments concerning our finding that CSAPR is "better-than-BART" (77 FR 33642) are outside the scope of today's rulemaking. Additionally, comments concerning our previous finding that CSAPR is "better-than-BART" are outside the scope of today's action.

Comment: Luminant provided background information on Texas' BART determination. [Luminant (0061) p. 24]

Consistent with EPA's prior determination, Luminant stated that Texas concluded that "participation in CAIR is equivalent to BART" for EGUs.[188] Accordingly, Texas did not conduct a source-specific BART analysis for SO_2 and NO_x for EGUs.[189]

Luminant noted that for the remaining non-EGU sources and for EGUs with respect to particulate matter ("PM"), Texas conducted a screening analysis to determine which sources were "BART-eligible."[190] Using a screening analysis, Texas concluded that 254 sites were "potentially BART-eligible based on distance and actual emissions."[191] These 254 sources were surveyed to determine "any equipment built or reconstructed during the applicable time period or if the PTE [potential to emit] of their site were less than 250 tpy."[192] If BART eligible equipment

[102] CSAPR's effective date was stayed by the D.C. Circuit during a portion of the litigation over the rule. Thus, the Rule's Phase 1 effective date of January 1, 2012 was delayed until January 1, 2015, and the Rule's Phase 2 effective date of January 1, 2014 was delayed until January 1, 2017.

did not exist at the site, the sources "were not asked to supply any further information and were considered not BART-eligible."[193] If the source potentially had BART-eligible equipment, a "detailed survey asked whether each piece of equipment at the site was built or reconstructed between the applicable dates" and if the "PTE of their BART-eligible equipment exceeded the 250 tpy threshold."[194] The results of Texas' survey revealed that "over 100 sources were identified as BART-eligible."[195]

Luminant stated that Texas conducted an analysis of which of those BART eligible sources were "subject to BART."[196] Texas used three methods, endorsed by EPA's BART guidelines, for determining whether the screened sources were "subject to BART": (1) "the use of model plants to exempt sources with common characteristics"; (2) "a cumulative modeling analysis to show that groups of sources are not subject to BART"; and (3) "an individual source attribution approach."[197] The cumulative modeling analysis utilized CAMx PSAT and resulted in 72 sources being screened out from further review.[198] For the remaining sources, the individual source modeling first relied on California Puff Model ("CALPUFF") and single-source CAMx.[199] The CALPUFF modeling resulted in 29 additional sources being screened out, and the single-source CAMx modeling resulted in six sources being screened out.[200] Texas further removed 22 sources from BART based on exemption requests relying on distance to Class I areas and levels of haze-producing emissions.[201] Based on the screening analysis and the exemption requests that were granted, Texas ultimately concluded that "no Texas sources remained subject to BART."[202]

Footnotes:
[188] 2009 Texas SIP Narrative at 9-1.
[189-190] Id.
[191] Id. at 9-3. The following sources that EPA proposes to regulate in this current proposal are BART-eligible and subject to BART controls: Big Brown, Sandow Unit 4, Martin Lake, and Monticello. The following sources are not: Limestone, San Miguel, Coleto Creek, and Tolk.
[192-195] Id.
[196] Id. at 9-6.
[197] Id.
[198] Id. at 9-6 to 9-8.
[199] Id. at 9-6, 9-13 to 9-15.
[200] Id. at 9-6, 9-14 to 9-15.
[201] Id. at 9-15 to 9-16.
[202] Id. at 9-17.

Response: We acknowledge the background information provided by the commenter. We take no position with respect to the commenter's synopsis.

Comment: EPA's treatment of BART-compliant sources in Texas is unprecedented and unlawful [Luminant (0061) p. 121]

Luminant stated that EPA's proposed additional emission limitations for BART-compliant sources in Texas under the guise of reasonable progress is unlawful and inconsistent with EPA's own proposed FIP. Many of the sources that EPA includes in its "small group" analysis (including all of the Luminant units) are BART-eligible and fully controlled under the BART provisions[755]—by inclusion in CAIR and now CSAPR—and thus are inappropriately targeted for additional controls in the first planning period. EPA's consistent and established practice is that "it is reasonable to conclude that any control requirements imposed in the BART determination also satisfy the RPG-related requirements for source review in the first RPG planning period."[756] Under EPA's own finding and precedent, Texas' decision not to further regulate these BART-complaint sources is reasonable and must be approved.

Luminant noted that EPA's proposal to target these BART-compliant sources in Texas is all the more arbitrary given EPA's proposed FIP that finds CSAPR's emission limits on these sources are ***better-than-BART***.[757] By definition, CSAPR "achieve[s] ***greater reasonable progress*** than would be achieved through the installation and operation of BART."[758] Thus, Texas' compliance with CSAPR amply demonstrates reasonable progress for these sources in the first planning period and fully justifies Texas' decision not to impose further controls on these units at this time. Indeed, until now, EPA has agreed with this standard. In reviewing other states' reasonable progress goals for the first planning period, EPA has repeatedly and systematically excluded sources that otherwise comply with the BART requirements, including complying through a regional trading program that is better-than-BART, from further emission controls in the first planning period without even conducting an "additional analysis" like it performs here for certain Texas sources.[759] In every instance Luminant located, EPA concluded that the CSAPR-is-better-than-BART program is all that is needed for these sources to make reasonable progress in the first planning period.[761] EPA gives no explanation of its failure to apply the same standard here to Texas' BART-compliant sources.

Luminant asserted that EPA's error is compounded by its failure to even include in its modeling and reasonable progress analysis the very emission reductions mandated by CSAPR that make these sources BART-compliant and that achieve reasonable progress. EPA has arbitrarily refused to include in its analysis the emission reductions and limitations that are imposed on these Texas sources by CSAPR, which became effective on January 1, 2015.[762] Thus, not only has EPA arbitrarily refused to exclude these BART-compliant sources from further analysis (as it has done for BART sources in other states), it has further arbitrarily refused to even consider the emission limitations that these sources must comply with under current regulatory programs.

Luminant noted EPA's own prior modeling of CSAPR clearly demonstrates that reasonable progress will be achieved at the three Class I areas of interest here, without any further controls beyond CSAPR's emission limits and other existing limitations. EPA's own prior modeling shows that the Wichita Mountains, Big Bend, and Guadalupe Mountains all meet the RPG for 2018 that EPA is proposing based on the implementation of CSAPR—even without the additional controls in this proposal. For its CSAPR-better-than-BART finding, EPA modeled the visibility in all Class I areas to determine the visibility (in deciviews) at each area in 2014 with the implementation of CSAPR and the application of BART in states not subject to CSAPR (including Oklahoma).[763] This included Big Bend, Guadalupe Mountains, and Wichita Mountains. EPA used the same model—CAMx—that it now uses to judge the Texas SIP. Table 9 shows the visibility at the three Class I areas of interest here that EPA modeled for 2014, assuming CSAPR emission budgets in Texas and other CSAPR states and BART controls in non-CSAPR states.

TABLE 9: EPA MODELED VISIBILITY AT THREE CLASS I AREAS WITH CSAPR IN PLACE

Class I Area	EPA Modeled Visibility Conditions with CSAPR in Place (2014) (20% Worst Days) [764]	EPA Proposed RPG (2018) (20% worst days)[765]
Big Bend	15.2 dv	16.57 dv
Guadalupe Mountains	14.7 dv	16.26 dv
Wichita Mountains	20.2 dv	21.33 dv

Thus, Luminant stated that based on EPA's own modeling (which was validated)[766] CSAPR will achieve greater progress than even EPA believes is reasonable for these three areas by 2018. Indeed, EPA's own prior modeling shows visibility at Big Bend and Guadalupe Mountains better than their respective URP, well before 2018. It was arbitrary for EPA to ignore this prior validated modeling, arbitrary for EPA to exclude CSAPR from its new modeling, and unlawful and unreasonable for EPA to conclude that Texas' compliance with CSAPR's better-then-BART emission limits does not satisfy the reasonable progress requirement for the first planning period.

Footnotes:
[755] According to EPA, the following sources that EPA proposes to regulate under reasonable progress are BART-eligible and subject to BART controls: Big Brown, Sandow, Martin Lake, Monticello. The following sources are not: Limestone, San Miguel, Coleto Creek, and Tolk.
[756] Reasonable Progress Guidance at 4-2 to 4-3; see also id. at 5-1 ("[T]he significant emissions reductions that we anticipate to result from BART, the CAIR, and the implementation of other CAA programs . . . may be all that is necessary to achieve reasonable progress in the first planning period for some States."). See also 77 Fed. Reg. 30,454, 30,460 (May 23, 2012) (explaining that a state's long-term strategy for the first planning period should include "BART and any additional controls for non-BART sources" (emphasis added)).
[757] 79 Fed. Reg. at 74,853; see also 77 Fed. Reg. 33,642, 33,648 (June 7, 2012).
[758] 40 C.F.R. § 51.308(e)(2) (emphasis added).
[759] Never, in its review of regional haze SIPs for the first planning period, has EPA imposed a FIP requiring additional "reasonable progress" controls on EGUs that relied on the implementation of CAIR/CSAPR to satisfy BART. See 77 Fed. Reg. 38,515 (June 28, 2012) (Alabama); 77 Fed. Reg. 38,501 (June 28, 2012) (Georgia); 77 Fed. Reg. 34,218 (June 11, 2012) (Indiana); 77 Fed. Reg. 38,006 (June 26, 2012) (Iowa); 77 Fed. Reg. 19,098 (Mar. 30, 2012) (Kentucky); 77 Fed. Reg. 71,533 (Dec. 3, 2012) (Michigan); 77 Fed. Reg. 38,007 (June 26, 2012) (Missouri); 77 Fed. Reg. 38,185 (June 27, 2012) (North Carolina); 77 Fed. Reg. 39,177 (July 2, 2012) (Ohio); 79 Fed. Reg. 24,340 (Apr. 30, 2014) (Pennsylvania); 77 Fed. Reg. 38,509 (June 28, 2012) (South Carolina); 77 Fed. Reg. 24,392 (Apr. 24, 2012) (Tennessee); 77 Fed. Reg. 35,287 (June 13, 2012) (Virginia); 77 Fed. Reg. 16,937 (Mar. 23, 2012) (West Virginia).
[760] Id.
[761] Id.
[762] FIP TSD at A-45.
[763] BART Alternative TSD at 25–30, tbl.3-3.
[764] Id. at tbl. 3-3.
[765] 79 Fed. Reg. at 74,887, tbl 43.
[766] See BART Alternative TSD at 9.

Response: Although EPA proposed to rely on CSAPR to address the BART requirements for EGUs in Texas, it is not finalizing that proposed action. On July 28, 2015, the D.C. Circuit

Court's issued its decision in *EME Homer City Generation v. EPA*, 795 F.3d 118 (D.C. Cir 2015), upholding CSAPR but remanding without vacating a number of the Rule's state emissions budgets. Specifically, the court invalidated a number of the Phase 2[103] ozone season NO_X budgets and found that the SO_2 budgets as to four states resulted in overcontrol for purposes of section 110(a)(2)(D). Texas' ozone season NO_X budget and its SO_2 budget are both implicated in this remand. EPA is in the process of acting on the Court's remand. As a result, at this time we cannot ensure that CSAPR will continue to be an appropriate alternative to BART for Texas EGUs. As a result, the comments that the emission limitations under reasonable progress should not be required for EGUs that are already compliant with BART is no longer applicable.

Even assuming, however, that *EME Homer City* had not invalidated the CSAPR NO_X and SO_2 budgets for Texas and that EPA were taking final action to address the BART requirements through reliance on CSAPR, we do not agree that EPA has been inconsistent in its treatment of Texas as compared to other states. As explained in our proposed rulemaking, allowing Texas to rely on CSAPR to meet its reasonable progress obligations is not appropriate, and the fact that other states did not require additional reasonable progress controls beyond CAIR (or CSAPR) does not automatically mean all states should not require any additional controls. Such a simplistic comparison ignores the meaningful differences between Texas and the states cited. These include the significant impacts that sources in Texas have on the visibility at the Wichita Mountains in Oklahoma, the quality of the Texas technical evaluation, and the quality of the consultations between Texas and Oklahoma. We address comments concerning other states' reasonable progress goals for the first planning period more fully elsewhere in this document.

We note that the modeling that was performed for the CSAPR Better-than BART demonstration was developed for the final CSARPR notice and did not include the supplemental adjusted budgets for Texas. Consistent with the requirements for determining whether a BART alternative provides for better reasonable progress than BART, the CSAPR Better-than-BART demonstration was focused on assessing the improvements in visibility ***on average across all Class I areas*** compared to BART level controls. We note that this modeling projection was based on different baseline conditions and emissions than the CENRAP modeling. The sensitivity analysis[104] performed that supported the CSAPR Better-than-BART rule demonstrated that the CSAPR budgets including the supplemental budget adjustment in Texas still were Better–than-BART but visibility at Class I areas impacted the most by Texas EGU emissions are not expected to achieve the same amount of visibility benefit as modeling based on the CSAPR budgets prior to the adjustments. The sensitivity analysis relied on a conservative assumption that visibility at the Class I areas nearest Texas saw no visibility benefits due to CSAPR reductions. Further, as discussed above, these budgets have been invalidated because they "required Texas to reduce emissions by more than the amount necessary to achieve attainment in every downwind State to which it is linked."[105]

[103] CSAPR's effective date was stayed by the D.C. Circuit during a portion of the litigation over the rule. Thus, the Rule's Phase 1 effective date of January 1, 2012 was delayed until January 1, 2015, and the Rule's Phase 2 effective date of January 1, 2014 was delayed until January 1, 2017.
[104] See Appendix C of the Technical Support Document for Demonstration of the Transport Rule as a BART Alternative. Available at http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OAR-2011-0729-0014
[105] *EME Homer City*, 795 F.3d at 129.

Comment: [Associations (0059) p. 16] The Associations stated that the EPA's individual source-based approach unlawfully creates inconsistent treatment of sources by subjecting them to different standards under BART and reasonable progress SIPs. Several of the sources that EPA evaluates and targets for additional emission controls are BART-eligible sources. Because Texas is currently subject to CSAPR, BART-eligible sources can be controlled through Texas' implementation of that rule because EPA has concluded that CSAPR's emission limits on those sources are more stringent than BART. 77 Fed. Reg. 33,642, 33,648 (June 7, 2012). Further, by definition, CSAPR "will achieve greater reasonable progress than would have resulted from the installation and operation of BART." 40 C.F.R. § 51.3108(e)(2). As a result, Texas' compliance with CSAPR should be sufficient to meet reasonable progress goals with respect to BART-eligible sources. EPA's proposal to require separate and additional controls for BART-eligible sources on a source-by-source basis is fundamentally incompatible with EPA's BART and CSAPR regulations and further underscores the fact that reasonable progress goals should not be developed in an individual source-specific manner.

Response: See our responses to other comments concerning our proposed control of sources that are also BART eligible.

Comment: Although there should be no need to promulgate a CSAPR=BART FIP – Because EPA had no sound basis for disapproving Texas' CAIR=BART SIP in 2012 – Reliance on CSAPR=BART in Texas is appropriate at this time given that CSAPR is now in effect. [UARG (0065) p. 30-32]

UARG noted that EPA in a separate rulemaking promulgated limited disapprovals of the regional haze SIPs of 14 states, including that of Texas, on the grounds that those SIPs – consistent with EPA's rules (specifically, 40 C.F.R. § 51.308(e)(4) as in effect at that time and as affirmed by the U.S. Court of Appeals for the District of Columbia Circuit in *Utility Air Regulatory Group v. EPA*, 471 F.3d 1333 (D.C. Cir. 2006)) – relied on those states' participation in CAIR to satisfy BART requirements with respect to EGUs' SO_2 and NO_x emissions. *See* 79 Fed. Reg. at 74,821. After Texas and other states submitted their "CAIR=BART" SIPs, EPA promulgated CSAPR to replace CAIR. 76 Fed. Reg. 48,208 (Aug. 8, 2011). EPA reasoned that because CAIR would no longer be in effect upon CSAPR's implementation, it was necessary to disapprove SIPs that had lawfully relied on CAIR and to promulgate FIPs replacing reliance on CAIR with reliance on CSAPR for states that were subject to both CAIR and CSAPR. *See* 77 Fed. Reg. 33,642, 33,643 (June 7, 2012). In the same June 7, 2012 rule in which EPA promulgated the limited SIP disapprovals, EPA also promulgated so-called "CSAPR=BART" FIPs for several states, but not for Texas. *Id.* at 33,643, 33,654. In the present rulemaking, EPA proposes a CSAPR=BART FIP for Texas to replace Texas' reliance on CAIR with reliance on CSAPR. 79 Fed. Reg. at 74,823, 74,844, 74,853-54, 74,888.

For the reasons described in UARG's comments on the proposed version of EPA's 2012 rule promulgating the limited disapprovals of the regional haze SIPs of Texas and other states,[7] UARG asserted that the EPA had no authority and no sound reason to promulgate limited disapprovals of SIPs that relied on CAIR to satisfy BART. At the same time, UARG recognizes that the June 2012 rule in which EPA promulgated its limited SIP disapproval actions is not directly at issue in the present rulemaking and is the subject of pending petitions for judicial review in the D.C. Circuit. UARG also recognizes that because CSAPR is currently in effect, reliance on participation in CSAPR to satisfy BART requirements for EGUs' SO_2 and NO_x emissions is appropriate pursuant to 40 C.F.R. § 51.308(e)(4) as revised.[8]

Footnotes:
[7] Comments of the Utility Air Regulatory Group on EPA's Proposed Rule: Regional Haze: Revisions to Provisions Governing Alternatives to Source-Specific Best Available Retrofit Technology (BART) Determinations, Limited SIP Disapprovals, and Federal Implementation Plans (Feb. 28, 2012), Doc. ID No. EPA-HQ-OAR-2011-0729-0298 ("UARG 2012 Comments").
[8] In addition, in light of EPA's determination that "the overall EGU emission reductions from CSAPR are larger than the EGU emission reductions that would have been achieved by CAIR," EPA was correct in its conclusion that it should not, and could not, "disapprove the reasonable progress goals in any of the regional haze SIPs for their reliance on CAIR, including those for Texas." 79 Fed. Reg. at 74,853.

Response: We acknowledge the background information provided by the commenter. We take no position with respect to the commenter's synopsis. To the extent that the commenter comments on our limited disapproval of SIPs that relied on CAIR, that comment is outside the scope of today's rulemaking. We agree with the commenter that we previously concluded not to disapprove the reasonable progress goals in any of the regional haze SIPs for their reliance on CAIR, including those for Texas.79 FR at 74851. As discussed in an earlier response in this section, we are not finalizing our proposed action on EGU BART for Texas at this time. We will address the question of appropriate SO_2 and NO_X BART limits for EGUS in Texas in a future rulemaking once EPA has determined how best to respond to the remand of some of the CSAPR state budgets. We note that a few of the sources for which we are finalizing SO_2 controls as part of the Texas long-term strategy are also BART-eligible. Should we determine in the future that it is necessary to perform source-specific BART determinations for these sources instead of relying on CSAPR, we anticipate that the SO_2 controls we are finalizing today, which are currently the most stringent available, will also be sufficient to satisfy the BART requirement.

Comment: [Xcel Energy (0064) p. 10] First, EPA claims that the CAIR program could not be used to demonstrate the RPGs because CAIR would not require emissions reductions to be achieved within Texas. But Texas is not relying on CAIR to meet reasonable progress goals or relying on either CAIR, or its successor rule, the Cross-State Air Pollution Rule ("CSAPR"), in lieu of meeting the RPGs. Rather, Texas simply used the indicative cost level of $2,700 from CAIR as a basis for deciding not to include some sources under its Regional Haze SIP. Using $2,700 as a basis for deciding not to require controls for some sources in regional haze requirements is not the same as allowing sources to avoid regional haze requirements by importing allowances. Further, EPA's concern about Texas importing unlimited allowances so as to avoid reducing emissions is not valid here because CSAPR, which replaced CAIR, limits the use of out-of-state allowances that can be used for compliance, and EPA has expressly allowed other states to rely on CSAPR to meet RPGs. *See* Proposed Michigan SIP Approval, 77 Fed. Reg. 46,912, 46,919 (Aug. 6, 2012) (the regional planning organization's "analysis shows emission reductions equivalent to the scale of CAIR are needed to meet reasonable progress goals. . . . EPA believes that with CSAPR providing the reductions that Michigan expects to obtain from CAIR, Michigan's long-term strategy can in fact be expected to achieve the state-adopted reasonable progress goals that Michigan established."). The fact that it is impossible to meet the RPGs in Texas does not make it less legitimate to rely on the cost thresholds used in CAIR for identifying reasonable controls.

Xcel Energy stated that despite EPA's action in Michigan, in this Proposal, EPA arbitrarily argues that CAIR could be used "in lieu of BART" but not used in the RPG context. While BART and RPGs are distinctive components of a regional haze strategy, EPA provides no reasoned basis for allowing consideration of CAIR in the BART context and rejecting it in the RPG context. 3 That EPA would allow CAIR or CSAPR to substitute for BART, which is a unit-specific standard with unit-specific performance criteria, but not for demonstrating reasonable progress, which is a state-wide, multi-source program aimed at reducing the pollutants of concern for regional haze, is illogical, as well as arbitrary and capricious. In fact, EPA has done the exact opposite in other RPG determinations and re-affirmed States' reliance on BART-equivalent analyses. For example, as stated in its proposed approval of the Georgia SIP, "EPA believes it is reasonable to conclude that any control requirements imposed in the BART determination also satisfy the RPG related requirements for source review in the first implementation period." *See* Proposed Georgia SIP Approval, 77 Fed. Reg. 11,452, 11,469 (Feb. 27, 2012); *see also* Final Georgia SIP Approval, 77 Fed. Reg. 38,501 (Jun. 28, 2012). In North Dakota, EPA specifically rejected modeling for RPGs that was not conducted in the same way as BART on the basis that the "ultimate goal is the same." Proposed North Dakota SIP Approval/Disapproval, 76 Fed. Reg. at 58,629 n. 85; *see also* Final North Dakota SIP Approval/Disapproval, 77 Fed. Reg. at 20,906-07.

Commenter's References:
[3] It does not make sense to disregard CAIR or CSAPR in the context of RPGs, because all electric generating units in the state are subject to their emission limitations, while only some electric generating units are subject to BART.

Response: Xcel raises concerns that we have allowed other states to rely on CSAPR to meet RPGs, citing to EPA's action on Michigan. As discussed elsewhere, Michigan had less than a 5% impact on visibility in downwind states. With respect to its own Class I areas, Michigan assessed the contribution of three Midwestern states together and concluded that the 47% reduction in SO_2 emissions was sufficient for reasonable progress. A number of non-EGUs also have significant impacts on visibility in Michigan's Class I areas and BART determinations (by the State and by EPA) require additional reductions from these sources. More generally, with respect to Xcel's comment that EPA provides no reasoned basis for rejecting consideration of CAIR in the reasonable progress context, we disagree that this is what we proposed to do in Texas. In our proposal we took into account the impact of CSPAR/CAIR on emissions in Texas, but determined that participation in this program would not ensure reasonable progress at the Wichita Mountains, Big Bend, and the Guadalupe Mountains. It is important to remember that the test for determining whether a BART alternative provides for greater reasonable progress than BART is based on improvements in visibility ***on average across all Class I areas***. We noted in 2005 that the determination that CAIR provided for greater reasonable progress than BART did not answer the question of whether more than CAIR would be required in a regional haze SIP:

Our determination that CAIR makes greater reasonable progress than BART for EGUs is not a determination that CAIR satisfies all reasonable progress requirements in CAIR affected States. Each State, whether in the CAIR region or not, is required to set reasonable progress goals for each Class I area within the State as required in regional haze rule section 308(d)(1), and to develop long term strategies, considering all anthropogenic sources of visibility impairing pollutants, as required by section 308(d)(3). In setting the reasonable progress goals, the State is to consider the amount of visibility improvement needed to achieve a uniform rate of progress towards natural background conditions in the year 2064. (This uniform rate of progress is sometimes referred to as the default glide-path). The State is also to consider the statutory reasonable progress factors contained in CAA section 169A(g)(1).85 In doing so, we anticipate that States will take into account the degree to which CAIR emissions reductions are projected to bring visibility conditions at its Class I areas in line with the default glide path. In some States, the improvements expected from CAIR, combined with the application of the reasonable progress factors to other source sectors, may result in a determination that few additional emissions reductions are reasonable for the first long-term strategy period. Nonetheless, each State is required to set its reasonable progress goals as provided by the regional haze rule and cannot assume that CAIR will satisfy all of its visibility-related obligations. 70 FR 39104, 39143 (July 6, 2005). This is consistent with our statement regarding the Georgia SIP cited by the commenter, where we noted that any ***control requirements*** imposed as BART would also satisfy reasonable progress. EPA's determination that CSPAR would provide for greater reasonable progress than BART did not result in the imposition of any control requirements imposed as BART.

Our response concerning Texas' use of the cost level of $2,700 from CAIR as a basis for deciding not to include some sources under its Regional Haze SIP is discussed more fully in consistency section of this document.

10. Installation of Controls Beyond the First Planning Period

Comment: [NERA (0061) p. 6]

In the report prepared for Luminant, NERA also considered the Cost-effective ness of the proposed scrubber retrofits. Those retrofits cannot be considered for reasonable progress because, as EPA admits, they cannot be installed by the end of the first planning period (2018).[12] However, even if these controls could be installed by 2018, they would only degrade the economic Cost-effective ness of EPA's proposed FIP.

Footnotes:
[12] 79 Fed. Reg. at 74,874.

Response:
The FIP imposes cost effective controls as an overall matter. We do not agree with the implied, artificial differentiation suggested by the comment, because "even if these controls could be installed by 2018," they would in fact still be deemed cost effective. The FIP accommodates a reasonable construction timeframe by allowing that emission limitations would be met after 2018, and they in fact are considered for reasonable progress as part of the long-term strategy,

which differs from whether they warrant inclusion in the numerical reasonable progress goals. Thus, the comment is not accurate in stating what "EPA admits" and the point about "degrad[ing]" cost-effectiveness has no identifiable bearing on the content of the final rule.

Comment: EPA's proposal exceeds its regulatory authority. [Luminant (0061) p. 4]

Luminant argued that the EPA has no legal authority to require the installation of scrubbers at Luminant's units in 2020 as part of its proposed FIP. Per EPA's regulations, the Texas SIP submission at issue—which was submitted by the Texas Commission on Environmental Quality ("TCEQ") to EPA in 2009—covers only the first regional haze planning period (2008-2018) and addresses emission reductions needed to meet the 2018 interim goal. EPA concedes that the scrubbers it is proposing would take at least five years to construct and thus cannot be operational by 2018.[15] EPA's proposal thus clearly runs afoul of the statutory factors for reasonable progress—which require consideration of "the time necessary for compliance" [16]—and exceeds EPA's FIP authority, which is only to fill the gaps in a SIP, not to add regulation outside the required scope of the SIP submission.[17] Whether these units must install controls to meet subsequent goals for later years is a matter fundamentally to be decided by Texas in the second planning period, not by EPA in the current period.

Footnotes:
[15] EPA, Technical Support Document for the Oklahoma and Texas Regional Haze Federal Implementation Plan (FIP TSD) 7 (Nov. 2014) ("FIP TSD").
[16] 42 U.S.C. § 7491(g)(1)
[17] Id. § 7602(y).

Response:
We disagree with the comment. The disapproval of the SIP submission authorizes and mandates that we take action to promulgate a FIP. See CAA Section 110(c). When we act under FIP authority we act in the place of the State, including by imposition of enforceable emission limitations, to ensure that CAA requirements are met and to ensure the inadequacy of the SIP is addressed. See CAA Section 302(y). As a practical matter, the enforceable emission limitations or control measures required by a FIP may not be implemented and put into effect at the earliest time directed by Clean Air Act. The timely installation of controls is ideal and would prove workable had such controls been required under an approvable SIP, but this fact does not excuse overdue controls from being installed and operated. Even as we note there is no prohibition against early compliance for sources that would meet the FIP requirements, we also anticipate the construction timeframes that are reasonably necessary for new controls. Thus, our FIP does properly take account of the "time necessary for compliance." The comment suggests that consideration of this statutory factor should exempt controls or that it necessitates special coordination with TCEQ's next obligation to submit a comprehensive periodic SIP revision for regional haze; however, we have determined that our specified FIP controls are required by the CAA for the current regional haze implementation period. These are due, if not overdue, emission limitations that should be met as soon as reasonable construction timeframes would allow. With the promulgation of enforceable emission limitations in the FIP, the TCEQ will have no difficulty in crediting these FIP controlled sources for purposes of studying what additional controls can and should be required in the next planning period. In other words, the

FIP is no obstacle to Texas planning and requirements that will be appropriate for the second regional haze planning period.

Comment: EPA has no authority to require emission controls in 2020 for the interim 2018 reasonable progress goal [Luminant (0061) p. 144]

Luminant stated that EPA steps well outside its authority in attempting to require the installation of new scrubbers at seven Texas EGUs in 2020. The time period at issue in Texas' submittal, and thus the scope of EPA's review and authority, is limited to the first regional haze planning period—2008 to 2018.[879] As EPA has explained: "The RHR [regional haze rule] requires control strategies to cover an initial implementation period extending to the year 2018, with a comprehensive reassessment and revision of those strategies, as appropriate, every 10 years thereafter."[880]

Thus, Luminant stated that the only relevant question in this submittal is whether Texas' SIP will achieve interim goals for reasonable progress in 2018—what happens in 2020 is irrelevant for present purposes. Indeed, the "time necessary for compliance" is one of the factors to be considered in establishing reasonable progress.[881] And EPA concedes, as it must, that "typical SO_2 scrubber installations can take up to five years to plan, construct and bring to operational readiness."[882] And EPA further concedes that it "cannot assume that the SO_2 controls we are proposing will be installed and operational within this planning period, which ends in 2018."[883]

Luminant noted, accordingly, EPA correctly does not take into account any emission reductions from the scrubber installations it is proposing to require in setting the reasonable progress goals for its proposed FIP.[884] But EPA errs and steps outside of its authority when it nevertheless asserts the authority to impose the reductions in 2020. EPA's regional haze guidance explains that time constraints which "preclude the installation of controls . . . by 2018" "should be considered in setting the RPG ***and in establishing the SIP requirements to meet the RPG***."[885] And EPA has further explained that "[i]n setting the RPGs, states must also consider the rate of progress needed to reach natural visibility conditions by 2064 (referred to hereafter as the 'Uniform Rate of Progress (URP)') ***and the emission reduction measures needed to achieve that rate of progress over the 10-year period of the SIP***."[886] This limitation extends to the contents of a long-term strategy for regional haze as well: "The LTS [long-term strategy] is the compilation of all control measures a state will use during the implementation period of the specific SIP submittal to meet applicable RPGs."[887] In no prior regional haze action that we have found has EPA ever finalized a FIP for the first regional haze planning period that required reasonable progress controls after 2018.[888] It may not lawfully do so here.

Luminant stated that EPA "is a creature of statute" and thus "has no constitutional or common law existence or authority, but only those authorities conferred upon it by Congress."[889] If EPA lacks authority under the CAA to promulgate a rule, "its action is plainly contrary to law and cannot stand."[890] Here, EPA's proposal to require scrubbers in 2020 contravenes the statute in at least two respects. First, it disregards the "time necessary for compliance" statutory factor in 42 U.S.C. § 7491(g)(1). EPA concedes that these controls cannot be installed and operational within this SIP period, and thus this factor dictates that consideration of the controls be deferred until the next planning period. That EPA's delay in reviewing Texas' SIP revision is the reason for this fact does not make EPA's proposal lawful. EPA had Texas' full and complete submission in early 2009 and thus could have completed its review in a timely manner. Second, EPA's proposal asserts FIP authority beyond the scope of the required SIP submission. EPA's authority to issue a FIP under 42 U.S.C. § 7410(c) is limited to filling the gap left in the SIP by virtue of its disapproval.[891] Indeed, the Clean Air Act delineates the scope of a FIP as "a plan (or portion thereof) promulgated by the Administrator to fill all or a portion of a gap or otherwise correct all or a portion of an inadequacy in a State implementation plan . . . ."[892] There is no gap in the Texas regional haze SIP that requires emission controls in 2020, nor do such controls address any "inadequacy" in Texas' submission for the first planning period. The required scope of the state's submission extended only to 2018, and achieving reasonable progress in 2018, and thus EPA's FIP authority extends no further.[893] The need for any emission controls in 2020, if any, is properly considered only in the second planning period, for which SIPs are not due until July 31, 2018.

Footnotes:
[879] Id. at 74,818.
[880] 77 Fed. Reg. at 30,252 (EPA proposed approval of Idaho reasonable progress goals and long-term strategy) 77 Fed. Reg. 30,454, 30,458 (May 23, 2012) (EPA proposed approval of Oregon reasonable progress goals and long-term strategy).
[881] 42 U.S.C. § 7491(g)(1); 40 C.F.R. § 51.308(d)(1)(i)(A).
[882] FIP TSD at 7.
[883] Id.
[884] 79 Fed. Reg. at 74,886.
[885] Reasonable Progress Guidance at 5-2.
[886] 76 Fed. Reg. 16,168, 16,173 (Mar. 22, 2011) (proposed approval of Oklahoma URP) (emphasis added).
[887] 77 Fed. Reg. at 30,251 (emphasis added).
[888] See 77 Fed. Reg. 20,894, 20,944 (Apr. 6, 2012) (compliance deadline of July 31, 2018 for Antelope Valley Station Units 1 and 2); 77 Fed. Reg. 57,864, 57,916 (Sept. 18, 2012) (compliance deadline of July 31, 2018 for the Blaine County Compressor Station); 79 Fed. Reg. 52,420, 52426 (Sept. 3, 2014) (compliance deadline of December 31, 2018 for Phoenix Cement Clarkdale Plant Kiln 4 and CalPortland Cement Rillito Plant Kiln 4).
[889] Michigan v. EPA, 268 F.3d 1075, 1081 (D.C. Cir. 2001).
[890] Id.
[891] See Arizona v. EPA, 151 F.3d 1205, 1212 (9th Cir. 1998) (A FIP is "specifically meant to fill in the gaps where a State has failed to submit an SIP or where the State's SIP does not satisfy minimum criteria under the CAA.").
[892] 42 U.S.C. § 7602(y).
[893] See 64 Fed. Reg. at 35,734 ("[T]he final rule requires control strategies to cover an initial implementation period extending to the year 2018, with a reassessment and revision of those strategies, as appropriate, every 10 years.").

Response: We understand the comment to argue that our authority to issue a FIP under 42 U.S.C. 7410(c) is limited to "filling the gap left in the SIP," and, by proposing requirements outside of the scope of Texas' SIP submission, we are exceeding that authority. 42 U.S.C. § 7410(c) mandates that we promulgate a FIP within two years after the Agency disapproves a SIP in whole or in part. The "gap" language to which Commenter refers is located at 42 U.S.C. § 7602(y), which defines FIP as "a plan (or portion thereof) promulgated by the Administrator to fill all or a portion of a gap or otherwise correct all or a portion of an inadequacy in a [SIP.]" We discern the comment to be claiming one of two things: (1) Our FIP authority is limited by the scope of the SIP submission, or, (2) since the required RPGs are limited to the first planning period, our FIP authority is likewise limited to the first planning period. We disagree with both possible claims. The Clean Air Act clearly establishes our authority to promulgate a FIP that addresses the requirements of the Regional Haze program where a State's SIP submission fails to meet the program requirements, including circumstances where the Long Term Strategy necessitates controls that cannot be installed during the planning period.

We disagree with any assertion that our FIP authority is limited by the scope of the SIP submission we could not approve. "Gap" or "inadequacy" refers not to a "gap" in the plan *as submitted* but to a "gap" in the plan that fails to address the Regional Haze program requirements contained in the statute and regulations. Where a SIP submission fails to address a major component of the program (such as the establishment of RPGs), we are required to disapprove the SIP to promulgate a FIP that does address that necessary component. A disapproved SIP's exclusion of sources from regulation or air pollution controls does not limit or exclude those sources from controls under a FIP. Any argument to the contrary misapprehends the structure of the CAA and the purposes and historic uses of FIP authority.

If Commenter's "gap" argument means to assert that the authority to impose FIP controls is limited, in a temporal sense, by the requirement to set RPGs for the planning period, we also disagree with the comment. It contravenes both the plain language of the statute and regulations as well as the common understanding of the Regional Haze program. The Regional Haze program includes three general components: "measures necessary to make progress toward meeting the national goal," a long-term strategy, and BART.[106] In issuing regulations related to the first component, we require a SIP to include "reasonable progress goals."[107] In our guidance on setting RPGs, we provided a definition of RPGs, explaining that RPGs are "interim goals that represent incremental visibility improvement over time toward the goal of natural background conditions [… .]"[108] The first planning period, ending in 2018, includes RPGs specific to that planning period; however, as discussed below, there is no such limitation to the first planning period for provisions in the long-term strategy and BART requirements. As two of the three major components of the Regional Haze program may extend beyond the first planning period, it follows that EPA has FIP authority fill in "gaps" or "inadequacies" related to those components irrespective of whether they are required during the first planning period or later.

We also disagree with comment's assertion that our proposed FIP disregards the "time necessary for compliance" factor contained in 42 U.S.C. 7491(g)(1). The requirements for a long-term strategy are not limited to the first planning period.

Congress declared that the "national goal" of the Regional Haze program is "the prevention of any future, and the remedying of any existing, impairment of visibility in mandatory Class I Federal areas which impairment results from man-made air pollution."[109] To meet this goal, Congress ordered us to issue regulations requiring States to implement SIPs "to contain such emission, limits, schedules of compliance and other measures as may be necessary to make reasonable progress toward meeting the national goal[,]" and the SIPs must include, among other

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[106] 79 Fed. Reg. 74818, 74824.
[107] 40 C.F.R. 51.308(d)(1).
[108] OAQPS, EPA, Guidance for Setting Reasonable Progress Goals Under the Regional Haze Program (June 1, 2007), 1–2.
[109] 42 U.S.C. § 7491(a)(1).

requirements, "a long-term (ten to fifteen years) strategy for making reasonable progress toward meeting the national goal[.]"[110] Congress stated that "in determining reasonable progress there shall be taken into account […] the time necessary for compliance[.]"[111] Thus, the Clean Air Act does not restrain EPA from requiring sources to install controls outside of the initial planning period in the long-term strategy, but rather, it requires us to consider the time necessary for compliance when determining what constitutes "reasonable progress" toward the national goal.[112]

We issued regulations including, in addition to BART requirements, four "core requirements" including reasonable progress goals, calculations of baseline and natural visibility conditions, a long-term strategy and a monitoring strategy and other implementation plan requirements.[113] As part of these SIP requirements, a State must "consider […] the time necessary for compliance" when establishing RPGs.[114] The long-term strategy component "must include enforceable emission limitations, compliance schedules, and other measures necessary to achieve the [RPGs]" however, this "must include" language does not limit the long-term strategy to only those measures to achieve RPGs.[115] Rather, it mandates inclusion of certain requirements to meet the RPGs without limiting planning authority to include other requirements to meet the national goal. Thus, there is no explicit statutory or regulatory requirement to limit control options to the first planning period, and further, EPA's long-standing interpretation of the Clean Air Act and its regulations explicitly provide for the type of post-planning period controls to which Commenter objects.

In issuing the Regional Haze rule and consistent with 42 U.S.C. 7491(b)(2)(B), we interpreted "long-term strategy" as the "control measures that are needed to ensure reasonable progress, together with a demonstration that those measures will provide for reasonable progress during the 10 to 15 year period."[116] Again, the reference to "reasonable progress," as opposed to RPG, refers to the national goal, and as noted above, the regulation provides for flexibility to achieve the national goal. In issuing its guidance on RPGs, the very situation to which Commenter objects is laid clear:

> The second factor is the "time necessary for compliance." It may be appropriate for you to use this factor to *adjust the RPG* to reflect the degree of improvement in visibility achievable within the period of the first SIP ***if the time need for full implementation of a control measure (or measures) will extend beyond 2018***. For example, if you anticipate that constraints on the availability of construction labor will preclude the installation of controls at all sources of a particular category by 2018, the visibility improvement anticipated from installation of controls at the percentage of sources that *could* be controlled within the strategy

[110] *Id. at* 7491(b)(2).
[111] *Id. at* 7491(g)(1).
[112] While the CAA does provide the statutory factors, including "time necessary for compliance," we note that it does not delineate 10 year planning periods. These are specified by the RHR.
[113] 40 C.F.R. § 51.308(d).
[114] *Id. at* 51.308(d)(1).
[115] *Id. at* 51.308(d)(3).
[116] 64 Fed. Reg. 35714, 35734.

> period should be considered in setting the RPG and in establishing the SIP requirements to meet the RPG.[117] (emphasis added)

Accordingly, we are required only to "*consider* […] time necessary for compliance" when establishing RPGs setting requirements to *meet the RPGs*, and the proposed FIP accords with our guidance.[118] By noting that scrubber retrofits may take up to five years to install, yet also noting that scrubber upgrades may be installed within three years, we proposed RPGs that only account for the visibility benefits associated with scrubber upgrades.[119] In doing so, we considered the time necessary for compliance in establishing RPGs, yet exercised our authority to propose a long-term plan including emission limits that likely require controls that may not be operational during the planning period.

We also note that, due to sequencing of the SIP process, including submission, review, revisions, re-review, and FIP preparation, public notice and promulgation, the CAA anticipates a substantial period of time between SIP submission and the promulgation of a FIP, as may ultimately be essential for carrying out CAA requirements. Those sources that should be subject to new controls under the CAA may take certain advantages from delays in having those control requirements imposed, but they do not have the benefit of an exclusion from CAA requirements. Instead, any emission limitations that prove to be required by the CAA for the first planning period need to be achieved at their soonest opportunity, not delayed, deferred or avoided for later planning periods at those times when other sources should be the focus of potential additional controls. Accordingly, we do not think the comment takes proper account of the time engagement required to promulgate a FIP within a planning period (if a FIP proves needed) or the significance of the CAA's contemplated ten- to fifteen-year long-term strategy, which could not be included in a FIP absent some degree of flexibility to extend FIP requirements beyond the date set for the end of the first planning period.[120]

Finally, we note that we have proposed controls outside of the planning period in other FIPs, including our proposed FIP for Arkansas and the FIP for Wyoming. Additionally, the Oklahoma FIP was stayed during litigation, resulting in a revised compliance date beyond 2018.

Comment: EPA lacks authority to include emission controls that cannot be implemented during the regional haze planning period. [Associations (0059) p. 19-20]

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[117] OAQPS, EPA, Guidance for Setting Reasonable Progress Goals Under the Regional Haze Program (June 1, 2007), 5–2.

[118] 40 C.F.R. § 51.308(d)(1)(A).

[119] 79 Fed. Reg. 74818, 74874.

[120] Additionally, the State's responsibility for its SIP, or EPA's authority when needing to promulgate a FIP, is not shown to be discontinuous or intermittent because of the requirement to conduct comprehensive periodic plan revisions. Instead, there is ongoing authority to ensure reasonable progress from sources within the State. As demonstrated by the progress report requirements of the RHR, the regional haze program expressly contemplates that a State may determine the need for "further revision of the existing implementation plan" because the existing plan "is or may be inadequate"; in such situations, the rule sets out, deficiencies are to be addressed promptly ("within one year"), not deferred to the next comprehensive periodic plan revision, as the comment thinks to be necessary. See 40 CFR 51.308(h).

The Associations argued that the proposed FIP exceeds EPA's legal authority under the regional haze program because it would require individual sources to install new emission control devices in 2020, after the 10-year regional haze planning period has concluded. Under EPA's regional haze rule, States must prepare SIPs that adopt control strategies over an initial implementation period from 2008 to 2018 and must then conduct "a comprehensive reassessment and revision of those strategies, as appropriate, every 10 years thereafter." 77 Fed. Reg. at 30,252. EPA recognizes the limited scope of the SIP in the preamble, noting that the proposal "addresses regional haze for the first planning period from 2008 through 2018." 79 Fed. Reg. at 74,818.

According to the Associations, focusing exclusively on emissions controls that can be implemented during the interim 2008 to 2018 planning period is consistent with both the reasonable progress goals and long-term strategy components of the States' regional haze plans. For example, EPA guidance directs States to focus on emissions controls at sources that "could be controlled within the strategy period" when "setting the RPG and … establishing the SIP requirements to meet the RPG." EPA, *Guidance for Setting Reasonable Progress Goals Under the Regional Haze Program* 5-2 (June 1, 2007). In evaluating SIPs submitted by other States, EPA has further explained that "[i]n setting the RPGs, states must also consider the rate of progress needed to reach natural visibility conditions by 2064 … and the emissions reduction measures needed to achieve that rate of progress *over the 10-year period of the SIP*." 76 Fed. Reg. 16,168, 16173 (Mar. 22, 2011) (proposed approval of Oklahoma Uniform Rate of Progress) (emphasis added). Likewise, EPA has previously explained that "[t]he [long-term strategy] is the compilation of all control measures a state will use *during the implementation period of the specific SIP submittal* to meet applicable RPGs." 77 Fed. Reg. at 30,251 (emphasis added).

Despite recognizing these limits on the scope of SIPs under the interim planning period, the Associations noted that the EPA proposes a FIP that would require emission controls that cannot be implemented until at least 2020. *See* FIP TSD at 7 (acknowledging that "typical SO_2 scrubbers take up to five years to plan, construct, and bring to operational readiness"). In fact, EPA acknowledges that it "cannot assume that the SO_2 controls we are proposing will be installed and operational within this planning period, which ends in 2018." *Id.* In this respect EPA's proposal is inconsistent with past regional haze actions, where EPA has consistently limited the scope of FIPs to control measures that can be implemented during the interim planning period. *See, e.g.*, 77 Fed. Reg. 20,894, 20,944 (Apr. 6, 2012) (applying a July 31, 2018, compliance deadline in North Dakota FIP); 77 Fed. Reg. 57,864, 57,916 (Sept. 18, 2012) (applying a July 31, 2018, compliance deadline in Montana FIP); 79 Fed. Reg. 52,420, 52,426 (Sept. 3, 2014) (applying a December 31, 2018, compliance deadline in Arizona FIP).

The Associations stated that the EPA's proposal to require installation of emission controls in 2020 exceeds EPA's authority under the Clean Air Act and is, therefore, unlawful for at least two independent reasons. First, EPA's proposed FIP ignores the statutory mandate to consider the "time necessary for compliance" as a factor in determining reasonable progress. 42 U.S.C. § 7491(g)(1). Because the time necessary for compliance will extend into the next planning period, beginning in 2018, EPA is obligated by statute to defer consideration of such emission controls until the next planning period. Further, by proposing emission controls that cannot be implemented until 2020, EPA's proposed FIP would unlawfully extend beyond the scope of

Texas' required SIP submission. Under the Clean Air Act, the scope of EPA's FIP authority is limited to preparing "a plan (or portion thereof)" that "fill[s] all or a portion of a gap or otherwise correct[s] all or a portion of an inadequacy in a State implementation plan." 42 U.S.C. § 7602(y). Yet, Texas was under no obligation under the Clean Air Act or Regional Haze Rule to develop a SIP that extended beyond 2018. Because the scope of Texas' SIP obligation was limited to achieving reasonable progress during the interim 2008 to 2018 planning period, EPA's FIP authority is necessarily subject to the same limits. Thus, determination of whether additional emission controls are needed after 2018 must, by statute, be deferred until the next planning period.

Response: Many of the concerns expressed in this comment are addressed by the response we provided, above, to a previous comment in this section. Commenter expresses concerns addressed above in this section.

We acknowledge the claim that the FIP for Texas is inconsistent with previous FIPs because other FIPs are confined to measures that can be implemented within the first planning period. We disagree with this claim, because we have proposed or promulgated FIPs with control measures that will be implemented beyond the first planning period. Examples are referenced above. Our FIP imposes emissions limitations that we conclude to be necessary under the CAA for the first planning period. Ideally, these controls would be installed and the emission limitations achieved, so the visibility improvements can be realized and built on in a subsequent comprehensive periodic SIP revision (see 40 C.F.R. 51.308(f)). We cannot agree that any delays in promulgating the FIP would create exclusions or deferments from meeting the emission limitation requirements of the CAA. Instead, it is our duty to ensure that sources subject to emission limitations for the first planning period meet those limitations in as timely a way as circumstances allow. As discussed above, the planning period deadline is relevant to RPGs but not to the long-term strategy, and our acknowledgement of reasonably necessary construction timeframes is fully in keeping with the consideration of the time necessary for compliance. We further address the Associations' comments alleging inconsistencies with our previous actions in a separate response.

Comment: [UARG (0065) p.22-24] As part of their argument that EPA's proposed FIPs for Texas and Oklahoma are unlawful, UARG noted that the EPA's FIP would impose requirements that cannot be achieved during the first planning period of the regional haze program. This is a problem of EPA's own making. It is, moreover, inconsistent with EPA's regulations and requires that the FIP be withdrawn. According to EPA, the Agency received the Texas regional haze SIP on March 31, 2009. Pursuant to CAA § 110(k)(1)(B), that plan was deemed complete by operation of law on September 30, 2009. Pursuant to CAA § 110(k)(2), therefore, EPA was obligated to take *final* action on the Texas SIP by September 30, 2010. EPA did not publish even its *proposed* action on the Texas SIP until December 16, 2014, and EPA is not scheduled to take final action on that SIP until September 4, 2015, nearly five years after the statutory deadline. After years of delay, EPA now proposes to disapprove (in part) Texas' regional haze SIP for the first planning period of the regional haze program, which runs from 2008 through 2018, and to impose requirements that, by EPA's admission, cannot be implemented until 2020, well after the end of the program's first planning period and, thus, well after the date by which the RPG is to be achieved. EPA has no authority to take this action.

UARG noted, consistent with EPA's regulations, the Texas SIP submission covers only those emission reductions needed in the first planning period. The CAA and EPA's regional haze rule state that, in assessing measures needed to achieve reasonable progress, states (and EPA) must take into account "the time necessary for compliance" with those measures. CAA § 169A(g)(1); 40 C.F.R. § 51.308(d)(1)(i)(A). One critical consideration is whether measures intended to ensure reasonable progress during the first planning period can in fact be implemented during that planning period. Indeed, EPA's Reasonable Progress Guidance expressly states that "[i]t may be appropriate" for states, in assessing the time-necessary-for-compliance factor, "to use this factor to adjust the RPG to reflect the degree of improvement in visibility achievable within the period of the first SIP if the time needed for full implementation of a control measure (or measures) will extend beyond 2018." Reasonable Progress Guidance at 5-2. Accordingly, reasonable progress requirements for emission reductions that could not or would not be required to be achieved within the first planning period should be adjusted, consistent with the RPGs that are intended to reflect those emission reductions, to mandate only those reductions that in fact can be achieved within the first planning period. As EPA explained in the Reasonable Progress Guidance, where time constraints "preclude the installation of controls … by 2018, the visibility improvement anticipated from installation of controls at the … sources that *could* be controlled within the strategy period [*i.e.*, by 2018] should be considered *in setting the RPG and in establishing the SIP requirements to meet the RPG*." *Id.* at 5-2 (second emphasis added).

UARG stated that the EPA candidly acknowledges that its FIP would impose requirements that extend beyond the first planning period. 79 Fed. Reg. at 74,874 ("we cannot assume that the SO_2 controls we are proposing will be installed and operational within this planning period, which ends in 2018"). Instead of adjusting its proposed reasonable progress requirements, however, EPA proposes to maintain its post-2018 emission reduction requirements but to exclude the effects of the post- 2018 emission reductions from the calculation of the RPGs it proposes:

> We note that we do not anticipate implementation of the identified scrubber retrofits by the end of 2018. Therefore, we are only adjusting the RPGs established by the states to reflect the additional anticipated visibility benefit from the scrubber upgrades over the 2018 projected visibility conditions. *Id. at* 74,866.

UARG stated that although EPA's proposed RPGs attempt to maintain the illusion that EPA is limiting its rulemaking action to the first planning period, the proposed FIP itself plainly imposes requirements applicable in the second planning period. The proposed FIP thus would violate the CAA's SIP and FIP provisions, which limit EPA's promulgation of FIPs to filling any "gap" left by a SIP. CAA § 302(y). Texas' SIP was properly limited to emission reduction requirements that could be implemented during the first planning period; Texas' obligation to submit a SIP to address reasonable progress in the second planning period lies in the future, and thus there is at this time no gap that a FIP could lawfully fill with respect to the second planning period. Only if Texas, in the future, defaults on its obligation to submit an approvable SIP addressing reasonable progress for the second planning period could EPA even conceivably have authority to take action with respect to any regional haze requirements that cannot be, and are not required to be, implemented by 2018.

Response: This comment is highly similar to earlier comments to which we already provide responses, above. Despite any delays in finalizing our action on the Texas SIP or in promulgating the FIP, our duty to act on the SIP and our FIP authority to impose the controls required by the CAA persists and is not forfeited. After our deadline for action on the SIP, we became subject to a judicially supervised deadline that acknowledges our continuing obligation to take action. Our authority to impose emission limitations needed for the first planning period or for a long-term strategy also continues after rulemaking or litigation delays would project that achievement of those limitations would fall after 2018. To assert otherwise is fundamentally at odds with the objectives of the CAA, and the long-term goal of the regional haze program. Air quality control authority—whether exercised under a SIP or a FIP—is not intermittent such that sources avoid or defer the control requirements that are due under the CAA because of an unapprovable SIP or a delayed FIP promulgation. Even as the RHR establishes a program of "comprehensive periodic" SIP revisions for regional haze, it too does not have limited windows for the imposition of controls. On the contrary, it expressly envisions that deficiencies may—and even must—be addressed even in the middle of a planning period. See 40 CFR 51.308(g)(4).

Comment: EPA unreasonably required controls at Coleto Creek Unit 1 despite acknowledging that visibility benefit will not be obtained in the applicable planning 2008-2018 period. [CCP (0075) p. 9]

CCP stated that the "time of compliance" is an express factor required for development of RPGs under CAA Section 169A(g). Texas' SIP covers a planning period of 2008-2018. EPA admits that its requirement to install WFGD scrubbers at Coleto Creek Unit 1 will have no impact on Texas' plan to meet 2018 goals. EPA has no authority to require installation of WFGD scrubbers in TCEQ's current plan when there will be no benefit until after the applicable planning period. Indeed, even EPA "request[s] that Oklahoma and Texas consider the additional visibility improvements anticipated from any proposed FIP controls implemented after 2018 with the submission of their next regional haze SIPs due July 13, 2018." Technical Support Document at 7. Thus, to the extent a scrubber retrofit on Coleto Creek Unit 1 is considered at all, it should only be evaluated as part of the next planning period.

Response: We disagree that Coleto Creek Unit 1 should only be evaluated in the next planning period. Under the technical record outlined by our proposal, controls are warranted and should be imposed for the first planning period. Our reference to Oklahoma and Texas taking account of FIP controls is a simple matter of coordination and taking account of emission limitations and visibility improvements that are in place or soon to be achieved. Taking account of the imposition of FIP controls, Oklahoma and Texas will be able to focus on other candidates for new controls as it establishes requirements for the next planning period and continues the work toward the national goal. The fact that the benefits of any controls may not be realized until after 2018 does not disprove our determination that such controls were needed for the first planning period or deprive our authority to impose the emission limitations so they are timely achieved under the circumstances.

Comment: Time Necessary for Compliance [GCLC (0063) p. 15]

According to GCLC, EPA has proposed that seven Texas coal-fired EGUs will be required to install scrubbers in 2020. This is beyond 2018, the year when the first regional haze period ends. This violates the "time necessary to comply" factor. Since these controls cannot be installed by the end of this first planning period, consideration of these types of controls must be deferred until the conclusion of the next planning period. While EPA may want to now act quickly, it is not the fault of Texas or its operators that a plan submitted in 2009 is only now being reviewed and EPA is only now proposing its FIP. EPA's delay does not excuse, or provide reason, to go beyond the limits of the phased implementation schedule. Furthermore, since a scrubber cannot be installed by 2018, that means there is no requirement to install such scrubber on the targeted Texas units. The question of whether these units must install controls, therefore, can only be addressed by Texas in the second planning period, not by EPA in this current period. EPA has acted too soon and without legal authority.

Response: We disagree with the comment for the reasons provided in responses to other comments above in this section. We do not agree with the claim that "since a scrubber cannot be installed by 2018, that means there is no requirement to install such scrubber on the targeted Texas units." The prospect of delayed implementation of CAA requirements provides no exclusion from CAA requirements. The FIP establishes enforceable emission limits within the boundaries of our statutory and regulatory authority, including emission limits that may not be achieved until 2020 to allow for additional time required to install scrubbers.

Comment: The proposed timing in the FIP is unjustified [EEI (0076) p. 4-5]

EEI stated that the Agency's proposed FIP raises serious concerns in its attempt to require reductions to meet the 2018 RPGs for three federally-protected Class I visibility areas in Texas (Big Bend National Park and Guadalupe Mountains National Park) and Oklahoma (Wichita Mountain Wilderness Area). Id.

EEI asserted that the Agency is attempting to require controls well beyond the Texas SIP that it knows will not be in place or effective within the first planning period, i.e., by 2018. EPA's proposal thus exceeds the scope of the state's submission and the Agency's authority to issue a FIP. EPA's proposal is at variance with the "time necessary for compliance" statutory factor in 42 U.S.C. § 7491(g)(1) for determining reasonable progress. Moreover, it also is unreasonable to require the proposed emissions controls on a tight regulatory timeline.

Given that the regional haze program's target extends to 2064, EEI noted that EPA's insistence on requiring extensive control equipment installations that will not be technically in place or effective to meet a 2018 milestone is unjustified at this time. Instead, these controls should only be considered by the states during the next planning period that runs between 2019 and 2028. This also is a more reasonable approach that would allow for the consideration of updated data, use contemporaneous monitoring and meteorological conditions, and would avoid overreliance on data and modeling that are more than 10 years out of date. Further, such an approach would allow the coordination of these important investment and regulatory decisions with the implementation of other pending regulations. Finally, this approach would give states and regulated entities the opportunity to conduct integrated compliance planning in ways that are consistent with provision of reliable and affordable electric power.

[EEI (0076) p. 11] EPA's insistence in the proposed FIP on requiring extensive control equipment that will not technically be in place or effective to meet a 2018 milestone is problematic. Instead, the proper course is for the states to consider these and other control options as part of the suite of possible actions that can be taken during the next planning period that runs between 2019 and 2028.

Response: We disagree with the comment for reasons explained in response to other comments. In addition, we note our disagreement with the comment for suggesting that a RH SIP that warrants disapproval is neither suited nor required to be addressed by a FIP. On the contrary, the FIP is meant to address the deficiencies identified in the SIP for the current period. The fact that the RH SIP for the current planning period is not approvable is not a basis for the deferring and exempting requirements and measures to make reasonable progress during that planning period. Instead, the FIP will impose the enforceable emission limitations, and having addressed these sources, we have full confidence that Texas will be better able to focus on other candidates for making reasonable progress in its next comprehensive SIP revision. Overall, we disagree that our FIP presents a tight regulatory timeline. It is an appropriate timeline for highly cost effective control measures needed for reasonable progress, and it is notable that the comment has not suggested or acceded to any concrete alternate timeframe for our consideration. The comment's assertions regarding electric reliability are addressed in responses to specific comments on that topic.

Comment: [Nucor Steel (0058) p. 3] Nucor Steel stated that EPA's interpretation and rule is contrary to the CAA because it seeks to establish reductions that it deems necessary to meet reasonable progress goals beyond the 2018 planning period addressed by the states of Texas and Oklahoma in their SIPs.

Response: For the reasons discussed in our responses to other similar comments, we disagree with this comment. The FIP establishes reductions to meet reasonable progress goals as well as the long-term strategy.

Comment: [OG&E (0057) p. 1-2, 4] OG&E noted, as evidenced by the ODEQ SIP and the Proposed Rule, Oklahoma and EPA do not believe further emission reductions are needed from Oklahoma sources at this time and may not be needed in the near future. Oklahoma is currently making significant emissions reductions from its coal-fired fleet and visibility monitoring in the Wichita Mountains Class I area is improving even before a large slate of emission reduction programs by the power sector has been fully implemented over the next roughly 10 years. OG&E believes the final rule should affirm it is not necessary to impose additional emission control requirements at this time from utilities in Oklahoma.

OG&E supported the EPA Proposal that no additional emission controls for Oklahoma sources are currently needed[2] and that the cumulative actions being taken by Oklahoma and Texas as well as other upwind states to comply with this and other EPA rules including the Cross State Air Pollution Rule ("CSAPR") be accounted for in the next iteration of the evaluation of the Regional Haze program in Oklahoma.

OG&E stated that utilities in Oklahoma are well underway toward complying with the Regional Haze State Implementation Plan (SIP) and FIP for Oklahoma which, in addition to actions being taken by Oklahoma sources to comply with the Mercury and Air Toxics Standards ("MATS") rule will achieve additional reductions in relevant emissions and impacts over 75%[3] of the coal-fired generation in the state through the installation of controls, conversion to gas, or retirements. Furthermore, visibility in the Wichita Mountains National Wildlife Refuge ("Wichita Mountains") is improving[4] as visibility monitors in the Wichita Mountains are already close to meeting the Uniform Rate of Progress goal ("URP") and achieving 2018 Reasonable Progress Goals ("RPG") developed by Oklahoma in the 2011 SIP[5]. These actions will continue to reduce emissions dramatically in the current Regional Haze planning period ending in 2018 and into the next 10-year planning period ending in 2028.

OG&E asserted that promulgating a requirement for further emission controls related to visibility in the Wichita Mountains appears unnecessary at this time. Not only are sources in Oklahoma reducing emissions as a result of a number of federal requirements[12], but sources in contributing states will be as well. It would be prudent for EPA to allow states to assess the efficacy of these and any additional reductions in a future planning period.

Footnotes:
[12] Such requirements include Regional Haze/BART, MATS, CSAPR, ozone NAAQS, and SO_2 NAAQS, among others.

Footnotes:
[2] 79 Fed. Reg. 74818 (December 16, 2014) "Approval and Promulgation of Implementation Plans; Texas and Oklahoma; Regional Haze State Implementation Plans; Interstate Transport State Implementation Plan to Address Pollution Affecting Visibility and Regional Haze; Federal Implementation Plan for Regional Haze and Interstate Transport of Pollution Affecting Visibility"
[3] EPA Air Markets Program 2014 available at http://ampd.epa.gov/ampd
[4] IMPROVE Summary Data website at: http://vista.cira.colostate.edu/DataWarehouse/IMPROVE/Data/SummaryData/RHR_2013/SIA_group_means_7_14.csv
[5] 76 Fed. Reg. 16176 (March 22, 2011)

Response: We agree that further emission reductions are not needed from Oklahoma sources during this planning period, and we appreciate OG&E's supportive comments for this aspect of our final rule.

Comment: EPA's proposed FIP requirement for some Texas EGUs to install new scrubbers is inappropriate because those scrubbers could not be installed until after the end of the 2008-2018 period covered by the FIP [AECT (0074) p. 9]

AECT stated that EPA's Proposal would require some Texas EGUs to install new scrubbers, but EPA has concluded that those scrubbers could not be installed until sometime after 2018.[30] In light of that, the requirement to add those new scrubbers cannot reasonably be part of EPA's proposed FIP for Texas since the scopes of the Texas Regional Haze SIP and the proposed EPA FIP are limited to the 2008-2018 planning period. In light of that, and of the "time necessary for compliance" factor, it is inappropriate for EPA to require that any Texas EGU install a new scrubber as part of the proposed FIP.

Footnotes:
[30] 79 Fed. Reg. at 74874 ("typical 502 scrubber installations can take up to five years to plan, construct and bring to operational readiness", which will be much later than 2018)

Response: We disagree with the comment for the reasons discussed in our responses to other comments, above in this section.

Comment: The Timeline for Compliance Should Be Shorter Than EPA Proposed.
[Earthjustice (0067) p. 39; Stamper (0068) p. 5]

Stamper noted that the first factor in establishing controls measures and reasonable progress goals for a Class I area is the time necessary for compliance. EPA has indicated that, due to delays in processing the Texas and Oklahoma regional haze SIPs, EPA "cannot assume that the SO_2 controls [EPA is] proposing will be installed and operational within this planning period, which ends in 2018." FIP TSD at 7. Thus, EPA's proposed reasonable progress goals for Oklahoma and Texas only accounted for the proposed scrubber upgrades to be completed by 2018. *Id.* EPA assumes that scrubber retrofits could not be accomplished by the end of 2018, or within the next approximately 3.75 years. However, EPA provided no support for this assumption.

Earthjustice et al., and Stamper stated that EPA should require implementation of all of its proposed reasonable progress requirements by the end of 2018, and EPA should revise the RPGs of each affected Class I area to account for these control measures being operational by the end of the first planning period in 2018. Earthjustice et al., stated that the EPA assumes that scrubber retrofits could not be accomplished by the end of 2018, or within the next approximately 3.75 years, but provided no support for this assumption in the proposed rule. Earthjustice et al., and Stamper noted that the EPA's statements in the proposal conflict with its statements during the adoption of the Mercury and Air Toxics Standards ("MATS") that EGUs could install required controls, including scrubbers, within 3 years. Specifically, EPA stated in 2011 that "[u]nits that choose to install dry or wet scrubbing technology should be able to do so within the compliance schedule required by the [Clean Air Act] as this technology can be installed within the 3-year window." 76 Fed. Reg. 24976, 25054 (May 3, 2011).

In support of this claim, Stamper noted that the EPA references a letter to Senator Carper dated November 3, 2010, in which David Foerter, executive director of the Institute of Clean Air Companies (ICAC), stated that wet scrubbers could be installed in 36 months, dry scrubbing technology could be installed in 24 months, and dry sorbent injection could be installed in 12 months. *Id.*, fn 172. ICAC's claims were based on 7 years of pollution control installation at coal-fired EGUs under the Clean Air Interstate Rule (CAIR) and under the NO_x SIP Call. The ICAC letter states that, between 2008 to 2010, flue gas desulfurization (FGD) controls were installed at numerous EGUs with combined capacity of 60 gigawatts (GW) while, concurrently, selective catalytic reduction was installed at roughly 20 GW of EGUs.[4] During that timeframe of significant pollution control installation, there were no labor shortages.[5]

Stamper noted that in analyses conducted for the MATS rule, EPA similarly found that there were significant FGD and SCR retrofits in recent years, and stated:

> These data depict a recent ramp-up in the [Air Pollution Control] deployment capabilities of all industry participants, including plant owners, the [Air Pollution Control] supply chain, and state and local permitting agencies. These expanded [Air Pollution Control] capabilities are still active today....[6]

Stamper noted that the compliance deadline for the MATS rule is April 2015, with the possibility of a one-year extension until April 2016. Because the first haze planning period ends in 2018, well after April 2016, there should not be any labor shortages for installing SO_2 controls to meet EPA's proposed reasonable progress requirements at the Texas EGUs.

Earthjustice et al., and Stamper noted that the EPA's statements in the MATS rulemaking are proving to be true, as many scrubbers are being installed to meet MATS within three years to no longer than four years, as shown in Table 2 of the attached Stamper Report (0068)).

Examples of FGD System Installation Timeframes
(provided by Stamper as Table 2 to 0068)

State	Facility	Unit	Time to Install FGD
MI	Dan E Karn	1 and 2	Contract for design and supply for dry scrubbers was issued in August 2011.[7] According to CAMD, dry lime scrubber began operation at Unit 1 on June 6, 2014. The scrubber on Unit 2 will be operational by April 2015.[8]
TN	Gallatin	1, 2, 3, 4	FGD design for all four units began in September 2011. The FGD at Unit 4 was expected to be in operation by April 2015, Unit 3 by June 2015, Unit 1 by November 2015, and Unit 2 by January 2016.[9]
PA	Homer City	1 and 2	Construction of FGDs began in 2012 and final tie-in to be completed by end of third quarter of 2015.[10]
MI	JH Campbell	2, 3	Engineering for the Unit 2 FGD began in late 2012 and the FGD is expected to be installed and operational by early 2016.[11]
KS	La Cygne	1, 2	Contract for design and supply of wet FGD systems issued in December 2011.[12] Installation of wet FGD systems to be completed by June 1, 2015.[13]

IN	Michigan City	12	Planning for the dry FGDs began in 2011 with final operation scheduled for 1st quarter 2016 for Unit 12.[14]
IN	RM Schahfer	14, 15	Co-located with the Michigan City Plant, FGD systems were installed and became operational at Unit 14 on November 1, 2013 and at Unit 15 on October 26, 2014 according to CAMD.[15]
PA	Homer City	1 and 2	Construction of FGDs began in 2012 and final tie-in to be completed by end of third quarter of 2015.[10]
MI	JH Campbell	2, 3	Engineering for the Unit 2 FGD began in late 2012 and the FGD is expected to be installed and operational by early 2016.[11]
KS	La Cygne	1, 2	Contract for design and supply of wet FGD systems issued in December 2011.12 Installation of wet FGD systems to be completed by June 1, 2015.[13]
IN	Michigan City	12	Planning for the dry FGDs began in 2011 with final operation scheduled for 1st quarter 2016 for Unit 12.[14]

Stamper noted that for those plants that will have multiple units at which scrubbers are to be installed under EPA's proposed rule, those plants will benefit from coordinated and shared engineering design and FGD fabrication, economies of scale benefits with FGD suppliers, and more consistent staffing levels with on-site contractors for concurrent FGD installations.[16] This is demonstrated in the table above. For example, the Gallatin plant will have four FGDs installed within approximately four years from design to operation.

Earthjustice et al., noted that at a public hearing on the proposed rule, Texas argued that EPA cannot impose new SO_2 emission limits that go into effect in 2020, given the end of the interim planning period in 2018. This argument fails for several reasons.

First, Earthjustice et al., stated that Texas' argument proceeds from a faulty premise. Contrary to Texas' argument, it is feasible for all of the proposed FIP controls—both the scrubber installations and the scrubber upgrades—to be completed by the end of 2018. EPA should revise the FIP to require installation and operation of all proposed controls by the end of the first planning period.

Second, Earthjustice et al., stated that Texas' argument mischaracterizes the law. The regional haze regulations do not require controls to be installed by the end of the planning period except in the case of BART alternatives, 40 C.F.R. § 51.308(e)(2)(iii), and the 5 year requirement for BART installation. 42 U.S.C. § 7491(g)(4). The statute notes that long-term strategies can be implemented over a 10- 15 year time frame. *Id.* § 7491(b)(2)(B).

Third, Earthjustice et al., stated that it would unreasonable for Texas sources to avoid installing controls because of the time it took to disapprove Texas' plan and develop a federal plan. Texas could have avoided the need for such a delay if its 2009 plan submittal had complied with the Clean Air Act. Texas sources would then have had 9 years (from 2009 through 2018) to install controls before the end of the first planning period—surely, a feasible length of time. Texas should not benefit from delays that result from Texas' failure to meet its legal obligations.

<u>Footnotes</u>:

[4] *See* November 3, 2010 letter from David C. Foerter, ICAC to Senator Carper, at 4 (Ex. 1).
[5] Id.
[6] *See* U.S. EPA, An Assessment of the Feasibility of Retrofits for the Toxics Rule, March 9, 2011, at 5. (Ex. 2).
[7] *See* August 3, 2011 "B&W gets contract for dry scrubber project at Karn coal plant." (Ex. 4A).
[8] *See* December 17, 2014 Extension Request for Consumers Energy Company's D.E. Karn Plant (SRN B2840) Units 1 & 2 for Compliance with the Mercury and Air Toxics Standard (40 CFR 63 Subpart UUUUU) and the Michigan Mercury Rule (R336.2501) at 2 (Ex. 4B).
[9] *See* July 9, 2014 TVA – Gallatin Fossil Plant (GAF) – Request for Compliance Extension - Mercury and Air Toxics (MATS), Enclosure at page 4 (Ex. 5).
[10] *See* November 5, 2013 Request for One-Year Extension of the Compliance Deadline for the Mercury and Air Toxics Standards and of the Expiration Date of the Plan Approval for the Installation of Flue Gas Desulfurization Units at 1-2 (Ex. 6).
[11] *See* October 4, 2012 Construction Extension for Consumers Energy Company's JH Campbell Facility Pursuant to the Mercury and Air Toxics Standard (40 CFR 63 Subpart UUUUU, also known as MATS) as well as the Michigan Mercury Rule (R336.2501, *et seq*), Exhibit B, Figures B-1c and B-1d (Ex. 7).
[12] *See* "Hitachi Power Systems America Awarded Contract to Supply Pollution Controls Equipment for KCP&L." (Ex. 8A).
[13] *See* June 22, 2012 Request for Extension of the Mercury and Air Toxics Standards (MATS) Compliance Deadline KCP&L La Cygne, Source
ID No. 1070005, at 1 (Ex. 8B).
[14] *See* January 30, 2013 NIPSCO – Michigan City and R.M. Schahfer Generation Stations Request for Extension of Time to Comply with the Utility MATS NESHAP at 1. (Ex. 11).
[15] *See* EPA's Clean Air Markets Database for RM Schahfer. *See also* January 30, 2013 NIPSCO – Michigan City and R.M. Schahfer Generation Stations Request for Extension of Time to Comply with the Utility MATS NESHAP at 1.
[16] *See,* e.g., testimony of Mr. Chad Teply, PacifiCorp, before the Wyoming Public Service Commission at 8-9, which outlines of the benefits of installation of multiple SCRs at the Jim Bridger Power Plant. (Ex. 3).

Response: We agree with Commenter's assertion that Regional Haze regulations do not require controls to be installed by the end of the planning period. Additionally, we agree that, if Texas' SIP had complied with the requirements of the rule such that we could have approved it in full as submitted, Texas sources would have ample time to install controls, including the scrubber retrofits, within the first planning period.

We note that Commenter asserts that the scrubber retrofits can be installed within three years' time. We agree that in some cases scrubber retrofits can and have been installed in less than three years. However, we do not have the level of detailed information necessary to make that evaluation for each facility. Thus, we proposed an installation timeframe that has been used in BART successfully in the past, which although conservative, ensures that any facility has the necessary time in which to install its controls.[121]

11. Cost

Comment: EPA's proposed determination that Texas analyzed the "costs of compliance" factor incorrectly is not supported by the CAA, EPA's Regional Haze rules, or EPA's reasonable progress guidance [AECT (0074) p. 2-4]

[121] This timeframe may also allow for additional coordination in terms of maintenance, installations, and shutdowns across multiple units and facilities. This timeframe may also better account for lead-in time to go out for bids and secure funding and other actions that do not necessarily fall between contract award and completion, a timeframe that was the seeming focus of many of the commenter's examples.

AECT stated that EPA's proposed determination that Texas analyzed the "costs of compliance" factor incorrectly is not supported by the CAA, EPA's Regional Haze rules, or EPA's guidance. Texas' analysis of the "costs of compliance" factor, however, is supported by the CAA, EPA's Regional Haze rules, and EPA's guidance.

According to AECT, EPA proposes to determine that Texas should have evaluated the costs of compliance factor individually for each of a select subset of Texas electric generating units ("EGUs") that were identified in EPA's screening process, rather than evaluating that factor collectively for all of those EGUs. That proposed determination is contrary to the CAA and EPA's own Regional Haze rules, as the Tenth Circuit Court of Appeals recently held.[4] Further, that proposed determination is contrary to EPA's own guidance; in fact, EPA's guidance clearly supports Texas' evaluation of the costs of compliance factor collectively for all of the identified EGUs. EPA states on page 5-l of its guidance document entitled "Guidance for Setting Reasonable Progress Goals under the Regional Haze Program" (June 1, 2007) ("Reasonable Progress Guidance") that each state has the discretion to interpret the costs of compliance factor "to encompass the cost of compliance for ... source categories ...". Further, EPA states on that same page that in applying the costs of compliance factor, states may use EPA's BART guidelines,[5] which provide that "states have flexibility in how they calculate costs" of compliance, and may choose to apply the costs of compliance factor collectively for all of the sources in a source category.[6] Moreover, EPA states in other Regional Haze guidance that "reasonable progress is not required to be demonstrated on a source-by-source basis".[7] In light of the foregoing, AECT requests that EPA defer to Texas' decision to evaluate the costs of compliance factor collectively for all of the identified EGUs.

In addition, AECT noted that Texas' analysis of the costs of compliance factor, which fully considered the costs of additional sulfur dioxide ("SO_2") and nitrogen oxides ("NOx") emissions controls at the identified EGUs relative to the predicted visibility improvement due to such additional controls, is consistent with the CAA, EPA's Regional Haze rules, and EPA's guidance. Indeed, Texas' costs of compliance factor analysis is more supportable under the CAA, EPA's Regional Haze rules, and EPA's guidance than is EPA's costs of compliance factor analysis, which considered the cost of the additional SO_2 emissions control per ton of SO_2 emissions it would reduce (in \$/ton SO_2 emissions reduced) for only a handful of sources, which EPA refers to as the "cost effectiveness" of each such control. Texas' costs of compliance factor analysis is consistent with, and is more supportable under, the CAA, EPA's Regional Haze rules, and EPA's guidance because "compliance" for purposes of the reasonable progress requirements in the CAA and EPA's Regional Haze rules should be viewed in relation to the visibility improvement that would be predicted to occur due to the additional SO_2 and/or NOx emissions controls, rather than on the reduction in tons of SO_2 and/or NOx emissions that would occur due to those additional emissions controls. On Page 5-2 of its Reasonable Progress Guidance, EPA states that because different pollutants impair visibility differently, in evaluating the costs of compliance factor, analyzing the costs of possible additional emissions controls relative to the visibility improvement that would be predicted to occur due to those controls may be more meaningful and appropriate than evaluating the cost effectiveness of such emissions controls in terms of their costs per ton of emissions they would reduce. Based on the foregoing, AECT requests that EPA defer to Texas' analysis of the costs of compliance factor, which involved consideration of the costs of additional SO_2 and NOx emissions controls at the identified EGUs relative to the predicted visibility improvement due to such additional controls.

Footnotes:
[4] WildEarth Guardians v. EPA, 770 F.3d 919, 944 (10th Cir. 2014) ("Neither the Clean Air Act nor the Regional Haze Rule requires source-specific analysis in the determination of reasonable progress.")
[5] 70 FR 39104 (July 6, 2005)
[6] Id., at 39127
[7] EPA's "Additional Regional Haze Questions" {September 27, 2006 Revision), available at http://tinvurl.com/EPARHquestions

Response: We agree that neither the CAA nor the Regional Haze Rule requires a source-by-sources analysis, and we did not propose to disapprove Texas' reasonable progress and long-term strategy analyses on that basis. See our responses to other more detailed comments on this issue.

AECT states that Texas' cost of compliance factor analysis is more supportable under the CAA, the Regional Haze Rule, and our regional haze guidance than is our cost of compliance factor, which AECT understands to be our cost effectiveness determinant of $/ton. AECT provides no documentation for this assertion except for stating that "compliance" for purposes of the reasonable progress requirements in the CAA and our Regional Haze rule should be viewed in relation to the visibility improvement that would be predicted to occur due to the additional SO_2 and/or NOx emissions controls, rather than on the reduction in tons of SO_2 and/or NOx emissions that would occur due to those additional emissions controls. AECT points to our Reasonable Progress Guidance as support for its position. First, we disagree with AECT that our proposed control set was based solely on a $/ton analysis. As we discuss in our Cost and FIP TSDs, we balanced our use of $/ton against the modeled visibility benefit.[122] In fact, the sources for which we conducted a cost analysis were selected because they were in fact the ones that had the most visibility impacts at the Wichita Mountains, Big Bend, and the Guadalupe Mountains Class I areas. Second, we believe AECT's reference to our Reasonable Progress Guidance, which is reproduced below, is misplaced:

> In considering the cost of compliance factor, you should keep in mind that different pollutants differently impact visibility impairment. For example, on a ton basis, sulfur dioxide related particles have a greater impact on visibility impairment than crustal material. Therefore, in assessing additional emissions reduction strategies for source categories or individual, large scale sources, simple cost effectiveness estimates based on a dollar-per-ton calculation may not be as meaningful as a dollar-per-deciview calculation, especially if the strategies reduce different groups of pollutants.

Because all of our analysis was done on the basis of SO_2, this reference to the visibility impact of multiple pollutants is moot. AECT seems to imply that Texas' approach to balancing cost and visibility was superior to our own. However, as we discuss in more detail in other responses, we disapproved Texas's approach in part because it masked the potential benefits of controlling individual sources.[123] Thus, we disagree with AECT that Texas' analysis of the costs of

[122] See discussion in our Cost TSD beginning on page 5. See discussion in our FIP TSD, beginning on page 27.
[123] 79 FR 74838.

compliance approach is more supportable under the CAA, the Regional Haze Rule, and our guidance that our own approach.

Comment: Time needed for scrubber upgrades.

NRG [NRG (0078) p. 13] attached a confidential report by Sargent & Lundy that indicates that significant modifications would be required to the existing Limestone plant scrubbers to achieve substantially lower SO_2 emission rates. Such modifications would likely include new dampers, modifications to existing duct work and spray towers, replacement of induced-draft fans, and reheat system upgrades or new chimneys. Therefore, to accommodate the detailed engineering analysis, procurement of long lead-time items such as fans, demolition or renovation of existing equipment followed by installation and commissioning of the new systems, additional time beyond EPA's proposed 3 year implementation may be required. If EPA requires upgraded SO_2 controls at Limestone to address regional haze, NRG requests that the compliance date for be set 42 months following the effective date of the rule such that the outages necessary to complete the modifications can be scheduled following the 2018 summer peak period.

Commenter 0054-39 (Sierra Club) suggested that the rule should be implemented sooner than the 3 to 5 years that EPA is proposing. The commenter noted that these plants have already had 30 to 40 years of getting off of the hook.

Commenter 0054-54 stated that a compliance time of 3 years for scrubber upgrades is too long and recommended 2 years to increase efficiency to 99 percent with a limit of 0.06. The commenter suggested compliance in 3 years (instead of 5 years) for retrofitted scrubbers that are 99 percent efficient.

Response: We respond to comment concerning our proposed emission limits in other comments. As we discuss in our proposal, we believe that three years is appropriate for these units, as we based our cost analysis on upgrading the existing wet FGD scrubbers of these units, which we believe to be less complex and time consuming that the construction of a new scrubber. We solicited comments on alternative timeframes: from two years up to five years from the effective date of our final rule. In so doing, we must judge the comments we receive based on the level of documentation that accompanies them.

We have reviewed the report referenced in the comment. Since the report was claimed as Confidential Business Information (CBI) under 40 C.F.R.§ 2.203(b), we have responded to the comments contained within it in a separate document that is not a part of our posted docket but will be available for review by NRG. As we have noted elsewhere in our response to comments, we are requiring that NRG upgrade the scrubber systems at the Limestone facility. That referenced S&L report does not contain any information concerning how long NGR projects it will take to upgrade the Limestone scrubber systems. Except for this comment, we have not seen any information from NRG that discusses the need for additional time to complete the scrubber upgrades. We expect that our final rule will be effective in January, 2016, resulting in a required operational date for the scrubber upgrades (or an alternative method for achieving the SO_2 limits) of approximately January, 2019.[124] NRG states that it wishes to complete the required upgrades following the summer 2018 peak period, but does not provide any reason why the upgrades could not be completed during one of its other scheduled outings, such as that following the summer 2017 peak period.

In addition, two commenters objected to the 3 years we proposed for the installation of scrubber upgrades. These commenters were neither specific as to the facility, nor did they provide any support for their allegations that the scrubber upgrades could be completed in a shorter period of time.

As a consequence, because (1) we have received no documentation from the two commenters to support their allegations that the scrubbers upgrades could be completed in a shorter timeframe, and (2) we have received no documentation from NRG that the additional time is necessary, or a reason why NRG could not complete the required upgrades during an earlier outage, we disagree with these commenters.

Comment: Implementation status for the regional haze rule in Oklahoma
[OG&E (0057) p. 2-3]

OG&E noted, in 2011, EPA acted to partially approve and partially disapprove the Regional Haze SIP developed by Oklahoma and promulgated a FIP for the portions disapproved[6]. In that action, EPA stated that the NOx controls adopted by the state meet the Clean Air Act Best Available Retrofit Technology ("CAA BART") requirements; the SO_2 BART controls proposed in the FIP, in addition to the state adopted NOx controls, would lead to significant improvement in visibility and meet the CAA BART requirements; additional NOx controls would not be cost effective; and additional pollutant controls are not needed to meet the CAA BART requirements[7]. OG&E and other source operators in the state have begun to implement the compliance plans.

According to OG&E, by this summer, low NOx burner technology will have been installed on the four affected coal-fired units in the OG&E fleet, reducing NOx emissions by over 50% from the coal units. Low NOx burners will be installed by the April 2017 compliance deadline on the remaining three SIP-affected units (gas-fueled boiler units). By 2019, OG&E will install dry flue gas desulfurization ("DFGD") systems on two of the four affected coal units, reducing permitted SO_2 emissions by approximately 95%. OG&E will also convert two coal units to natural gas, virtually eliminating SO_2 emissions from these units after 2018. Emissions reductions of NOx and SO_2 in addition to that from the OG&E system in Oklahoma will occur due to the announced retirement of two Public Service of Oklahoma ("PSO") coal-fueled units, one in 2016 and one in 2026 as well as from the retirement of one of the Grand River Dam Authority ("GRDA")'s units at its Choteau facility.

Footnotes:
[6] 76 Fed. Reg. 81728 (December 28, 2011)
[7] Id. at 81754

[124] See our final action for more details and specificity.

Response: We thank OG&E for its work in reducing regional haze.

Comment: [San Miguel (0060) p. 1-2] San Miguel stated that their principal business is the production of electric energy in South Central Texas. San Miguel operates only one power generation facility, which includes one (1) lignite-fired power plant and one (1) lignite mine in South Central Texas. This lignite-fired power plant has a net capacity of 391 Megawatts and is a base load unit. The generating unit fires only lignite provided by the lignite mine. This one lignite-fired unit comprises 100% of SMEC's generating capacity and average yearly output is 2.9 million megawatt hours. San Miguel is a small business as defined by the FERC. Being a not-for-profit cooperative, San Miguel will be forced to pass along, to its consumer-owners, all costs of meeting any new requirements that may result from the implementation of the Proposed FIP.

San Miguel stated that they have a significant interest in the outcome of this rulemaking. San Miguel's lignite fired electric generating facility is a major source of electrical generation to our member cooperatives, under long term wholesale power contracts for 100% of the generation of the San Miguel Generating Station.

Response: We applaud San Miguel for upgrading its scrubber system, and demonstrating that even considering the extremely high sulfur content of the coal it burns (way in excess of any other unit in our proposal) that its scrubber is capable of essentially the same efficiency as we assumed for the other units in our proposal. As we note in our proposal, we believe that based on the scrubber upgrades it has recently performed and its demonstrated ability to maintain an emission rate below the value we proposed that it can consistently achieve this emission level we proposed without further upgrades. We address San Miguel's specific comments on its emission limit in another comment.

Comment: The Proposed FIP Will Result in Additional Economic Benefits.
[Earthjustice (0067) p.17]

Earthjustice et al stated that requiring antiquated power plants and other sources to invest in modern pollution controls is a job-creating mechanism in itself, as each installation creates short-term construction jobs, as well as permanent operations and management positions.[18] As EPA has explained, installing BART "will require well-paid, skilled labor which can potentially be drawn from the local area and support local growth." 77 Fed. Reg. 57,864, 57,909 (Sept. 18, 2012) (final Montana regional haze FIP).

<u>Footnote</u>:
[18] Ceres, *New Jobs – Cleaner Air: Employment Effects Under Planned Changes to the EPA's Air Pollution Rules* 1–3 (2011), *available at* http://www.ceres.org/resources/reports/new-jobscleaner- air.

Response: We take no position on whether the facilities included in our FIP are antiquated. We do agree that the installation of controls required by our final decision will require the same kinds of well-paid, skilled labor which can potentially be drawn from the local area and support local growth, as would the installation of BART controls.

Comment: [Earthjustice (0067) p.17] Earthjustice et al., stated that the regional haze program protects national parks and wilderness areas, which are of great natural and cultural value, in addition to serving as engines for sustainable local growth. A National Park Service study found that national park visitors contribute approximately $30 billion to local economies and support 300,000 jobs, that every dollar invested in park operations generates about $10 in local communities, and that every two Park Service jobs yield one job outside the parks.[19] Nearly 300 million people visit national parks every year, and communities near national parks enjoy greater-than-average economic growth due to the economic benefits of park visitors and related businesses.[20] Indeed, national parks attract businesses and individuals to the local area; the resulting economic growth in areas near national parks is 1 percent per year greater than statewide rates over the past three decades.[21]

Earthjustice et al., stated that Texas's two national parks are important components of west Texas's economy. In 2014, over 314,000 people visited Big Bend and over 166,000 people visited Guadalupe Mountains.[22] Tourism at Big Bend in 2010 supported 372 jobs and resulted in over $16.6 million in visitor spending.[23] Tourism at Guadalupe Mountains that same year supported 258 jobs and resulted in over $13.3 million in visitor spending.[24] Studies show that national park visitors highly value clean air and prioritize the enjoyment of beautiful scenery when visiting national parks.[25] Moreover, national park visitors readily perceive haze, enjoy their visit less when haze is bad, and are willing to cut short visits to national parks based on their perception of air quality.[26] A decrease in visits means less time and money spent in Texas's national parks and surrounding communities.

<u>Footnotes</u>:

[19] Daniel J. Stynes, Mich. State Univ., *Economic Benefits to Local Communities from National Park Visitation and Payroll, 2010*, at page v (2011), *available at* http://nature.nps.gov/socialscience/docs/NPSSystemEstimates2010.pdf; *see also* NPS, National Park System – Summary: 1990 to 2008 (in 2008, National Park Service units received over 274 million visits, accounting for over $2.5 billion in expenditures and revenue), *available at* http://www.census.gov/compendia/statab/2010/tables/10s1215.pdf.

[20] *See* Jared Hardner & Bruce McKenney, Hardner & Gullison, *The U.S. National Park System, An Economic Asset at Risk* 5 (2006).

[21] *Id*.

[22] Nat'l Park Serv., Annual Recreation Visitation Summary report for 2014, *available at* https://irma.nps.gov/Stats/SSRSReports/National%20Reports/Annual%20Visitation%20Summary%20Report%20(1979%20-%20Last%20Calendar%20Year).

[23] Headwater Economics, Nat'l Park Serv. Units: Economic Impacts of Visitation & Expenditures, *available at* http://headwaterseconomics.org/apps-public/nps/impacts/.

[24] *Id.*

[25] Abt Assocs. Inc., *Out of Sight: The Science and Economics of Visibility Impairment*, at ES-7 (2000), *available at* http://www.abtassociates.com/reports/ES-clear.pdf.

[26] *Id.*

Response: We acknowledge that today's action may have positive economic impacts, as described by Commenter, although we are not charged to specifically take these benefits into account when making our determination. Congress recognized the need for improvement in visibility at Class I areas and set forth requirements in the Clean Air Act that directed the states and EPA to secure that improvement. We agree that our Class I areas and other national parks and wilderness areas are a source of jobs and contribute to the economies of their respective states.

Comment: [Earthjustice (0067) p.18] Earthjustice et al., stated that the regional haze program also provides important environmental benefits. In addition to impairing visibility, NOx, SO_2, and PM pollution harm plants and animals, soil health, and entire ecosystems. NOx and SO_2 are the primary causes of acid rain, which acidifies lakes and streams and can damage certain types of trees and soils. Acid rain also accelerates the decay of building materials and paints, including irreplaceable buildings and statues that are part of our nation's cultural heritage.[27] In addition, nitrogen deposition—caused by wet and dry deposition of nitrates derived from NOx emissions—causes well-known adverse impacts on ecological systems. At times, nitrogen deposition exceeds "critical loads" beyond the tolerance of various ecosystems.[28] NOx is also a precursor to ozone, and ground-level ozone impacts plants and ecosystems by interfering with plants' ability to produce and store food, and increasing their susceptibility to disease and insects.[29]

Footnotes:
[27] EPA, Effects of Acid Rain, *available at* http://www.epa.gov/acidrain/effects/index.html (last visited Sept. 30, 2013).
[28] *See, e.g.*, William D. Bowman *et al., Nitrogen Critical Loads for Alpine Vegetation and Soils in Rocky Mountain National Park*, 103 Journal of Envtl. Mgmt. 165–71 (2012); NPS, Nitrogen Deposition: Issues and Effects in Rocky Mountain National Park (2005), *available at* http://www.nps.gov/romo/parkmgmt/upload/romo_n_fact_final.pdf; *see also* National Park Service, NPS Critical Loads and Deposition, *available at* http://www.nature.nps.gov/air/studies/criticalloads/ecoregions/images/nps_cl_ecoregion_tdep10 12.pdf.
[29] EPA, Ground-level Ozone – Ecosystem Effects, http://www.epa.gov/groundlevelozone/ecosystem.html.

Response: We agree that the regional haze program provides environmental benefits that go beyond regional haze.

Comment: [San Miguel (0060) p. 2, 5-6] San Miguel encouraged the EPA to withdraw the Proposed FIP and allow Texas to continue with its implementation of the Texas SIP. If EPA continues with the Proposed FIP, San Miguel requested the EPA remove San Miguel from the list of EGUs with source-specific SO_2 emissions limit. Further, if EPA maintains San Miguel's inclusion on that list of EGUs, San Miguel requested that EPA increase the San Miguel emission limit and increase average period to an annual average to insure the limit and average period appropriately reflect base load operations and periods when the sulfur in the fuel increases to elevated levels, as was the case between 2009 and 2011.

[San Miguel (0060) p. 3] San Miguel also stated that Table 1 shows how sulfur and heating value vary over the past 14 years and how these two values determine the inlet quantity of SO_2 into the wet flue gas scrubber system. Table 1 is referenced as Attachment A to comment 0060 which was separately hand-delivered to EPA's Region 6 office as it contains Confidential Business Information.

[San Miguel (0060) p. 3-4] San Miguel expressed appreciation that the EPA has seen that San

Miguel has been proactive in improving its SO_2 scrubber system to operate at the highest level. San Miguel also appreciates EPA's understanding that the lignite burned from the San Miguel Mine has a naturally occurring and varying sulfur content. EPA has further recognized that San Miguel is using the best technology available to remove sulfur at the highest level expected. Thus the EPA has not proposed any further control for San Miguel.

According to San Miguel, the EPA has specifically solicited comments on the proposed SO_2 emission limit for San Miguel and the potential need for a higher limit to provide sufficient operational headroom. In response, San Miguel believes that a higher limit and an annual emission limit is necessary to provide operational headroom to demonstrate compliance.

San Miguel stated that they are a mine mouth plant. Its only source of fuel is the lignite that is delivered to the plant directly from the San Miguel Lignite Mine. This fuel varies significantly in its heating value and sulfur content depending on the lignite seam and mining geographic location. The lignite delivered is a blend of three seams of lignite from two geographical separated areas in the mine. Each area and each seam has its own unique qualities - sulfur and heating value. The mine attempts to provide a fuel that provides the specified heating value for the lignite designed steam generator. The mining areas have moved approximately 14 miles since San Miguel started commercial operation in 1982. The sulfur in the lignite has varied in the mine as mining operations have moved. Table 1 [separately delivered to EPA as CBI material] shows how sulfur and heating value vary over the past 14 years and how these two values determine the inlet quantity of SO_2 into the wet flue gas scrubber system.

San Miguel noted that the equivalent SO_2 is the inlet SO_2 loading to the scrubber system. This value is directly related to the amount of SO_2 that can be removed by the scrubber system.

According to San Miguel, Table 2 shows the relationship between actual annual emission rate and the calculated emission limit based on a 94% removal rate of the average fuel. Modifications to the scrubber have increased efficiency from 90% in the early 2000's to the current maximized efficiency of 94%.

In the discussion of long-term strategy for San Miguel the EPA stated: "We believe that based on the scrubber upgrades it has recently performed and its demonstrated ability to maintain an emission rate below this value on a monthly basis from December 2013 to June 2014 that it can consistently achieve this emission level." While it is true that San Miguel did achieve the emission level discussed in the Proposed FIP, this is not typical of San Miguel's operations and was due to outstanding events that contributed to achieving that emissions rate. During that time period: 1) San Miguel was only operating for 3,332 hours out of the possible 5,064 hours; 2) San Miguel, a base load unit, operated only one out of the seven months as a base load unit during that time period. These changes in operations were due to economic and other external factors and are at variance with long-time historic operations so they should be considered an exception, not the norm of our operations for purposes of assessing long-term compliance feasibility. For example, during all other months of 2014 San Miguel was operating in a load following mode, cycling between full load and minimum load.

San Miguel stated that when they return back to operating as a base load unit, the emission limit will be unachievable, especially during the peak summer months. A higher limit in combination with a limit based on an annual average, rather than the proposed 30 day rolling emission average, will help to address these concerns.

San Miguel asserted that another reason the limit should be increased is due to variations in the sulfur content and heat rate of the lignite. As demonstrated in Table 2, when the sulfur content of the fuel was at its peak from 2009 through 2011, and the scrubber operating at 94% efficiency, the limit could not be met. This indicates a higher limit would be necessary to demonstrate compliance.

Table 2. Actual vs. Calculated Emission Rate:

Table 2
Actual vs Calculated Emission Rate

Year	Inlet SO2 lbs/mmBtu	Calculated Emission Rate lbs/mmBtu	Actual Emission Rate lbs/mmBtu	Actual Months Average Emissions Above 0.6 lbs/mmBtu
2000	7.386	0.443	0.68	8
2001	8.237	0.494	0.746	11
2002	8.721	0.523	0.731	11
2003	7.483	0.449	0.531	1
2004	7.623	0.457	0.486	2
2005	7.551	0.453	0.733	9
2006	9.040	0.542	0.657	10
2007	9.408	0.564	0.496	3
2008	9.983	0.599	0.581	7
2009	10.152	0.609	0.628	7
2010	10.635	0.638	0.62	8
2011	10.417	0.625	0.607	6
2012	9.616	0.577	0.621	6
2013	9.138	0.548	0.581	4
2014	8.669	0.520	0.482	0

Comment: Averaging period [San Miguel (0060) p. 4-5]

San Miguel stated that 2014 was an aberration and not in line with San Miguel's historic operations. EPA should, therefore, raise the emissions limit to reflect the actual operation of the San Miguel facility, while also increasing the averaging period to one year, rather than the currently proposed 30-day rolling average. We understand that EPA has voiced a preference for shorter averaging periods due to seasonal variations of emissions and visibility impacts. However, since San Miguel is a base load unit and intends to operate year-round, these concerns are minimized. That being said, if EPA does intend to proceed with a 30-day rolling SO_2 emissions limit, San Miguel's limit should be raised to an even higher level than discussed above.

This would account for fuel variability leading to higher than normal emissions over a period of time greater than 30 day.

Response: For the reasons discussed in our proposal and in our response to comments, we believe that we must finalize our proposed FIP controls for San Miguel. In our Cost TSD, we noted that prior to the start of its scrubber upgrade program, the San Miguel FGD system required a DBA level of approximately 1,400 ppm to achieve 94.75% SO_2 removal while firing lignite with an average sulfur content of 9.6 lb/MMBtu. San Miguel provided a 2013 report that detailed the scrubber upgrades that it had performed. In that report, its contractor, URS outlined two options for improving the scrubber efficiency, involving improvements to its scrubber system. Option 1 was designed to achieve the same 94.75% SO_2 removal with a higher 10.5 lb/MMBtu coal with a lower DBA concentration of about 725 ppm. Option 2 was designed to achieve the same 94.75% SO_2 removal with 10.5 lb/MMBtu lignite with an even lower DBA concentration of about 125 ppm. San Miguel elected to initially install the Option 1 scrubber upgrade in all four of its absorber modules during its spring 2010 outage, and the Option 2 scrubber upgrade during its spring outage in 2012. San Miguel subsequently further upgraded the scrubber system by making improvements to the tank agitators in 2011 - 2012, and again replacing its trays with an improved design during the spring 2014 outage. URS stated that it appears the FGD system is currently operating as intended both from a chemical and physical design standpoint and that the FGD system was achieving approximately 94% SO_2 removal efficiency at absorber DBA concentrations of about 400 ppm.

San Miguel requests that should we finalize our FIP, we increase its emission limit and increase its averaging period to an annual average to insure the limit and average period appropriately reflect base load operations.

We proposed that San Miguel's SO_2 emissions not exceed 0.60 lbs/MMBtu based on a 30 day boiler operating day average. In our proposed Cost TSD, we presented San Miguel's historical sulfur content and Btu coal values reported by it. Below we extend that information to 2014,[125] and we also calculate the resulting uncontrolled SO_2 emissions, and a 94% control (what we assumed in our proposal) of the SO_2 emissions:

Year	% Sulfur	Btu/lb	Lbs SO_2/MMBtu	94% control
2009	2.68	5,280	10.15	0.609
2010	2.82	5,303	10.64	0.638
2011	2.75	5,280	10.42	0.625
2012	2.49	5,179	9.62	0.577
2013	2.38	5,209	9.14	0.548
2014	2.25	5,210	8.64	0.518

We calculated the uncontrolled SO_2 emissions as follows, using year 2014 as an example:

Uncontrolled SO_2 Emissions = (2.25 % sulfur X lb/5,210 Btu) X (1,000,000 Btu/MMBtu) X (2 molecules SO_2/molecule S) X (1.0/100%) = 8.64 lbs/MMBtu

[125125] We used the data reported by San Miguel to the Energy Information Administration in Form EIA-923, available here: http://www.eia.gov/electricity/data/eia923/

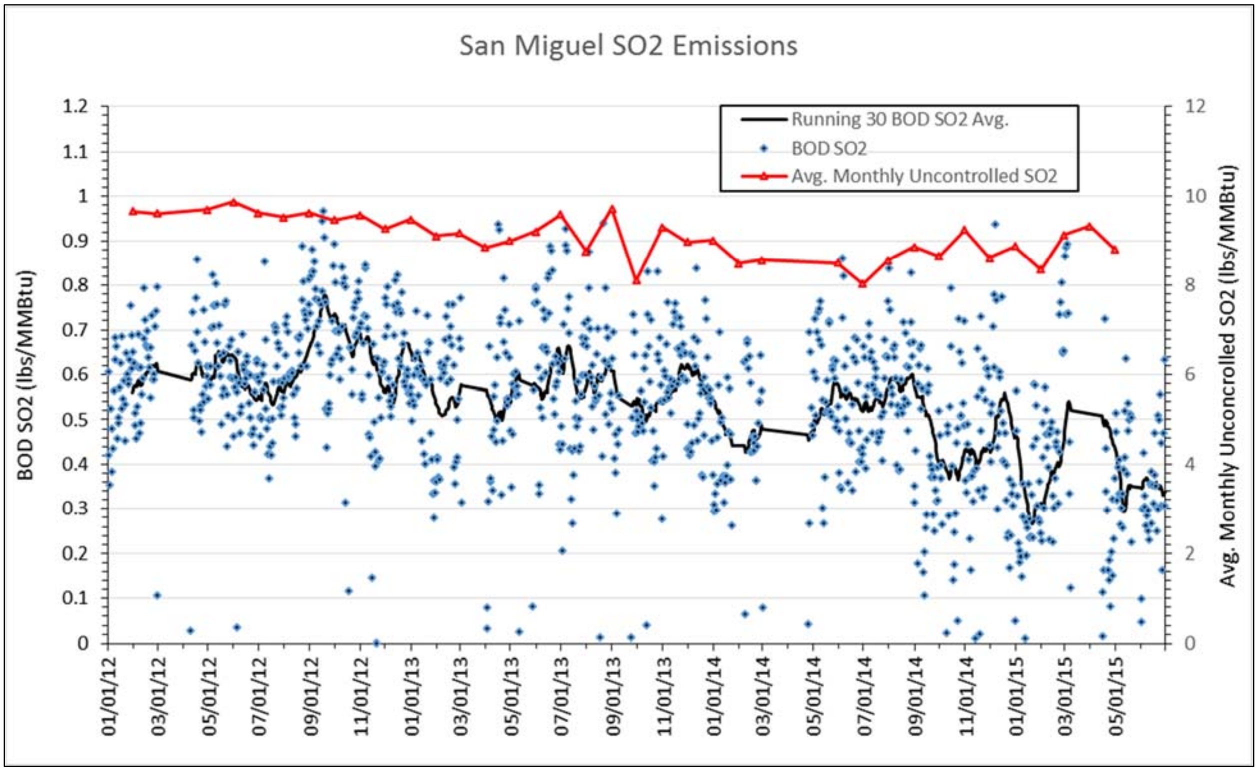
As can be seen from the above table, 94% control of the coal that San Miguel has burned since 2012 would have resulted in an annual average SO_2 emission limit below our proposed FIP limit of 0.60 lbs/MMBtu. In addition, we note that the coal sulfur content of the coal burned by San Miguel has trended steadily downward since 2010, when San Miguel's average annual uncontrolled SO_2 emissions was 10.64 lbs/MMBtu. San Miguel states with reference to its Table 2 that 2014 was an aberration in its operations, but we note that it had only finished upgrading its scrubber system after the 2014 spring outage, so we view the information prior to this period as not fully reflecting its scrubber capabilities.

We also examined the monthly SO_2 emission data for San Miguel. We update that information below:

Year	**Month**	**Operating Time (hours)**	SO_2 **(tons)**	SO_2 **Emission Rate (lbs/MMBtu)**
2013	1	744	886.184	0.544
2013	2	671.5	759.849	0.569
2013	3	49.75	74.948	0.710
2013	4	668.5	753.295	0.587
2013	5	344.75	383.038	0.594
2013	6	720	917.028	0.637
2013	7	731	922.075	0.581
2013	8	649	795.605	0.626
2013	9	379	439.158	0.530
2013	10	728.75	967.086	0.552
2013	11	720	1104.451	0.624
2013	12	744	982.405	0.545
2014	1	536	510.134	0.425
2014	2	511	554.017	0.519
2014	3	1	0.047	0.079
2014	4	127	126.051	0.572
2014	5	743.5	925.666	0.580
2014	6	720	811.227	0.521
2014	7	743.25	870.983	0.576
2014	8	744	920.341	0.592
2014	9	672.5	419.734	0.442
2014	10	611.25	483.517	0.494
2014	11	630.25	545.097	0.480
2014	12	698.5	697.135	0.482
2015	1	709.5	407.832	0.330
2015	2	672	617.49	0.486
2015	3	168.75	272.642	0.712
2015	4	366.25	192.262	0.279

2015	5	492.25	445.863	0.419
2015	6	702	493.456	0.358

We have typically conditioned our FIPs based on 30 day averaging periods and continue to believe that a 30 day averaging period is appropriate. Our goal in proposing emission limits for pollution control devices in regional haze federal plans is that the emission limits be attainable within the specified averaging periods, considering start-up or shutdown issues. For instance, in our Texas FIP we proposed that the emission limits employ a 30 Boiler Operating Day (BOD) average, as specified by the regional haze rule for BART determinations, since our control analysis was similar to what we would have conducted for BART. A 30 BOD average is inherently easier for a typical EGU to meet, because it does not over-weigh emission spikes caused by start-up or shutdown events, as a straight 30 calendar day average has the potential to do. Below are the results of a 30 day BOD average for San Miguel:



We constructed this graph[126] by downloading San Miguel's SO_2 emission data from our website,[127] filtering out any days when the boiler was not operating (BOD SO_2), and calculating a running 30 day BOD average (Running 30 BOD SO_2 Avg.). We also downloaded San Miguel's monthly coal sulfur data from EIA[128] and calculated San Miguel's average monthly uncontrolled SO_2 emission limit (Avg. Monthly Uncontrolled SO_2). The above graph shows that following San Miguel's spring 2014 outage, when it further upgraded its scrubber system, its running 30 BOD SO_2 average has been trending downward, while its coal sulfur content has been slightly trending upward. Focusing on the

[126] See the file, "San Miguel Daily Emissions.xlsx" in our final docket.
[127] http://ampd.epa.gov/ampd/
[128] http://www.eia.gov/electricity/data/eia923/

peaks in San Miguel's running 30 BOD SO_2 average that occurred on 12/18/14 and 3/6/15, we note that San Miguel's running 30 BOD SO_2 average was 0.559 lbs/MMBtu and 0.541 lbs/MMBtu, respectively. During these months, San Miguel's average calculated uncontrolled SO_2 was 8.87 lbs/MMBtu and 9.33 lbs/MMBtu, respectively. This results in a control level of approximately 94%. We reaffirm our proposed conclusion that based on the coal that San Miguel has historically burned over the last several years, and its demonstrated ability to remove 94% of the sulfur from that coal, that it should be able to comfortably meet our proposed emission limit of 0.60 lbs/MMBtu based on a 30 BOD average.

San Miguel states that its ability to achieve our proposed FIP emission rate was due to outstanding events that are not typical of its operations. It states that it was only operating for 3,332 hours out of the possible 5,064 hours, and that it operated only one out of the seven months as a base load unit during that time period. San Miguel does not fully explain how it believes these circumstances should impact its ability to achieve our proposed SO_2 emission limit. We assume it has to do with more frequent startup and shut down emission fluctuations. However, our experience has been that when an EGU operates as a base load unit, its emissions tend to be the most stable and its emissions are the lowest due to minimal startup and shut down emission fluctuations. Our above analysis is largely independent of those issues, because as we explain above, the BOD averaging method only considers those days when San Miguel's boiler was operating. Thus, emission fluctuations due to startup and shut down events are minimized. Also, to the minor extent those fluctuations do impact emissions, we believe it would impair — not aid San Miguel in achieving our proposed SO_2 emission limit. As a consequence, we do not believe that San Miguel has demonstrated that intermittent or load following operation impairs its ability to achieve our proposed SO_2 emission limit.

San Miguel also requests that should we finalize our FIP, we increase its SO_2 emission limit in case it burns coal with higher sulfur levels, similar to that it burned between 2009 and 2011, when its calculated annual average uncontrolled SO_2 emissions reached 10.64 lbs/MMBtu. First, we realize that San Miguel is a mine mouth facility and does not have rail access to outside sources of coal. However, we are unaware of another facility in the United States that burns a coal with a higher sulfur content than San Miguel, which causes San Miguel's visibility impact to remain significant even when controlled to 94%. We believe this places a special burden on us to ensure that we appropriately analyze San Miguel under the reasonable progress and long-term strategy provisions of our FIP.

Second, we note that applying a 94% removal efficiency to a coal with an uncontrolled emission rate of 10.64 lbs/MMBtu results in a controlled emission rate of 0.59 lbs/MMBtu. Although this is just under our proposed FIP emission limit of 0.60 lbs/MMBtu, the uncontrolled emission rate calculation of 10.64 lbs/MMBtu was based on an annual average sulfur content and does not allow for normal monthly variations in sulfur content. However, we note that one of San Miguel's stated purposes for upgrading its scrubber system was to reduce its DBA usage and thus realize a savings in annual operating costs. As we note above, prior to its scrubber upgrade, San Miguel previously used a DBA level of approximately 1,400 and that URS reports that following the spring 2014 upgrade, San Miguel's scrubber system was operating as expected and was achieving approximately 94% SO_2 removal efficiency using DBA concentrations of about 400 ppm. Thus, we believe that some spare capacity exists in San Miguel's scrubber system.

However, to ensure that San Miguel can meet our proposed FIP emission limit, even if it must again burn its historically higher sulfur coal, we will offer San Miguel the following option, if it cannot achieve our proposed emission limit of 0.60 lbs/MMBtu based on a 30 day BOD average:

- Install a CEMS at the inlet of the scrubber system. The 30 BOD SO_2 average from the existing outlet CEMS must read at or below 6.0% (94% control) of a 30 BOD SO_2 average from the inlet CEMS. San Miguel must inform us in writing of its decision to select this option for compliance by no later than their compliance date.

This option is specified in more detail in our final rule.

11.a. Use of Confidential Business Information

Comment: [Luminant (0061)] The following attachments to the April 2015 Sargent & Lundy report included in the Luminant comments were submitted separately as CBI:

Attachment 1 - Approach to Estimating O&M Costs
Attachment 2 - Scrubber Upgrade Capital Cost Adjustment and Cost Effectiveness

Response: We have responded to Luminant's CBI comments in a separate attachment that is not a part of our posted docket, but is available for viewing by Luminant.

Comment: [NRG (0078) p. 12] NRG provided a confidential report by Sargent & Lundy titled, *S&L Comments to EPA Assessment of Limestone FGD Capability* (Apr. 15, 2015).

Response: We have responded to NRG's CBI comments in a separate document that is not a part of our posted docket, but is available for viewing by NRG.

Comment: [TCEQ/PUCT (0056) p. 17] The TCEQ stated that the EPA's cost analysis for the proposed FIP is not adequate, in particular regarding the FGD scrubber upgrades. The EPA cannot use the claim of confidential business information to circumvent its obligation to provide the public with adequate information regarding the economic analysis of its regulatory actions or to defend its decision to disapprove the Texas 2009 RH SIP.

As part of their comments on the proposed FIP requirements, the TCEQ noted that the EPA cites the companies' claims of confidential business information to defend its complete lack of any cost information regarding upgrades to scrubbers and merely claims that all the scrubber upgrades were less than $6oo per ton (79 FR 74877). Confidential business information is not a justification for failing to provide proper cost impact information of a proposed rule. The EPA could have provided example cost information for each type of scrubber upgrade considered without disclosing any specific information claimed confidential by the companies. The EPA has not even provided a total cost for all the scrubber upgrades. Additionally, while the proposal preamble and *Technical Support Document for the Cost of Controls Calculations for the Texas Regional Haze Federal Implementation Plan* include detailed information on the costs of the scrubber retrofits, the EPA also did not provide a total cost estimate of the seven EGUs that EPA has proposed standards that would require installation of new FGD scrubbers. The only total cost estimate provided by the EPA for the proposed FIP is the approximate $2 billion provided by EPA staff in informal discussions with the TCEQ.

The TCEQ noted that the EPA claims the TCEQ should have considered scrubber upgrades as a cost-effective control measure in the Texas 2009 RH SIP revision. Yet, even with the proposed FIP, the EPA has not provided the TCEQ or the public with any information to evaluate the cost-effectiveness of scrubber upgrades. Neither the TCEQ nor the public is required to accept the EPA's unsubstantiated claim that the cost-effectiveness of the scrubber upgrades is less than $6oo per ton. The EPA is using the cost -effectiveness of scrubber upgrades as a basis for disapproving the Texas 2009 RH SIP and must provide adequate information for evaluating the basis of the EPA's decision. The EPA should provide cost information for all scrubber upgrade methodologies considered by the agency.

Response: We disagree with the TCEQ that we should have provided more information concerning the cost of the scrubber upgrades we analyzed. Our scrubber upgrade cost information was based on information supplied by the affected facilities in response to requests for information under section 114(a) of the CAA. The affected companies claimed that information as Confidential Business Information (CBI) under 40 C.F.R.§ 2.203(b) by the authority of the CAA as amended (42 U. S. C. 7401, 7411, 7412, 7414, 7416, 7601) therefore we are generally prohibited from making it available for public review. Any excerpts or summaries must also be treated as being subject to CBI claims and therefore we are prohibited from it disclosure or release to another party. Accordingly, although this information is being used to support our decision making, because all of the affected companies claimed that information as CBI, it cannot be included in our docket for public review and can only be disclosed by us to the extent permitted by Section 114(c) of CAA and our regulations governing treatment of CBI as set out at 40 CFR Part 2, Subpart B.

We also disagree with the following statement made by the TCEQ:

> The EPA has not even provided a total cost estimate of the seven EGUs that EPA has proposed standards that would require installation of new FGD scrubbers. The only total cost estimate provided by the EPA for the proposed FIP is the approximate $2 billion provided by EPA staff in informal discussions with the TCEQ.

Our Cost TSD provides much more than just cost summaries for all of our proposed scrubber retrofits (what the TCEQ refers to as “installation of new FGD scrubbers”). We have provided detailed information concerning every aspect of the cost analyses of our proposed scrubber retrofits, including our choice of cost models, all the inputs, results summaries, detailed discussion of the results, and the accompanying cost spreadsheets. All of this information and more is present in the docket for this action.

Comment: EPA’s RPG analysis impermissibly fails to consider site-specific factors
[CCP (0075) p. 8]

Despite an express requirement to consider "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," EPA failed to consider site-specific factors applicable to the Coleto Creek Unit 1 and other sources in adopting its one-size-fits all wet FGD ("WFGD") scrubber control strategy.[1] There is no excuse for such oversight because EPA specifically solicited information from CCP via a CAA Section 114 information request seeking specific information related to installation of additional controls at Coleto Creek Unit 1 and arbitrarily decided to ignore it. For example, Coleto Creek produced confidential business information to EPA indicating that capital cost for a WFGD scrubber would greatly exceed EPA's estimated capital cost for CCP of $262,435,000 as stated in the Cost TSD. Consistent with EPA's statement at page 12 of its TSD, CCP is limited in what it may publicly state in these comments without compromising its claim of Confidential Business Information under 40 C.F.R. Part 2, Subpart B. Therefore, CCP refers EPA to the Phase I Screening Study labeled COL_CONFIDENTIAL_007212 for information indicating that the capital costs of a WFGD scrubber is much higher than EPA estimates.[2]

Footnotes:

[1] EPA also fails to consider more general factors applicable to use of WFGD scrubbers. For example, EPA fails to consider the impact and costs associated with managing and disposing of scrubber and ash residue in light of the proposed Coal Combustion Residue rule. EPA is required by law to account for such "non-air environmental impacts." 40 C.F.R. § 50.308(d)(1).

[2] EPA does appropriately determine that any implementation of controls stemming from RPGs should allow for an implementation period of five years for Coleto Creek Unit 1.

Response: We have reviewed the document that CCP has referenced in the above comment. The only wet FGD cost information we could find in that document was contained in a summary table that produced a single number for the total capital cost of a wet FGD. This number was not accompanied by a line-item break down of the costs or any backup whatsoever. Thus, we do not know what equipment or assumptions went into the generation of that number, or if the costs contained items that are disallowed by our Control Cost Manual, such as AFUDC or owner's costs. As a consequence, that cost assertion is not reliable for a regulatory cost determination.

Comment: [Stamper (0068) p. 39] The fact that all 15 of the Texas EGUs with SO_2 controls proposed by EPA have provided detailed cost estimates, emission reductions, and scrubber upgrade measures in publicly available documents does call into question whether it is justifiable for the owners/operators of the Texas EGUs evaluated by EPA for scrubber upgrades to withhold such information from the public as CBI.

Response: We disagree with the comment that we should have provided more information concerning the cost of the scrubber upgrades we analyzed. Our scrubber upgrade cost information was based on information supplied by the affected facilities in response to requests for information under section 114(a) of the CAA. The affected companies claimed that information as Confidential Business Information (CBI) under 40 C.F.R.§ 2.203(b) by the authority of the CAA as amended (42 U. S. C. 7401, 7411, 7412, 7414, 7416, 7601) therefore we are generally prohibited from making it available for public review. Any excerpts or summaries must also be treated as being subject to CBI claims and therefore we are prohibited from it disclosure or release to another party. Accordingly, although this information is being used to support our decision making, because all of the affected companies claimed that information as CBI, it cannot be included in our docket for public review and can only be disclosed by us to the extent permitted by Section 114(c) of CAA and our regulations governing treatment of CBI as set out at 40 CFR Part 2, Subpart B.

11.b. General cost comments

Comment: [Luminant (0061) p. 5] Luminant operates nine of the fifteen units in Texas that EPA proposes to regulate in this rulemaking, and Luminant would bear over half of the more than $2 billion in costs that EPA seeks to impose—for no perceptible improvement in visibility, according to EPA's projections.

Response: We believe, for reasons we have outlined in our proposal and elsewhere in our response to comments, that the controls we proposed under our FIP will result in significant improvements in visibility at a number of Class I areas. We do not agree that the consideration of visibility improvement must directly reflect human perception. As we explain in our FIP TSD, we have linked many aspects of our reasonable progress and long-term strategy analyses to our BART Guidelines.[129] The CAA and the RHR require, as part of each BART analysis, consideration of "the degree of improvement in visibility which may reasonably be anticipated to result from the use of such technology." The regulations do not require that the improvement anticipated to result from a particular technology at a particular source be perceptible by a single human being in order to be relevant as part of a BART determination. As we explained in the preamble to the BART Guidelines:

> Even though the visibility improvement from an individual source may not be perceptible, it should still be considered in setting BART because the contribution to haze may be significant relative to other source contributions in the Class I area. Thus, we disagree that the degree of improvement should be contingent upon perceptibility.

Therefore, in our visibility improvement analysis, we have not considered perceptibility as a threshold criterion for considering improvements in visibility. Rather, we have considered visibility improvement in a holistic manner, taking into account all reasonably anticipated improvements in visibility expected to result at all Class I areas, and the fact that in the aggregate, improvements from controls on multiple sources will contribute to visibility progress. Visibility impacts below the thresholds of perceptibility cannot be ignored because regional haze is produced by a multitude of sources and activities which are located across a broad geographic area.

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[129] To assist in interpreting these reasonable progress factors, we will rely on our reasonable progress Guidance.3 Our Reasonable Progress Guidance notes the similarity between some of the reasonable progress factors and the BART factors contained in Section 51.308(e)(1)((ii)(A), and suggests that the BART Guidelines be consulted regarding cost, energy and non-air quality environmental impacts, and remaining useful life. We are therefore relying on our BART Guidelines for assistance in interpreting those reasonable progress factors, as applicable. FIP TSD page 6.

Comment: [NERA (0061) p. 1] In a report prepared for Luminant, NERA provided an analysis of certain economic aspects of EPA's proposal. The report demonstrates that the additional controls not required by Texas's SIP, but proposed by EPA in its FIP, make no sense from the standpoint of rational decision making, and are significantly less cost effective than controls that EPA has declined to require in other regional haze actions that EPA has finalized for this same planning period. This set of technical comments complements and supplements the many other legal and other analytical issues identified in Generation Company LLC's (Luminant's) comments on the proposed FIP and is submitted in support of Luminant's comments.

According to NERA, in support of its proposal, EPA has developed an arbitrary rationale to support which emissions sources should be required to take action under the proposed FIP and which other emissions sources are not required to take action. There are numerous inconsistencies and flaws in the logic applied in EPA's screening and quantitative analyses. Ultimately, however, rational and sound decision making must demonstrate that the resulting set of actions produce reasonable visibility benefits in return for the costs that they will impose on society. That is the essence of a cost-benefit analysis. EPA has not demonstrated that here.

[NERA (0061) p. 3] NERA stated that this report and its statements are based on EPA's own cost estimates for the upgrades and retrofits in the proposed FIP. The fact that we use EPA's cost estimates to demonstrate the lack of cost effectiveness of those proposed controls does not imply that we are endorsing them. Luminant contends in other parts of its comments that these estimates are not correct and that EPA understates the costs of its proposal. To the extent that actual costs are higher than EPA has estimated, our conclusion that the proposed FIP is exceptionally cost ineffective would be further reinforced.

Response: We disagree that our rationale is arbitrary and that there are numerous inconsistencies and flaws in logic in our analysis. Our action is based on an appropriate and thorough study of the cost considerations deemed necessary by the Regional Haze Rule. We respond to these generalized comments in other our responses to other comments in which these issues are more specifically discussed.

Comment: [TCEQ/PUCT (0056) p. 15-16] The TCEQ stated that that its analysis of potential additional controls is adequate and approvable. It stated that the EPA's proposed finding that a specific type of unit-by-unit cost and effectiveness analysis was necessary to have an approvable long-term strategy and an approvable consultation with Oklahoma contradicts the EPA's own June 1, 2007 *Guidance for Setting Reasonable Progress Goals Under the Regional Haze Program.* The EPA's methodology of evaluating possible additional controls on existing EGUs is not required by the RHR or by the guidance in place at the time Texas prepared its 2009 RH SIP.

The TCEQ noted that the EPA's own guidance, Chapter 4: Identify Control Measures for Contributing Source Categories for the First Planning Period, page 4-2, states:

> The Regional Haze Rule gives States wide latitude to determine additional control

> requirements, and there are many ways to approach identifying additional control measures; however, you must at a minimum, consider the four statutory factors.

The TCEQ stated that it prepared its analysis of the cost and effectiveness of additional controls by selecting sources and controls that met a $2,700 per ton threshold. This threshold amount was used in CAIR, as well as used by the EPA in preparing its BART rules and guidance.

The TCEQ noted that the control package Texas considered included SO_2 controls at 24 facilities from 15 sites. The NO_x controls included 24 facilities at 15 sites. The calculated haze index improvements at affected Class I areas from the additional controls ranged from a low of 0.04 deciview at Wheeler Peak in New Mexico to 0.36 deciview at Wichita Mountains in Oklahoma. The estimated annualized cost for the controls necessary to achieve these calculated benefits was $324 million. Texas determined that this cost is unreasonable for a visibility improvement that is below the threshold of perception and below the 0.5 deciview criteria the EPA used for "contribute to."

The TCEQ stated that on page 4-2, the guidance refers to the EPA's AirControlNET database as a source of $324 million a year. In its analysis, Texas relied on the cost and effectiveness information supplied by AirControlNET regarding control techniques for specific source categories. In preparing the 2009 RH SIP, Texas did use appropriate areas of influence; it did consider controls from the EPA's AirControlNET database; and it did consider the four statutory factors in considering whether additional controls were reasonable to implement.

The TCEQ stated that the EPA's preference for a different analysis procedure that reaches a similar conclusion about cost and effectiveness is not a justifiable basis for the EPA to disapprove Texas' process in developing its 2009 RH SIP submittal nor is it a justifiable basis for the EPA to disapprove the Texas-Oklahoma consultation about Texas' impact on visibility impairment at Wichita Mountains.

Response: We disagree with the TCEQ that its analysis of potential controls was adequate for the reasons discussed in our proposal and TSDs. We also disagree, as discussed in depth elsewhere, with the TCEQ that we required a specific type of analysis or that we disapproved the SIP based on the supposed use of a source category-based analysis by Texas. We chose our analysis strategy to remedy specific flaws in the TCEQ's analysis. As we state in our proposal:[130]

> The TCEQ constructed a large potential control set consisting of a mix of large and small sources, located at various distances from Class I areas, with a large geographical distribution. Because of the variation in size, type, and location of these sources, the potential to impact visibility and potential benefit from controls at a given Class I area can vary greatly between the identified sources. This potential control set identified by the TCEQ included controls on some sources that would likely result in significant visibility benefits, but also included controls on many sources with much less anticipated visibility benefits. Because it only estimated the visibility benefit of all the controls together, the TCEQ was not able

[130] 79 FR 74838.

> to assess the potential benefit of controlling individual sources with significant, and potentially cost-effective, visibility benefits. Also, we believe that individual benefits were masked by the inclusion of those controls with little visibility benefit that only served to increase the total cost figures. For example, the TCEQ identified SO_2 controls at Big Brown to be approximately $1,500/ton, significantly less than its $2,700/ton threshold. These controls were estimated to achieve greater than 40,000 tpy SO_2 emission reductions. Despite this evidence in the record of an identified cost-effective control that results in large emission reductions, and source apportionment modeling identifying large impacts from EGU sources in northeast Texas, the TCEQ did not separately evaluate the visibility benefit from the implementation of this control, or appropriately weigh the four reasonable progress factors in determining the reasonableness of this individual control.

Because the TCEQ's analysis masked the potential visibility benefits from controlling specific sources or groups of sources, our analysis was designed to investigate whether individual source-specific controls were justified.

The fact that the TCEQ used the cost effectiveness tool we mentioned in our Reasonable Progress Guidance, AirControlNET, does not mean that its resulting analysis is shielded from our review. As the Regional Haze Rule states:[131]

> In determining whether the State's goal for visibility improvement provides for reasonable progress towards natural visibility conditions, the Administrator will evaluate the demonstrations developed by the State pursuant to paragraphs (d)(1)(i) and (d)(1)(ii) of this section.

Thus, regardless of the specific tools a state uses in its SIP, we must analyze its demonstration.

We agree with the TCEQ that our Reasonable Progress Guidance, and the Regional Haze Rule itself, provides states with wide latitude in complying with many aspects of the Regional Haze Rule. However, that latitude concerns *how* states comply with certain aspects of the Regional Haze Rule, not *whether* states must comply with the Regional Haze Rule. As we discuss in our proposal, we determined that cost effective controls were available that would provide significant visibility benefits to the Wichita Mountains Class I areas and other Class I areas that Texas should have required. Instead, despite the fact that sources within Texas impact the visibility at the Wichita Mountains in Oklahoma more than do sources in Oklahoma, Texas required no additional controls other than CAIR/CSAPR and those already on its books. We conclude that the flaws in Texas's analyses cannot be approved as latitude and/or flexibility in how a proper analysis might be conducted under the Regional Haze Rule.

We address comments concerning no perceptible visibility benefits and Texas' consideration of visibility benefits along with the use of a 0.5 dv threshold in the section of this document concerning cost versus visibility benefits. We address comments on Texas' selection and application of the $2,700/ton threshold in the consistency section of this document.

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[131] 40 CFR Section 51.308(d)(1)(iii).

Comment: Scrubber upgrades on NRG's plants would be unreasonable
[NRG (0078) p. 12]

NRG stated that the EPA has proposed to require scrubber upgrades at two of NRG's assets, Units 1 and 2 at the Limestone power plant. 79 Fed. Reg. at 74,884. As indicated throughout these comments, NRG does not agree that additional SO_2 controls on these units are warranted to address regional haze.

NRG stated that the EPA's proposed SO_2 emission rate for Limestone would be inappropriate, because it would not meaningfully improve visibility and relies on an erroneous cost-effectiveness analysis. NRG requests that EPA withdraw its proposed SO_2 emission rate for the Limestone plant.

In addition, NRG supported the exclusion of the W.A. Parish plant from EPA's proposed SO_2 emission limits for similar reasons. NRG disagrees that emission reductions from the Parish plant would be cost-effective from a visibility improvement perspective.

Response: We disagree with NRG that scrubber upgrades at the Limestone facility are not warranted. We address NRG’s general comments concerning our cost analyses and its emission limit in our responses to its specific cost comments. Many of these comments were submitted by NRG as Confidential Business Information. We have responded to NRG’s CBI comments in a separate document that is not a part of our posted docket, but is available for viewing by NRG.

Comment: Texas’s Aggregate Analysis Masked Cost-Effective Controls.
[Earthjustice (0067) p.24]

Earthjustice et al., stated that the EPA also properly rejected Texas’ reasonable progress control analysis because Texas compared the costs of controls against benefits in such a way that led the State to reject controls as too costly even though the costs met the State’s own cost threshold. EPA rightly concluded that Texas’s analysis is unreasonable because it led Texas to overlook reasonable, cost-effective controls.

Earthjustice et al., stated that Texas decided that reasonable progress controls costing $2,700 per ton or less were cost-effective; it screened controls over that amount out of its analysis. Texas then analyzed in the aggregate reasonable progress controls costing $2,700 or less by comparing the total cost of controls at all reasonable progress sources to the total visibility benefits. In essence, Texas applied two cost-effectiveness tests – one based on costs per ton to screen out specific controls, and the second based on a cumulative dollars per deciview ($/dv) argument to eliminate all controls evaluated.

With regard to the second cost-effectiveness test, Earthjustice et al., stated that Texas’s approach guaranteed that the state could overlook controls that would have been reasonable if the State had conducted a more fine-grained analysis. EPA properly concluded that Texas’s analysis was unreasonable because the methodology masked the availability of more effective, lower cost controls for specific sources by lumping them together with less effective, higher cost controls

Response: We agree that Texas' long-term strategy and reasonable progress demonstration was flawed.

Comment: EPA's Conservative Assumptions Underestimate the Cost-Effectiveness of the Proposed Controls. [Earthjustice (0067) p.36, Stamper (0068) p.4]

Earthjustice et al., stated that the attached Stamper Report (0068) confirms EPA's conclusion that the controls proposed in the FIP are cost-effective. Ms. Stamper[46] conducted her own analyses of the proposed controls and concludes that the proposed controls are even more cost-effective than EPA considered, and most of the proposed controls even meet the very low $2,700/ton cost-effectiveness threshold that Texas adopted.[47] The Stamper Report confirms EPA's conclusion that the controls proposed in the FIP are cost-effective.

Stamper stated that the EPA has proposed to find that SO_2 controls on 15 EGUs are justified to achieve reasonable progress towards the national goal of eliminating anthropogenic visibility impairment in Class I areas. The Stamper report (0068) evaluates EPA's four-factor analyses of its proposed reasonable progress controls, and provides additional support for EPA's finding that these controls are cost effective. Further, this report shows that SO_2 control measures on 5 other EGUs evaluated by EPA are cost effective and should be part of EPA's FIP, and that controls or emission limitations on additional units would be meaningful and should have been evaluated.

Footnotes:

[46] Victoria R. Stamper is an independent air quality consultant and engineer with extensive experience spanning government and the private sector. Ms. Stamper's experience includes ten years working in EPA's Region VIII NSR Program and significant work on regional haze and Class I air quality matters, including work on permit and plan review and analysis. Ms. Stamper's Curriculum Vitae is included as Attachment A to her expert report.

[47] To be clear, Texas's cost-effectiveness threshold is not adequately supported in the record and is unreasonable. We reference Texas's threshold solely to point out that Texas's methodology caused the State to overlook controls that meet Texas's own cost-effectiveness threshold.

Response: In performing our cost analyses, we attempted to choose conservative input values where possible. We agree that our cost analyses are conservative and cost effective. We disagree that we should have proposed controls for the 5 other EGUs mentioned in the Stamper report. We address EarthJustice, et al.'s general comments concerning control measures on additional EGUs in our responses to specific comments on each of these EGUs.

Comment: Cost Analyses Using More Reasonable Assumptions [Earthjustice (0067) p. 38; Stamper p. 37, 43]

Earthjustice et al., noted that Ms. Stamper revised EPA's analyses to be based on a 5-year annual average emissions baseline, 5-year annual average SO_2 rate in lb/MMBtu, and 5-year average gross heat rate and MW-hrs generated, based on actual operating data from 2009 to 2013. She also presents a 4th control option for the EGUs: a NID™ circulating dry scrubber, based on the SDA IPM cost module but assuming SO_2 control efficiency of 98% or an SO_2 limit of 0.04 lb/MMBtu, whichever is more stringent.

As shown in the FIP TSD, EPA's calculated costs of scrubber retrofits range from $1,255/ton to $3,500/ton of SO_2 removed. Earthjustice et al., stated that EPA's costs for SO_2 controls represent a worst case cost estimate, since EPA's costs are based on highest uncontrolled sulfur content and maximum MW-hours generated per year. Ms. Stamper's revised cost analyses for scrubber retrofits, which follow a methodology consistent with prior EPA analyses, are all lower than EPA's cost estimates stated in the FIP TSD, and range from $1,103/ton to $3,459/ton. All of these costs are reasonable. Other similar sources have had to bear similar costs for pollution control to address regional haze as described in the Stamper Report.

Stamper stated that EPA's proposed scrubber upgrades are cost effective. Stamper noted that the EPA provided extensive information on the various types of scrubber upgrades in its Cost TSD, and provided justification that such upgrades were very cost effective. Cost TSD at 31-52. However, EPA did not provide the specifics details of the scrubber upgrades at each EGU because the information collected by EPA on each units' specific scrubber and scrubber upgrades was withheld as Confidential Business Information (CBI). Cost TSD at 55. EPA also did not provide any of the cost information for the scrubber upgrades, due to the information being withheld as CBI. *Id.* EPA did state that each of the EGUs had engineering firms evaluate SO_2 scrubber upgrade options and costs which EPA was able to review and which, in some cases, were very detailed. *Id. at* 53. Thus, clearly the scrubber upgrades and costs were based on site-specific analyses and data, which should mean that the scrubber upgrade details are feasible and the costs are realistic.

Because EPA did not provide costs for any of the scrubber upgrades, Stamper only estimated the annualized costs of these upgrades. EPA stated that the cost effectiveness for all of the scrubber upgrades at the EGUs listed in Table 19 of the Cost TSD were less than $600/ton of SO_2 removed. Cost TSD at 55. From that $600 per ton value and the SO_2 emission reductions due to the scrubber upgrades listed in Table 19 of the Cost TSD, one can estimate a range of annualized costs of these upgrades of $1,050,000 per year up to $12,473,400 per year. It must be noted that this range could be very inaccurate, since we do not know with any certainty the cost per ton of SO_2 removed for scrubber upgrades at each unit. This just provides a low end and a high end estimate of the annualized costs for these controls.

Stamper gathered other available data on SO_2 scrubber upgrades required to meet BART to determine if these costs seemed reasonable. Stamper attachment 48 is a compilation of that data, and the information is summarized in the table below.

Table 11. Summary of Scrubber Upgrades and Cost Effectiveness Required to Meet BART and Other Regional Haze Provisions.[152]

Plant	Unit	Description of Scrubber Upgrades	Annualized Costs in 2012$	Cost Effectiveness
Jim Bridger	1	Existing Wet Scrubbers: Eliminated bypass, relocated opacity monitor, stack liner and drains for wet stack operation, added new ID fans, used a refined soda ash reagent in place of existing sodium reagent.	$2,423,840	$603
Jim Bridger	2		$2,423,840	$603
Jim Bridger	3		$2,419,322	$602
Jim Bridger	4		$1,175,146	$497
Coal Creek	1	Existing wet scrubbers: Eliminate bypass and modify stack, new mist eliminator, liquid distribution ring, and fan, PLUS lignite coal drying	$11,973,831	$577
Coal Creek	2		$11,973,831	$577
Cholla	4	Replacing existing wet scrubber tower that only treated 36% of flue gas, with a new wet scrubber that treats 100% of flue gas	$9,149,759	$901
Hayden	1	Existing lime spray dryer: Add spare atomizer parts and increase in reagent.	$124,894	$2,047
Hayden	2		$124,894	$3,202
Colstrip	1	Existing wet venturi scrubbers: Additional scrubber vessel and add lime injection.	$3,960,664	$883
Colstrip	2		$3,960,664	$959

[152] *See* SO2 Scrubber Upgrade Costs Data (Ex. 48). For underlying data, see May 28, 2009 Wyoming Department of Environmental Quality BART Application Analysis for Jim Bridger Power Plant (Ex. 49); December 12, 2007 Coal Creek Station Units 1 and 2 Best Available Retrofit Technology Analysis (Ex. 50); January 2008 BART Analysis for Cholla Unit 4 (Ex. 51); Colorado Department of Public Health and Environment, Best Available Retrofit Technology (BART) Analysis of Control Options for Public Service Company-Hayden Station (Ex. 52); Hayden BART Cost Analysis (Ex. 53); EPA's Colstrip Unit 1 SO2 Emissions and Costs Summary (Ex. 54); EPA's Colstrip Unit 2 SO2 Emissions and Costs Summary (Ex. 55).

Earthjustice et al., stated that the costs of scrubber upgrades proposed by EPA in the Texas regional haze FIP are quite reasonable to justify these controls to meet regional haze requirements, whether based on EPA's conservative cost estimates or the revised cost estimates provided by Ms. Stamper. Based on the above information (provided as Table 11 of Stamper (0068)), Earthjustice et al., and Stamper concluded that the cost effectiveness of scrubber upgrades (including one complete replacement of a wet scrubber) that have been required to meet BART or other regional haze requirements has ranged from $497 to $3,202 per ton of SO_2 removed. A comparison of EPA's cost numbers for the 9 EGUs in Texas to the cost numbers provided above from the Stamper Report demonstrates that the total annual costs for scrubber upgrades assumed by EPA are well within the range that has been provided by other facilities. Indeed, the cost effectiveness of the scrubber upgrades at the Texas EGUs of less than $600/ton of SO_2 removed are quite reasonable, given the range of cost effectiveness that has been considered reasonable to meet BART and reasonable progress requirements. Thus, Earthjustice et al., and Stamper concluded that the EPA is justified in finding that the cost effectiveness for the scrubber upgrades at Sandow Unit 4, Martin Lake Units 1-3, Monticello Unit 3, W.A. Parish 8, and Limestone Units 1 and 2 are reasonable, as other EGUs have had to bear similar costs to meet regional haze requirements as well as requirements under other Clean Air Act programs.

Stamper and Earthjustice et al., stated that all of the SO_2 scrubber control retrofits and upgrades evaluated by EPA have been adequately justified as cost effective methods to reduce SO_2 emissions from Texas sources, which EPA has identified as the primary contributor to regional haze in the Class I areas impacted by Texas sources. FIP TSD at 3. The installation of a NID™ circulating dry scrubber can achieve the same levels of SO_2 reduction as a wet scrubber, but with much lower water use and lower costs. Thus, for those units for which water use is a concern, such as the Tolk units, a NID system may be the best choice for SO_2 control, and it is also a more cost effective choice for SO_2 control. Stamper stated that all of these measures are necessary to provide reasonable progress towards the national visibility goal of attaining natural background visibility conditions at the Wichita Mountains, Big Bend, Guadalupe Mountains, Caney Creek, Salt Creek, and the other Class I areas with visibility impairment causes by Texas sources. Most of the Class I areas impacted by Texas sources are not on track to attain natural background visibility conditions by 2064. However, with EPA's proposed FIP along with the SO_2 scrubber retrofits at the W.A. Parish and Welsh units, air quality in these Class I areas will be improved more quickly.

Stamper stated that not only are all of the scrubber retrofits and upgrades evaluated by EPA cost effective and justified as reasonable progress controls, but there are additional measures that EPA should consider to improve the rate of progress towards achieving natural conditions at all of the Class I area that are impacted by air emissions sources in Texas. This is discussed in the next section of this report.

Response: We confirm that we intended to construct conservative cost analyses. We agree that our Cost TSD provided extensive information concerning various types of scrubber upgrades typically performed and that our resulting scrubber upgrade costs are very cost effective. We also agree that our scrubber upgrade cost analyses were based on site specific information that was claimed as CBI by the respective companies that supplied it under our CAA section 114 requests, which prevented us from presenting our scrubber upgrade cost analyses. We believe that our scrubber upgrades costs (all of which are wet FGD) are in line with the information Ms. Stamper provides concerning other similar wet FGD scrubber upgrades that have been found by us to be cost effective.

We also agree that the NID technology the comment cites is capable of a similar level of SO_2 control. We take up the issue of whether we should have consider NID technology in another comment. We address comments on additional measures in separate responses to comments.

Comment: EPA's Proposed Scrubber Upgrade Reasonable Progress Requirements.
[Stamper (0068) p. 33]

Stamper stated that the EPA proposed to require upgrades to existing scrubbers at Sandow Unit 4, Martin Lake Units 1, 2, and 3, Monticello Unit 3, W.A. Parish WAP8, Limestone Units 1 and 2, and San Miguel. 79 Fed. Reg. 74884 (December 16, 2014). All of the existing scrubbers at these units are wet scrubbers. Cost TSD at 25. With respect to the San Miguel facility, its existing wet scrubber was recently upgraded, and EPA's proposed FIP simply imposes an SO_2 emission limit reflective of those scrubber upgrades. 79 Fed. Reg. 74822-3, 74877 (December 16, 2014); FIP Cost TSD at 56-61.

Stamper stated that the EPA provided a comprehensive list of the types of upgrades to wet scrubbers that can be done to improve SO_2 removal efficiency and lower SO_2 emissions. Those types of upgrades include:

- Elimination of scrubber bypass
- Upgrades to the scrubber components (installation of liquid distribution rings, perforated trays, redesign of spray header or nozzle configuration)
- Use of organic acid additives
- Improve/upgrade scrubber auxiliary system equipment.

Cost TSD at 26, referencing EPA's BART Guidelines.

Stamper agreed that the scrubber modifications/upgrades that EPA has described in its Cost TSD have been commonly implemented, generally achieve very high SO_2 removal efficiencies, and are cost effective.

Stamper noted that URS estimated the range of costs for three categories of scrubber upgrades – minor, moderate, and major – to reduce hazardous air pollutant (HAP) emissions for the EPA's Mercury and Air Toxics Standards (MATS), since SO_2 scrubbers also control certain HAPs. Their categorization is as follows:[134]

> Minor Upgrades: These consist of moderate changes to some of the internals of a scrubber module, reusing most of existing process and structural components. The primary focus is enhancement of gas/liquid contacting within the absorber. Examples of applicable modifications to the configuration or type of reagent spray headers used (to improve overall reagent coverage and overlap within the absorber). Typical minor upgrades have been used to boost FGD performance to 92 – 97% SO_2 removal.
>
> Moderate Upgrades: These upgrades typically consist of major overhauls to the internals of a scrubber module to replace poor performing or failing components. In many cases, the existing internal process and structural components are removed; the absorber shell and large equipment components are maintained. Modifications include installation of new and improved reagent spray header arrays and absorber trays.
>
> Major Upgrades: For some old FGD units, systems operating with lower-efficiency technologies and units that have been out of commission for extended periods of time, major upgrades are required to obtain desired levels of performance. Such upgrades

typically involve the same activities described for moderate upgrades, but can also include additional replacement of some large equipment along with modifications or additions associated with balance-of-plant equipment. The latter can include additions or modifications to reagent preparation systems (e.g., ball mills), byproduct dewatering systems, and process slurry recirculation systems. In some cases, enhancements are made to existing mist eliminators to reduce carry-over of particulate material from the scrubber. Conversions from one FGD technology to another may include demolition of old or unneeded process components and/or addition of new ones.

Stamper noted that URS concluded the capital cost ranges for each of these categories of upgrades are as follows:

- Minor Upgrades: $5 - $10/kW
- Moderate Upgrades: $15 - $25/kW
- Major Upgrades: $50 - $100/kW

Stamper stated that these capital costs for scrubber upgrades are lower than the capital costs of a new wet FGD or dry FGD system.

Footnotes:
[134] URS, Assessment of Technology Options Available to Achieve Reductions of Hazardous Air Pollutants, 4/5/11, pp. A-5 to A-7 (Ex. 43); Babcock Power Environmental, Wet Flue Gas Desulfurization Scrubber Upgrades, 2009, (Ex. 44), available at www.babcockpower.com/pdf/WetFlueGasDesulfurizationUpgradesSS.pdf.

Response: We agree with the commenter that scrubber retrofits are common and generally very cost effective.

11.c. Individual Cost Criticisms (AFUDC, lifetime, escalation, etc.)

Comment: EPA's cost control analysis is flawed and arbitrary and capricious
[Luminant (0061) p. 130]

Luminant stated that EPA's so-called cost-effectiveness analysis is flawed in several respects. Luminant believes our proposal relies on significantly overstated cost-effectiveness values to justify both the scrubber upgrades and the retrofits it is proposing. Luminant believes our analysis omits substantial costs associated with these upgrades and retrofits, overstates the SO_2 reductions that are achievable (further skewing its cost-effective values), and is internally inconsistent in the methodology that is applied. Moreover, states Luminant, despite claiming that visibility is a key factor in its analysis, we fail to consider costs with respect to the visibility benefits that EPA contends will be achieved. EPA's analysis relies entirely on a cost-per-ton metric but ignores the more meaningful cost-per-deciview metric. An analysis of the cost-per-deciview of EPA's proposal shows that the costs EPA would impose here are well out of proportion to the visibility benefits and well in excess of costs that EPA has concluded elsewhere are not reasonable to impose for regional haze purposes.

Response: The items that Luminant summarizes in this comment, and the information provided in its attached Sargent and Lundy (S&L) report, regarding our scrubber upgrade costs are detailed in a separate comment package submitted under the Confidential Business Information (CBI) provisions of 40 C.F.R.§ 2.203(b). Within those CBI comments, S&L also provides its own cost analyses for upgrading Luminant's scrubbers. We are prohibited from responding to many of these summarized scrubber upgrade comments here with any specificity, because doing so would involve citing and discussing in detail items that Luminant has claimed as CBI. Accordingly, many of our responses to the scrubber upgrade comments are contained within a separate document that is not a part of our posted docket, but will be available for review by Luminant. The responses to comments that do not contain CBI information are contained within this document.

With regard to our scrubber upgrade cost analysis, we generally disagree with Luminant that our analysis was flawed. We used Luminant's own information, backed by independent contractors hired by it, supplied by Luminant in response to our CAA section 114 requests for information. This included cost estimates from well-known and respected contracting firms with a history of many scrubber upgrades. In any event, criticisms regarding our use of this information are moot, because S&L has provided its own cost analysis (under the CBI protections), which it offers as a replacement to our own cost analyses. We have reviewed the scrubber upgrade cost analyses performed by S&L and adopted its methodology. However, we noted many errors and undocumented cost figures in its analyses. We corrected these errors and rejected some of the undocumented assertions and/or costs in S&L's cost analyses. Nevertheless, in order to produce a conservative scrubber upgrade cost analysis and set many of the issues that Luminant raises aside, we incorporated many of Luminant's cost items. The resulting costs for Luminant's scrubber upgrades increased slightly, resulting in a range of $368/ton to 910/ton for all of the scrubber upgrades, well within a range that we believe is cost effective, given the significant visibility benefits that will result from the installation of those controls.

Luminant did not submit any documentation that caused us to conclude that we overstated the SO_2 reductions that are achievable in either our scrubber upgrade or scrubber retrofit analyses.

Because Luminant did not submit its comments concerning our proposed scrubber retrofit costs as CBI, we address them within this document as they arise.

Regarding Luminant's assertions about the cost per deciview metric, we disagree that it is a more meaningful metric. As we note in our Oklahoma FIP:[132]

> [T]he BART Guidelines require that cost effectiveness be calculated in terms of annualized dollars per ton of pollutant removed, or $/ton.[133] OG&E provided a $/deciview analysis for its units and comparable BART determination performed by us. In our analysis for our BART FIP for OG&E and AEP/PSO, we did not evaluate $/deciview. We explain that the BART Guidelines list the $/deciview metric as an optional cost effectiveness measure that can be employed along with

[132] Response to Technical Comments for Sections E. through H. of the Federal Register Notice for the Oklahoma Regional Haze and Visibility Transport Federal Implementation Plan, Docket No. EPA-R06-OAR-2010-0190, 12/13/2011, pdf 116.
[133] 70 FR 39167.

> the required $/ton metric for use in a BART evaluation. The metric can be useful in comparing control strategies or as additional information in the BART determination process; however, due to the complexity of the technical issues surrounding regional haze, we have never recommended the use of this metric as a cutpoint in making BART determinations. We note that to use the $/deciview metric as the main determining factor would most likely require the development of thresholds of acceptable costs per deciview of improvement for BART determinations for both single and multiple Class I analyses. We have not developed such thresholds for use in BART determination made by us. As OG&E acknowledges, EPA did not use this metric as part of its proposed BART determinations for either the Four Corners Power Plant FIP in AZ, or the San Juan Generating Station FIP in NM. Generally speaking, while the metric can be useful if thoughtfully applied, we view the use of the $/deciview metric as suggesting a level of precision in the calculation of visibility impacts that is not justified in many cases. While we did not use a $/deciview metric, we did, however, consider the visibility benefits and costs of control together, as noted above by weighing the costs in light of the predicted visibility improvement.

Our decision was reviewed and upheld in Oklahoma v. EPA, 723 F.3d 1201 by the Tenth Circuit which ruled:

> Oklahoma first suggests EPA should not have rejected the visibility analysis it conducted in the SIP, which used the dollar-per-deciview method. This argument is misguided. The EPA rejected the SIP because of the flawed cost estimates. When promulgating its own implementation plan, it did not need to use the same metric as Oklahoma. The guidelines merely permit the BART-determining authority to use dollar per deciview as an optional method of evaluating cost effectiveness. *See* 40 C.F.R. pt. 51 app. Y(IV)(E)(1).[134]
>
> And in the final rule, the EPA explained why it did not use the dollar-per-deciview metric used by Oklahoma. "Generally speaking, while the metric can be useful if thoughtfully applied, we view the use of the $/deciview metric as suggesting a level of precision in the calculation of visibility impacts that is not justified in many cases." 76 Fed.Reg. at 81,747. The EPA has never mandated the use of this metric, and has not developed "thresholds of acceptable costs per deciview improvement." *Id.* While the federal land managers have developed thresholds, these thresholds were apparently developed without input from the EPA and without notice-and-comment review. EPA Br. at 54 n. 13. In light of this, we do not find it arbitrary or capricious that the EPA chose not to use the dollar-per-deciview metric in evaluating BART options in creating the FIP. We

[134] We note, however, that in both its final rule and in its brief the EPA asserts that the guidelines require the use of the dollar-per-ton metric in evaluating cost effectiveness. The guidelines themselves are a bit unclear. In the section on cost effectiveness, the guidelines mention only the dollar-per-ton metric. 40 C.F.R. pt. 51 app. Y(IV)(D)(4)(c). However, the guidelines later state that in evaluating alternatives, "we recommend you develop a chart (or charts) displaying for each of the alternatives" that includes, among other factors, the cost of compliance defined as "compliance — total annualized costs ($), cost effectiveness ($/ton), and incremental cost effectiveness ($/ton), and/or any other cost-effectiveness measures (such as $/deciview)." Id. app. Y(IV)(E)(1) (emphasis added).

> therefore also conclude that any argument by the petitioners that the dollar-per-deciview measurement proves the scrubbers are not cost effective lacks merit. *See* Pet. Reply Br. at 16.

We see no reason, despite that fact that the facilities we evaluated in our proposed TX/OK FIPs were done under the reasonable progress and long-term strategy sections of the Regional Haze Rule, to deviate from our view of the dollar per deciview metric here. We also note that the use of the dollar per deciview metric is further complicated in the present case due to our use of CAMx modeling. As we discuss in our proposal and elsewhere in our response to comments, there is no way to directly compare the CAMx modeling we used in our proposed TX/OK FIPs with previous CALPUFF modeling results.[135] Consequently, even if we were to use the dollar per deciview metric in our TX/OK FIPs, we would be unable to effectively compare the results against other modeling and cost analyses, the vast majority of which employed CALPUFF.

Comment: EPA's analysis overstates the cost effectiveness of the controls it proposes [Luminant (0061) p. 131]

Luminant stated that EPA contends that the costs of the controls it would require are reasonable and cost-effective when viewed under a cost-per-ton metric. For the proposed scrubber upgrades EPA concluded that "in all cases, the cost effectiveness was less than \$600/ton" of SO_2 removed.[798] For the scrubber retrofits at Luminant's units, EPA found that the cost effectiveness of wet scrubbers at Big Brown Units 1and 2 would be \$1,255/ton and \$1,257/ton of SO_2 removed with a total capital cost of \$515,173,000, and the cost effectiveness of wet scrubbers at Monticello Units 1and 2 would be \$1,937/ton and \$2,170/ton of SO_2 removed with a total capital cost of \$504,981,000.[799]

Luminant asked Sargent & Lundy (S&L) to perform an independent evaluation of EPA's determination of the cost effectiveness of the scrubber upgrades and scrubber retrofits. To conduct this evaluation, S&L reviewed EPA's Upgrade Analysis Document, the Scrubber Upgrades spreadsheet, and the confidential business information provided by us to EPA that included historic scrubber upgrade studies performed by S&L.[800] Based on this review, S&L concluded that EPA substantially overstates the cost-effectiveness of the scrubber upgrades and retrofits that are proposed (that is, EPA's estimated \$/ton of SO_2 removed are too low).[801] Luminant goes on to summarize the points made by Sargent and Lundy in its report.

Luminant states that the limits EPA is proposing in its FIP are more stringent than even Best Available Retrofit Technology ("BART") limits for existing EGUs that EPA has recently approved.[826] There is no basis, and EPA cites none, for imposing more stringent limitations than the "best available retrofit technology" can achieve in order to achieve the lesser "reasonable progress" standard.

Thus, Luminant stated that even EPA's simple (and misguided) cost-effectiveness analysis suffers from multiple flaws and is incomplete. Indeed, EPA concedes that its calculations "may contain some error," but it arbitrarily proceeds with its proposal nonetheless—claiming that it considers the scrubber upgrades to be reasonable at any cost.[827] This is the epitome of arbitrary

[135] See our FIP TSD, beginning on page A-35.

and capricious rulemaking, and it disregards one of the statutory reasonable progress factors. As S&L's analysis shows, EPA's analysis contains significant errors—more error than can be corrected by just minor adjustments—and thus the analysis cannot support EPA's proposal. These errors pervade not only EPA's cost-effective analysis (one of the statutory factors EPA claims to evaluate in reviewing Texas's SIP) but also EPA's choice of emission limits in the proposed FIP. Thus, neither EPA's proposed disapproval nor its proposed FIP should be finalized.

Footnotes:
[798] Cost TSD at 55.
[799] Id. at 24.
[800] Sargent & Lundy LLC, Review of EPA's Cost Analysis for Proposed Action on Texas Regional Haze State Implementation Plan and Proposed Federal Implementation Plan, Report No. SL012741, at 3 (April 20, 2015). The results of Sargent & Lundy's analysis are summarized in these comments, and the full report is attached and incorporated by reference into these comments. Portions of S&L's report with detailed cost information are submitted to EPA as confidential business information in accordance with and under the protections of 40 C.F.R. Part 2.
[801] Id. at ES-3.
[802] Id.
[803] Id. at 14.
[804] Id.
[805] Id. at 8.
[806] Id. at 5–6.
[807] Id. at 7.
[808] Id. at 7–8.
[809] Id. at 9.
[810] Id.
[811] Id. at 10.
[812] Id.
[813] Id.
[814] Id. at 11.
[815] Id.
[816] Id. at 11–12.
[817] Id. at 13.
[818] Id.
[819] Id. at 15–21.
[820] Id. at 15–17.
[821] Id. at 17–18.
[822] Id. at 18–21.
[823] Id. at 22.
[824] Id. at 21.
[825] Id. at 22.
[826] See, e.g., Alaska: 0.30 lb/MMBtu for Healy Unit #1 (78 Fed. Reg. 10,546, 10,549 (Feb. 14, 2013)); Arizona: 0.23 lb/MMBtu for the Sundt Generating Station (79 Fed. Reg. 9318, 9325 (Feb. 18, 2014)), 0.15 lb/MMBtu for Cholla and Apache, and 0.08 lb/MMBtu for Coronado (77 Fed. Reg. 72,512, 72,515 (Dec. 5, 2012)); Colorado: 0.11 lb/MMBtu for Tri-State Craig, 0.12 lb/MMBtu for Comanche Station, 0.13 lb/MMBtu for Hayden, and 0.13 lb/MMBtu and 0.26 lb/MMBtu for Martin Drake (77 Fed. Reg. 18,052, 18,073 (March 26, 2012)); Kansas: 0.10 lb/MMBtu for La Cygne, and 0.15 lb/MMBtu for Westar Jeffrey (75 Fed. Reg. 80,754, 80,758 (Dec. 27, 2011)); Montana: 0.08 lb/MMbtu for Colstrip Units 1 and 2, and 0.57 for JE Corette (77 Fed. Reg. 57,864, 57,915 (Sept. 18, 2012)); North Dakota: 0.15 lb/MMBtu for Leland Olds Station, Milton R. Young Station, and Coal Creek Station, 0.24 lb/MMBtu and 0.16 lb/MMBtu for Stanton Station (76 Fed. Reg. 58,570, 58,595 (Sept. 21, 2011)); Nevada: 0.15 lb/MMBtu for Reid Gardner (77 Fed. Reg. 17,334, 17,338 (March 26, 2012)); New York: 0.09 lb/MMBtu for Danskammer Generating Station (77 Fed. Reg. 51,915, 51,928 (Aug. 28, 2012)); Oregon: 0.40 lb/MMBtu for PGE Boardman (76 Fed. Reg. 38997, 39,002 (July 2, 2011)); South Dakota: 0.09 lb/MMBtu for Big

Stone (77 Fed. Reg. 24,845, 24,848 (April 26, 2012)).
[827] 79 Fed. Reg. at 74,885.

[Sargent & Lundy (0061) p. 3] S&L reviewed the EPA's Upgrade Analysis Document[3], Scrubber Upgrades spreadsheet[4], and documents that were provided by Luminant to EPA as confidential business information (CBI). Reports prepared by S&L and submitted by Luminant to EPA as CBI are listed below.

- TXU – Monticello FGD Flow Modeling Study, FGD Upgrade and ID Fan Addition, Analysis of Proposed Retrofit, S&L Report No. SL008398, December 2, 2004 (LUMINANT_REGHAZ_3-000000334-000000571.pdf)
- TXU Monticello Steam Electric Station Unit 3 100% Scrubbing Study (FGD) Conceptual Cost Estimate (LUMINANT_BB-000292725.pdf)
- Monticello Unit 3 & Sandow Unit 4 100% Flue Gas Scrubbing Study, S&L Report No. SL008590, January 20, 2006 (LUMINANT_MO-000035024-000035057.pdf)
- Maximum Scrubbing Project, TXU Electric, Martin Lake Station Units 1-3, S&L Report No. SL008303, May 26, 2006.

According to S&L, the goal of this review was to analyze EPA's use and interpretation of the technical information and costs included in these reports, and to identify whether any conclusions reached by EPA were inconsistent with S&L's experience with scrubber upgrade projects, in general, and as they apply to Luminant's units in particular.

S&L stated that EPA relied upon costs developed in conceptual studies for which S&L conducted limited engineering and which necessarily included design assumptions that either no longer apply or were not confirmed by EPA in its analysis. The cost estimates included in both the Monticello Unit 3 & Sandow Unit 4 100% Flue Gas Scrubbing Study and the Martin Lake Station Units 1-3 Maximum Scrubbing Project are consistent with Class 4 estimates as defined by the Association for the Advancement of Cost Engineering. Because the quantity of engineering completed to support Class 4 estimates is small, these high-level costs can be underestimated by as much as 50%.[5] In fact, the reports specifically indicate that further analysis is required to define the costs of scrubber upgrades at each unit.

To improve estimate accuracy of study-phase estimates, S&L frequently solicits budgetary quotations from vendors to support cost development for specific equipment items, but very few budgetary quotations were received from vendors with respect to the scrubber upgrade cost estimates for Luminant's units. The S&L report for the Monticello 3 and Sandow 4 scrubber upgrade cost estimates does not indicate that any cost items were based upon receiving vendor quotations.[6] The S&L report for Martin Lake Units 1 through 3 indicates that budgetary quotations were received for CEMS equipment and ID fan costs only.[7]

S&L stated that another means of improving study-phase estimate accuracy, particularly for upgrade projects that rely upon the use of existing equipment, is to conduct condition assessments, or inspections, of existing equipment to assess other upgrades that may be required. Performing condition assessments was not part of S&L's scope of work with Luminant's predecessor and information from such inspections is not included in S&L's cost estimates.

According to S&L, because the studies were conducted in the 2004 to 2006 timeframe, many of the assumptions included in the reports are no longer valid. As is discussed in more detail in Section 2.3, the S&L reports were based on specific design conditions while firing specific design fuels. In the context of estimating scrubber upgrade performance, typically higher sulfur design fuels are chosen to ensure outlet emission rates are achievable across a range of fuels expected to be fired. However, for balance of plant impacts such as pressure drop and the associated fan modifications and auxiliary power consumption, fuels having lower heating values have a greater impact because, at the same boiler heat input, higher volumes of flue gas are generated. The S&L reports do not consider lower heating value fuels that are frequently fired at the Luminant units; therefore, conclusions regarding fan modifications, auxiliary power consumption, and electrical system upgrades are likely no longer valid. In addition, as is discussed later in the report, the absorber trays at Monticello 3 and Sandow 4 were removed to accommodate larger volumes of flue gas while minimizing the impacts to the ID fans. The study estimates did not include costs to reinstall the trays or analyze the impacts of the existing ID fans with new trays installed.

S&L's reports clearly indicate that further definition is required to define the cost of the scrubber upgrades and state the assumptions upon which the studies and cost estimates are based. For Monticello 3 and Sandow 4, the report states that the retrofit of scrubber upgrades at either unit "…will require a more in depth evaluation of the work proposed."[8] Additionally, some systems, such as the makeup water system were not evaluated, "[d]ue to the time constraints and broad scope of this study."[9] Finally, S&L notes that several conclusions are based upon informal discussions as opposed to detailed engineering investigations. For the Stack option selected by EPA in its analysis, S&L's Martin Lake report cautions about the "…risk associated with it because it is a concept that has been demonstrated on smaller stacks," but not to the scale required at Martin Lake.[10] In addition, the S&L study included information from other projects because some original design information was not available for the study.[11] Finally, S&L included a specific "Qualifications" section highlighting that while S&L's analysis was based upon the information it had received, further work needed to be done to properly define the scope.[12]

Additionally, S&L's report includes a construction schedule for the stack option EPA selected for its analysis. This option uses a temporary stack and ductwork to divert flue gas from the existing chimney in order to allow the existing chimney to be partially demolished and a new wet chimney erected in its place. The reason this option was considered to be advantageous at the time of the analysis was because it took advantage of the existing foundation and some of the existing chimney structure. Since the temporary stack and ductwork are transferred to each unit sequentially, the construction schedule in the study shows that a duration of 43 months is required to complete this approach for all three units.[13] Therefore, the scrubber upgrades proposed by EPA at Martin Lake cannot be implemented before the first Regional Haze Planning Period ends in 2018.

For all of the above reasons, it is clear that EPA's analysis ignores many of the important qualifying factors S&L included in its reports. While S&L believes that our conceptual cost estimates were appropriate for providing indicative costs of scrubber upgrades to Luminant's predecessor for its intended use at the time, we do not believe they are appropriate for EPA to use in assessing actual scrubber upgrade project costs in 2015.

Footnotes:
[3] TX Scrubber Upgrade Analyses-CBI-Luminant(FROM EPA).docx
[4] CBI Scrubber Upgrades-Luminant(FROM EPA).xlsx
[5] Cost Estimate Classification System – As Applied in Engineering, Procurement, and Construction for the Process Industries, AACE International Recommended Practice No. 18R-97, Christensen and Dysert, 2005, page 2.
[6] Monticello Unit 3 & Sandow Unit 4 100% Flue Gas Scrubbing Study, S&L Report No. SL008590, Exhibit A.
[7] Martin Lake Station Units 1-3 Maximum Scrubbing Project, S&L Report No. SL008303, page 6-5 and Appendix B.
[8] Monticello Unit 3 & Sandow Unit 4 100% Flue Gas Scrubbing Study, S&L Report No. SL008590, pg.1.
[9] *Id*., at pg. 6.
[10] Martin Lake Station Units 1-3 Maximum Scrubbing Project, S&L Report No. SL008303, page 1-1.
[11] *Id*., at pg.4-1.
[12] *Id*., at pg. 6-5.
[13] *Id*., at pg. 9-5

Response:

The items that Luminant summarizes in this comment, and the information provided in its attached Sargent and Lundy (S&L) report, regarding our scrubber upgrade costs are detailed in a separate comment package submitted under the Confidential Business Information (CBI) provisions of 40 C.F.R.§ 2.203(b). Within those CBI comments, S&L also provides its own cost analyses for upgrading Luminant's scrubbers. We are prohibited from responding to many of these summarized scrubber upgrade comments here with any specificity, because doing so would involve citing and discussing in detail items that Luminant has claimed as CBI. Accordingly, many of our responses to the scrubber upgrade comments are contained within a separate document that is not a part of our posted docket, but will be available for review by Luminant. The responses to comments that do not contain CBI information are contained within this document.

With regard to our scrubber upgrade cost analysis, we generally disagree with Luminant that our analysis was flawed. We used Luminant's own information, backed by independent contractors hired by it, supplied by Luminant in response to our CAA section 114 requests for information. This included cost estimates from well-known and respected contracting firms with a history of many scrubber upgrades. In any event, criticisms regarding our use of this information are moot, because S&L has provided its own cost analysis (under the CBI protections), which it offers as a replacement to our own cost analyses. We have reviewed the scrubber upgrade cost analyses performed by S&L and adopted its methodology. However, we noted many errors and undocumented cost figures in its analyses. We corrected these errors and rejected some of the undocumented assertions and/or costs in S&L's cost analyses. Nevertheless, in order to produce a conservative scrubber upgrade cost analysis and set many of the issues that Luminant raises aside, we incorporated many of Luminant's cost items. The resulting costs for Luminant's scrubber upgrades increased slightly, resulting in a range of $368/ton to 910/ton for all of the scrubber upgrades, well within a range that we believe is cost effective, given the significant visibility benefits that will result from the installation of those controls.

We take up the issue of whether requiring controls that will not be operational until after 2018 is a flaw in our proposed FIP in responding to another comment.

Luminant and others state that we concede that our calculations "may contain some error," but that we arbitrarily proceed with our proposal nonetheless—claiming that it considers the scrubber upgrades to be reasonable at any cost. Luminant claims that this indicates we are being arbitrary and capricious, and that we are disregarding one of the statutory reasonable progress factors. Luminant then makes a general statement that our cost analysis is flawed it prevents us from finalizing our disapproval of Texas' SIP and our FIP. The full quote from our proposal regarding our acknowledgement that our control cost analysis may contain some error is as follows:[136]

> In our Cost TSD, we discuss how we calculated the SO_2 removal efficiency of the units we analyzed for scrubber upgrades. We note that due to a number of factors we could not accurately quantify, our calculations of scrubber efficiency may contain some error. Based on the results of our scrubber upgrade cost analysis, we do not believe that any reasonable error in calculating the true tons of SO_2 removed affects our proposed decision to require emission reductions, as all of the scrubber upgrades we analyzed are cost-effective (low $/ton). In other words, were we to make reasonable adjustments in the tons removed to account for any potential error in our scrubber efficiency calculation, we would still propose to upgrade these SO_2 scrubbers. We believe we have demonstrated that upgrading an underperforming SO_2 scrubber is one of the most cost-effective pollution control upgrades a coal fired power plant can implement to improve the visibility at Class I areas.
>
> However, our proposed FIP does specify a SO_2 emission limit that is based on 95% removal in all cases. This is below the upper end of what an upgraded wet SO_2 scrubber can achieve, which is 98–99%, as we have noted in our Cost TSD. We believe that a 95% control assumption provides an adequate margin of error for any of the units for which we have proposed scrubber upgrades, such that they should be able to comfortably attain the emission limits we have proposed. However, for the operator of any unit that disagrees with us on this point, we propose the following:
>
> (1) The affected unit should comment why it believes it cannot attain the SO_2 emission limit we have proposed, based on a scrubber upgrade that includes the kinds of improvements (e.g., elimination of bypass, wet stack conversion, installation of trays or rings, upgraded spray headers, upgraded ID fans, using all recycle pumps, etc.) typically included in a scrubber upgrade.
>
> (2) After considering those comments, and responding to all relevant comments in a final rulemaking action, should we still require a scrubber upgrade in our final decision making action we will provide the company the following option to seek a revised emission limit after taking the following steps:
>
> > (a) Install a CEMS at the inlet to the scrubber.

[136] 79 FR 74885.

(b) Pre-approval of a scrubber upgrade plan conducted by a third party engineering firm that considers the kinds of improvements (e.g., elimination of bypass, wet stack conversion, installation of trays or rings, upgraded spray headers, upgraded ID fans, using all recycle pumps, etc.) typically performed during a scrubber upgrade. The goal of this plan will be to maximize the unit's overall SO_2 removal efficiency.

(c) Installation of the scrubber upgrades.

(d) Pre-approval of a performance testing plan, followed by the performance testing itself.

(e) A pre-approved schedule for 2.a through 2.d.

(f) Should we determine that a revision of the SO_2 emission limit is appropriate, we will have to propose a modification to our decision making to do so. It should be noted that any proposal to modify the SO_2 emission limit will be based largely on the performance testing and may result in a proposed increase or decrease of that value.

First, we are unaware of any cost estimate we have seen, including those submitted by Luminant's contractor, that does not contain some acknowledgment of margin for error, hence the use of the term, "estimate." Cost estimates all acknowledge this and account for it through the use of contingencies and other factors. The mere fact that we have acknowledged that and specifically provided the affected facilities the ability to benefit from a refined approach, when warranted, does not constitute arbitrary and capricious behavior—in fact just the opposite. In the above quote, we are acknowledging that our calculations of the efficiencies of those units that have an underperforming scrubber system are estimations that may contain some error. We explain that we believe it is relatively minor and inconsequential to our decision making because even if we adjusted the control efficiency and cost-effectiveness, the costs would still be well within a range that we find to be very cost-effective. Nevertheless, we offer the affected facilities an opportunity to address any errors. Our approach is not arbitrary or capricious, because we are proceeding rationally with available information and are expressly open to making appropriate refinements in finalizing emission limits for these sources.

We address Luminant's comment alleging our FIP emission limits are more stringent than BART limits for EGUs that we have recently approved in our consistency section. We address Luminant's comments regarding our scrubber retrofit costs and those portions of Luminant's scrubber upgrade cost that we can respond to outside of the CBI claims in separate responses to those comments in this document.

Comment: Omission of equipment capital costs [Sargent & Lundy (0061) p. 5]

S&L stated that, to estimate the total capital cost of the proposed scrubber upgrades, EPA relied upon cost estimates included in study reports prepared by S&L in 2006. For Monticello Unit 3 and Sandow Unit 4, those reports contained costs to reconfigure the spray headers as well as replacing the mist eliminators. However, EPA removed these costs from its Monticello Unit 3 and Sandow Unit 4 scrubber upgrade cost estimates. It is possible that EPA excluded those costs based on EPA's misreading of Luminant's 2013 Use Determination Application to the Texas Commission on Environmental Quality (TCEQ) which identified that new replacement tower spray nozzles and mist eliminators had been installed. By removing these line items, EPA apparently assumed that the new spray nozzles listed in Luminant's Use Determination Application were capable of achieving 95% SO_2 removal while processing 100% of the flue gas flow through the absorbers, yet none of the documentation or information provided confirms that assumption.

According to S&L, in point of fact, EPA's assumption was incorrect. Because spray nozzles inside a wet FGD absorber are exposed to a slurry of liquid and ground solid material, they erode over time and must be replaced periodically. The spray nozzles listed in the Use Determination Application were replaced in-kind due to normal maintenance practices to maintain the current level of performance, but were not designed to achieve 95% removal while treating 100% of the flue gas, as EPA assumes. The cost item in S&L's report represented the cost to change the configuration of the nozzles (including *additional* nozzles arranged in a *new* pattern), such that the sprayed liquid slurry would contact more of the gas. This cost item also included the cost to replace the spray headers, which are piping sections that feed the nozzles and which must be replaced to accommodate more spray nozzles. These changes would be required to achieve higher SO_2 removal efficiencies while treating 100% of the flue gas flow through the absorbers. Because the spray headers were not replaced and because the nozzle configurations were not changed, EPA was in error when it removed this line item from its capital cost estimate.

Response: As we note above, the items that Luminant and S&L summarize in this comment, and the information provided in its attached Sargent and Lundy (S&L) report that are outlined in successive comments below regarding our scrubber upgrade costs, are detailed in a separate comment package submitted under the Confidential Business Information (CBI) provisions of 40 C.F.R.§ 2.203(b). We are unable to respond to many of these summarized scrubber upgrade comments here with any specificity, because doing so would involve citing and discussing in detail items that Luminant has claimed as CBI. Accordingly, most of our responses to the scrubber upgrade comments are contained within a separate document that is not a part of our posted docket, but will be available for review by Luminant.

With respect to S&L's reference to our removal of the costs for upgraded spray headers for Monticello 3 and Sandow 4, we did in fact remove these costs for the reasons S&L suggests. We assumed wrongly that after having identified that its scrubber system could be upgraded cost effectively, and having performed some of those modifications, Luminant would have simply installed the new upgraded spray headers and nozzles rather than replace its worn out spray header and nozzles with the less efficient design. However, we added these cost back into our updated scrubber upgrade cost analyses and the result was a very minor increase in cost effectiveness (higher $/ton). This did not affect our conclusion that upgrading the scrubbers for these units is very cost effective.

Comment: EPA's methodology to escalate costs and its escalation time frame
[Sargent & Lundy (0061) p. 6]

Costs included in the S&L reports that EPA used as the basis for its estimates are not in today's dollars; therefore, S&L agrees with EPA's decision to include escalation in its capital cost estimates. EPA applied the composite Chemical Engineering Plant Cost Index (CEPCI) to escalate costs in S&L's reports "from year 2006 to year 2013 dollars."[14] This approach does not accurately account for control technology cost increases for at least two reasons: (1) the CEPCI index should not be used to escalate costs beyond 5-years; and (2) the escalation period (2006 to 2013) is incorrect and should be corrected to 2005 to 2015.

S&L stated that the CEPCI composite index is updated monthly in Chemical Engineering Magazine. The composite index is built from four sub-indexes (Equipment, Construction Labor, Buildings, and Engineering & Supervision), and seven equipment component sub-indexes (e.g., process machinery, pipe, valves & fittings, electrical equipment, etc.). Although the CEPCI indexes are commonly used in industry to escalate project costs on a year-to-year basis, there are limitations to its use. One of the most important limitations is the general industry standard that the composite CEPCI index should not be used to escalate costs beyond 5-years.[15] Beyond the 5-year window, cost indexes may not accurately reflect changes in relative weighing-factor of the underlying costs, such as fabricated equipment prices, labor costs and productivity, and commodity pricing. Studies have found that beyond a period of 5-years, the differences between actual prices of equipment and labor and those predicted by a cost index become too great to provide meaningful budgetary cost estimates.[16] This limitation applies to escalations of capital as well as operating costs.

S&L stated that EPA acknowledged this limitation in its Scrubber Upgrade Analysis, noting that "[b]ecause the 2006 Sargent & Lundy cost estimate lies beyond the five year customary rule of thumb for escalating costs, we add an additional 10% to this cost...."[17] EPA provides no explanation or basis for this adjustment. Although proper application of the CEPCI index can be used to escalate costs for periods of up to 5-years, the approach should not be used to escalate costs beyond the 5-year timeframe. A more accurate approach would be to develop project costs based on more recent projects, up-to-date commodity pricing, and more recent labor costs.

According to S&L, even assuming the CEPCI composite index can be used to escalate equipment costs beyond the 5-year limitation, EPA escalated costs "from year 2006 to year 2013 dollars" which does not represent the appropriate amount of escalation. EPA incorrectly assumed the capital cost estimates included in S&L's 2006 studies represented costs in 2006 dollars. However, the reports were first issued in 2005, and they represent costs in 2005 dollars. Final versions of the reports were updated in 2006, including updates to the cost estimates; however, no additional escalation was included in the revised estimates. Therefore, the cost-dollar basis remained 2005 and was not converted to a 2006 dollar basis. The S&L reports clearly state that "the estimates are based upon 2005 dollars."[18]

In addition, S&L noted that EPA escalated capital costs to year 2013 even though its FIP is proposed to be final in late 2015. Accordingly, the total capital cost developed by EPA should have included 10 years of escalation (2005 to 2015) instead of 7 years of escalation (2006 to 2013). Therefore, even assuming the CEPCI composite index can be used to escalate costs over a 10-year period, EPA underestimated escalation by using the shorter time period, making the scrubber upgrade projects appear to be more cost-effective. In order to adjust EPA's estimate to include sufficient escalation for this analysis, S&L determined the average rate of escalation from EPA's evaluation, which was estimated to be approximately 1.6% per year and applied that rate over 10 years.

Footnotes:
[14] TX Scrubber Upgrade Analyses-CBI-Luminant, Section 1.8, page 14.
[15] *See*, Vatavuk, W., "Updating the CE Plant Cost Index," Chemical Engineering, January 2002, pg. 62, at pg. 66.
[16] Vatavuk, at pg. 66.
[17] TX Scrubber Upgrade Analyses-CBI-Luminant, Section 1.8, pg. 14.
[18] Monticello Unit 3 & Sandow Unit 4 100% Flue Gas Scrubbing Study, S&L Report No. SL008590, Section 4, pg 15.

Response: As we note above, the items that Luminant and S&L summarize in this comment, and the information provided in its attached Sargent and Lundy (S&L) report that are outlined in successive comments below regarding our scrubber upgrade costs, are detailed in a separate comment package submitted under the Confidential Business Information (CBI) provisions of 40 C.F.R.§ 2.203(b). We are unable to respond to many of these summarized scrubber upgrade comments here with any specificity, because doing so would involve citing and discussing in detail items that Luminant has claimed as CBI. Accordingly, most of our responses to the scrubber upgrade comments are contained within a separate document that is not a part of our posted docket, but will be available for review by Luminant.

We accept S&L's statement that the costs developed in the 2006 reports it cites were developed in 2005 and that an additional year of escalation is appropriate. However, we cannot agree with S&L that we should have carried our escalation forward to 2015. The Control Cost Manual uses the overnight cost methodology, in which costs are calculated based on current dollars. As we have noted in our proposal, one of our basic tasks in conducting visibility modeling and control cost analyses was to conduct a cost versus benefit analysis. This requires that both the visibility modeling and cost analyses be synchronized. Our visibility and cost analyses were conducted in 2014. Both of these tasks required the use of emission data. We used the most recent emission data that was available, for both the cost analyses and modeling, which was 2013 data. Were we to escalate the costs to 2015, it would introduce a mismatch between the costs and the emission data used to calculate the cost effectiveness ($/ton).

S&L objects to our addition of 10% to our cost escalation to account for the fact that the 2006 S&L cost estimate lies beyond the five year customary rule of thumb for escalating costs. S&L states we provided no explanation or basis for this adjustment. It states that a more accurate approach would be to develop project costs based on more recent projects, up-to-date commodity pricing, and more recent labor costs. As with any cost estimator, we must work with the information we have available to us, considering its quality, and when necessary employing conservative assumptions to ensure the result fits the required accuracy. As we have discussed in our response to other comments, our cost analyses employed many conservative assumptions and this is no exception. Below is the CEPCI Composite Indices from 2005 to 2013:

Year	Composite CE Index	Percent Change over Previous Year
2004	444.2	
2005	468.2	5.40%
2006	499.6	6.71%
2007	525.4	5.16%
2008	575.4	9.52%
2009	521.9	-9.30%
2010	550.8	5.54%
2011	585.7	6.34%
2012	584.6	-0.19%
2013	567.3	-2.96%
2014	576.1	1.55%
Average % Increase		2.78%
Total Increase 2005 - 2013		23.05%

The CEPCI index is used to escalate the cost of an applicable item by simply multiplying that cost by the ratio of the CEPCI index of the year in which the cost was calculated by the CEPCI index of the year in which the escalated is desired. For instance, if an item cost $100.0 in 2005, it would be expected to cost $123.0 in 2014 ($100 X 576.1/468.2), or an increase of 23%. However, as we indicated in our scrubber upgrade cost analyses (and as S&L notes here), the commonly accepted rule of thumb for cost escalation is that costs not be escalated beyond five years. As can be seen from the above table, the CECPI indices have ranged from an increase of 9.52% to a decrease of 9.30%, with an average annual increase of 2.78%. In fact, the CEPCI index has actually decreased three times during this period. In light of this, we conclude that our approach of adding an additional 10% to our escalated cost is reasonable and likely conservative.

Comment: Omitted project costs [Sargent & Lundy (0061) p. 7]

S&L stated that the EPA also omitted from its capital cost estimate certain indirect capital costs that would be incurred by Luminant as part of the scrubber upgrade projects, including Owner's Costs and project financing costs (or AFUDC). The term "total capital investment" is defined in the Control Cost Manual (which EPA claims to follow in its proposal), includes all costs required to purchase the equipment needed for the control system (purchased equipment costs), the costs of labor and materials for installing that equipment (direct installation costs), costs for site preparation and building, working capital, and off-site facilities, as well as indirect installation costs "such as engineering costs; construction and field expenses (i.e., costs for construction supervisory personnel, office personnel, rental of temporary offices, etc.); contractor fees (for construction and engineering firms involved in the project); start-up and performance test costs (to get the control system running and to verify that it meets performance guarantees); and contingencies.[19]

S&L stated that owner's Costs and AFUDC are both indirect capital costs that should be included in a capital cost estimate prepared in accordance with the methodology described in the Control Cost Manual. Owner's Costs include a variety of non-financial costs incurred by the owner to support the air pollution control project. Owner's Costs are project-specific, but generally include costs incurred by the owner to manage the project, hire and retain staff to support the project, and costs associated with third party assistance associated with project development and financing. Owner's Costs include, but may not necessarily be limited to:

- site investigations (geotechnical, hydrology, etc.) for project design;
- environmental permitting/approvals;
- insurance during construction;
- site security during construction;
- transmission interconnection (if applicable);
- fuel interconnection (if applicable);
- owner's mobilization costs;
- owner's project management and support staff;
- insurance advisor;
- labor relations consultant;
- tax consultant;
- financial advisor;
- legal advisor; and
- community relations/community outreach program.

S&L stated that owner's Costs are real costs that the owner will incur during the project and are typically included in cost estimates prepared for large air pollution control retrofit projects. In fact, EPA's Coal Quality Environmental Cost (CUECost) model includes Owner's Costs (or "Home Office" costs) in its air pollution control system cost estimating workbook and interrelated set of spreadsheets. CUECost uses a factor of 10% of the total installed cost to estimate Engineering and Home Office Costs for limestone forced oxidation and lime spray dryer control systems.[20]

Based on S&L's experience on large air pollution control system projects and given the nature of the upgrades proposed by EPA, it is reasonable to estimate Owner's Costs using a factor of 5% of the total direct costs, and it was incorrect for EPA to exclude Owner's Costs from the cost estimate.

S&L stated that AFUDC accounts for the time value of money associated with the distribution of construction cash flows over the construction period.[21] AFUDC can represent a significant cost on large construction projects with long project durations and can be calculated based on a typical construction project cash flow and real rate of interest. EPA's CUECost model includes AFUDC in its calculation of air pollution control technology capital costs using an AFUDC factor and the total plant cost.[22] For FGD upgrades, the project could be spread over a construction period of 30 months or more, particularly given the time necessary for the construction of a new wet chimney.

S&L stated that AFUDC is a real cost that Luminant would incur to implement the proposed scrubber system upgrades, and is a cost that is allowed by the constant dollar approach described in the Control Cost Manual. Excluding AFUDC from the cost estimate underestimates the total capital investment for capital intensive projects with extended project durations. By excluding AFUDC from its calculation of total capital costs, EPA failed to follow the methodology described in the Control Cost Manual and failed to include an important line-item in the capital cost calculation. AFUDC should be included in the total capital investment for the FGD upgrades. With a typical construction project cash flow for a new chimney, assuming a real interest rate of 7%, S&L estimated AFUDC to be 10% of the total project costs, which is consistent with AFUDC factors used in the CUECost and IPM cost algorithms (which EPA also claims to be following here).

Footnotes:
[19] Control Cost Manual, Section 1, Section 2, page 2-5.
[20] Coal Utility Environmental Cost (CUECost) Workbook Development Documentation, Version 5.0, prepared by William H. Yelverton, U.S. EPA Office of Research and Development, EPA/600/R-09-131, September 2009, Appendix B, pages 38 and 41.
[21] *Id*., at pg. 33.
[22] *Id*., at pg. 17.

Response: As we have indicated in our Cost TSD, we did not blindly adopt the IPM cost algorithms but made necessary changes to comply with our Control Cost Manual and other aspects of a typical regional haze cost analysis.[137] Also, as we have noted in a number of our FIPs, AFUDC and Owner's Costs are not valid costs under our Control Cost Manual methodology. We invite S&L to examine to examine our response to similar comments we received in response to those actions.[138]

Comment: EPA underestimated the annualized capital cost of the proposed scrubber upgrades - incorrect assumptions for estimating the operating life of the scrubber upgrades and existing equipment [Sargent & Lundy (0061) p. 9]

In the report prepared for Luminant, S&L noted that, to calculate the cost-effectiveness of the scrubber upgrades, EPA annualized the capital cost of the upgrades using a 30-year equipment life[23] This approach is inconsistent with the methodology described in the Control Cost Manual, and does not take into consideration the actual scope of the proposed upgrades. As described in S&L's 2006 reports, scrubber upgrades generally include modifications or upgrades to the spray headers and mist eliminators, modifications to the existing duct work, and installation of turning vanes, expansion joints, and dampers to provide better reactant-flue gas contact. Modifications do not include rebuilding or replacing the entire reactor shell. Equipment included as part of the scrubber upgrades (excluding the new stacks) would have a useful life of significantly less than 30-years.

[137] Cost TSD, pages 11, 21, and 22.
[138] See for instance our "Response to Technical Comments for Sections E. through H. of the Federal Register Notice for the Oklahoma Regional Haze and Visibility Transport Federal Implementation Plan," Docket No. EPA-R06-OAR-2010-0190, 12/13/2011.

S&L stated that The Control Cost Manual describes a methodology for annualizing the capital cost of the control system, as well as annualizing the cost of replacement materials. Replacement materials include components such as nozzles, which last for more than a year but are consumed by the system.[24] The Manual notes that "[t]he useful life of replacement material is generally less than the useful life of the rest of the control system - typically two to five years. Consequently, the annualization of the system's replacement materials must be done separately from the annualization of the control system itself."[25] By applying a 30-year equipment life to the scrubber upgrades, EPA failed to take into consideration the actual scope of the proposed upgrades and failed to follow the methodology described in the Control Cost Manual.

Furthermore, S&L noted that the Control Cost Manual assumes an equipment life of less than 30-years for other air pollution control equipment and does not specify otherwise for scrubber upgrades.[26] EPA has used a 20-year scrubber useful life in several Regional Haze BART determinations.[27] It is also important to note that the majority of these evaluations were completed for retrofit FGD systems (i.e., new systems) and not upgrades to existing scrubbers and related equipment that has already been operating for more than 30 years. Thus, a 20-year useful life is more than reasonable, and in line with EPA's Control Cost Manual, to use for the upgrades to existing scrubbers that EPA is proposing.

According to S&L, by utilizing a 30-year useful life to annualize the capital cost of the scrubber upgrades, EPA is significantly overestimating the capabilities and scope of the proposed upgrades. These upgrades are intended to improve performance, and the scope of the upgrades does not include the high cost of repair and replacement work which would be required to maintain the existing scrubbers to continue operating for a period equivalent to an entirely new FGD system. EPA's use of a 30-year evaluation period has significantly overestimated the cost-effectiveness of the FGD upgrades, as the annualized costs do not include the additional maintenance and capital expenditures that would be required for a 30-year evaluation period.

Footnotes:
[23] See, TX Scrubber Upgrade Analyses-CBI-Luminant, Section 1.8, pg. 17.
[24] *OAQPS Control Cost Manual*, Section 1, Chapter 2, pg. 2-33.
[25] *Id*.
[26] See, e.g., Control Cost Manual Section 4.2, Chapter 2, pg. 2-50 (20-year equipment life for selective catalytic reduction control systems); Section 6, Chapter 1, pg., 1-48 (typical 20-year life for a fabric filter baghouse); and Section 5, Chapter 1, pg. 1-28 (15-year life for wet acid gas scrubber).
[27] See, e.g., Best Available Retrofit Technology (BART) Determination, American Electric Power, Northeastern Power Plant, May 30, 2008. BART Five Factor Analysis, Kansas City Power & Light, La Cygne Generation Station, August 2007.

Response: We disagree that our use of a 30 year life is inconsistent with our Control Cost Manual. S&L is incorrect that our Control Cost Manual assumes a 20-year useful life for other pollution control equipment retrofitted on coal-fired boilers and does not specify otherwise for scrubber upgrades. We suspect S&L is referring to the Control Cost Manual's treatment of SCR, in which it does not recommend a lifetime for an SCR, but rather sets out a calculation example that uses a lifetime of 20 years. We agree that the life of the control has a significant impact on the cost effectiveness. However, as we state in our Oklahoma FIP,[139] we noted that scrubber vendors indicate that the lifetime of a scrubber is equal to the lifetime of the boiler, which might easily be well over 60 years. We identified specific scrubbers installed between 1975 and 1985 that were still in operation.

S&L states that our Control Cost Manual differentiates between the cost annualization of capital and replacement materials. We agree, and reproduce the full quote to which S&L refers:

> The useful life of replacement materials is generally less than the useful life of the rest of the control system - typically two to five years. Consequently, the annualization of the system's replacement materials must be done separately from the annualization of the control system itself. Furthermore, the annualized cost of the pollution control system should be performed net of the cost of the replacement materials needed at the beginning of operations to prevent double counting. Replacement materials labor will vary, depending upon the amount of the material, its workability, accessibility of the control device, and other factors. The cost of replacement materials labor should be included in the cost of the materials before annualization

Here, our Control Cost Manual refers to typical items that are included in Operations and Maintenance (O&M) cost items, the costs of which are calculated annually. We agree that scrubber systems include many O&M costs and we have separately calculated them just as described above. However, the fact that some parts must be replaced or repaired at normal service intervals does not mean that the pollution control system as a whole has that equipment life. Facilities regularly replace and/or repair many of the parts of a scrubber system (e.g., nozzles, headers, mist eliminators, pumps, pipes, etc.) at regular intervals, often multiple times over the life of the scrubber system, including those parts that S&L mentions. The life of the scrubber system ends when the system can no longer be maintained. As we discuss above, scrubber vendors indicate that the lifetime of a scrubber is equal to the lifetime of the boiler, which might easily be well over 60 years.

Additionally, we are unaware of any additional capital and/or O&M costs that would have to be considered in a 30 year versus 20 year operational life. S&L has recalculated the capital and O&M costs of several of the scrubber upgrades (which we largely adopt). Thus, it has had ample opportunity to identify these additional cost items it claims are necessary into the record, but has failed to do so.

We address S&L's allegation that we have approved of 20 year equipment lives in other actions in the consistency section of this document.

Because none of the facilities involved have entered into or offered to enter into enforceable commitments to shut down the applicable units earlier, we will continue to use a 30 year equipment life for scrubber upgrades, as we believe that is proper.

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[139] Response to Technical Comments for Sections E. through H. of the Federal Register Notice for the Oklahoma Regional Haze and Visibility Transport Federal Implementation Plan, Docket No. EPA-R06-OAR-2010-0190, 12/13/2011. See discussion beginning on page 36.

Comment: Arbitrary approach to estimating operating and maintenance costs
[Sargent & Lundy (0061) p. 10]

According to S&L, there are several errors in EPA's approach to estimating the operating and maintenance costs related to the proposed upgraded scrubbers. These errors include:

- Incorrect reference to information from the URS Report upon which EPA relied to develop annual O&M costs
- Arbitrary escalation of operating costs using indices
- Inaccurate application of URS operating costs
- Use of a report from URS containing insufficient detail
- Incorrect assumptions for developing Martin Lake O&M costs

These errors are discussed in more detail in Attachment 1 (submitted as confidential business information). For the above reasons, S&L does not believe that the operating costs developed by EPA in its Upgrade Analysis Document represent the real operating costs that Luminant would incur to meet the requirements of the proposed FIP. As shown in Attachment 1, EPA significantly underestimated the real operating costs. In order to provide a more accurate estimate of the expected operating costs associated with the future operating scenario, S&L developed utility consumption rates and operating costs using information provided by Luminant regarding the current operation of the scrubbers and recent commodity pricing. Attachment 1 details how the increases in commodities were developed to estimate O&M costs consistent with industry practice and contains the estimated increase in O&M costs associated with the FGD upgrades and treating 100% of the flue gas.

Response: The items that Luminant summarizes in this comment, and the information provided in its attached Sargent and Lundy (S&L) report, regarding our scrubber upgrade costs are detailed in a separate comment package submitted under the Confidential Business Information (CBI) provisions of 40 C.F.R.§ 2.203(b). Within those CBI comments, S&L also provides its own cost analyses for upgrading Luminant's scrubbers. We are prohibited from responding to many of these summarized scrubber upgrade comments here with any specificity, because doing so would involve citing and discussing in detail items that Luminant has claimed as CBI. Accordingly, many of our responses to the scrubber upgrade comments are contained within a separate document that is not a part of our posted docket, but will be available for review by Luminant. The responses to comments that do not contain CBI information are contained within this document.

With regard to our scrubber upgrade cost analysis, we generally disagree with Luminant that our analysis was flawed. We used Luminant's own information, backed by independent contractors hired by it, supplied by Luminant in response to our CAA section 114 requests for information. This included cost estimates from well-known and respected contracting firms with a history of many scrubber upgrades. In any event, criticisms regarding our use of this information are moot, because S&L has provided its own cost analysis (under the CBI protections), which it offers as a replacement to our own cost analyses. We have reviewed the scrubber upgrade cost analyses performed by S&L and adopted its methodology. However, we noted many errors and undocumented cost figures in its analyses. We corrected these errors and rejected some of the undocumented assertions and/or costs in S&L's cost analyses. Nevertheless, in order to produce a conservative scrubber upgrade cost analysis and set many of the issues that Luminant raises aside, we incorporated many of Luminant's cost items. The resulting costs for Luminant's scrubber upgrades increased slightly, resulting in a range of $368/ton to 910/ton for all of the scrubber upgrades, well within a range that we believe is cost effective, given the significant visibility benefits that will result from the installation of those controls.

Comment: [CCP (0075) p. 8-9] CCP noted that an example of EPA's failure to consider site-specific factors is the total disregard of the costs and limited availability of water near Goliad, Texas. Texas is suffering from one of the worst droughts on record and water conservation is being encouraged. Yet EPA assumes that sufficient water can be obtained for a WFGD scrubber and makes no attempt to evaluate specific costs or availability for Coleto Creek Unit 1. This factor is especially important given that WFGD scrubbers consume tremendous amounts of water, more than any other control option that CCP evaluated in its confidential Phase I Screening Study labeled COL_CONFIDENTIAL_007212 (at page 007235).

Response: Please refer to our response to a more detailed comment from Xcel on this issue.

Comment: [CCP (0075) p. 9] CCP noted that the EPA also inconsistently assumes a 30-year scrubber life for the WFGD scrubber retrofit on Coleto Creek Unit 1 when estimating the cost-effectiveness of a scrubber, despite the fact that EPA guidance uses a 20-year lifetime in similar assessments. See Cost Manual, Section 4.2 at 2- 50. This will over-estimate cost-effectiveness. In fact, CCP estimated a useful life of less than 20 years for WFGD scrubbers, as reflected in confidential business information provided to EPA pursuant to its Section 114 information request in a Regulatory Changes Impacts document labeled COL_CONFIDENTIAL_001767 (at page 001778).

Response: We disagree that our use of a 30 year life is inconsistent with our Control Cost Manual. CCP is referring to the Control Cost Manual's treatment of SCR, in which it does not recommend a lifetime for an SCR, but rather sets out a calculation example that uses a lifetime of 20 years. We agree that the life of the control has a significant impact on the cost effectiveness. See our response to a similar comment above in which we reference our Oklahoma FIP, where we noted that scrubber vendors indicate that the lifetime of a scrubber is equal to the lifetime of the boiler, which might easily be well over 60 years. We identified specific scrubbers installed between 1975 and 1985 that are still in operation today. Because CCP has not entered an enforceable commitment to guarantee a 20 year (or shorter) operational life or provided any basis to question a longer equipment lifetime, it is rational to assume 30 years in our cost analyses.

Comment: EPA's Proposal Significantly Underestimates the Cost of Installation of Scrubbers at Tolk. [Xcel Energy (0064) p. 5-6, 29; 0053-24 and 0054-4]

[Xcel Energy (0064) p. 6] Xcel Energy stated that the EPA proposes to require Tolk to install SO_2 scrubbers at a cost of approximately $400 million in capital costs alone. These costs, however, ignore the other important factors required for installing and operating scrubbers. First, EPA ignored the extremely limited water supplies in the region and the costs that would be required for Xcel Energy to acquire the necessary water rights for the addition of scrubbers. EPA also ignored the costs resulting from making its fly ash unmarketable and the resulting cost of landfilling its ash. EPA also failed to consider the environmental impacts of both further accelerating the already-rapidly depleting aquifer and the requirement to create new landfills.

Xcel Energy stated that, in evaluating control costs for Tolk, EPA failed to consider site-specific factors applicable to Tolk, despite an express requirement to do so under the RPG rules. *See* 40 C.F.R. § 51.308(d)(1)(i)(A) (requiring consideration of "costs of compliance, the time necessary for compliance, the energy and nonair quality environmental impacts of compliance, and the remaining useful life of any potentially affected sources"); *see also* 79 Fed. Reg. at 74,874 n. 292 (noting that Tolk was the "one exception" "merit[ing] special consideration of the energy and non-air quality environmental impacts of compliance"). This is particularly true regarding water consumption at Tolk. EPA wrongly assumes that Tolk currently has available groundwater that would allow it to operate scrubbers. EPA also fails to consider the impact and costs associated with managing and disposing of scrubber and ash residue in light of Tolk's current 100% beneficial reuse of ash and the requirements that apply to a new landfill under the final Coal Combustion Residue ("CCR") rule, 80 Fed. Reg. 21,302 (Apr. 17, 2015).[11] Finally, EPA made an unreasonable assumption regarding the likely and appropriate amortization period for the scrubbers. All of these omissions result in a significant underestimation of costs.

Commenter's References:

[11] At least in part due to these "special" considerations at Tolk, EPA did appropriately determine that any installation of controls at Tolk stemming from RPGs should allow for an implementation period of five years.

Response: Each of these arguments are detailed in other comments below and we respond to them there.

Comment: Water availability and cost were not appropriately considered [at Tolk].
[Xcel Energy (0064) p. 29-30]

Xcel Energy noted, in the FIP TSD, EPA recognizes that water scarcity in the region around the Tolk facility is a serious concern for the implementation of a wet scrubber. FIP TSD, at 8, 30. However, EPA fails to recognize that the issue is just as problematic for a dry scrubber. The qualifier "dry" in dry scrubber is the difference in how the control device utilizes the sorbent material for removal. It does not mean that the control device operates without water. A dry scrubber still uses water to hydrate the removal media (generally lime) to operate properly. A wet scrubber uses water sprays and a lime sludge recycle to effectuate removal. Dry scrubbers may require approximately 50% percent less water to operate than wet scrubbers, but they still use a significant amount of water.

Xcel Energy noted that the EPA stated in a meeting with Xcel Energy on February 4, 2015, in the EPA Region 6 office in Dallas, Texas that use of a dry scrubber requires 3% to 5% more water than the same plant without a dry scrubber. Xcel Energy could not find any support for this statement from EPA but, even if true, it is not true in the case of Tolk. Due to water scarcity in the region, Xcel Energy has undertaken aggressive measures to minimize and reuse the limited water that is available from the aquifer. All of Tolk's water comes from the underground Ogallala aquifer, the same aquifer used by the farmers and communities in the panhandle of Texas. To conserve available water, Tolk installed additional clarifying capacity to enhance the current treatment facilities at Tolk, which allows the cooling tower blowdown from its neighboring Xcel Energy facility to be sent to Tolk, recycled and reused. This saves billions of gallons of fresh water by maximizing the use of the existing water.

Xcel Energy stated that, in addition, the plant monitors water treatment continuously to maximize the water quality on the supply side to the cooling cycle so that maximum cycles of concentration can be utilized to limit the amount of blowdown water on the discharge side of the cooling cycle. Basically, Tolk "reuses" the water 20 to 25 times before a solubility limit is reached. To maintain the proper chemistry, some of the cooling water is blowdown (average of 300-350 GPM) to evaporation ponds. This maximum use of existing water means the total plant water "makeup" (water required for all of plant operations including cooling tower evaporation, boiler water, auxiliary cooling, washdowns, etc.) is much less than other plants that do not maximize water usage. Even though a dry scrubber sorbent preparation system could reuse part of the blowdown as makeup water, the plant would still require additional fresh makeup water for the dry scrubber process. As a result, installing dry scrubbers at Tolk would increase the makeup water intake requirements for the complex by approximately 9-12%.

Xcel Energy stated that these increased water requirements are highly significant in light of the critical lack of water in the region. This additional amount of water is simply not available at the Tolk site. Xcel Energy estimates adding dry scrubbers would require approximately 1,165 acre/feet per year of water availability. Over 30 years, as amortized by EPA for this Proposal, additional water requirements would be approximately 36,000 acre-feet for operation of the scrubbers. To obtain the additional amount of water necessary to support the operation of dry scrubbers, SPS would attempt to purchase significant water rights from existing farmers along with a gathering system or look at other costly alternatives. Based on the historical cost of water rights in the area, this is an additional cost of approximately $40 million that was not included in EPA's cost estimates. This is also assuming that these water rights are available. The acquisition of these water rights may require the purchase of neighboring agricultural businesses, which could further increase acquisition costs. These costs for additional water rights, infrastructure or alternatives are not included in EPA's overall cost estimate for dry scrubber installation. If these costs were added, they would greatly increase the estimated cost of dry scrubbers at Tolk and the associated cost per ton of emissions reduction.

Response: In this comment, Xcel states that adding dry scrubbers would require 1,165 ac-ft/yr (722 gpm)[140] of water availability. In subsequent correspondence with EPA, Xcel clarified that "[t]his estimate is the incremental additional water that would be required to operate dry scrubbers. This estimate already assumes (i.e. was reduced by) our expectation that we could

[140] (1,165 ac-ft/yr)(0.61955 gpm/ac-ft/yr) = **722 gpm**.

reuse approximately 70% of the current blowdown water in the dry scrubbers."[141] The Xcel comment states that the average blowdown to evaporation ponds is 300 to 350 gpm. Thus, Xcel estimates that it has 210 to 245 gpm available. In subsequent correspondence, Xcel estimates the total water requirement for operating dry scrubbers at Tolk is 1,046 gpm, and the additional water need as being 816 gpm.[142]

We compared Xcel's water estimate to estimates for comparable dry scrubbers made by others, expressed on a gallon per pound of SO_2 removed basis as the amount of water depends directly on the amount of SO_2 that must be removed. The results of this analysis are summarized and discussed below.

Unit Dry Scrubber Water Use
PRB Coal

Source	gal/lb SO_2
Tolk Units 1 & 2	14.3[143]
Flint Creek Unit 1	3.9
B&W	3.9-4.6
CBI Unit 1	3.4
CBI Unit 2	3.9

This table shows that Xcel's estimate of Tolk scrubber water demand is very high when compared to dry scrubber water demand reported elsewhere.

First, Babcock & Wilcox (B&W), a major supplier of SO_2 control systems, presented typical examples of dry scrubber design in its handbook, Steam, Its Generation and Use. This handbook includes a chapter on scrubber design that includes mass balances for the two general types of dry scrubbers, recycle and single pass, for a typical PRB coal fired in a 500 MW boiler. These mass balances indicate that to remove 4,118 lb/hr of SO_2, the recycle system would require 317 gpm and the single pass system would require 266 gpm.[144] Thus, the unit water use would range from 3.9 to 4.7 gal/lb SO_2 removed.[145]

141 Email from Jeff West, Xcel, to Joe Kordzi, EPA, September 1, 2015.

142 Email from Jeff West to Guy Donaldson, EPA, October 19, 2015. Xcel assumes the average of 210 and 245 gpm as being available. Thus 1,046 gpm – 230 gpm = 816 gpm. We note that the report referenced in this email, "Phase I AQCS Engineering Services Study – Harrington Generating Station Unit 1, 2, & 3 and Tolk Generating Station Units 1 & 2, November 2011," assumes all of the estimated 300 gpm blowdown is available for makeup to dry scrubbers, concluding that an additional 746 gpm is needed.

143 The unit water use for the Tolk units, per pound of SO_2 removed, is calculated as follows: The SDA Cost IPM spreadsheets (SDA Cost IPM 5-13 Sources ver 2.xlsx) indicate that the proposed SO_2 limit of 0.06 lb/MMBtu is based on removing 9,195 ton/yr of SO_2 at Tolk Unit 171B and 10,015 ton/yr of SO_2 at Tolk Unit 172B, for a total SO_2 reduction of 19,210 ton/yr. Thus, the unit water use per pound of SO_2 removed: 1,046 gpm)(60 min/hr)(24 hr/day)(365 day/yr)/(19,210 ton/yr)(2000 lb/ton) = **14.3gal/lb**.

144 Babcock & Wilcox, Steam Its Generation and Use, Chapter 35: Sulfur Dioxide Control, Figure 13 and Table 8.

145 For the single pass system: (83+183 gpm)(60 min/hr)/(4381-263 lb SO_2 removed/hr) = **3.88 gal/lb** SO_2 **removed.** For the recycle system: (48+269 gpm)(60 min/yr)/(4381-263 lb SO_2 removed/hr) = **4.62 gal/lb** SO_2 **removed.**

Second, a study-level analysis, accurate to +/-20%, for Flint Creek Unit 1 (558 MW boiler burning PRB coal), similar to the Tolk units (533 MW & 543 MW boilers burning PRB coal), reported water use for four types of scrubbers designed to reduce an inlet SO_2 of 0.8 lb/MMBtu to 0.06 lb/MMBtu, removing 15,155 ton/yr SO_2 as follows:[146]

- **SDA:223 gpm**
- CDS:228 gpm
- NID: 229 gpm
- WFGD: 250 gpm

The spray dryer absorber (SDA) is the type of dry scrubber that we evaluated for the Tolk units. It has the lowest water demand of all reported scrubbers. The unit water demand for the SDA, based on this Flint Creek analysis, is 3.9 gal/lb SO_2 removed.[147]

Third, we acquired data from two SDA designs which have been claimed as Confidential Business Information (CBI). We have included a redacted version of a spreadsheet that shows our calculations for the CBI data, but does not identify the facility or the source of the data. These SDA designs are for units of similar size to Tolk, but burn coals containing higher sulfur contents. These SDA designs have a much lower water demand than Xcel has claimed. Assuming parity among the most significant impactors to SDA systems, we would expect that the higher sulfur coals would require more lime and thus more water.

Any of the unit water demand estimates are three times lower than those we estimated above using Xcel's reported scrubber water demand. These estimates by others indicate Xcel's estimate is very high for an SDA, suggesting the scrubber is not designed to minimize water use by, for example, selecting the most efficient spray nozzles. If the lower unit water demand estimates reported elsewhere are used to estimate Tolk's scrubber water demand, the existing Tolk water supply is almost adequate to support a dry scrubber, as summarized below:

Revised Tolk Water Demand
Based on Gal/lb SO_2 Removed
Additional Water Beyond Boiler Blowdown

Source	gpm
Xcel Estimate	816
Revised, Flint Creek Unit 1	53
Revised, B&W	54-108
CBI Unit 1	19
CBI Unit 2	55

[146] American Electric Power, Flint Creek Unit 1, Flue Gas Desulfurization (FGD) Project, Technology Evaluation and Recommendation, October 25, 2011, pdf 12.

[147] The unit water use for the Flint Creek SDA, per pound of SO_2 removed, is calculated as follows: The Flint Creek SDA is designed to remove 15,155 ton/yr SO_2. AEP 2011, pdf 22. Thus, the unit water use per pound of SO_2 removed: (223 gpm)(60 min/hr)(24 hr/day)(365 day/yr)/[(15,155 ton/yr)(2000 lb/ton)] **= 3.87 gal/lb** SO_2 **removed.**

Revised Water Demand Based on Babcock & Wilcox Case Studies

Assuming the new scrubbers are based on the recycle design, the Tolk scrubbers would require 338 gpm of water[148] compared to Xcel's estimate of 816 gpm. As noted above, 230 gpm would be available as boiler blowdown, requiring only an additional 108 gpm (338 -230 = 260).

Assuming the new scrubbers are based on the single pass design, the Tolk scrubbers would require 284 gpm of water[149] compared to Xcel's estimate of 816 gpm. As noted above, 230 gpm would be available as boiler blowdown, requiring only an additional 54 gpm (284 - 230 = 54).

Revised Water Demand Based on Flint Creek and CBI Units Estimates

Assuming the Flint Creek water demand of 3.9 gal/lb, the new Tolk scrubbers would require only 283 gpm.[150] As noted above, 230 gpm would be available as boiler blowdown, requiring only an additional 53 gpm. Using the CBI Unit 1 and 2 data, would require only 249 to 285 gpm.[151] As noted above, 230 gpm would be available as boiler blowdown, requiring only an additional 19 to 55 gpm.

These various estimates indicate that from 19 gpm to 108 gpm of additional water would be required to operate dry scrubbers on the Tolk units, much less than Xcel's estimate of 816 gpm. This water will be available when the Plant X units shutdown, as we discuss below.

Plant X Water Supply

In a rate making case in testimony before the Public Utility Commission of Texas, Alan Davidson, SPS's Director of Regional Capital Projects in the Engineering and Construction Department of Energy Supply, disclosed that Plant X Units 1 and 2 will be retired in 2019 and 2020, respectively, or before the new scrubbers would be operating. In addition, Plant X Unit 3 would be retired in 2024.[152] Thus, water that is currently being used for these units would be available for the new scrubbers.

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[148] Revised dry scrubber water demand, based on B&W recycle design: (4.62 gal/lb SO_2 removed) (9,195+10,015 ton SO_2 removed/yr)(2000 lb/ton)/(365 day/yr)(24 hr/day)(60 min/hr) = **338 gpm.**

[149] Revised dry scrubber water demand, based on B&W single pass design: (3.88 gal/lb SO_2 removed) (9,195+10,015 ton SO_2 removed/yr)(2000 lb/ton)/(365 day/yr)(24 hr/day)(60 min/hr) = **284 gpm.**

[150] Tolk scrubber water demand, based on Flint Creek unit demand per pound of SO_2 removed: (3.87 gal/lb SO_2 removed)(9,195+10,015 ton SO_2 removed/yr)(2000 lb/ton)/(365 day/yr)(24 hr/day)(60 min/hr) = **283 gpm.**

[151] Tolk scrubber water demand, based on CBI Unit 1 demand per pound of SO_2 removed: (3.4 gal/lb SO_2 removed)(9,195+10,015 ton SO_2 removed/yr)(2000 lb/ton)/(365 day/yr)(24 hr/day)(60 min/hr) = **249 gpm.** Using the CBI Unit 2 demand per pound of SO_2 removed: (3.9 gal/lb SO_2 removed)(9,195+10,015 ton SO_2 removed/yr)(2000 lb/ton)/(365 day/yr)(24 hr/day)(60 min/hr) = **285 gpm**

[152] Direct Testimony of Alan J. Davidson on Behalf of Southwestern Public Service Company, Docket No. 43695, Application of Southwestern Public Service Company for Authority to Change Rates, Public Utility Commission of Texas, December 1, 2014 (Davidson Testimony), p. 40.

The record does not disclose the current amount of water used by Plant X, but it can be estimated from the total water demand for both plants combined, minus the water demand for Tolk, which are separately reported.

Correspondence with Xcel indicates that the combined annual water demand of Plant X and Tolk ranges between 3.5 billion gallons per year (BG/yr) (6,700 gpm) and 5.2 BG/yr (9,900 gpm).[153] The average of these two values is 4.4 BG/yr or 8,300 gpm.

Information provided to the Public Utility Commission of Texas indicates that the annual average water demand of the Tolk station ranged from 3.4 BG/yr (6,500 gpm) to 4.0 BG/yr (7,600 gpm) and averaged 3.7 BG/yr (7,000 gpm) over the five year period 2009 to 2013.[154] Thus, the average water demand for Plant X is about 1,300 gpm (8,300 – 7,000 = 1,300). Assuming the upper end of the range, the water demand for Plant X is about 2,300 gpm (9,900 – 7,600 = 2,300). The lower end of the range is not reasonable to consider as it is substantially less than the blowdown from Plant X's cooling tower (>3,000 gpm) that is sent to Tolk.

Estimated Water Demand for Plant X

Plant	Low End Annual Water Usage (gallons)	High End Annual Water Usage (gallons)	Average Annual Water Usage (gallons)
Plant X + Tolk	3.5 billion	5.2 billion	4.4 billion
Tolk	3.4 billion	4.0 billion	3.7 billion
Resulting for Plant X	N/A	1.2 billion	0.7 billion

Plant X consists of four gas-fired turbines. Below is the annual heat input data for these four units from 2010 to 2014:[155]

Annual Heat Input of Plant X Gas-Fired Turbines

Facility Name	Unit ID	Year	Heat Input (MMBtu)	5 Yr Heat Input Avg. (MMBtu)	% of total
Plant X	111B	2010	1,138,763	1,239,256	8.4
Plant X	111B	2011	1,473,226		
Plant X	111B	2012	1,648,757		
Plant X	111B	2013	1,708,798		
Plant X	111B	2014	226,735		
Plant X	112B	2010	2,932,116	2,741,626	18.6
Plant X	112B	2011	2,345,968		
Plant X	112B	2012	2,756,134		
Plant X	112B	2013	3,406,092		

153 Email from Jeff West, Xcel Energy Inc. to Joe Kordzi, EPA, August 20, 2015.

154 SOAH Docket No. 473-14-1665, Docket No. 42004, Southwestern Public Service Company's Response to Sierra Club's First Request for Information Question Nos. 1-1 through 1-49, p. 29.

155 Downloaded from our Air Markets Program at http://ampd.epa.gov/ampd/.

Plant X	112B	2014	2,267,818		
Plant X	113B	2010	2,208,577		
Plant X	113B	2011	2,256,570		
Plant X	113B	2012	3,179,326	2,695,015	18.3
Plant X	113B	2013	3,166,651		
Plant X	113B	2014	2,663,949		
Plant X	114B	2010	6,164,434		
Plant X	114B	2011	7,949,946		
Plant X	114B	2012	10,160,965	8,084,042	54.8
Plant X	114B	2013	8,008,612		
Plant X	114B	2014	8,136,254		
Totals				14,759,938	100.0

Based on the average CAMD data from 2010 to 2014, the heat input for Units 111A and 112B slated for shutdown before scrubber startup, comprised about 27% of the total heat input for the station (8.4 + 18.6 = 27.0). Thus, about 27% of Plant X's average water demand (1,300 gpm) or about 351 gpm on average (0.27 x 1,300) or up to 621 gpm (0.27 x 2,300) would be freed up for use by the Tolk scrubbers. This is more than enough to supply the additional 19 to 108 gpm required to operate the Tolk scrubbers.[156] Further, in 2020, when Unit 113B shuts down, an additional 238 to 421 gpm of water will be freed up (0.183 x 1,300 & 0.183 x 2,300), which could be used to offset any subsequent decline in the water table. Thus, we conclude there is adequate water to continue to supply both Tolk and Plant X, while accommodating the addition of dry scrubbers.

We believe any costs required to secure Tolk's existing water supply should not be passed off as costs required for new scrubbers. As demonstrated above, the existing water supply, consisting of boiler blowdown and excess water from Plant X unit retirements, is adequate to support the proposed scrubbers. Additionally, a pipeline connecting these two facilities is already in place.

Further, studies done by consultants to SPS who costed scrubbers did not conclude that scrubbers were infeasible due to lack of water. Rather, they assigned a cost to acquiring the water, but amortized it over the life of the facility and reported it as an O&M cost in dollars per thousand gallons. The unit cost of water that we assumed in our cost analysis is substantially higher than these estimates. Burns & McDonald concluded: "Tolk water (new wells) - $0.75/kgal."[157] Elsewhere, URS, another consultant to SPS, concluded: "Any new water consumption will be at a cost of $0.11/1,000 gallons without considering the capital investment for the new well field located 50-70 miles from the Tolk plant."[158] Thus, as we assumed a water cost of $1.00/kgal, well in excess of these estimates, we conclude that any additional water required to supply dry scrubbers could also be obtained by drilling new wells, as assumed in our cost analyses. We

[156] Note this calculation is conservative as we included the 2014 value for unit 111B in averaging its 5 year heat input, when it is significantly below its historical value.

[157] Burns & McDonnell, Draft Report Presentation, Harrington and Tolk Generating Stations, AQCS Engineering Services (Phase 1) Study, September 21, 2011, TOLK_0000389.

[158] 12/12/13 URS, TOLK_0000150.

discuss this below.

Based on information in its Securities and Exchange Commission Form 10-Q filing,[159] Xcel has apparently conceded that dry scrubbers are technically feasible at Tolk, and that the water issue described above could be addressed:

> In May 2014, the EPA issued a request for information under the CAA related to SO_2 control equipment at Tolk Units 1 and 2. In December 2014, the EPA proposed to disapprove the reasonable progress portions of the SIP and instead adopt a Federal Implementation Plan. The EPA proposed to require dry scrubbers on both Tolk units to reduce SO_2 emissions to help achieve reasonable progress goals for Texas and Oklahoma national parks and wilderness areas. As proposed, the dry scrubbers would need to be installed and operating within five years of the EPA's final action, currently expected in December 2015. Whether dry scrubbers are required is dependent on the EPA's final decision. If required, they would cost approximately \$600 million, with an annual operating cost of approximately \$10.4 million. SPS believes these costs would be recoverable through regulatory mechanisms and therefore does not expect a material impact on results of operations, financial position or cash flows.

We note from the above that Xcel has estimated the total cost of installing scrubbers to be approximately \$600 million. Annualized over 30 years at 7% interest, this results in an annual cost of \$48,351,842. Added to Xcel's annual operating cost of \$10,400,000, results in a total annualized cost of \$ 58,751,842. It has been our experience that costs reported in this manner include AFUDC and owner's costs, which, as explained in our responses to other comments, are disallowed by the Control Cost Manual methodology we use. Our total proposed SDA costs for both units, with these costs added back in, total \$514,279,000. Annualized over 30 years at 7% interest, results in an annual cost of \$41,443,895. Our proposed operating costs total \$23,359,302. Adding these cost together results in a total annualized cost of \$64,803,197, which is significantly greater than an equivalent annualization of the costs reported to the SEC by Xcel. We do not know to what degree the costs reported to the SEC are backed by engineering analyses. However, we conclude this is additional evidence that our proposed costs were reasonable and inclusive of all costs, including the cost of the water necessary for dry scrubber operation.

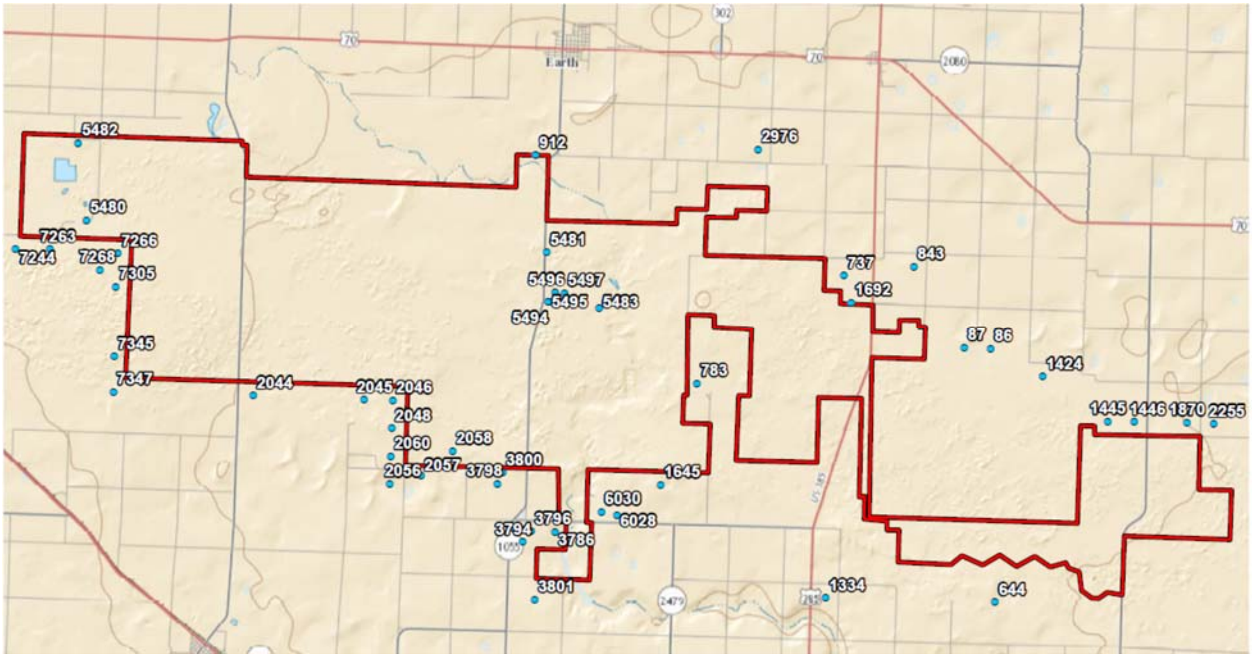
In sum, Xcel will have adequate water to supply dry scrubbers at the Tolk plant, even assuming its overestimated water demand of 1,046 gpm. Thus, there is no need to "…purchase significant water rights from existing farmers along with a gathering system or look at other costly alternatives."

Water Rights

Our conclusion that Xcel will definitely have, with the closure of the Plant X units, enough water to supply dry scrubbers aside, we believe Xcel has added additional water reserves. We

159 United States Securities and Exchange Commission, Form 10-Q, available here: http://www.getfilings.com/sec-filings/150803/SOUTHWESTERN-PUBLIC-SERVICE-CO_10-Q/.

contacted the High Plains Water District (HPWD) about Xcel's water rights in the area of Tolk and Plant X, and were provided with the following map:



We were informed by the HPWD[160] that this map was provided to it by Xcel and represents the areal extent of land to which Xcel controls the water rights (note the numbers refer to metered locations and not well locations). The boundary encloses an area of 47,188 acres. The HPWD informed us that according to its rules, this allows Xcel to annually withdraw 18" for every acre it controls, or in excess of 23 Billion gallons annually.

Xcel has supplied us with information[161] that causes us to conclude that due to aquifer depletion and well drawdown, the actual amount of water that can annually be withdrawn is less. Xcel states that it has 73 wells that annually produce from 3.5 to 5.2 billion gallons (11,000 acre-feet to 15,900 acre-feet). Xcel explained that it expects its well productivity to decrease due to aquifer depletion. We find this to be a reasonable conclusion. However, according to Xcel's own information, the percentage of Tolk's total water usage that would be devoted to the dry scrubber is 9-12%. Consequently, we conclude that absent a switch to dry or hybrid cooling (which we discuss below), the aquifer's depletion will be a limiting factor on the plant itself, not on the operation of the scrubbers.

We believe Xcel has recognized the strategic need for additional water and has taken steps to acquire additional water rights, and thus potentially limit its future water usage. For instance, based on information we have reviewed, we believe that additional acreage has been added to the above map. In testimony in the aforementioned rate making case, Mr. Davidson identified the following capital projects for rate recovery that were completed or underway:

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[160] See email from Jed Leibbrandt to Joe Kordzi, dated 8/12/2015.

[161] See emails from Jeff West to Joe Kordzi dated 8/20/2015 and 8/26/2015.

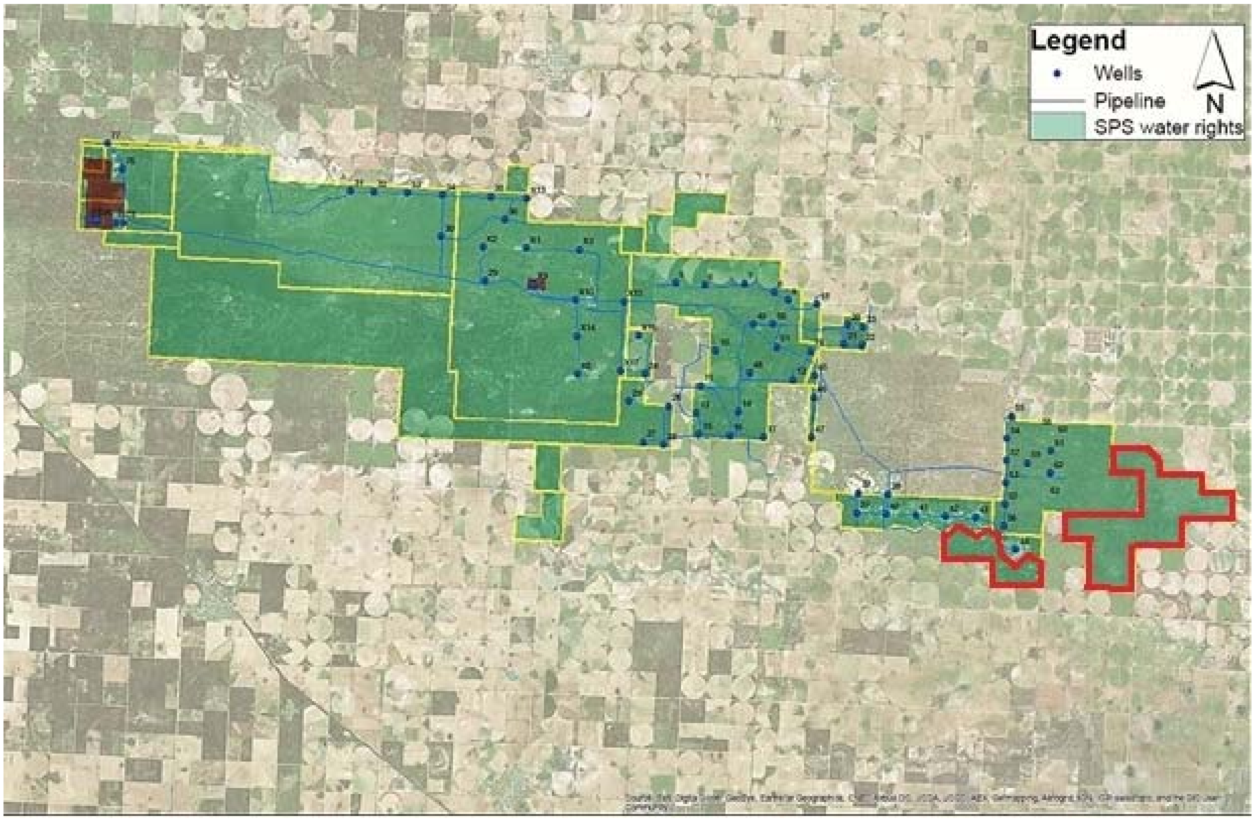
- Tolk Station – Purchase Barrett Water Rights (Parent Work Order 11763413) – This project consisted of purchasing additional water rights, wells, electrical infrastructure, roads, and rights-of-way from the Barrett family that were contiguous with SPS's current water rights. The additional water rights and wells will be used to offset production declines from SPS's existing wells supplying water to Tolk Station and to Plant X.

- Tolk Station and Plant X – Water Wells Phase 6 (Parent Work Order 28 11488948) – This project continued the development of new water wells to off-set production declines from existing wells at the Tolk Station and Plant X. Three new wells, additional gathering pipelines, electrical service to the 31 wells, roads, pumps, and controls were added. To maintain reliability, it is critical to have adequate water supply available all year, but especially in the summer. Decline of SPS's current well field production puts Tolk Station and Plant X at risk for a water shortage.

- Tolk Station – Purchase Rose Water Rights (Parent Work Order 33 11649187) – This project consists of purchasing additional water rights, 34 roads, and rights-of-way from the Rose family that are contiguous with SPS's current water rights. The additional water rights will be used to off-set 2 production declines from SPS's existing wells supplying water to Tolk 3 Station and to Plant X.[162]

In response to our questions regarding these additional water rights and other related questions, Xcel has provided the following map that depicts the current areal extent of its water rights, and indicates the locations of its wells and pipelines:

[162] Davidson Testimony, December 1, 2014.



The yellow boundary defines the areal extent of Xcel's water rights. It can be seen from a comparison to the HPWD map that Xcel has added additional acreage to the southeast, which is outlined in red. Possibly additional acreage has also been added in the western end.

Xcel has also supplied a map that indicates the saturated aquifer thickness.[163] The saturated thickness is a measure of the amount of recoverable water.[164] The greater the saturated thickness, the more water that can be recovered using conventional methods.

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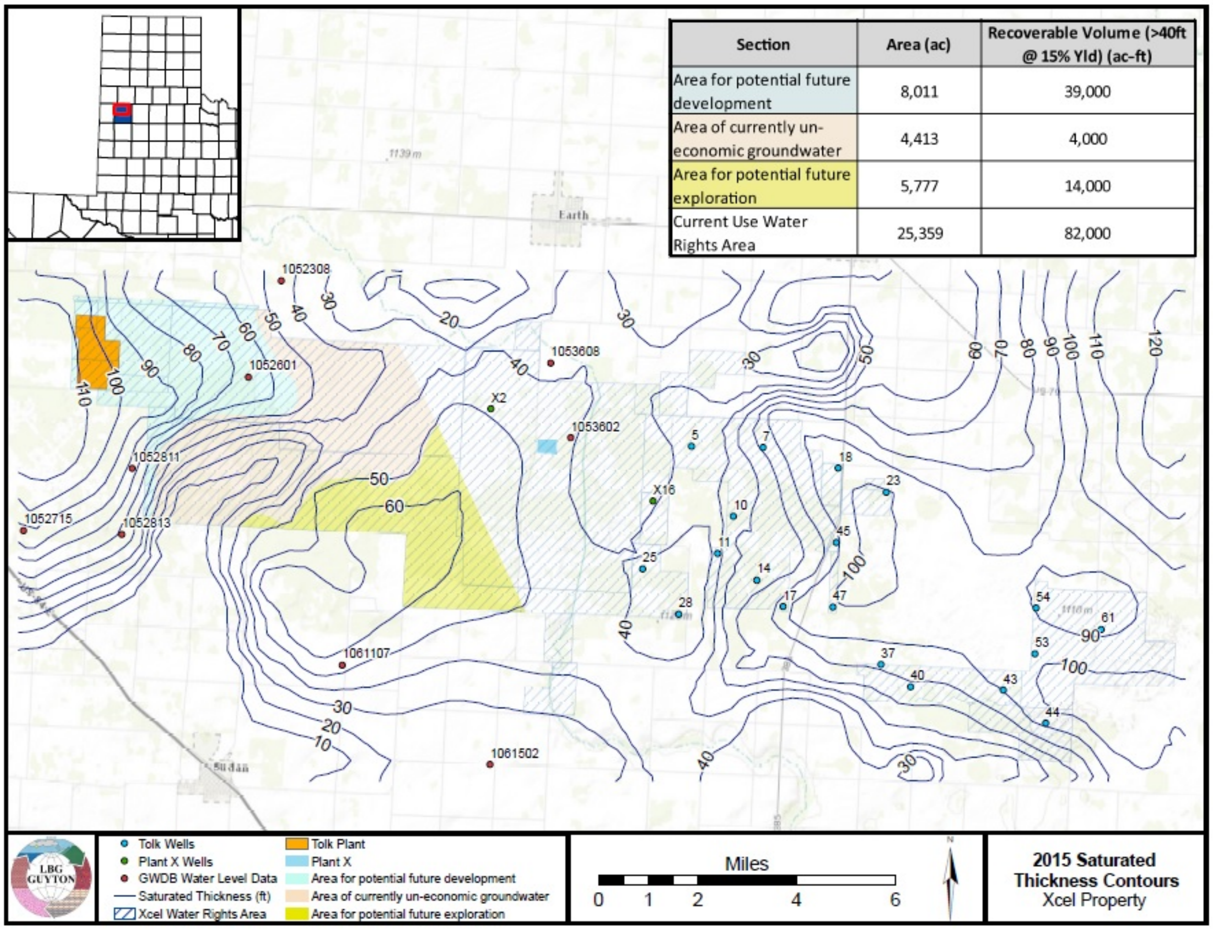
[163] Email from Jeff West to Joe Kordzi dated 8/26/15. See Attachment 2.

[164] Recoverable water = surface acreage x saturated thickness x specific yield (fraction of bulk aquifer volume that will yield water).



Section	Area (ac)	Recoverable Volume (>40ft @ 15% Yld) (ac-ft)
Area for potential future development	8,011	39,000
Area of currently un-economic groundwater	4,413	4,000
Area for potential future exploration	5,777	14,000
Current Use Water Rights Area	25,359	82,000

It can be seen from the above map that the additional area added to the southeast (and possibly the west) lies within the areas containing some of the greatest saturated aquifer thickness. This map also indicates that additional areas for potential future development and exploration are available to Xcel for the drilling of additional wells. According to Xcel, individual wells have achieved peak flows of up to 550 gpm.[165] Even considering production decline, we conclude that one or two additional wells located in these high production zones would be adequate to supply the additional water needed for Tolk's scrubbers. Further, even areas that are currently not economic to produce with a standard vertical well would likely be available for production with alternative well completions.[166] We therefore conclude that even discounting our finding that Xcel will have more than adequate water available to run our proposed dry scrubbers with its planned shutdown of the Plant X units coupled with its boiler blowdown currently sent to an evaporation pond, it has more than adequate additional capacity within its well field to supply these scrubbers.

165 Email from Jeff West to Joe Kordzi dated 8/26/15.

166 Letter Report from Tyler A. Davidson, LBG-Guyton Associates, to Amy Wilhite, Xcel Energy, Re: Tolk Station/Plant X Water Rights Area Saturated Thickness and Static Volume, June 17, 2015, p. 2.

As we noted above, the decline in the aquifer, which we acknowledge, is not a limiting factor on the installation, but rather on the continued operation of the plant, since other plant processes use much more water than would dry scrubbers. Xcel has recognized this basic limitation and has taken steps to address it, beyond simply acquiring more water rights. For instance, much of a typical coal fired power plant's total water budget goes to wet cooling. We contacted GEA Heat Exchangers concerning the potential conversion of Tolk's wet cooling system to a dry or hybrid system. We were informed by GEA that Xcel had already contacted them for an estimate to convert their existing wet cooling system to a hybrid system in which 70% of the cooling needs would be handled by dry cooling and 30% would be handled by wet cooling. GEA supplied us with redacted and unredacted versions of its quote to Xcel, which covered a number of potential options. We have placed the redacted version in our docket.[167] Although we have concluded that adequate water is available, it appears that a hybrid cooling system, such as that costed by GEA, is technically feasible and could increase the water supply by as much as 232 gpm. We encourage Xcel to consider adopting such a system in order to limit its water usage.

Comment: Baghouse- and waste-related costs were not adequately considered [at Tolk].
[Xcel Energy (0064) p. 31-32]

Xcel Energy stated that Tolk beneficially re-uses 100% of its fly ash. In the Technical Support Document for the Cost of Controls Calculations for the Texas Regional Haze Federal Implementation Plan ("Cost TSD"), EPA recognizes that it is important to retain consistent fly ash specifications to be able to beneficially re-use fly ash. Cost TSD, at 9 (2014) (EPA Docket ID EPA-R06-0AR-2014-0754-0008). Tolk currently has a baghouse to control particulate matter emissions. If dry scrubbers were to be installed at Tolk, the plant would not be able to beneficially re-use 100% of its flyash, which would result in two major issues that EPA failed to consider. The first is the potential need for additional baghouses and the second is the need for a landfill.

Xcel Energy stated that there are two options for a scrubber to be placed in the flue gas stream. Option A would locate the scrubber upstream of the existing baghouse and Option B would locate the scrubber downstream of the existing baghouse but it also would require an additional baghouse to be built downstream of the scrubber.

Option A would end the re-use of the existing fly ash as all of the fly ash would be contaminated with scrubber waste and, thus, would no longer be suitable for re-use. Option A is lower in capital cost and aligns better with EPA's current estimate, which does not factor in additional baghouse costs. The loss of revenue from the sales of the fly ash (approximately $2 million annually), additional O&M for handling of fly ash and bottom ash (currently netted out of fly ash revenues) and increased bag replacements would have to be included in the total cost estimates for SO_2 removal. It is Xcel Energy's opinion at this time that Option A has the most economic benefit of the two options even though EPA's cost estimates are artificially low.

[167] GEA, Investigation of Conversion of Wet to Dry/Wet Cooling System for Tolk Power Plant, Texas, USA, September 19, 2012. The current cooling tower makeup demand is on p. 11 and the makeup for the various options that were studied are found at pp. 18, 24, 32, 38, and 45. The best case option, p. 32, reduces makeup water demand by (173,659,000 gal – 51,498,000 gal/yr)/[365 day/yr x24 hr/day x 60 min/hr] = 232 gpm.

Option B would allow for the continued re-use of the existing fly ash, but would require substantial additional capital cost estimated at $45-62 million for Tolk for a post scrubber baghouse. This cost estimate is based on historical studies conducted by Bums & McDonnell Engineering Company, Inc. ("B&M") for Xcel Energy's Harrington Generating Station, where B&M estimated $38 million for a new baghouse. Harrington's coal-fired units are smaller in size than Tolk's. Accordingly, for Tolk, Xcel Energy increased the $38 million estimate by 37% to address the ratio between the size of the Tolk units and the Harrington units. Xcel Energy then scaled down the Tolk estimate by 10% as the secondary baghouse would be smaller than a full particulate baghouse but still would require a high cloth to air stream number. Finally, Xcel Energy increased the Tolk estimate by 12% for overhead, engineering and management and 15% for contingency for unknowns.

Xcel Energy stated that the EPA erroneously assumed this post scrubber baghouse was in place and would allow Tolk to continue the re-use of ash. This is not the case for Tolk. It is Xcel Energy's opinion that the fly ash revenue stream and reduced O&M expense do not cover the additional cost of the baghouse and this option is not economically viable. If Option B were chosen by EPA, then EPA would need to add substantial capital (with additional O&M) to its cost estimates for emissions removal.

Xcel Energy stated that either scrubber arrangement option would require a new landfill at Tolk, a cost that EPA also has not factored into its estimates. Tolk currently generates approximately 170,000 tons of fly ash on an annual basis. The addition of a scrubber would generate approximately 80,000 tons of scrubber waste. There is variability to this number as some of the existing ash is used in start-up and becomes part of the waste.

Xcel Energy stated that a new landfill would vary in size and capacity depending on which option was chosen for the baghouse arrangement. If Option A were selected, then the total of the ash and scrubber waste would need to be landfilled annually. If Option B were selected, then only the scrubber waste would be landfilled annually. Under Option A, Xcel Energy estimates the cost for the construction of a landfill for this ash would be an initial capital investment of $10 million with ongoing capital expenses every five years of approximately $5 million for new cell construction. [See Appendix D to comment 0064, excerpt from Harrington Generating Station Units 1, 2 & 3 and Tolk Generating Station Units 1 & 2 Phase I Air Quality Control Study Engineering Services Project Study Prepared for Xcel Energy, B&M (Nov. 2011).] B&M estimated the initial cost of a landfill to be approximately $1.1 to $5.2 million. There also are ongoing capital costs for the addition of a new cell and capping an old cell every five years at a cost of approximately $1.1 to $5.2 million. After reviewing these costs, Xcel Energy utilized past internal experience for site work for ponds, estimates for using a lime landfill with minimal liner and monitoring wells and concluded that the B&M costs were understated for the initial landfill as they only considered the first cell opening and not the development of the whole site. Therefore, Xcel Energy estimates that initial landfill development (site selection and first five-year cell) would be approximately $10 million and then $5 million every five years for ongoing cell development. These costs do not include the ongoing operational costs associated with ash hauling placement and compaction in the landfill. The current EPA estimate fails to include these additional capital costs. Additionally, the new CCR rule will impose significant new requirements for the construction of an ash landfill. These requirements include prescribed composite liners, leachate collection, ground water monitoring and a host of other operating costs that were not included in EPA's cost estimates. There also are O&M costs associated with ash handling and placement in a new landfill that were not factored into EPA's cost analysis. See Cost TSD, at 6.

Regardless of the arrangement of a scrubber in the flue gas stream, Xcel Energy noted that the EPA failed to include all of the costs necessary to manage and landfill the wastes created by the scrubber, which artificially lowers EPA's estimated cost per ton removed. EPA also failed to properly analyze the cost benefit ratio of discontinuing the re-use of the fly ash on the environment by forcing the creation of a landfill that would be attendant to the addition of scrubbers at Tolk.

Response: We are aware that Tolk beneficially re-uses 100% of its fly ash, and we support this re-use. This comment identifies two options for location of the scrubber in the pollution control train: (1) Option A locates the scrubber upstream of the existing baghouse and (2) Option B locates the scrubber downstream of the existing baghouse.

The EPA's cost estimate locates the scrubber downstream of the existing baghouse and includes the costs of a new baghouse downstream of the scrubber (Option B in this comment), to protect the beneficial use of flyash and enhance the SO_2 removal efficiency of the dry scrubber. A substantial amount of the SO_2 removal achieved by a dry scrubber occurs in the tail-end baghouse because the scrubber ash is rich in lime. Without the tail-end baghouse, the dry scrubber would only achieve about 75% SO_2 control. As the Integrated Planning Model (IPM) algorithms that EPA used in its Tolk cost estimate are based on 95% SO_2 control, the costs must therefore include a tail-end baghouse.[168]

The IPM support document for the SDA dry scrubber,[169] for example, states: "The curve fit was set to represent...a "typical" SDA FGD retrofit for removal of 95% of the inlet sulfur."[170] A 95% SO_2 control efficiency can only be achieved with a tail-end baghouse. The O&M costs for this tail-end baghouse are included in EPA's cost analysis. The IPM support document, for example, states: "The fixed maintenance materials and labor (includes bag replacement) is a direct function of the process capital cost..."[171] The baghouse costs are included in the "balance of plant costs" in the IPM SDA model. We confirmed that the SDA cost model we relied on includes a tail-end baghouse with the EPA Lead Reviewer of the IPM Project.[172]

This comment also argues that either scrubber option would require a new landfill at Tolk, which it asserts is not included in EPA's cost estimate. The comment presents capital and O&M costs for a new landfill for Option A, an upstream baghouse and landfilling of all ash and scrubber

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[168] Sargent & Lundy, White Bluff Station Units 1 and 2, Evaluation of Wet vs. Dry FGD Technologies, October 28, 2008, pp. 2-2 and 2-9.
[169] Sargent & Lundy, IPM Model – Updates to Cost and Performance for APC Technologies, SDA FGD Cost Development Methodology, Final, March 2013 (3/13 S&L SDA).
[170] 3/13 S&L SDA, p. 1.
[171] 3/13 S&L SDA, p. 4.
[172] E-mail from William Stevens, EPA, to Joe Kordzi, EPA, Re: Question on SDA IPM Cost Algorithm, August 13, 2015.

wastes from a 2011 Burns & McDonnell report, but failed to report any cost information for Option B, a tail-end baghouse, which is the option that EPA costed.

However, subsequent work by URS in 2013 for Xcel reviewed and revised the 2011 Burns & McDonnell work cited in this comment. The subsequent URS study concludes with respect to the landfill: "the B&Mc study included the capital cost for a new cell to be developed. In this analysis, no additional capital development cost is included; the landfill costs for solid wastes are dealt with as strictly an operating cost at the $/ton rate specified in Section 3. The URS study further does not include costs for the TCEQ unlined landfill registration process as were included in the B&Mc study."[173] This 2013 URS study assumes disposal costs of $5/ton for calcium solids and $10/ton for sodium solids disposal in 2013 dollars.[174] In comparison, we assumed a dry FGD solids disposal cost (sum of sodium and calcium solids) of $30/ton in 2012 dollars. Thus, we substantially overestimated these costs and do not believe a revision is required.

The comment is correct that the new CCR rule[175] may impose significant new requirements for construction of landfill as these requirements apply to flue gas desulfurization materials. We note that Xcel has stated in discussing its corporate costs (not just Tolk) that, "Based on our initial review of the final rule, we believe our costs for the management and disposal of coal ash will not significantly increase under the new rule."[176]

Regardless, a new ash landfill is not required for the small amount of calcium and sodium solids that will be generated by the Tolk dry scrubbers. The EPA's cost analysis assumes these materials will be sent for offsite disposal and assigns a per ton cost of $30/ton. As EPA's per ton cost is substantially higher than estimated by SPS's consultants before the CCR rule was on the horizon, we believe it has adequate margin to accommodate any future increase in cost to comply with the CCR rule. However, even if the scrubber solids disposal cost were increased to $50/ton, the cost effectiveness of the Tolk scrubbers would remain highly cost effective. At Tolk 171B, cost effectiveness would increase from $3,178/ton to $3,285/ton and at Tolk 172B, from $2,998/ton to $3,091/ton or by 3%. Thus, no change is required.

Below, we reproduce the Securities and Exchange Commission Form 10-Q filing we referenced in another comment, in which SPS reported its estimated cost of proposed scrubbers at its Tolk units:[177]

> In May 2014, the EPA issued a request for information under the CAA related to SO_2 control equipment at Tolk Units 1 and 2. In December 2014, the EPA proposed to disapprove the reasonable progress portions of the SIP and instead

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173 12/12/13 URS, TOLK_0000115/116.
174 12/12/13 URS, Table 4, TOLK_0000112.
175 http://www2.epa.gov/coalash/coal-ash-rule
176 https://www.xcelenergy.com/staticfiles/xe/Corporate/CRR2014/environment/environmental-policy.html. Xcel Corporate Responsibility Report 2014, page 119, available at: https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&ved=0CCMQFjABahUKEwjakMaO-f7HAhUMGz4KHZdPCoE&url=https%3A%2F%2Fwww.xcelenergy.com%2Fstaticfiles%2Fxe%2FCorporate%2FCRR2014%2Fcrr-2014.pdf&usg=AFQjCNGPd_TbVnVS1ljNJE1nDJH8k0o14Q&cad=rja
177 United States Securities and Exchange Commission, Form 10-Q, available here: http://www.getfilings.com/sec-filings/150803/SOUTHWESTERN-PUBLIC-SERVICE-CO_10-Q/

> adopt a Federal Implementation Plan. We proposed to require dry scrubbers on both Tolk units to reduce SO_2 emissions to help achieve reasonable progress goals for Texas and Oklahoma national parks and wilderness areas. As proposed, the dry scrubbers would need to be installed and operating within five years of the EPA's final action, currently expected in December 2015. Whether dry scrubbers are required is dependent on the EPA's final decision. If required, they would cost approximately $600 million, with an annual operating cost of approximately $10.4 million. SPS believes these costs would be recoverable through regulatory mechanisms and therefore does not expect a material impact on results of operations, financial position or cash flows."

While SPS's capital costs are higher than ours ($600 million vs. $445 million), likely due to the use of the all-in costing method and the inclusion of invalid costs such as the costs discussed above plus AFUDC and owners cost, its O&M costs are lower (10.4 million/yr vs. our 23.4 million/yr). The cost effectiveness of scrubbers at Tolk, based on SPS's Form 10-Q report is then $3,059/ton removed[178]. This is approximately equal to our own calculations for scrubber retrofits for Unit T171B ($3,178/ton) or T172B ($2,998/ton).

Comment: EPA did not adequately consider lower-cost options for compliance, such as dry sorbent injection [at Tolk]. [Xcel Energy (0064) p. 32-33]

Xcel Energy argued that EPA too quickly eliminated the lower-cost option of dry sorbent injection ("DSI") at Tolk without sufficient evidence for doing so in the proposal. In the Cost TSD, EPA says, "we lack the site specific information, which we believe requires an individual performance test, in order to be able to accurately determine the maximum SO_2 removal efficiency for the individual units .... "and EPA goes on to note that such site-specific information has already shown infeasibility at more than one unit (i.e., Luminant's Big Brown and Monticello units). Cost TSD, at 7. Yet EPA still evaluates "each unit at its maximum recommended DSI performance level[:] ... 90% SO_2 removal..." Cost TSD, at 8. Without the site-specific information that EPA admits it needs and does not have, it is arbitrary to select the maximum performance level for each unit under consideration. This lack of information does not fully consider all appropriate options for controls at a facility. In tum, EPA has failed to properly perform a four-factor analysis because EPA arbitrarily and unreasonably failed to consider alternative, less expensive controls such as DSI, or to compare the incremental costs and environmental benefits associated with such controls and scrubbers at particular units. EPA has done this comparative cost incremental analysis for source-specific RPG controls in other regional haze SIPs/PIPs. *See* Proposed North Dakota SIP Approval/Disapproval, 76 Fed. Reg. at 58,631 (analyzing RPGs for a source in the North Dakota FIP using incremental cost effectiveness analyses for various controls of NO_x emissions).

Response: *First,* it is standard practice in cost estimating to use a performance range to bound costs when a site-specific estimate is not available. The BART Guidelines explain this procedure. When a range of performance levels are possible, as here, the Guidelines hold that:

[178] Cost effectiveness of scrubbers at Tolk Units 174A and 174B, based on its June 30, 2015 10-K filing: $[(600,000,000)*0.0806 + 10,400,000]/[10,015+9,195 \text{ ton/yr}] = \$3,059/\text{ton } SO_2$ removed.

"2. In assessing the capability of the control alternative … Without a showing of differences between the source and other sources that have achieved more stringent emissions limits, you should conclude that the level being achieved by those other sources is representative of the achievable level for the source being analyzed.

3. You may encounter cases where you may wish to evaluate other levels of control in addition to the most stringent level for a given device. While you must consider the most stringent level as one of the control options, you may consider less stringent levels of control as additional options…."[179]

This is the procedure we followed in selecting the range of 50% to 80% (ESP) to 90% (FF) for DSI.[180] This procedure requires that the upper end of the range be the level achieved by other sources when there is no contrary information, as here, and that lower levels may also be evaluated, so long as the most stringent level is considered. The IPM DSI methodology identifies 80% (ESP) to 90% (FF) SO_2 control as the upper end of the range and 50% as the lower end.[181] Thus, the evaluation of this range, in the absence of site specific tests, is not arbitrary, but rather standard practice. In response to our request for information under Section 114 of the CAA, Xcel itself has provided to us DSI analysis that indicates it assumed control efficiencies that fit comfortably with the range of efficiencies we analyzed.

*Second***,** this comment incorrectly asserts that "EPA goes on to note that such site-specific information has already shown infeasibility at more than one unit ()…yet EPA still evaluates "each unit at its maximum recommended DSI performance level[:]…90%." This is incorrect. Luminant disclosed that DSI had been tested at its Big Brown and Monticello units and was found to be infeasible. Thus, while we presented DSI costs for these units for completeness, we concluded that DSI was not feasible at these units, based on Luminant's site-specific information. We evaluated all other units that are not currently controlled with a scrubber assuming DSI at both 50% and 90% and invited comments on the feasibility of DSI on these units.[182]

The performance of a DSI system depends on coal type, combustion conditions, ductwork, temperature, other acid gases in the flue gas (i.e., HCl), and other air pollution control equipment at a plant. Every boiler unit is unique. A reliable estimate of the actual performance of DSI cannot be determined without an on-site demonstration test.[183] However, it is feasible to evaluate

[179] 40 CFR 51, Appx. Y, p. 627.
[180] See Cost TSD, pp. 6-8. A control level of 80% was used when the unit was equipped with electrostatic precipitators (ESP) and a control level of 90% was used when the unit was equipped with fabric filters (FF).
[181] Sargent & Lundy, IPM Model – Updates to Cost and Performance for APC Technologies, Dry Sorbent Injection for SO_2 Control Cost Development Methodology, March 2013, pp. 1, 3.
[182] See Cost TDS at pp. 6-8; 76 FR 74,876. Table 32 (December 16, 2014).
[183] See, for example, United Conveyor Corp., Dry Sorbent Injection for SO_2, SO3, Hg and HCl, Available at: http://unitedconveyor.com/uploadedfiles/systems/dry_sorbent_injection/ucc-040_dsibrochureusversion_spreadsfinal.pdf; DCI-ACI Technology for MAT Compliance, Power Engineering: ("Testing is the first step for determining emission rates and ascertain if existing APC equipment can achieve compliance on their own."), Available at: http://www.power-eng.com/articles/print/volume-118/issue-1/features/dsi-

the range of expected performance, based on numerous tests conducted by vendors and CBI data submitted in response to our Section 114 requests. Thus, we evaluated 50% and 80% (ESP) or 90% (FF) SO_2 control using DSI at all unscrubbed units including the Luminant units, where DSI was concluded to be infeasible based on site-specific tests.

As to Tolk, SPS's response to EPA's Section 114 request did not include any DSI performance data. Thus, we evaluated the typical range of 50% to 90% for the Tolk units to bound performance. Evaluating a control range to bracket performance is a standard method used in cost effectiveness analysis.

In fact, the documents produced by SPS include a URS study commissioned by SPS that concluded in 2013 that "[s]ite specific testing is the suggested way to determine the impacts that might be expected at the Tolk and Harrington plants." TOLK_0000116. SPS did not produce the test results recommended by its consultants. Thus, we have no basis to evaluate a control efficiency outside of the widely accepted range of 50% (ESP) to 90% (FF) SO_2 control and specifically higher than 90%, as recommended by the IPM DSI documentation. It would be arbitrary for us to assume a higher control efficiency than 90%, which is the upper bound recommended by the IPM documentation, or a lower efficiency than 50%, which is the recommended lower bound when a facility is equipped with a baghouse.

Further, a higher SO_2 control efficiency would not alter our decision to select SDA rather than DSI. In fact, it supports our decision to eliminate DSI. As we state on page 30 of our FIP TSD:

> As we note in section 5, for all but one of the units we analyzed that currently have no SO_2 controls, even at the lower level of control of 50%, the cost-effectiveness of DSI was worse (higher $/ton) than either SDA or wet FGD, even with the latter options offering much greater levels of control and visibility benefit. At the higher 80% or 90% level of control, the cost-effectiveness of DSI was worse than either SDA or wet FGD in all cases. Consequently, we are not proposing that DSI be installed at any unit.

Xcel has taken the statement, "we lack the site specific information, which we believe requires an individual performance test, in order to be able to accurately determine the maximum SO_2 removal efficiency for the individual units…" out of context. Our cure for the lack of site specific data was to evaluate a range of control efficiencies, known to be achievable, based on the IPM model documentation, the DSI literature, and confidential information submitted by other utilities and invited comment on its applicability to specific units.

Our purpose in testing the cost effectiveness of DSI at its theoretical upper level of control was to both acknowledge the problem of a lack of site specific data, but in so doing to also bound the

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aci-technology-for-mats-compliance.html; Thomas A. Dunder, Stack Testing Technologies for DSI Evaluation Studies ("DSI must be evaluated at each facility to determine optimal sorbents, injection rate, and injection points."), Available at: http://www.slideshare.net/trc_companies/euec-paper-c5-1-emissions-testing-for-dsi-evaluation-trc.; Diane Fischer and Preston Tempero, Early Lessons Learned from Implementation of Dry Sorbent Injection Systems, p. 5 ("Experience has shown that baseline testing and sorbent injection testing are critical steps in the design of DSI systems."), Available at: http://bv.com/docs/reports-studies/early-lessons-learned-from-implementation-of-dsis.pd.

range of DSI cost effectiveness. In other words, we wished to test whether any reasonable range of DSI control was cost effective in comparison with scrubbers. As we discussed in our Cost FIP: "…we believe that the maximum performance level for DSI can only be determined after an onsite performance test. Therefore, we don't know whether a given unit is actually capable of achieving these DSI control levels, and (2) we believe it is useful to evaluate lesser levels of DSI control (and correspondingly lower costs). We therefore also evaluated all the units at a DSI SO_2 control level of 50%, which we believe is likely achievable for any unit."[184] The Tolk dry scrubbers were evaluated at an SO_2 control efficiency of 91.7%, while the maximum SO_2 control efficiency for DSI was evaluated at 90%. As we have demonstrated, the cost effectiveness of DSI worsens (higher $/ton) as the control level increases. Thus, if the cost effectiveness of DSI at 90% control is already worse than the cost effectiveness of SDA at 91.7% control, then as we demonstrated, DSI cannot compete with SDA in cost effectiveness. This ignores the increased visibility benefit of SDA due to its higher control level, increasing the attractiveness of SDA.

One consultant to SPS, Burns & McDonnell, evaluated DSI at 70% SO_2 control, while another evaluated the range of 50% to 80%,[185] both without any demonstration test data.[186] These ranges are consistent with the range we used. The resulting cost effectiveness values for DSI at both 50% and 90% are reported in the Cost TSD, Table 5, and in the proposed rulemaking, 79 FR 74,876, Table 32 (December 16, 2014).

Third, this comment claims we failed to properly perform a four-factor analysis because it "arbitrarily and unreasonably failed to consider less expensive controls such as DSI…" This is incorrect. As explained above, we considered DSI at two control levels, 50% and 80% (ESP) to 90% (FF), which bracket the range of demonstrated performance at other similar facilities, documented in the DSI literature and CBI data submitted by other applicants.

Fourth, this comment claims "EPA arbitrarily and unreasonably failed …to compare the incremental costs and environmental benefits associated with such controls and scrubbers at particular units." As explained in the BART Guidelines: "The incremental cost effectiveness analysis compares the costs and performance level of a control option to those of the next most stringent option…" Part 51, Appx. Y, p. 629.

As an initial matter, our control cost and visibility analysis was performed under the reasonable progress and long-term strategy requirements of the Regional Haze Rule, which do not require the type of incremental cost analysis to which Xcel refers. That type of analysis is required under the BART provisions of the Regional Haze Rule. That aside, the incremental cost effectiveness is negative, meaning it costs less to reduce more SO_2 with the most effective control than with the next most efficient control. The cost of removing 167 ton/yr more SO_2 at Unit 171B using SDA eliminates spending $3.2 million dollars per year for only 90% control using DSI. This supports the selection of the SDA over DSI. Similarly, the cost of removing 84 ton/yr more SO_2 at Unit 172B using SDA eliminates spending $1.9 million per year, compared to the next most effective control, a 90% efficient DSI. Thus, the cost of removing additional SO_2 is lower with an SDA than with a 90% efficient DSI and no incremental cost analysis is required.

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[184] FIP TSD, p. 11.

[185] URS ccc

[186] Burns & McDonnell, TOLK_00001092/1093.

As noted above, we contrasted the cost effectiveness and visibility benefits of DSI with dry and wet scrubbers and concluded that in all cases, scrubbers represented a better cost versus benefit solution.

Lastly, this comment asserts we failed to consider the environmental benefits of DSI compared to SDA. In the TSD FIP, p. 8, we concluded that DSI and scrubbers do not present any unusual environmental impacts, with the exception of water supply at Tolk, which we addressed by eliminating wet scrubbers. The only environmental benefit of DSI is that it does not use any water. However, DSI has many adverse impacts that offset this benefit.

Elsewhere, Xcel disclosed that if lime sorbent for SDA were injected upstream of the existing baghouse, it would render the fly ash unusable as Tolk beneficially re-uses 100% of its fly ash.[187] While we did not propose this option, this disclosure by Xcel reveals a new adverse impact of DSI that we did not consider that supports our decision to eliminate it.

In DSI, trona is injected upstream of the baghouse, which would contaminate the baghouse flyash. This would result in additional costs, not included in our DSI cost analysis. Based on Xcel's claims in –another comment, this could include: (1) lost revenue from the sale of the fly ash (approximately $2 million annually), (2) increased capital cost for a new landfill ($10 million for landfill development and then $5 million every 5 years for ongoing cell development); and (3) additional O&M for handling of bottom ash, which is currently netted out of fly ash revenues. The cost model we used included the resulting increase in O&M cost for fly ash handing and increased bag replacements due to increased particulate loading from injected trona. Additionally, the new CCR rule may impose significant new requirements for the construction of an ash landfill. These requirements include prescribed composite liners, leachate collection, ground water monitoring and a host of other operating costs that were not included in EPA's DSI cost estimates. The adverse impact of DSI on the salability of Tolk's fly ash and attendant fly ash waste disposal issues supports our decision to eliminate DSI.

Further, DSI injection upstream of the baghouse could result in other adverse environmental impacts, including reduction in mercury capture and increase in NOx and particulate matter emissions as well as sorbent buildup in ducts and particulate control devices, causing degraded performance and frequent downtime.[188]

SPS recently installed mercury control at its Tolk plant, consisting of activated carbon injection (ACI) upstream of the baghouse to comply with the mercury standards under the Mercury and Air Toxics Standards (MATS) rule. [189] Sodium sorbents used in DSI, such as trona, generate NO_2 in the presence of carbon, which increases NOx emissions and reduces mercury capture by carbon-based sorbents, limiting SO_2 control to about 30% to 40% and requiring increased

[187] Xcel Energy (0064) pp. 31-32.
[188] Cost TSD, p. 8.
[189] 8/20 15 West Letter, p. 3; Letter from Jeff West, Xcel, to Joe Kordzi, EPA, Re: Proposed Approval/Disapproval of Texas and Oklahoma Regional Haze State Implementation Plans; Federal Implementation Plan for Regional Haze, August 28, 2015; See also: http://www.getfilings.com/sec-filings/150803/SOUTHWESTERN-PUBLIC-SERVICE-CO_10-Q/ and 2014 Form EIA-860 Data - Schedule 6B, 'Emission Standards and Control Strategies," Available here:http://www.eia.gov/electricity/data/eia860/.

amounts of carbon to sustain mercury reduction goals. A recent study concluded:

> "Although choosing DSI for SO_2 or HCl trim may appear to be the appropriate economic choice for many unscrubbed plants, challenges associated with inadvertent impacts on mercury control due to NO2, and impacts to ash and landfill management may result in additional unplanned costs."[190]

A consultant to SPS reported similarly:

> "Initial tests of the DSI on PRB fired units with ACI installed for Hg reduction indicated some negative impacts on Hg emissions performance. This was confirmed during recent testing at a Michigan generating plant where activated carbon usage was seen to increase when used in conjunction with a trona DSI system. It appeared that the catalytic reaction of NO in the presence of the sodium compounds produced sufficient quantities of NO2 to interfere with the ACI adsorption of mercury (NO2 competes for active sites on AC and inhibits carbon capture of Hg). The AC feed rates at that facility had to be increased more than 30-40% to maintain similar Hg performance when operating the trona DSI system at SO_2 removal efficiencies above 70%."[191]

DSI also results in adverse landfill impacts. Sodium in the trona is very soluble and sodium-containing ash can mobilize heavy metals in ash. Discharge limits are of particular concern and are identified in the proposed Effluent Limitation Guidelines. Sodium-containing ash entering an ash pond or landfill may mobilize metals otherwise stable in the pond, such as selenium and arsenic. Sodium-contaminated fly ash may also require special ash handling procedures to limit sodium leaching, which can affect local vegetation. If large amounts of sodium are present in the ash, landfill subsidence may be a concern if significant mass leaches out of the landfill, leaving voids and thus affecting stability.[192]

Alternatively, if trona is injected downstream of the existing baghouses, thus protecting the current sale of flyash, additional costs would be incurred for a tail-end, polishing baghouse plus landfilling the spent trona. The SO_2 control efficiency in the downstream position would be lower than in the upstream position because control efficiency is much greater at the higher temperatures upstream of the existing baghouses than downstream.[193] However, this position would not eliminate the solids disposal issues discussed above, as the waste trona itself must still be disposed. These additional costs coupled with lower SO_2 control efficiencies would render

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[190] C. Senior and S. Sjostrom, A Look into the Crystal Ball: Post-MATS Utility Environmental Challenges, August 19-21, 2014, pp. 6-9, Available at: http://www.adaes.com/wp-content/uploads/Mega14_116_Senior.pdf.
[191] TOLK_000016.

[192] Senior and Sjostrom, 2014, pp. 7-8; K. Baldrey, S. Sjostrom, and K. Ellison, Options to Stabilize and Utilize Tomorrow's Fly Ash: Approaches and Intial Results, 2015 World of Coal Ash Conference, May 5-7, 2015, Available at: http://www.flyash.info/2015/105-sjostrom-2015.pdf.
[193] M. Wood and others, Solvay Chemicals, Dry Sorbent Injection of Trona or Sodium Bicarbonate for Air Pollution Control and Corrosion Prevention, CoalPower, 2008, pdf 29 ("Flue gas temperature – minimum 275 F, the higher, the better up to 800 F).

the incremental cost effectiveness of SDA relative to DSI even less cost effective.

Finally, DSI injection anywhere along the pollution control train can increase particulate matter emissions, adversely affect the performance of particulate control devices, and cause plugging and caking in ducts, causing flow blockages.[194] Thus, we believe for the units we examined, the adverse impacts of DSI, far outweigh the adverse impacts of SDA for much smaller reductions in SO_2. For long-term, highly efficient SO_2 control, DSI cannot match the performance or cost effectiveness of SDA

Comment: EPA failed to consider non-air environmental impacts [at Tolk]
[Xcel Energy (0064) p. 33]

Xcel Energy stated that the EPA's four-factor reasonable progress analysis requires that potential controls be evaluated for their non-air environmental impacts. As discussed above, the installation of dry scrubbers at Tolk would require a significant increase in the use of precious water resources and would result in the landfilling of all of Tolk's fly ash. EPA failed to give any consideration to the environmental impact of increasing water usage in this extremely arid region. The Ogallala aquifer is the main source of water for all of the farmers, residences and industrial activities in this area. The Ogallala aquifer is famously over-utilized and stressed. Operating dry scrubbers at Tolk would increase its water demand by 9% - 12%. EPA gave no consideration to the impact of requiring dry scrubbers on the extremely scarce water resources on this part of West Texas.

Similarly, Xcel Energy stated that the EPA failed to weigh the non-air environmental impact of requiring Tolk to begin landfilling the fly ash from its operations. Currently, Tolk beneficially utilizes 100% of its fly ash. Installing dry scrubbers would require SPS to cease selling its fly ash and, instead, construct extensive landfills to dispose of the scrubber residue. This is not just a significant cost, but also an unnecessary burden on the land and would result in additional environmental and management risks associated with such landfills.

Response: We considered both water supply and waste disposal in our four factor analysis for Tolk. As to water, see our response to another comment. As to flyash, the issue is irrelevant as we selected the dry scrubber option located downstream of the baghouse, costed to include a tail-end, polishing baghouse. This eliminates contamination of the fly ash from the primary baghouse and allows Tolk to continue to beneficially reuse its flyash. Thus, landfilling of flyash is not required. As there is no impact to fly ash under our proposal, there is no obligation to evaluate flyash contamination as a non-air environmental impact. See our response to a related comment for more information.

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194 Dry Sorbents and Systems and Material Handling in Coal-fired Power Plants, Hot Topc Hour, June 7 & June 21, 2012, Available at: http://www.mcilvainecompany.com/Decision_Tree/subscriber/Tree/DescriptionTextLinks/Dry%20Sorbent%20Hot%20Topic%20June%207,%202012.htm Ron Sahu, Dry Sorbent Injection (DS() and Its Applicability to TVA's Shawnee Fossil Plant (SHF), April 2013, Available at; http://www.cleanenergy.org/wp-content/uploads/Final_Sahu_DSI_Report.pdf.

Comment: EPA's amortization timeframe [at Tolk] is inappropriate.
[Xcel Energy (0064) p. 33-34]

Xcel Energy stated that the EPA's amortization period assumption of 30 years for the required controls at Tolk is inappropriate and leads to underestimated costs of reduction per ton of emissions for these controls. Typically, in public utility commission ratemaking processes, utilities seek and receive cost recovery for 20 years of equipment life for emissions controls. Further, emissions retrofit equipment does not last for 30 years without substantial new investments, often in the face of increasingly stringent emissions requirements that may require upgrades. The 30-year amortization period also is a questionable assumption for emissions units that will be approaching 40 years old by the time the Proposal requires the scrubbers in 2020.12 Finally, EPA has previously accepted a 20-year amortization period for the life of these types of controls. EPA, Air Pollution Cost Control Manual, at 3-33 (2002) (stating amortization over 20-30 years is appropriate); Wyoming Regional Haze FIP, 79 Fed. Reg. 5032, 5064-65 (Jan. 30, 2014) (using a 20-year amortization period for the Dave Johnson and Naughton plants); Arizona FIP, 79 Fed. Reg. 52,240, 52,459 (Sept. 3, 2014) (assuming a 20-year amortization period); Montana FIP, 77 Fed. Reg. 57,864, 57,882 (Sept. 18, 2012) (using a 20-year amortization period).

Figure 6 provided by Xcel Energy below shows that a more appropriate 20-year amortization period for the scrubbers would increase the cost per ton of emissions controlled by 9%. The table below in Figure 6 utilizes the EPA estimates in the Cost TSD, but only considers the amortization factor and does NOT include the additional impacts of the costs to obtain water or to construct and operate a new landfill.

Cost Estimate for Tolk Units 1 and 2 with Revised Amortization and Costs (Figure 6 provided by Xcel Energy)

Tolk Unit	Cost per Ton - 30 Yr	Cost per Ton - 20 Yr	% Increase over EPA Estimate
Tolk Unit 1	$3,178	$3,505	9%
Tolk Unit 2	$2,998	$3,310	9%

Commenter's References:
[12] Tolk Unit 1 will have been in operation for 38 years in 2020, and Tolk Unit 2 for 35 years

Response: The lifetime used to estimate the capital recovery factor in a cost effectiveness analysis is a site-specific determination, based on the design of the proposed control equipment and the remaining useful life of the facility in which it is installed. Thus, our decisions in other cases do not establish the lifetime of scrubbers at Tolk. We address the comment alleging our use of a 20 year life in the consistency section of this document.

We have also used a 30 year scrubber lifetime in other cases, including the Oklahoma FIP.[195] As explained in the FIP TSD for Texas, "We have used this 30 year lifetime approach in prior actions and we therefore adopted the same scrubber lifetime in our present analysis. See 76 FR 52388 (Aug 22, 2011); 76 FR 81728 (Dec. 28, 2011); Oklahoma v. EPA, 723 F.3d 1201 (July 19, 2013), *cert. denied* (U.S. May 27, 2014)."

Scrubbers typically have a lifetime even longer than the 30 years assumed in EPA's analysis. S&L, for example, estimated the lifetime of dry scrubbers retrofit to White Bluff Units 1 and 2 of 40 years.[196]

In a retrofit application, as here, the lifetime assumed in the cost analysis may be constrained by the remaining useful life of the facility. If the remaining useful life of a facility clearly exceeds the lifetime of the control, the remaining useful life has no effect on control costs and on the BART determination process. However, where the remaining useful life is less than the lifetime of the control, e.g., scrubbers, the shorter time period must be used in the cost calculations.[197]

Control cost studies prepared by two consultants to Xcel Energy, Burns & McDonnell and URS, selected a site-specific lifetime for a dry scrubber installed on the Tolk units of 30 years. In 2011, Burns & McDonnell selected a lifetime of 30 years for each of the Tolk units.[198] In December 2012, URS, in a subsequent study for Xcel Energy, assumed a remaining plant life of 30 years[199] in costing a dry scrubber and other control equipment.

Elsewhere, in proceedings before the Texas Public Utility Commission, SPS reported retirement dates for these units as 2042 for Unit 1 and 2045 for Unit 2, as of June 30, 2013[200] and remaining useful lives, as of June 30, 2013 of 29.5 years for Unit 1 and 32.5 years for Unit 2.[201] It would be typical in utility practice to extend these retirement dates as they approach, if the units remain economic to continue to operate.[202]

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[195] EPA, Response to Technical Comments for Sections E. through H. of the Federal Register Notice for the Oklahoma Regional Haze and Visibility Transport Federal Implementation Plan, Docket No. EPA-R06-OAR-2010-0190, December 13, 2011.

[196] Sept. 2002, Sargent & Lundy, Table 1-1.

[197] BART Guidelines, 40 CFR 51, p. 662-663 ("Where the remaining useful life is less than the time period for amortizing costs, you should use this shorter time period in your cost calculations.").

[198] Nov. 2011 B&M Study, Table 8.6, TOLK_00001063.

[199] URS, Final Report: SPS AQCS Cost Refinement Study – Tolk and Harrington Generating Plants, Xcel Energy, December 12, 2013, TOLK_0000097 – 208 (12/12/13 URS Report), pdf 16, Table 4, TOLK_00000112 and TOLK_0000146.

[200] SOAH Docket No. 473-14-1665, Docket No. 42004, Southwestern Public Service Company's Response to Sierra Club's First Request for Information, Question Nos. 1-1 through 1-49, pdf 28, Available at: http://www.xcelenergy.com/staticfiles/xe/Regulatory/Regulatory%20PDFs/TX-Rate-Case-2014/Revenue%20Requirment%20Testimony/Dane-Watson-Direct-Testimony.pdf, based on Direct Testimony of Dane A. Watson on behalf of Southwestern Public Service Company, Docket No. 42004, Public Utility Commission of Texas, Appendices C and D, Available at: http://interchange.puc.state.tx.us/WebApp/Interchange/Documents/42004_333_785057.PDF.

[201] Direct Testimony of Dane A. Watson on behalf of Southwestern Public Service Company, Docket No. 42004, Public Utility Commission of Texas, Appendix D, pdf 50, Available at: http://www.xcelenergy.com/staticfiles/xe/Regulatory/Regulatory%20PDFs/TX-Rate-Case-2014/Revenue%20Requirment%20Testimony/Dane-Watson-Direct-Testimony.pdf.

[202] See, e.g., Davidson Testimony for SPS, p. 46.

Thus, the 30 year lifetime that we used in our cost analysis actually corresponds to the remaining useful life of these facilities. We conclude that our original determination that the proposed scrubbers for the two Tolk units would have at least a 30 year service life remains correct and fully supported by SPS's fillings in other proceedings. If Xcel wishes to use a shorter lifetime, taking into account the date the new scrubbers would come on line, it must accept an enforceable shutdown date. As no such date has been proposed, and this change would not affect the cost effectiveness of the scrubbers, no change is required.

Comment: Limestone scrubber upgrades would not be cost-effective. [NRG (0078) p. 13]

NRG stated that, in addition to being minuscule, the visibility improvements that EPA proposes to require with scrubber upgrades at Limestone 1 and 2 would not be cost-effective. As documented in the attached confidential report by Sargent & Lundy, EPA's cost-effectiveness analysis greatly understates the annual capital and operating cost of the scrubber upgrades that EPA is proposing to mandate. The estimated actual cost-effectiveness, based on a preliminary analysis, is projected to be $2,579 per ton, or more than 16 times that projected by EPA. [Sargent & Lundy Report at 17.] The real costs, which would need to be based on a more extensive engineering analysis, could be far higher. Accordingly, EPA's cost-effectiveness analysis is dramatically overstated as to Limestone, making the cost per deciview of visibility improvement unreasonable.

Response: The items that NRG summarizes in this comment, and the information provided in its attached Sargent and Lundy (S&L) report, regarding our scrubber upgrade costs are detailed in a separate comment package submitted under the Confidential Business Information (CBI) provisions of 40 C.F.R.§ 2.203(b). Within those CBI comments, S&L also provides its own cost analyses for upgrading NRG's scrubbers. We are unable to respond to many of these summarized scrubber upgrade comments here with any specificity, because doing so would involve citing and discussing in detail items that NRG has claimed as CBI. Accordingly, many of our responses to the scrubber upgrade comments are contained within a separate document that is not a part of our posted docket, but will be available for review by NRG. The responses to comments that do not contain CBI information are contained within this document.

With regard to our scrubber upgrade cost analysis, we generally disagree with NRG that our analysis was flawed. We used NRG's own information, backed by independent contractors hired by it, supplied by NRG in response to our Section 114 requests for information. This included cost estimates from well-known and respected contracting firms with a history of many scrubber upgrades. In any event, criticisms regarding our use of this information are moot, because S&L has provided its own cost analysis (under the CBI protections), which it offers as a replacement to our own cost analyses. We have reviewed the scrubber upgrade cost analyses performed by S&L and adopted its methodology. However, we noted many errors and undocumented cost figures in its analyses. We corrected these errors and rejected some of the undocumented assertions and/or costs in S&L's cost analyses. Nevertheless, in order to produce a conservative scrubber upgrade cost analysis and set many of the issues that NRG raises aside, we incorporated many of NRG's cost items. The resulting costs for NRG's scrubber upgrades increased slightly, resulting in a range of $368/ton to 910/ton for all the scrubber upgrades, well within a range that we believe is cost effective, given the significant visibility benefits that will result from the installation of those controls.

Comment: Controls should not be required for the Parish plant. [NRG (0078) p. 13]

NRG supported EPA's proposed exclusion of the Parish plant from new SO_2 limits under this proposal for similar reasons as apply to Limestone:

- Even if new scrubbers were installed at three units and the existing scrubber upgraded at the Parish plant, these controls would only achieve a 0.361 deciview improvement as compared to average natural conditions far less than the eye can detect. (79 Fed. Reg. at 74,881 & Tbl. 34.)

- The projected visibility improvement from new and upgraded SO_2 controls at Parish under EPA's projected 2018 emissions inventory would be significantly lower, at 0.071 deciview.

- Actual costs of increasing SO_2 control at the Parish plant are significantly higher than EPA's estimates. While NRG did not commission an engineering analysis similar to that performed on the Limestone scrubbers, we note that EPA's cost effectiveness analysis for W. A. Parish was incomplete and omitted necessary capital and operating and maintenance costs.

Thus, NRG disagreed that new and upgraded SO_2 controls at Parish would be cost-effective.

Response: We agree with NRG that additional controls at the Parish facility are not appropriate during this planning period, but Limestone warrants controls this planning period on the basis of the technical record. That record, predicated on visibility benefits and cost effectiveness, is distinct and distinguishable from that of the Parish plant. We urge the State of Texas to re-examine the Parish facility with the submission of its next regional haze SIP.

Comment: Remaining Useful Life [GCLC (0063) p. 16]

GCLC stated that the EPA attempts to claim that the remaining useful life of the units indicates that the costs of controls will not be significant, because the costs can be distributed over the remaining life of the targeted EGUs. However, this is seriously misguided. Particularly for units that EPA anticipates will have to have scrubber retrofits, there is a very high probability that the unit will cease to operate. While there may be decades of useful life remaining, it would be extremely difficult in Texas' competitive electricity market to justify the installation of controls nearing $300 million for each unit; and those costs are based on EPA's estimates, when in reality, the costs will likely be much higher.

Response: As we state in our responses to other comments, we believe a 30 year operational life is appropriate for our proposed scrubber upgrades and retrofits. Because none of the facilities affected by our proposal have entered or offered to enter into an enforceable commitment to guarantee a shorter operational life, we consider it appropriate to assume 30 years in our cost analyses. The claim that any units would cease to operate has not been factually substantiated with information provided by any commenter. See our response to similar issues concerning grid reliability elsewhere.

Comment: EPA Assumed Too High of an Interest Rate in Determining the Annualized Capital Costs of SO_2 **Controls Evaluated.** [Earthjustice (0067) p. 37, Stamper (0068) p. 13]

Earthjustice et al., and Stamper noted that the EPA assumed a 7% social interest rate in determining the annualized capital costs of SO_2 controls evaluated. Cost TSD at 10. While the Office of Management and Budget ("OMB") has, in the past, recommended a 7% social interest rate, OMB's current recommendation is 1.4% for a 30-year period. Moreover, the Control Cost Manual recommends that a source-specific interest rate be used for reasonable progress determinations, rather than the social interest rate applied in promulgation of regulations.

Stamper stated that the EPA did not provide much justification for the 7% interest rate, other than to state that a 3% interest rate and a 7% interest rate were used in determining cost effectiveness for the BART Guidelines, and that a 7% interest rate is recommended by the Office of Management and Budget. *Cost TSD at 10.*

Stamped noted that to determine the annualized capital costs of a control technology, the total capital costs are multiplied by the cost recovery factor, which is determined based on an assumed life of the pollution control equipment and an assumed interest rate. Specifically, the capital recovery factor (CRF) is based on the following equation:

$$CRF = [i(1+i)n]/[(1+i)n - 1]$$

where "i" is the interest rate and "n" is the life of the pollution control equipment. In essence, annualization establishes an annual payment sufficient to finance the capital investment for its entire life.[36]

Stamper stated that the EPA cites to an out-of-date OMB circular for justifying a 7% interest rate in its Cost TSD. The OMB circular cited to by EPA is dated September 17, 2003, and thus is from almost 12 years ago. Further, the 2003 OMB circular indicates that a 7% interest rate is a default interest rate, but that the real cost of capital or the "social" interest rate has averaged around 3% in real terms on a pre-tax basis. Consequently, this 2003 OMB circular cited by EPA recommends that, for regulatory analyses, one should utilize both a 3% and a 7% interest rate. However, the docket for EPA's proposed reasonable progress controls only includes cost effectiveness analyses based on Capital Recovery Factors determined with a 7% interest rate.

Stamper explained that the 7% "social interest rate" is used to estimate the *cost to society* of taking an action.[38] However, the Control Cost Manual states that this social interest rate "is probably not appropriate for industry." [37,39] The Regional Haze Rule requires EPA to make case-by-case determinations of "the costs of compliance" for identified BART and reasonable progress options, 42 U.S.C. § 7491(g)(1), (2)—i.e., the actual *cost to the source* of implementing the studied alternatives. In such situations, where EPA, the state, or industry is evaluating "the economic impact that [air pollution-control] equipment would have upon the source," a source-specific interest rate is appropriate.[40]

Stamper noted that OMB updates interest rates yearly and the current social interest rate is 1.4% for a 30-year period.[41]Therefore, even if EPA were correct in applying the social interest rate, it should have used the current published OMB rate in accordance with the Control Cost Manual.

While the 7% interest rate assumed by EPA is much higher than any of these EGU owners will be subject to, Stamper did not revise EPA's cost analyses to use these lower "real cost of capital" interest rates or the current social interest rate. A consistently-used interest rate among the Texas units at least provides for apples-to-apples cost effectiveness comparisons in this proceeding. However, EPA should make clear that the annualized cost projections for the controls it has evaluated do not reflect the true annual costs of these controls at the Texas EGUs. Use of more realistic interest rates would significantly lower the annualized costs and cost effectiveness (i.e., make the controls more cost effective) for the controls evaluated by EPA.

Footnotes:
[36] EPA Control Cost Manual, January 2002, Section 1, at 2-21.
[37] *See* EPA's Control Cost Manual at 2-12 to 2-13.
[38] Id. at 2-12 to 2-13.
[39] *Id. at* 2-13.
[40] Id.
[41] *See* OMB Circular A-94, App. C (revised January 21, 2015) (Ex. 13).

Response: We agree with the commenter that our selection of an interest rate has a significant impact on our cost effectiveness calculations, and that were we to adopt a 3% (or lower) interest rate, the cost effectiveness of our proposed controls would become much more attractive (lower $/ton). As we have noted in our responses to other comments, we believe that our proposed cost analyses calculations are already cost effective, especially the scrubber upgrades. We have retained the use of a 7-percent interest rate in calculating the capital recovery factor. For cost analyses related to government regulations, an appropriate ''social'' interest (discount) rate should be used, not the source's actual rate of borrowing. OMB Circular A–4, providing Federal agencies guidance on developing regulatory analyses, and dated September 17, 2003,[203] reiterates the guidance found in the earlier Circular A–94:[204]

> As a default position, OMB Circular A–94 states that a real discount rate of 7 percent should be used as a base-case for regulatory analysis. The 7 percent rate is an estimate of the average before-tax rate of return to private capital in the U.S. economy, based on historical data. It is a broad measure that reflects the returns to real estate and small business capital as well as corporate capital. It approximates the opportunity cost of capital, and it is the appropriate discount rate whenever the main effect of a regulation is to displace or alter the use of capital in

[203] https://www.whitehouse.gov/sites/default/files/omb/assets/omb/circulars/a004/a-4.pdf
[204] https://www.whitehouse.gov/sites/default/files/omb/assets/a94/a094.pdf

the private sector.

The yearly updates to OMB Circular A-94 to which the commenter references, are to Appendix C. However, as the letter that transmits this yearly updates explains:[205] "The rates presented in Appendix C do not apply to regulatory analysis or benefit-cost analysis of public investment. They are to be used for lease-purchase and cost-effectiveness analysis, as specified in the Circular." Note that the reference to "cost-effectiveness analysis" here does not refer to that used in the regional haze program, but rather to the analysis of programs requiring the expenditure of federal funds.

Comment: Remaining Useful Life (30-yr equipment life) [Stamper (0068) p.9]

Stamper stated that the EPA used a 30-year life for the pollution controls that it evaluated in its SO_2 control cost analyses. FIP TSD at 8-9. There is ample support for the assumption of a 30-year life for a scrubber or a DSI system. There are numerous EGUs with wet scrubbers and SDAs that have been in operation for at least 30 years.[23] Many of the scrubbers in operation today were installed in the late 1970's to early 1980's[24], and thus have been in operation more than 30 years. In addition to the BART determinations that EPA cited in which EPA assumed a 30-year life of the pollution controls being evaluated, Sargent & Lundy assumed a 40-year life for retrofit SO_2 scrubbers on the White Bluff facility in a BART analysis for that facility.[25]

Moreover, Stamper agreed that, if an EGU owner indicates that a shorter life of the SO_2 controls should be evaluated in EPA's cost effectiveness determination due to a planned shutdown of a unit, then that shorter lifetime needs to be made into an enforceable requirement. This is consistent with how EPA has considered shorter equipment lifetimes in cost analyses for BART determinations, and there is no justification for a different approach for cost effectiveness analyses done for reasonable progress requirements.

For example, Stamper noted that the owners of Dave Johnston Unit 3 in Wyoming informed EPA that the unit would be shut down in 2027. 79 Fed.Reg. 5045 (January 30, 2014). Consequently, EPA considered a shortened lifetime for the NOx controls it was evaluating for the unit to meet BART. Although EPA had initially found that selective catalytic reduction (SCR) was cost effective for Dave Johnston Unit 3, when EPA evaluated selective catalytic reduction based on a remaining useful life of the unit ending in 2027, EPA found that SCR was no longer cost effective.[26] *Id.* Based on these analyses, EPA imposed two requirements, either one of which could be met by the Dave Johnston Unit 3 owners: 1) that Dave Johnston Unit 3 meet a NOx limit of 0.07 lb/MMBtu based on SCR installation by March 4, 2019, or 2) that the owners permanently cease operation of the unit on or before December 31, 2027. 79 Fed.Reg. 5221 (January 30, 2014). In other words, EPA only took into consideration a reduced remaining useful life in its NOx BART cost effectiveness analysis when there was an enforceable limitation on the unit's remaining useful life.

In summary, Stamper concluded that the EPA's assumption of a 30-year life for the SO_2 controls evaluated is based on real life scrubber operating experience and is fully supported. Further,

[205] https://www.whitehouse.gov/sites/default/files/omb/memoranda/2015/m-15-05.pdf

EPA is justified in requiring a federally enforceable restriction for a remaining useful life of less than 30 years in its cost effectiveness evaluations, as is required by the BART Guidelines. FIP TSD at 9.

Footnotes:
[23] *See* Burns & McDonnell, Utility FGD Design Trends, which provides, among other things, the year each FGD system at an EGU began operation. (Ex. 67).
[24] Id.
[25] Sargent & Lundy, White Bluff Station Units 1 and 2, Evaluation of Wet vs. Dry FGD Technologies, Prepared for Entergy Arkansas, Inc., Rev. 3, October 28, 2008. (Ex. 20).
[26] With a shorter period of time over which the capital expenditure of a pollution control is amortized, the annualized costs and the overall cost effectiveness numbers will be higher.

Response: We agree with the commenter that a 30 year operational life is appropriate for our cost analyses.

Comment: EPA Assumed Default Auxiliary Power Costs Rather than Site-Specific Auxiliary Power Costs in its Cost Effectiveness Analyses.
[Earthjustice (0067) p. 37; Stamper p. 15]

Earthjustice et al., stated that EPA assumed higher default auxiliary power costs rather than site-specific auxiliary power costs in its cost effectiveness analysis. And EPA's assumed level of SO_2 control in its cost effectiveness analyses for SO_2 for wet FGD and SDA systems is likely conservative and does not reflect the full extent of SO_2 emission reductions that can be achieved with these control technologies. That means EPA's cost effectiveness calculations should be lower and the visibility improvements higher for several of the EGUs evaluated by EPA for reasonable progress controls.

Stamper noted that the Sargent & Lundy IPM cost modules assume a cost of auxiliary power of \$0.06/kW.[42] Although EPA acknowledged that the true auxiliary power cost for "most if not all of the units" EPA analyzed is "considerably less" than this value, EPA conservatively used the default value of \$0.06/kWh in the cost evaluations. Cost TSD at 10. EPA indicated that it has the actual cost of auxiliary power in the information obtained via its Section 114(a) requests made to each company. Id. Given that EPA has site-specific auxiliary power cost information for each EGU, EPA should use such actual auxiliary power cost in its SO_2 control cost effectiveness calculations.

Response: We agree with the commenter that our auxiliary power cost assumptions are likely high and thus worsen our cost effectiveness calculations (higher \$/ton). One of our intentions in performing our cost analyses was to conservatively estimate many of the individual cost parameters and demonstrate that even doing this, our proposed scrubber upgrade and scrubber retrofit cost analyses were cost effective. We believe we have met that goal.

Comment: Energy and non-air quality environmental impacts. EPA should have considered blending with low-sulfur coal, lignite drying, and a circulating dry scrubber called Novel Integrated Desulfurization (NID™) technology. [Earthjustice (0067) p.36, Stamper (0068) p.8]

Stamper noted that the second factor in establishing controls measures and reasonable progress goals for a Class I area is to consider the energy and non-air quality environmental impacts of compliance with such control measures. EPA included in its cost effectiveness analyses the costs of auxiliary power required to operate the SO_2 controls evaluated (i.e., wet scrubber, spray dryer absorber (SDA) dry scrubbers, and dry sorbent injection (DSI)) and also the costs of waste disposal associated with these SO_2 controls. FIP TSD at 7-8.

Earthjustice et al., and Stamper agreed that including the energy and waste impacts in the cost analyses is an appropriate way to evaluate these impacts in the analysis of reasonable progress controls, but they stated that there are additional factors that EPA should consider with respect to the energy and non-air quality environmental impacts of SO_2 scrubbers and DSI technology.

Specifically, Earthjustice et al., and Stamper stated that the EPA should have evaluated the blending with lower sulfur coal for those EGUs that burn high sulfur coal, and/or EPA should have considered the use of coal drying for the units that burn lignite coal. Blending with lower sulfur coal, which essentially is a pollution prevention control, would decrease the power needs of an SO_2 scrubber and waste products of the SO_2 controls due to lower concentrations of SO_2 to remove. Stamper explained that based on publicly available information, the costs of such controls are admittedly difficult to calculate, because boilers are typically designed for a certain type of coal and it is often unclear the impacts that coal blending will have on a unit without access to unit-specific information or testing various coals. However, if feasible for a unit, coal blending provides a viable option to not only lower the operational costs of SO_2 controls (due to less SO_2 to be removed) but also decrease the unit's energy needs and waste generated.

Similarly, Stamper explained that lignite drying is a viable option to decrease the power and non-air quality impacts of SO_2 scrubber upgrades and scrubber retrofits. The Coal Creek power plant which burns North Dakota lignite has been using low grade heat rejected from the steam condenser and waste heat from the flue gas to evaporate some of the moisture in the lignite coal in a fluidized bed dryer. Lignite coal is very high in moisture content.[17] The reduction in moisture content of the Coal Creek coal improves the heating value of the coal, which means fewer tons of coal need to be burned to achieve the same amount of heat input.[18] Further, the decrease in lignite moisture content results in a higher boiler efficiency and lower flue gas volume, which results in increased SO_2 removal efficiency.[19] Moreover, the lignite drying system reduced SO_2, NOx, carbon dioxide, and mercury emissions, reduced station power consumption by 18%, and reduced water use by 2.5%.[20] Thus, Stamper and Earthjustice et al., concluded the use of a lignite drying system in combination with a scrubber could reduce overall energy needs and scrubber waste generated, as well as reduce the operational costs and possibly even the capital costs of a scrubber.

Stamper and Earthjustice et al., stated that another control measure that EPA should have evaluated to decrease energy and non-air quality impacts is a circulating dry scrubber. EPA limited its evaluation of dry scrubbers to spray dryer absorbers (SDAs), which do use less water than wet scrubbers but also typically do not achieve as high of SO_2 removal rates as wet scrubbers. EPA did not give any consideration to circulating dry scrubbers, which can achieve higher SO_2 removal efficiencies (as high as 98%), with lower water use and waste. Specifically, Stamper stated that a type of circulating dry scrubber called Novel Integrated Desulfurization technology (NID™), because a baghouse is an integral part of these scrubbers, can achieve very high SO_2 removal efficiencies, as well as high PM removal, at similar costs to dry scrubbers. According to Alstom, some of the benefits of a NID™ system are: low capital investment and maintenance costs, low power consumption, high SO_2 removal and high removal efficiencies of SO3 and hazardous air pollutants.[21] Further, a NID™ system typically has lower water consumption and lower reagent use, and thus is best for future National Pollution Discharge Elimination System (NPDES) permit compliance.[22]

Stamper stated that the EPA should have considered these control methods as viable options to reduce auxiliary power needs and/or reduce non-air quality impacts of SO_2 controls. However, irrespective of these additional considerations, Earthjustice et al., and Stamper stated that the EPA appropriately addressed the costs of energy usage and of waste disposal in its cost evaluation of scrubber upgrades. Further, as stated by EPA, the SO_2 scrubber technologies evaluated by EPA are widely used by coal-fired EGUs, and these SO_2 controls do not pose any unusual energy and non-air quality impacts. FIP TSD at 8.

Footnotes:
[17] *See*, e.g., EPA AP-42, Chapter 1.7 Lignite Combustion.
[18] *See* December 12, 2007, Coal Creek Station Units 1 and 2, Best Available Retrofit Technology Analysis, at iv, 31 (Ex. 50).
[19] *Id. at* iv.
[20] *Id. at* 31.
[21] *See* Alstom Brochure, NID™ Flue Gas Desulfurization System for the Power Industry at 3-4 (Ex. 28).
[22] *See* February 8, 2012 Direct Testimony of Christian T. Beam on behalf of Southwestern Electric Power Company, In the Matter of Southwestern Electric Power Company's Petition for a Declaratory Order Finding that Installation of Environmental Controls at the Flint Creek Power Plant is in the Public Interest, Before the Arkansas Public Utilities Commission, Docket 12-008-U, at 19-21. (Ex. 29).

Response: *First*, this comment asserts that we should have evaluated blending with lower sulfur coals for EGUs that burn high sulfur coal. However, we cannot dictate to facilities which coal they should burn as a control measure.

Second, we disagree with Earthjustice that consideration of coal drying falls within the purview of "the energy and non-air quality environmental impacts of compliance," under Section 51.308(d)(1)(i), which is within the reasonable progress portion of the Regional Haze Rule that governs the subject cost analysis. Our Reasonable Progress Guidance considers this factor from the standpoint of whether it would cause the reconsideration of the control in question due to energy or non-air quality penalties.[206] In other words, the energy and non-air quality environmental impacts of compliance serves as a potential modifier to the particular control being considered. Thus, in this context, coal drying is not in and of itself something that should be considered from an energy and non-air quality standpoint. Rather it is an option for improving the power plant's efficiency, which also offers modest improvements in the control of a number of pollutants, including SO_2. We agree that in some circumstances coal drying can be a viable technology for improving boiler efficiency, and in the process, reduce emissions because

[206] Guidance for Setting Reasonable Progress Goals Under the Regional Haze Program, page 5-2.

less coal is burned to achieve the same heat input to the boiler. However, we are not required to consider every available technology under the reasonable progress and long-term strategy provisions of the Regional Haze Rule, which applies to the analysis in question. We considered both wet and dry scrubbing, and the next most promising SO_2 removal control, DSI. We rejected DSI as not being cost effective in comparison to both types of scrubbers. Were we to have considered coal drying, it would have ranked below DSI in its ability to remove SO_2. We agree with Earthjustice that we appropriately addressed the costs of energy usage and of waste disposal in our evaluation of scrubber technologies. We discuss Earthjustice's assertion that we should have considered circulating dry scrubbers in our response to another comment.

Comment: Commenter 0054-45 noted that scrubbers take toxins out of power plant smokestacks, but scrubber waste is dumped in the water or accumulate in huge piles such that toxic scrubber waste will sooner or later be dispersed to poison air, water, and soil. The commenter noted that the SWEPCO AEP Turk plant near Texarkana dumps its scrubber waste into the Little River, which goes down to the Red and the Mississippi and the Gulf of Mexico to poison oceans.

Response: We agree with the commenter that the burning of coal and the disposal of its waste products, including waste products from the use of some types of scrubbers, can pose a variety of environmental issues or hazards. Because our proposal seeks to address only one aftereffect of coal combustion—regional haze—we are limited here in addressing only those comments that relate to regional haze. We note that our cost evaluation for scrubbers does include the consideration of costs for proper disposal or reuse of scrubber waste.

Comment: EPA's Cost Effectiveness Analyses for SO_2 **Scrubber/DSI Retrofits: Big Brown Units 1 and 2, Monticello Units 1 and 2, Coleto Creek Unit 1, Welsh Units 1, 2, and 3, and Parish Units 5, 6, and 7. [Stamper (0068) p. 21]**

Stamper stated that the Big Brown power plant was shown to significantly contribute to visibility impairment at several Class I areas, with its largest impacts being modeled at the Wichita Mountains (contributing 1.590%). FIP TSD at A-51. The Big Brown power plant was also shown to significantly contribute to visibility impairment at Caney Creek (contributing 0.626%), Guadalupe Mountains (contributing 0.502%), Hercules Glades (contributing 0.363%), Big Bend (contributing 0.435%), and its contribution to impairment at Salt Creek was very close to EPA's 0.3% threshold.[81] Big Brown was the second highest contributor to visibility impairment at Wichita Mountains based on the modeling results presented by EPA.[82] EPA adjusted the modeled impacts at Wichita Mountains, Guadalupe Mountains, and Big Bend to reflect 2008-2012 average emissions, which increased the Big Brown facility's contribution to visibility impairment at these Class I areas to 2.060%, 0.651%, and 0.564%, respectively.[83] FIP TSD at A-51. According to the data in EPA's Clean Air Markets Database, the Big Brown Units 1 and 2 were the largest emitters of SO_2 of all of the EGUs in Texas based on 2013 emissions data.[84] Despite this, neither Big Brown Unit 1 nor Unit 2 have SO_2 controls. Thus, EPA has ample justification for evaluation of the Big Brown plant for pollution controls.

Stamper stated that the EPA presents the results of its SO_2 control cost effectiveness evaluation for Big Brown Units 1 and 2 in its FIP TSD at 14 (Table 4). For the reasons discussed in Section I.A.1.d) (1) above, we have revised EPA's analyses to be based on a 5-year annual average emissions baseline, 5-year annual average SO_2 rate in lb/MMBtu, and 5-year average gross heat rate and MW-hrs generated, based on actual operating data from 2009 to 2013.

With respect to DSI, Stamper stated that it was not appropriate to evaluate DSI at 80%/90% control for any EGU without adequate support for such a high SO_2 removal efficiency and without accounting for an increase in particulate matter emissions. Further, for Big Brown Units 1 and 2, EPA stated in its Cost TSD that it determined that DSI was not technically feasible for the Big Brown units. Cost TSD at 8. This was based on Luminant's study of DSI at its units in 2011, which found that a very high feed rate was required to achieve "modest SO_2 removal" and that sorbent buildup harmed the performance of the control equipment (presumably this was referring to the baghouses). Cost TSD at 8.

Although EPA found that DSI was not a feasible alternative for the Luminant facilities including Big Brown, Stamper noted that the EPA nonetheless evaluated the cost effectiveness of DSI at Big Brown (as well as Monticello) at both 50% and 90% SO_2 removal. It appears questionable that even 50% removal is achievable without adverse impacts at Big Brown Units 1 and 2, based on Luminant's testing as discussed in the Cost TSD. However, for the purpose of completeness, we also revised EPA's DSI cost effectiveness analyses for DSI in the same manner discussed above (i.e., based on 5-year average baseline, SO_2 rate, gross heat rate and MW-hours generated per year), but we only evaluated a 50% removal efficiency.

Last, Stamper presented a fourth control option for the Big Brown units of a NID™ circulating dry scrubber, based on the SDA IPM cost module but assuming an SO_2 control efficiency of 98% or an SO_2 limit of 0.04 lb/MMBtu, whichever is more stringent. The SDA IPM cost module likely overstates the costs of a NID™ circulating dry scrubber by 1-2%.

Table 4. Revised SO2 Control Cost Effectiveness Evaluation for Big Brown Units 1 and 2[85]

Big Brown Unit	SO2 Control	Total Annualized Costs	Tons SO2 Removed	Cost Effectiveness	EPA's Original Cost Effectiveness[86]
1	Wet FGD	$32,825,829	29,759 tpy	$1,103/ton	$1,255/ton
1	NID™ CDS	$33,625,322	29,759 tpy	$1,130/ton	---------------
1	SDA	$33,425,314	29,076 tpy	$1,150/ton	$1,377/ton
1	DSI at 50%	$24,307,811	15,303 tpy	$1,588/ton	$2,223/ton
2	Wet FGD	$32,927,313	29,793 tpy	$1,105/ton	$1,257/ton
2	NID™ CDS	$33,719,186	29,793 tpy	$1,132/ton	---------------
2	SDA	$33,518,146	29,076 tpy	$1,152/ton	$1,373/ton
2	DSI at 50%	$22,467,459	15,319 tpy	$1,581/ton	$2,201/ton

[85] *See* spreadsheets with filenames "Wet_FGD_Cost_IPM_TX_Sources_Revised_VS_Mar 27_2015.xlsx," "NID CDS_Cost_IPM_TX_Sources_VS_Mar 27_2015.xlsx," "SDA_Cost_IPM_TX_Sources_Revised_VS_Mar 27_2015.xlsx," and "DSI_Cost_IPM_TX_Sources_Revised_VS_Mar 27_2015.xlsx," at Exhibits 34, 35, 36, and 37 to this report.
[86] *See* FIP TSD at 14.

Stamper stated that all of these costs are reasonable, with the top two technologies in terms of SO_2 emission reductions – i.e., wet FGD and NID™ circulating dry scrubber – being the most cost effective. As the above table shows, using the 5-year average baseline, SO_2 rates, and projections for heat rate and MW-hours generated provides an average cost effectiveness that is lower than projected by EPA.

Stamper stated that Monticello Units 1 and 2 had some of the most significant contributions to visibility impairment at Class I areas in Oklahoma and Texas of all of the power plants analyzed by EPA. Specifically, the modeling of Monticello Station showed that it contributes 1.734% to visibility impairment at the Wichita Mountains Class I area, greater than any of the other 37 sources modeled. FIP TSD at A-51. EPA adjusted the modeled impacts at Wichita Mountains to reflect 2008-2012 average emissions, which increased the Monticello facility's contribution to visibility impairment 1.834%. FIP TSD at A-51. On a cumulative basis, the Monticello Station also contributed a greater percentage to visibility impairment at the 18 Class I areas in total compared to the other sources modeled by EPA.[87] In addition to Wichita Mountains, the Monticello Station was shown to contribute 1.759% to visibility impairment at Caney Creek, 0.827% at Hercules Glades, 0.450% at Upper Buffalo, 0.261% at Salt Creek, 0.244% at Guadalupe Mountains, and other Class I areas.[88] The Monticello Units have no SO_2 controls. Thus, EPA had ample justification for evaluating SO_2 controls for the Monticello units.

Stamper stated that the EPA presents the results of its SO_2 control cost effectiveness evaluation for Monticello Units 1 and 2 in its FIP TSD at 16 (Table 6). For the reasons discussed above, we have revised EPA's analyses to be based on a 5-year annual average emissions baseline, 5-year annual average SO_2 rate in lb/MMBtu, and 5-year average gross heat rate and MW-hrs generated, based on actual operating data from 2009 to 2013.

Stamper stated that the EPA found that DSI was not feasible for Monticello Units 1 and 2 based on testing done by Luminant. Cost TSD at 8. Although EPA found that DSI was not a feasible alternative for the Luminant facilities including Monticello, EPA nonetheless evaluated the cost effectiveness of DSI at Big Brown (as well as Monticello) at both 50% and 90% SO_2 removal. It appears questionable that even 50% removal is achievable without adverse impacts at Monticello Units 1 and 2, based on Luminant's testing as discussed in the Cost TSD. However, for the purpose of completeness, we also revised EPA's DSI cost effectiveness analyses for DSI in the same manner discussed above (i.e., based on 5-year average baseline, SO_2 rate, gross heat rate and MW-hours generated per year), and we only evaluated a 50% removal efficiency.

Last, Stamper presented a fourth control option of a NID™ circulating dry scrubber, based on the SDA IPM cost module but assuming an SO_2 control efficiency of 98% or an SO_2 limit of 0.04 lb/MMBtu, whichever is more stringent. The SDA IPM cost module likely overstates the costs of a NID™ circulating dry scrubber by 1-2%.

Table 5. Revised SO2 Control Cost Effectiveness Evaluation for Monticello Units 1 and 2[89]

Monticello Unit	SO2 Control	Total Annualized Costs	Tons SO2 Removed	Cost Effectiveness	EPA's Original Cost Effectiveness[90]
1	Wet FGD	$28,367,531	15,763 tpy	$1,800/ton	$1,937/ton
1	NID™ CDS	$27,779,811	15,763 tpy	$1,762/ton	---------------
1	SDA	$27,683,047	15,426 tpy	$1,795/ton	$2,012/ton
1	DSI at 50%	$15,171,434	8,217 tpy	$1,846/ton	$2,728/ton
2	Wet FGD	$28,003,743	14,810 tpy	$1,891/ton	$2,170/ton
2	NID™ CDS	$27,349,616	14,810 tpy	$1,847/ton	---------------
2	SDA	$27,255,372	14,486 tpy	$1,882/ton	$2,254/ton
2	DSI at 50%	$14,530,730	7,729 tpy	$1,880/ton	$3,086/ton

According to Stamper, all of these costs are reasonable, with the top two technologies in terms of SO_2 emission reductions – i.e., wet FGD and NID™ circulating dry scrubber – being the most cost effective. As the above table shows, using the 5-year average baseline, SO_2 rates, and projections for heat rate and MW-hours generated provides an average cost effectiveness that is lower than projected by EPA. With respect to DSI, the use of the 5-year average MW-hrs generated and SO_2 emission rate resulted in much lower operating costs, which are the bulk of the costs associated with DSI, in comparison to EPA's analysis which was based on the maximum year of generation and the maximum monthly uncontrolled SO_2 rate.

Stamper stated, as EPA documented in its FIP TSD, that the Coleto Creek plant was shown to contribute significantly to visibility impairment at Wichita Mountains (contributing 0.481%) and at Big Bend National Park (contributing 0.444%). FIP TSD at A-51. EPA adjusted those modeled impacts to reflect 2008-2012 average emissions, which increased Coleto Creek's contributions to 0.513% at Wichita Mountains and 0.473% at Big Bend Class I area. FIP TSD at A-51. In 2013 and 2014, the Coleto Creek Unit 1 had the 8th highest SO_2 emissions of all of the 41 coal-fired EGUs that reported emissions to EPA's Clean Air Markets Database in 2013.[91] Coleto Creek Unit 1 has no SO_2 controls, and thus EPA evaluated SO_2 retrofit controls to reduce this facility's impacts on visibility impairment.

Stamper stated that the EPA presents the results of its SO_2 control cost effectiveness evaluation for Coleto Creek Unit 1 in its FIP TSD at 18 (Table 8). For the reasons discussed above, we have revised EPA's analyses to be based on a 5-year annual average emissions baseline, 5-year annual average SO_2 rate in lb/MMBtu, and 5-year average gross heat rate and MW-hrs generated, based on actual operating data from 2009 to 2013. We only evaluated DSI at 50% SO_2 removal efficiency because, as stated above, additional site-specific test data should be submitted before EPA considers DSI to be able to achieve 90% control, especially without significantly increasing particulate matter. Last, we present a 4th control option of a NID™ circulating dry scrubber, based on the SDA IPM cost module but assuming an SO_2 control efficiency of 98% or an SO_2 limit of 0.04 lb/MMBtu, whichever is more stringent. As discussed in Section I.A.1.d) (6) above, the SDA IPM cost module likely overstates the costs of a NID™ circulating dry scrubber by 1-2%.

Table 6. Revised SO2 Control Cost Effectiveness Evaluation for Coleto Creek Unit 1[92]

Coleto Creek Unit	SO2 Control	Total Annualized Costs	Tons SO2 Removed	Cost Effectiveness	EPA's Original Cost Effectiveness[93]
1	Wet FGD	\$30,791,903	15,726 tpy	\$1,958/ton	\$2,278/ton
1	NID™ CDS	\$30,464,329	15,726 tpy	\$1,937/ton	---------------
1	SDA	\$30,331,340	15,257 tpy	\$1,988/ton	\$2,356/ton
1	DSI at 50%	\$16,083,740	8,333 tpy	\$1,930/ton	\$2,792/ton

Stamper stated, as the above table shows, using the 5-year average baseline, SO_2 rates, and projections for heat rate and MW-hours generated provides an average cost effectiveness that is lower than projected by EPA. With respect to DSI, the use of the 5-year average MW-hrs generated and SO_2 emission rate resulted in much lower operating costs, which are the bulk of the costs associated with DSI, in comparison to EPA's analysis which was based on the maximum year of generation and the maximum monthly uncontrolled SO_2 rate. As will be discussed further below, all of these costs are reasonable, with the top two technologies in terms of SO_2 emission reductions – i.e., wet FGD and NID™ circulating dry scrubber – providing the greatest emission reductions.

Stamper noted that the EPA's modeling showed that the Welsh Power Plant contributed significantly to visibility impairment at Caney Creek and at Wichita Mountains, with contributions of 0.595% and 0.475%, respectively.[110] The Welsh Power Plant also was shown to contribute 0.226% to Hercules Glades Class I area.[111] EPA adjusted the contribution at Wichita Mountains up to 0.862% based on 2008-2012 average emissions. FIP TSD at A-51. Had EPA adjusted the Caney Creek and Hercules Glades impacts based on 2008-2012 average emissions, those impacts would have increased significantly as well. The Welsh Power Plant emitted almost 20,000 tons of SO_2 in 2013 based on information submitted to EPA's Clean Air Markets Database.[112] None of the Welsh units have SO_2 pollution controls. Thus, EPA evaluated SO_2 retrofit controls to reduce the Welsh Power Plant's contribution to visibility impairment.

Stamper stated that the EPA presents the results of its SO_2 control cost effectiveness evaluation for Welsh Units 1, 2 and 3 in its FIP TSD at 23 (Table 12). For the reasons discussed above, we have revised EPA's analyses to be based on a 5-year annual average emissions baseline, 5-year annual average SO_2 rate in lb/MMBtu, and 5-year average gross heat rate and MW-hrs generated, based on actual operating data from 2009 to 2013. We only evaluated DSI at 50% SO_2 removal efficiency because, as stated above, additional site-specific test data should be submitted before EPA considers DSI to be able to achieve 90% control, especially without significantly increasing particulate matter. Last, we present a fourth control option of a NID™ circulating dry scrubber, based on the SDA IPM cost module but assuming an SO_2 control efficiency of 98% or an SO_2 limit of 0.04 lb/MMBtu, whichever is more stringent. As discussed in Section I.A.1.d) (6) above, the SDA IPM cost module likely overstates the costs of a NID™ circulating dry scrubber by 1-2%.

Table 9. Revised SO2 Control Cost Effectiveness Evaluation for Welsh Units 1, 2 and 3[113]

Welsh Unit	SO2 Control	Total Annualized Costs	Tons SO2 Removed	Cost Effectiveness	EPA's Original Cost Effectiveness[114]
1	Wet FGD	$25,059,457	7,245 tpy	$3,459/ton	$3,508/ton
1	NID™ CDS	$23,816,110	7,245 tpy	$3,287/ton	-----------------
1	SDA	$23,716,772	6,890 tpy	$3,442/ton	$3,489/ton
1	DSI at 50%	$12,710,339	3,978 tpy	$3,195/ton	$3,718/ton
2	Wet FGD	$25,236,325	7,355 tpy	$3,431/ton	$3,454/ton
2	NID™ CDS	$23,996,058	7,355 tpy	$3,262/ton	-----------------
2	SDA	$23,895,470	6,995 tpy	$3,416/ton	$3,438/ton
2	DSI at 50%	$12,863,266	4,038 tpy	$3,186/ton	$3,611/ton
3	Wet FGD	$25,550,640	7,744 tpy	$3,299/ton	$3,379/ton
3	NID™ CDS	$24,331,623	7,744 tpy	$3,142/ton	------------------
3	SDA	$24,227,221	7,371 tpy	$3,287/ton	$3,368/ton
3	DSI at 50%	$13,391,943	4,245 tpy	$3,155/ton	$3,690/ton

Stamper concluded based on the above table that using the 5-year average baseline, SO_2 rates, and projections for heat rate and MW-hours generated provides an average cost effectiveness that is lower than projected by EPA. With respect to DSI, the use of the 5-year average MW-hrs generated and SO_2 emission rate resulted in much lower operating costs, which are the bulk of the costs associated with DSI, in comparison to EPA's analysis which was based on the maximum year of generation and the maximum monthly uncontrolled SO_2 rate. All of these costs are reasonable.

Stamper noted that the modeling of the W.A. Parish Station showed that it contributed 0.291% to visibility impairment at Wichita Mountains, 0.181% to Caney Creek, 0.125% to Big Bend, and 0.089% to Guadalupe Mountains.[115] EPA adjusted the modeled impacts up significantly to 0.881% at Wichita Mountains, 0.559% at Big Bend, and 0.268% at Guadalupe Mountains. FIP TSD at A-51. Had EPA adjusted the modeled impacts at Caney Creek based on 2008-2012 average emissions, the W.A. Parish Station's impacts at Caney Creek would likely have exceeded EPA's 0.3% threshold. On a plantwide basis, the W.A. Parish Station had the third highest emissions of SO_2 in 2013 of the 20 coal-fired power plants in Texas that report to EPA's Clean Air Markets Database.[116] W.A. Parish Units 5, 6, and 7 do not have any SO_2 controls. EPA thus has ample justification for the evaluation of SO_2 controls to reduce W.A. Parish Station's impacts on visibility.

Stamper stated that the EPA presents the results of its SO_2 control cost effectiveness evaluation for W.A. Parish Units WAP5, WAP6, and WAP7 in its FIP TSD at 25 (Table 13). For the reasons discussed above, we have revised EPA's analyses to be based on a 5-year annual average emissions baseline, 5-year annual average SO_2 rate in lb/MMBtu, and 5-year average gross heat rate and MW-hrs generated, based on actual operating data from 2009 to 2013. We only evaluated DSI at 50% SO_2 removal efficiency because, as stated above, additional site-specific test data should be submitted before EPA considers DSI to be able to achieve 90% control, especially without significantly increasing particulate matter. Last, we present a fourth control option of a NID™ circulating dry scrubber, based on the SDA IPM cost module but assuming an SO_2 control efficiency of 98% or an SO_2 limit of 0.04 lb/MMBtu, whichever is more stringent. As discussed in Section I.A.1.d) (6) above, the SDA IPM cost module likely overstates the costs of a NID™ circulating dry scrubber by 1-2%.

Table 10. Revised SO2 Control Cost Effectiveness Evaluation for W.A. Parish Units WAP5, WAP6, and WAP7[117]

W.A. Parish Unit	SO2 Control	Total Annualized Costs	Tons SO2 Removed	Cost Effectiveness	EPA's Original Cost Effectiveness[118]
WAP5	Wet FGD	$30,137,671	13,414 tpy	$2,247/ton	$2,389/ton
WAP5	NID™ CDS	$29,695,816	13,414 tpy	$2,214/ton	-----------------
WAP5	SDA	$29,571,390	12,973 tpy	$2,279/ton	$2,441/ton
WAP5	DSI at 50%	$14,973,555	7,148 tpy	$2,095/ton	$2,559/ton
WAP6	Wet FGD	$30,888,503	14,461 tpy	$2,136/ton	$2,334/ton
WAP6	NID™ CDS	$30,509,329	14,461 tpy	$2,110/ton	-----------------
WAP6	SDA	$30,380,079	14,004 tpy	$2,169/ton	$2,401/ton
WAP6	DSI at 50%	$15,770,760	7,688 tpy	$2,051/ton	$2,699/ton
WAP7	Wet FGD	$26,588,066	11,407 tpy	$2,331/ton	$2,542/ton
WAP7	NID™ CDS	$25,666,913	11,407 tpy	$2,250/ton	------------------
WAP7	SDA	$25,565,365	11,051 tpy	$2,313/ton	$2,559/ton
WAP7	DSI at 50%	$12,700,875	6,060 tpy	$2,096/ton	$2,805/ton

Stamper concluded based on the above table that using the 5-year average baseline, SO_2 rates, and projections for heat rate and MW-hours generated provides an average cost effectiveness that is lower than projected by EPA. With respect to DSI, the use of the 5-year average MW-hrs generated and SO_2 emission rate resulted in much lower operating costs, which are the bulk of the costs associated with DSI, in comparison to EPA's analysis which was based on the maximum year of generation and the maximum monthly uncontrolled SO_2 rate. All of these costs are reasonable.

Footnotes:

[115] *See* TX116-07-_29_Source_selection_analysis_TX_RH-1-31-14.xlsx at "All Class I areas data" tab.

[116] *See* spreadsheet with TX EGUs 2013 CAMD Data Ranked for SO_2, Ex. 69.

[117] *See* spreadsheets with filenames "Wet_FGD_Cost_IPM_TX_Sources_Revised_VS_Mar 27_2015.xlsx," "NID CDS_Cost_IPM_TX_Sources_VS_Mar 27_2015.xlsx," "SDA_Cost_IPM_TX_Sources_Revised_VS_Mar 27_2015.xlsx," and "DSI_Cost_IPM_TX_Sources_Revised_VS_Mar 27_2015.xlsx," at Exhibits 34, 35, 36, and 37 to this report.

[118] *See* FIP TSD at 26.

Footnotes:
[110] *See* TX116-07-_29_Source_selection_analysis_TX_RH-1-31-14.xlsx at "All Class I areas data" tab.
[111] Id.
[112] *See* spreadsheet with TX EGUs 2013 CAMD Data Ranked for SO_2, Ex. 69.
[113] *See* spreadsheets with filenames "Wet_FGD_Cost_IPM_TX_Sources_Revised_VS_Mar 27_2015.xlsx," "NID CDS_Cost_IPM_TX_Sources_VS_Mar 27_2015.xlsx," "SDA_Cost_IPM_TX_Sources_Revised_VS_Mar 27_2015.xlsx," and "DSI_Cost_IPM_TX_Sources_Revised_VS_Mar 27_2015.xlsx," at Exhibits 34, 35, 36, and 37 to this report.
[114] *See* FIP TSD at 20.

Footnotes:
[91] *See* spreadsheet with TX EGUs 2013 CAMD Data Ranked for SO_2, Ex. 69.
[92] *See* spreadsheets with filenames "Wet_FGD_Cost_IPM_TX_Sources_Revised_VS_Mar 27_2015.xlsx," "NID CDS_Cost_IPM_TX_Sources_VS_Mar 27_2015.xlsx," "SDA_Cost_IPM_TX_Sources_Revised_VS_Mar 27_2015.xlsx," and "DSI_Cost_IPM_TX_Sources_Revised_VS_Mar 27_2015.xlsx," at Exhibits 34, 35, 36, and 37 to this report.
[93] *See* FIP TSD at 14.

Footnotes:
[87] *See* TX116-07-_29_Source_selection_analysis_TX_RH-1-31-14.xlsx at "All Class I areas data" tab.
[88] Note that it appears that EPA did not adjust the visibility impacts results for these other Class I areas based on 2008 to 2012 emissions.
[89] *See* spreadsheets with filenames "Wet_FGD_Cost_IPM_TX_Sources_Revised_VS_Mar 27_2015.xlsx," "NID CDS_Cost_IPM_TX_Sources_VS_Mar 27_2015.xlsx," "SDA_Cost_IPM_TX_Sources_Revised_VS_Mar 27_2015.xlsx," and "DSI_Cost_IPM_TX_Sources_Revised_VS_Mar 27_2015.xlsx," at Exhibits 34, 35, 36, and 37 to this report.

Footnotes:
[81] *See* TX116-07-_29_Source_selection_analysis_TX_RH-1-31-14.xlsx at "All Class I areas data" tab. Note that EPA's Cost TSD cites to this spreadsheet as well as TX116-07-30_Source_selection_analysis_TX_RH-es-1-31-14 in its FIP TSD for its data on percent of extinction on the worst 20% days contributed by a source and unit (in Tables A.4-3 and A.4-4). We do not find any significant differences between these two spreadsheets.
[82] Id.
[83] Note that it appears that EPA did not adjust the visibility impacts results for any other Class I area.
[84] *See* spreadsheet with TX EGUs 2013 CAMD Data Ranked for SO_2, Ex. 69.

Response: This comment supports our decision to regulate SO_2 emissions from the Big Brown, Monticello, Coleto Creek units and presents revised analyses that suggest the control of SO_2 from these units is even more cost effective than our analyses indicate.

These revised analyses involve the use of a different baseline, the reanalysis of our DSI cost effectiveness, and the appropriateness of NID. See our response to other comments regarding these issues. With regard to the Big Brown units, we agree that DSI is not feasible at these units, based on Luminant's test data.

The selection of a NID, rather than WFGD would not change our proposed SO_2 limit of 0.04 lb/MMBtu. The non-air quality environmental impacts of a NID and WFGD are similar and do not warrant eliminating either technology. We proposed that the units in question meet certain SO_2 emission limits, but we did not mandate a specific control technology in doing so.

Consequently, any unit, including the ones discussed herein, may elect to use a NID to achieve our proposed SO_2 emissions with no adverse non-air quality impacts.

Comment: EPA's Cost Effectiveness Analyses for SO_2 **Scrubber/DSI Retrofits: Tolk Units 171B and 172B** [Stamper (0068) p. 25]

Stamper stated that the EPA's modeling showed that the Tolk Station contributed significantly to visibility impairment at Salt Creek Class I area, with a contribution of 1.012%.[94] The Tolk Station also was shown to contribute to visibility impairment in excess of EPA's 0.3% contribution threshold at White Mountains (contributing 0.657%), Guadalupe Mountains (contributing 0.646%)[95], and Bandelier National Monument (contributing 0.368%). On a cumulative basis, the Tolk Station had the 4th high impacts in total (combined contributions to visibility impairment at all 18 Class I areas modeled) among all of the 37 sources modeled by EPA.[96] Neither of the Tolk units have SO_2 controls and thus EPA properly evaluated SO_2 retrofit controls to reduce the Tolk Station's contribution to visibility impairment.

Stamper stated that the EPA presents the results of its SO_2 control cost effectiveness evaluation for Tolk Units 171B and 172B in its FIP TSD at 20 (Table 10). EPA states in its FIP TSD that it limited its control evaluation for Tolk to SDA and DSI. It was assumed by EPA that well water is used at the Tolk plant rather than surface water, and EPA apparently assumed use of well water would have adverse energy and non-air quality impacts for use of a wet FGD which uses more water than an SDA. FIP TSD at 8. A review of data submitted to the Energy Information Administration shows that the source of water at the Tolk power plant is indeed well water.

Stamper stated that while many EGUs that rely solely on well water use dry scrubbing to remove SO_2 rather than wet scrubbing, there are some EGUs that rely on well water and use wet FGDs for SO_2 control. For example, the Coronado power plant in Arizona relies on well water for its water supply[97], and it recently installed wet scrubbers at both of its units pursuant to a Consent Decree with EPA.[98]

Stamper stated that there are many EGUs in arid areas that rely on scrubbers for SO_2 control. In fact, there are 38 EGUs (including the Coronado Plant) located in areas that receive lower annual precipitation than Lamb County where the Tolk Station is located, and yet these facilities all utilize wet scrubbers for SO_2 control.[99] The location of the Tolk Plant, in Lamb County, Texas, gets approximately 18.9 inches of precipitation per year, which is 46% greater than the mean amount of precipitation in the locations of the 38 non-Xcel boilers with wet FGD systems of 12.9 inches per year.[100] Indeed, the county that the Tolk plant is located in receives greater precipitation on an annual average basis than all but 2 of the 38 EGUs with wet scrubbers in arid areas.[101] Thus, the record for EPA's FIP must include more documentation to justify the outright elimination of wet FGD as an SO_2 control option for the Tolk units.

Stamper contended that if water availability and costs are justified as a concern for the Tolk units, then a circulating dry scrubber, which can achieve 98% SO_2 removal efficiencies similar to a wet FGD system, may be the best choice for SO_2 control at these units, since circulating dry scrubbers use 60% less water than wet FGD systems. Stamper noted that SWEPCO selected a

NID™ system for SO_2 control due to the lowest water consumption, in addition to lowest capital and operation and maintenance costs on a 30-year cumulative present worth basis, lowest auxiliary power usage, lowest reagent usage, smallest footprint, among other benefits.[102]

Below Stamper provided a cost effectiveness analysis for a NID™ circulating dry scrubber, as well as revised cost effectiveness analyses for wet FGD, SDA, and DSI at 50% control. For the reasons discussed above, we have revised EPA's analyses to be based on a 5-year annual average emissions baseline, 5-year annual average SO_2 rate in lb/MMBtu, and 5-year average gross heat rate and MW-hrs generated, based on actual operating data from 2009 to 2013. And we have used the same assumptions for the circulating dry scrubber analysis. As discussed in Section I.A.1.d) (6) above, the SDA IPM cost module likely overstates the costs of a NID™ circulating dry scrubber by 1-2%. We only evaluated DSI at 50% SO_2 removal efficiency because, as stated above, additional site-specific test data should be submitted before EPA considers DSI to be able to achieve 90% control, especially without significantly increasing particulate matter.

Table 7 Revised SO2 Control Cost Effectiveness Evaluation for Tolk Units 171B and 172B[103]

Tolk Unit	SO2 Control	Total Annualized Costs	Tons SO2 Removed	Cost Effectiveness	EPA's Original Cost Effectiveness[104]
171B	Wet FGD	$27,242,107	9,492 tpy	$2,870/ton	$3,204/ton
171B	NID™ CDS	$25,826,757	9,492 tpy	$2,721/ton	---------------
171B	SDA	$25,723,648	9,125 tpy	$2,819/ton	$3,178/ton
171B	DSI at 50%	$11,355,033	5,112 tpy	$2,221/ton	$3,084/ton
172B	Wet FGD	$28,601,938	10,092 tpy	$2,834/ton	$3,019/ton
172B	NID™ CDS	$27,189,344	10,092 tpy	$2,694/ton	---------------
172B	SDA	$27,076,936	9,694 tpy	$2,793/ton	$2,998/ton
172B	DSI at 50%	$12,166,882	5,445 tpy	$2,235/ton	$2,828/ton

Stamper noted, as the above table demonstrates, use of annual average baseline emissions, SO_2 emission rates, and MW-hours in the cost effectiveness analyses significantly reduces the cost effectiveness values compared to EPA's analysis. Moreover, the use of a NID™ circulating dry scrubber would result in the greatest SO_2 emission reductions for the most reasonable costs, and this is likely the best choice for the Tolk units due to the lower water usage expected with a circulating dry scrubber. All of these costs are reasonable, as will be discussed further below.

Stamper noted that the EPA considered the costs to purchase water rights for operation of scrubbers in its SO_2 BART cost evaluation for the Gerald Gentleman Station, and EPA found that when such costs were added in, installation of scrubbers (either wet or dry) was still cost effective. 77 Fed. Reg. 40,150, 40,162 (July 6, 2012). With respect to water availability for the Tolk units, it should be noted that in 2004 Xcel Energy began using blowdown water from its Plant X generation station to use in Tolk's cooling towers, which reduced the combined plants water consumption by 180 million gallons per year.[105] That water savings would equate to most of the water needs for operation of a scrubber at one of the Tolk units.[106] It is not clear if Xcel maintains those pre-existing water rights or has lost them. EPA should investigate Xcel's existing water rights further before taking into account the cost to purchase additional water rights for the operation of scrubbers at Tolk Station.

In an attempt to address concerns that may be raised regarding the need to purchase land for the additional water needs of scrubbers at the Tolk Station, Stamper analyzed the costs to purchase land for water rights for all of the makeup water needed for operation of wet FGD, SDA, and a NID™ CDS at Tolk Units 171B and 172B, and recalculated cost effective numbers from Table 7 above. We used the same assumptions that EPA used for this analysis for the Gerald Gentleman plant. Specifically, we assumed 0.176227 acre-feet of water is available per acre of land, and we used EPA's high end land cost estimate of $10,000 per acre. 77 Fed. Reg. at 40,162. Table 8 of comment 0068 contains Stamper's updated cost effectiveness analysis with the costs to purchase land for water rights for wet FGD, SDA, and a NID™ CDS at Tolk Units 171B and 172B.

Consideration of Costs to Obtain Water Rights to Operate SO_2 Scrubbers at Tolk Units 171B and 172B[107] (provided by Stamper, Table 8 to comment 0068)

	Tolk Unit 171B			Tolk Unit 172B		
	Wet FGD	**SDA**	**NID™ CDS**	**Wet FGD**	**SDA**	**NID™ CDS**
Acre-feet of water for scrubber per year108	887	653	653	966	713	713
Acres of land required	5,013	3,707	3,707	5,483	4,047	4,047
Total costs for land (@$10,000 per acre)	$50,314,371	$37,073,747	$37,073,747	$54,826,239	$40,466,986	$40,466,986
Annualized costs of obtaining land for water rights109 ($/year)	$4,055,338	$2,988,144	$2,988,144	$4,418,995	$3,261,639	$3,261,639
Annualized cost of SO_2 control ($/year)	$27,242,107	$25,723,648	$25,826,757	$28,601,938	$27,076,936	$27,189,344
Total Annualized Cost of SO_2 control + water rights ($/year)	$31,297,445	$28,711,792	$28,814,901	$33,020,933	$30,338,575	$30,450,983
Tons SO_2 reduced (tpy)	9,492	9,125	9,492	10,092	9,694	10,092
Cost Effectiveness ($/ton)	$3,297/ton	$3,146/ton	$3,036/ton	$3,272/ton	$3,130/ton	$3,017/ton

Stamper argued that all of these costs, which include the potential added costs to obtain land for water rights for the scrubbers, are reasonable, as will be shown further below in this report. The NID™ CDS scrubber is the most cost effective and has the highest SO_2 removal for the lowest water use.

Footnotes:

94 *See* TX116-07-_29_Source_selection_analysis_TX_RH-1-31-14.xlsx at "All Class I areas data" tab.

95 Note that EPA adjusted these impacts at Guadalupe Mountains downwards to 0.620% based on 2008-2012

average emissions. FIP TSD at A-51.
[96] Id.
[97] EIA-860.
[98] *See* "Salt River Project Agriculture Improvement and Power District Settlement," at http://www2.epa.gov/enforcement/salt-river-project-agriculture-improvement-and-power-district-settlement.
[99] *See* spreadsheet with data on EGUs with wet scrubbers in arid areas (Ex. 32). The data in this spreadsheet are from EPA's Clean Air Markets Database, based on 2013 data, and from the National Climate Data Center (NCDC).
[100] *Id. at* Summary tab.
[101] Id.
[102] *See* February 8, 2012 Direct Testimony of Christian T. Beam on behalf of Southwestern Electric Power Company, In the Matter of Southwestern Electric Power Company's Petition for a Declaratory Order Finding that Installation of Environmental Controls at the Flint Creek Power Plant is in the Public Interest, Before the Arkansas Public Utilities Commission, Docket 12-008-U, at 19-21. (Ex. 29).
[103] *See* spreadsheets with filenames "Wet_FGD_Cost_IPM_TX_Sources_Revised_VS_Mar 27_2015.xlsx," "NID CDS_Cost_IPM_TX_Sources_VS_Mar 27_2015.xlsx," "SDA_Cost_IPM_TX_Sources_Revised_VS_Mar 27_2015.xlsx," and "DSI_Cost_IPM_TX_Sources_Revised_VS_Mar 27_2015.xlsx," at Exhibits 34, 35, 36, and 37 to this report.
[104] *See* FIP TSD at 20.
[105] *See*, e.g., Xcel Energy, We are energized, Texas and New Mexico, downloaded from https://www.xcelenergy.com/staticfiles/xe/Corporate/Corporate%20PDFs/SPS_Collateral_2011_CRR.pdf, attached as Ex. 33. *See also* Xcel Energy, Tolk Generating Station, Environmental Highlights, at http://www.xcelenergy.com/Company/Operations/Power_Generation_Stations/Tolk_Generating_Station.
[106] For example, at 2008-2013 average generation rates, the makeup water needs for a NID™ circulating dry scrubber based on EPA's IPM SDA cost module would be approximately 213 million gallons per year for Tolk Unit 171B. *See* Ex. 38, Tolk Costs for Water Rights Purchase for SO_2 Scrubbers.xlsx.
[107] *See* Tolk Costs for Water Rights Purchase for SO_2 Scrubbers.xlsx (Ex. 38).
[108] Based on Makeup Water Rate calculated in the IPM cost modules for wet FGD and SDA. See Exs. 34, 35, and 36 at cell E17 in the tabs for the Tolk units (tabs "T 171B" and "T 172B").
[109] As with the SO_2 control cost analysis, a cost recovery factor was applied based on a 7% interest rate and a 30 year life of the pollution controls.

Response: This comment supports our decision to regulate SO_2 emissions from the Tolk units and presents revised analyses that suggest the control of SO_2 from these units is even more cost effective than our analyses indicate. These comments also urge the use of more efficient SO_2 controls.

First, this comment argues for the use of a wet FGD, which achieves 98% SO_2 control, compared to the 95% efficient dry scrubber we proposed. We eliminated wet FGD as it uses more water than any other scrubber technology. See –our response to other comments on this issue. This comment notes that other similar units use wet FGD and use well water and/or are located in arid areas with less annual precipitation. However, the use of well water and the amount of precipitation are not key factors in our decision to eliminate wet FGD at Tolk. The Tolk units use groundwater from a portion of the Ogallala aquifer which is among the most severely overdrafted in the High Plains Aquifer, i.e., more water is withdrawn, mostly for irrigation, than is replaced by precipitation.[207] This comment fails to point to another similarly situated facility. The local overdraft situation warrants selecting the scrubber technology with

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[207] USGS, Water-Level and Storage Changes in the High Plains Aquifer, Predevelopment to 2013 and 2011-2013, http://ne.water.usgs.gov/ogw/hpwlms/files/HPAq_WLC_pd_2013_SIR_2014_5218_pubs_brief.pdf; Water Encyclopedia, Ogallala Aquifer, http://www.waterencyclopedia.com/Oc-Po/Ogallala-Aquifer.html; JasonJ. Gurdak and Cassia D. Roe, Recharge Rates and Chemistry Beneath Playas of the High Plains Aquifer – A Literature Review and Synthesis, USGS Circular 1333, 2009 http://pubs.usgs.gov/circ/1333/pdf/C1333.pdf.

the lowest water demand, which is the SDA. We recognized this situation in our proposal and discuss it in our response to another comment.

Second, this comment argues that if water availability and costs are justified, then a circulating dry scrubber (NID) should be chosen as it can achieve 98% SO_2 control and uses 60% less water than wet system. However, as we explain in response to another comment, there is currently not adequate performance data to support basing a reasonable progress limit on the NID. Further, a study-level analysis done by AEP for Flint Creek Unit 1 indicates that the SDA that we selected uses less water than the NID or any other scrubber technology.

Third, this comment presents revised cost analyses that use a different baseline. See our response to another comment on this issue.

Fourth, this comment presents an analysis of the cost to obtain additional water rights, based on an analysis for Gerald Gentleman. The acquisition of water rights involves site-specific considerations such as the local economy and the local cost of land and its beneficial uses. We discuss this in detail in our response to a comment from Xcel.

Comment: The Costs of Scrubber Retrofits at All of the EGUs Evaluated by EPA Are Reasonable. [Stamper (0068) p. 32]

Stamper noted, as shown in the FIP TSD and in the above tables, the EPA's calculated costs of scrubber retrofits range from $1,255/ton to $3,500/ton of SO_2 removed. As discussed above, the EPA's costs for SO_2 controls represent a worst case cost estimate, since EPA's costs are based on highest uncontrolled sulfur content and maximum MW-hours generated per year. Our revised cost analyses for scrubber retrofits, which follow a methodology consistent with prior EPA analyses, are all lower than EPA's cost estimates, and range from $1,103/ton to $3,459/ton.

Stamper stated that all of these costs are reasonable, in that other similar sources have had to bear similar costs for pollution control to address regional haze. For example, EPA approved installation of a dry FGD at the Colorado Springs Nixon Unit 1 as a reasonable progress measure at a cost effectiveness of $3,744/ton.[119] In addition, EPA proposed a FIP of reasonable progress measures based on switching to a lower sulfur fuel oil at the fuel oil-fired boilers at the Kanoelehua Hill Power Plant, the Puna Power Plant, and the Shipman Power Plant at a cost effectiveness of approximately $5,600/ton.[120] EPA also approved Wyoming's adoption of reasonable progress requirements for each of the Jim Bridger units to install SCR at a cost effectiveness ranging from $2,743/ton to $3,403/ton in 2013 dollars.[121]

Stamper stated that these Texas EGU control costs are also reasonable compared to the costs incurred by other EGUs to meet SO_2 BART. Data compiled by the National Park Service of State SO_2 BART determinations shows that the costs of SO_2 controls to meet BART at EGUs ranges from $1,571/ton to $7,309/ton.[122] Colorado based its SO_2 BART determination for Martin Drake Units 6 and 7 based on installation of dry FGDs at a cost effectiveness of $2,808/ton and $2,345/ton, respectively.[123] To address regional haze requirements for SO_2, the state of Wyoming found that a new dry scrubber and baghouse at Dave Johnston Unit 4 was cost effective at $5,028 per ton of SO_2 removed.[124] Wyoming also found that the costs of SO_2 retrofit controls at Naughton Units 1and 2 were cost effective at $1,622 to $2,654/ton.[125] Several EGUs were required to be retrofitted with scrubbers as part of the North Dakota regional haze plan, with cost effectiveness ranging from $463/ton to $2,006/ton.126 In the regional haze FIP for Oklahoma sources, EPA found that dry scrubbers were reasonable to meet BART at cost effectiveness numbers ranging from $1,291/ton to $1,544/ton in 2009 dollars, or $1,446/ton to $1,729/ton in 2012 dollars. 76 Fed. Reg. 16,183 (March 22, 2011).

Stamper stated that the projected costs for new scrubbers at the Texas EGUs are also comparable to costs for NOx controls that EPA and states have found to be reasonable to meet BART. EPA Region IX has required SCR as BART for the Four Corners Units 1 - 5 to meet a NOx limit of 0.11 lb/MMBtu at a cost effectiveness of $2,515/ton to $3,163/ton in 2008 dollars,[127] or $2,555/ton to $3,214/ton in 2012 dollars. In its FIP for Montana, EPA found that the cost effectiveness of SCR controls for Colstrip Units 1 and 2 of approximately $3,200/ton per unit (in 2010 dollars), or $3,396/ton in 2012 dollars, was reasonable.[128] In its FIP for Arizona regional haze, EPA required SCR along with combustion controls to meet BART at the BART-subject coal-fired units at Apache, Cholla, and Coronado power plants at cost effectiveness values ranging from $2,275/ton to $3,472/ton.[129] EPA Region VIII proposed SCR as BART at the Leland Olds Unit 1, Milton R. Young Unit 1, and Milton R. Young Unit 2 at costs of $1,800/ton, $2,600/ton, and $2,700/ton in 2009 dollars (or $2,016/ton, $2,912/ton, and $3,024/ton in 2012 dollars), respectively.[130] In its final action on the Wyoming regional haze plan, EPA found that costs for SCR plus low NOx burners and overfire air ranging from $2,635/ton to $4,461/ton (2008 dollars) are reasonable to require SCR as BART at Naughton Unit 3, Dave Johnston Unit 3, and at Laramie River Units 1, 2, and 3.[131] These costs range from $2,677/ton to $4,532/ton in 2012 dollars. Moreover, the state of Arizona has stated that a cost effectiveness value of more than $4,489/ton of NOx removed is cost effective.[132]

Stamper stated that the costs of scrubber upgrades proposed by EPA in the Texas regional haze FIP are quite reasonable to justify these controls to meet regional haze requirements, whether based on EPA's conservative cost estimates or the revised cost estimates provided in this report. The costs of SO_2 control, which range from $1,255/ton to $3,500/ton of SO_2 removed based on EPA's cost estimates, are within the range that other similar sources have had to bear to meet regional haze requirements.[133]

Footnotes:

[119] 77 Fed. Reg. 18052, 18082 (March 26, 2012).

[120] 77 Fed. Reg. 61478, 61490 (October 9, 2012; *see also* 77 Fed.Reg. 31692, 31711-2 (May 29, 2012).

[121] *See* 79 Fed. Reg. 5032 , 5040-41, 5046 (January 30, 2014).

[122] *See* March 2011 National Park Service spreadsheet "EGUs with Proposed BART Controls." (Ex. 39).

[123] 77 Fed. Reg. 18052, 18070-1 (March 26, 2012)

[124] *See* May 28, 2009 Wyoming Department of Environmental Quality BART Application Analysis, Dave Johnston Plant, at 23 (Ex. 40).

[125] *See* May 28, 2009 Wyoming Department of Environmental Quality BART Application Analysis, Naughton Plant, at 26-28 (Ex. 41).

[126] 76 Fed. Reg. 58570, 58586-7, 58589, 58594 (September 21, 2011).

[127] *See* 75 Fed.Reg. 64227 (October 19, 2010). *See also* 77 Fed.Reg. 51620, 51621-2 (August 24, 2012).

[128] *See* 77 Fed. Reg. 24026-7, 24034-5 (April 20, 2012).

[129] 77 Fed. Reg. 42857, 42860, 42862 (July 20, 2012).

[130] *See* 76 Fed.Reg. 58599 (September 21, 2011). While EPA did not ultimately require SCR as BART for these

North Dakota EGUs in its final regional haze action, EPA's decision was based on whether SCR was technically feasible for these lignite-fired units and not based on costs of controls. *See* 77 Fed.Reg. 20897-8 (April 6, 2012).
[131] 79 Fed. Reg. 5032-5222, at 5039-5043 (January 30, 2014).
[132] Letter from Arizona Department of Environmental Quality to Steve Fry, EPA Region IX, Re: Consultation Regarding Best Available Retrofit Technology Analyses for the Four Corners Power Plant and Navajo Generating Station, May 12, 2008. Ex. 42.
[133] While we do not agree that TCEQ's cost effectiveness threshold of $2,700/ton has been justified or is reasonable for defining cost effective controls, it should be noted that the revised cost effectiveness of scrubber retrofits provided in this report show costs at $2,700/ton or well below $2,700/ton for all EGUs evaluated with the exception of the Welsh units.

We agree with the commenter that our cost effectiveness calculations were based on conservative inputs. We also agree that the cost effectiveness of the controls we proposed are well within a range that have been found to be cost effective by us in previous FIPs and by states in many BART analyses for similar power plant units.

11.d. Control Level

Comment: [Sargent & Lundy (0061) p. ES-2] S&L stated that EPA overestimated SO_2 removal that would be continuously achievable on a long-term basis for the scrubber upgrades due to the following errors:

- EPA's calculation of baseline SO_2 emissions from the existing units fails to provide a realistic depiction of anticipated emissions, especially for sources that implemented SO_2 emission reduction strategies during the 2009-2013 baseline period.
- EPA's calculations of controlled SO_2 emissions are based on: (1) incorrect assumptions regarding design conditions and variation in operation; (2) limitations on future fuel flexibility; and (3) failure to differentiate between design/guarantee performance and long-term performance.

[Sargent & Lundy (0061) p. ES-3] S&L stated that EPA overestimated SO_2 emission reductions associated with the proposed retrofit scrubber technologies due to the following:

- Inaccurate estimate of baseline SO_2 emissions.
- EPA's calculations of controlled SO_2 emissions are overstated and based on incorrect assumptions regarding the actual performance and operation of wet FGD technology. EPA's selection of a controlled emission rate of 0.04 lb/MMBtu is more consistent with the lowest achievable emission rate (LAER) applicable to newly-constructed units, rather than an emission rate achievable with retrofit controls installed on existing units. In fact, a controlled emission rate of 0.04 lb/MMBtu is significantly lower than the most aggressive Best Available Retrofit Technology (BART) SO_2 emission limits imposed by EPA on BART-eligible sources throughout the U.S.
- A controlled SO_2 limit of 0.04 lb/MMBtu is not a realistic or sustainable value to maintain on a long-term basis when considering the normal variation in operating parameters that occur at all coal-fueled facilities.

Response: The SO_2 removal efficiency and some of the other items that Luminant summarizes in this comment, and the information provided in its attached Sargent and Lundy (S&L) report, regarding our scrubber upgrade costs are detailed in a separate comment package submitted under the Confidential Business Information (CBI) provisions of 40 C.F.R.§ 2.203(b). Within those CBI comments, S&L also provides its own cost analyses for upgrading Luminant's scrubbers. We are unable to respond to many of these summarized scrubber upgrade comments here with any specificity, because doing so would involve citing and discussing in detail items that Luminant has claimed as CBI. Accordingly, many of our responses to the scrubber upgrade comments are contained within a separate document that is not a part of our posted docket, but will be available for review by Luminant. The responses to comments that do not contain CBI information are contained within this document.

With regard to our scrubber upgrade cost analysis, we generally disagree with Luminant that our analysis was flawed. We used Luminant's own information, backed by independent contractors hired by it, supplied by Luminant in response to our Section 114 requests for information. This included cost estimates from well-known and respected contracting firms with a history of many scrubber upgrades. In any event, criticisms regarding our use of this information are moot, because S&L has provided its own cost analysis (under the CBI protections), which it offers as a replacement to our own cost analyses. We have reviewed the scrubber upgrade cost analyses performed by S&L and adopted its methodology. However, we noted many errors and undocumented cost figures in its analyses. We corrected these errors and rejected some of the undocumented assertions and/or costs in S&L's cost analyses. Nevertheless, in order to produce a conservative scrubber upgrade cost analysis and set many of the issues that Luminant raises aside, we incorporated many of Luminant's cost items. The resulting costs for Luminant's scrubber upgrades increased slightly, resulting in a range of $368/ton to 910/ton for all of the scrubber upgrades, well within a range that we believe is cost effective, given the significant visibility benefits that will result from the installation of those controls.

We address S&L's comments related to our calculation of baseline emissions elsewhere in our response to comments. Regarding S&L's assertion that our proposed emission limits are more consistent with LAER, we note that BART stands for "Best Available Retrofit Technology." As we state in the BART rule,[208] "You should be sure to consider the level of control that is currently best achievable at the time that you are conducting your BART analysis." Therefore, whether a particular emission limit could be viewed as BACT, LAER, or some other regulatory designation has no relevance here. BART requires consideration of the best performance the scrubber is able to achieve. As we note in our COST TSD, we believe that our proposed emission limits are conservative and are continuously achievable on a long term basis. See our response to another comment in which we present current monitoring information for scrubber retrofits that demonstrates this fact.

Regarding S&L's assertion of the need for fuel flexibility, we can only perform scrubber cost analysis on the basis of the sulfur content of coal that has historically been burned. Absent information from the facilities (and appropriate enforceable commitments when warranted) we cannot anticipate what the sulfur content of the fuels that facility may burn in the future.

[208] 70 FR 39171.

Comment: EPA overestimated annual SO_2 emission reductions achievable with scrubber upgrades - biased methodology for estimating baseline emissions [Sargent & Lundy (0061) p. 10]

S&L stated that EPA also overstated the amount of additional SO_2 that would be removed were the upgrades performed. EPA calculated baseline SO_2 emissions by averaging the annual SO_2 emissions reported in the Air Markets Program Data from the previous five years (2009-2013), excluding the maximum and minimum annual values. EPA asserted that this was a "reasonable compromise between simply selecting the maximum value from 2009 - 2013 or using the average of the values from 2009 – 2013."[28] However, the approach used by EPA is entirely arbitrary, and may not provide a realistic depiction of anticipated emissions from the existing sources.

According to S&L, the BART Guidelines (40 CFR Part 51 Appendix W) state that baseline emissions from exiting sources "should represent a realistic depiction of anticipated annual emissions for the source."[29] In general, for the existing sources, facilities should estimate the anticipated annual emissions based upon actual emissions from a baseline period.[30] However, EPA provides no explanation or analysis to demonstrate that the approach taken results in a realistic depiction of anticipated annual emissions from the existing sources. In addition, there is no basis for concluding that EPA's approach of excluding actual emissions data more accurately represents the actual operation of the units. This would be especially true on existing units that have implemented SO_2 control strategies during EPA's 2009-2013 baseline period. Finally, to our knowledge, this approach has not been used previously by EPA as a methodology for evaluating baseline emissions in other evaluations (and even if EPA had done so, it is not justified here).

The following table shows a comparison between the baseline emissions as established using EPA's approach, baseline emissions calculated as a straight average of the 2009-2013 data, baseline emissions calculated as a 3-year average of actual emissions from 2011-2013, and baseline emissions calculated as a 5-year average of actual emissions from 2010-2014.

Table 1: Comparison of Baseline SO_2 Emissions for Existing Scrubbers

Unit	EPA Approach 3 Year Average* (tons)	5 Year Average 2009-2013 (tons)	3 Year Average 2011-2013 (tons)	5 Year Average 2010-2014 (tons)
Martin Lake 1	24,495	22,292	20,524	20,631
Martin Lake 2	21,580	21,128	19,512	18,861
Martin Lake 3	19,940	20,807	18,217	19,170
Monticello 3	13,857	13,375	10,429	11,455
Sandow 4	22,289	21,765	22,289	19,979

With the exception of Martin Lake Unit 3, EPA's approach of eliminating the maximum and minimum values results in higher baseline SO_2 emissions compared to averaging the entire 5-year period, and in all cases EPA's approach results in higher baseline SO_2 emissions compared to the 3-year average emission rate achieved for 2011-2013. Moreover, by using the most recent data from 2010 to 2014 to calculate the 5-year average, SO_2 baseline emissions in all cases are lower than the 5-year average using data from 2009 to 2013. Overestimating the baseline SO_2 emissions results in overestimating the amount of SO_2 that would be removed and overstating the cost-effectiveness of the scrubber upgrades.

Footnotes:
[28] Technical Support Document for the Cost of Controls Calculations for the Texas Regional Haze Federal Implementation Plan, November 2014, page 11.
[29] 79 FR 39167.
[30] *Id*.

Response: We disagree with S&L that we erred in the procedure we used in estimating baseline emissions for our scrubber upgrade cost analyses. As we note in our proposal, we used the BART Guidelines for some aspects of our analysis. Regarding the calculation of baseline emissions, the BART Guidelines state[209]:

> How do I calculate baseline emissions?
>
> 1. The baseline emissions rate should represent a realistic depiction of anticipated annual emissions for the source. In general, for the existing sources subject to BART, you will estimate the anticipated annual emissions based upon actual emissions from a baseline period.
>
> 2. When you project that future operating parameters (e.g., limited hours of operation or capacity utilization, type of fuel, raw materials or product mix or type) will differ from past practice, and if this projection has a deciding effect in the BART determination, then you must make these parameters or assumptions into enforceable limitations. In the absence of enforceable limitations, you calculate baseline emissions based upon continuation of past practice.

We believe the procedure we outline below is in compliance with this language. We calculated our baseline SO_2 emissions by first acquiring the 2009 to 2013 emissions as reported to us the facilities in question.[210] This is reflective of the actual emissions due to the underperforming scrubber systems installed at the units in question. We then calculated the uncontrolled SO_2 emissions by acquiring EIA coal usage data. This considers the amount of each type of coal burned and the sulfur content of each type of coal that the units in question reported to the EIA. We used these two figures to calculate the level of control for each year. The following is a summary of that information for Martin Lake Unit 1[211]:

[209] 70 FR 39167.
[210] http://ampd.epa.gov/ampd/
[211] See the file, "Coal vs CEM data 2009-2013.xlsx," which was in the docket for our proposal.

	2009-2013 Average	2009	2010	2011	2012	2013	3 yr Average (eliminate max and min)
Annual Emissions CEM (tpy)	22,292.3	23,922.0	25,966.2	24,728.0	12,010.3	24,834.8	24,494.9
Annual Emissions Coal data (tpy)	72,380.7	82,293.4	79,832.5	69,206.9	57,281.4	73,289.4	74,109.6
Annual Heat Input Coal Data (MMBtu)	60,825,717.0	61,512,078.8	67,858,114.7	64,876,594.8	46,059,863.8	63,821,933.0	65,518,880.8
Average estimated percent emitted	30.8%	29.1%	32.5%	35.7%	21.0%	33.9%	33.1%
Average estimated percent not emitted	69.2%	70.9%	67.5%	64.3%	79.0%	66.1%	66.9%
CEM data emission rate (lb/MMBtu)	0.76	0.81	0.79	0.77	0.56	0.82	
Coal data emission rate (lb/MMBtu)	2.38	2.68	2.35	2.13	2.49	2.30	2.26
95% removal from coal data (emissions tpy)	3,619.0	4,114.7	3,991.6	3,460.3	2,864.1	3,664.5	3,705.5
95% eff. Removal rate (lb/MMBtu coal)	0.12	0.13	0.12	0.11	0.12	0.11	0.12
Additional tons of SO_2 removed from annual emissions at 95% control							20,789.4

We eliminated the high low values from the 2009-2013 emission to better address the issues S&L raises in its other comments (variations in coal sulfur data, capacity usage, upgrades in equipment. etc.) and make the baseline more representative of plant operations. The difference between our baseline calculations and a straight 2009-2013 average is small and would not change our proposed conclusion that the scrubber upgrades we proposed are very cost effective. We direct S&L to our response to a related comment concerning our scrubber upgrade baseline emissions calculations which demonstrates that our methodology was likely inherently conservative.

Comment: Incorrect assumptions for estimating achievable SO_2 emission rates
[Sargent & Lundy (0061) p. 11]

In its 2006 studies for Luminant's predecessor, S&L identified the necessary upgrades and associated costs to eliminate flue gas bypass on each of Luminant's existing scrubbers while maintaining a high level of SO_2 removal. For each of these units and the associated upgrades, S&L identified the achievable performance based on the design conditions. The achievable performance associated with these upgrades identified by S&L is as follows:

Table 2: Summary of FGD Upgrade Performance from S&L Studies

Unit	Design Inlet Sulfur (lb/MMBtu)	SO_2 Remova	SO_2 Emission Rate (lb/MMBtu)
Monticello Unit 3	1.84	93.0	0.13
Sandow Unit 4	3.90	93.0	0.27
Martin Lake Units 1-3	3.88	95.0	0.20

The S&L report predicted 95% removal may be achievable in the FGD systems with the bypass still in operation, but further predicted that eliminating the bypass would result in 93% removal in the scrubbers at Monticello and Sandow. This performance reduction is due to a higher velocity in the absorber associated with treating more flue gas; this in turn reduces the residence time available for the chemical reactions to occur. EPA, however, wrongly assumes 95% removal efficiency could be achieved with the FGD upgrades identified in S&L's report in conjunction with dibasic acid (DBA) addition. This is not a proper reading of our reports and results in an overstatement of the amount of SO_2 removal that can be achieved. This error is even more apparent when the removal of the trays is taken into consideration. Trays provide additional contact between the liquid and the gas which facilitates the scrubbing of SO_2 from the flue gas at lower liquid to gas ratios but also introduces significant pressure drop. Luminant removed the trays in an effort to accommodate additional flue gas in the absorbers while limiting the impact on the existing fans. When trays are removed the overall removal efficiency of the system is reduced; therefore, the stated performance in the reports cannot be achieved without additional improvements beyond those identified in the S&L reports such as higher L/G ratios and the use of dibasic acid (DBA) or replacement of the removed trays. Even if it were possible in theory to achieve 95% SO_2 removal with DBA addition and the other upgrades (a fact that EPA's proposal does not establish), EPA failed to account for all of the additional costs associated with achieving and maintaining that removal efficiency.

S&L stated that EPA further erred by applying the 95% SO_2 removal to the inlet sulfur concentrations developed from the Energy Information Administration (EIA) coal database. This approach is based on several flawed assumptions including:

- The historical coal sulfur levels will remain constant
- The SO_2 removal identified can be achieved at lower inlet sulfur concentrations
- The SO_2 removal is sustainable over time and through varying operating conditions

By taking this approach, EPA assumes that the current coal characteristics will not vary in the future, which is not a reasonable assumption. S&L's report estimated that the expected performance was achievable while firing the design fuel. This estimate was based on the design coal, the original equipment design, and the proposed upgrades. The inlet sulfur concentrations derived from the EIA coal data are much lower than the design inlet sulfur used as the basis of S&L's analysis.

The S&L report did not indicate that the estimated removal efficiency could be achieved consistently at these lower fuel sulfur levels. SO_2 removal efficiencies cannot be universally applied across any range of coal sulfur levels, especially when considering upgrades to existing equipment. Existing scrubbers have limitations based on their original equipment design. While upgrades, such as those proposed in the reports, can improve the performance of existing scrubbers, it is not possible for these existing scrubbers to achieve the same flexibility and performance as new FGD systems. The S&L reports do not establish the achievable performance at conditions other than the specified design parameters. Therefore, it is not appropriate for EPA to assume that 95% SO_2 removal can be achieved at the lower inlet sulfur concentrations derived from the EIA coal database.

Further, the SO_2 emission rates associated with the achievable performance identified in the S&L report are design values for the upgrades which represent guarantee or initial performance at the design conditions. Guarantee performance testing is short-term testing that is conducted under ideal operating conditions just after the new equipment is installed and performing its best. These values do not account for variability in the operating conditions nor normal equipment performance degradation between maintenance cycles. Although these emission rates are acceptable design targets for the upgrades, they do not represent emission rates that can be achieved on a long-term basis under all normal operating conditions. It is customary to include reasonable margin between the design target and the anticipated long-term actual controlled emission rate to allow for normal fluctuations in the controlled emission rate and, especially in the case of FGD upgrades, periods of equipment maintenance.

According to S&L, EPA's approach to estimating controlled SO_2 emissions has several significant flaws. EPA is overestimating the capabilities of the technology, overestimating the tons of SO_2 removed, and thus overestimating the cost-effectiveness of the proposed upgrades. To accurately reflect S&L's determinations and findings in it reports, and in light of the above considerations, EPA should revise the tons of SO_2 removed to be based on a future emission rate of 0.13 lb/MMBtu for Monticello Unit 3, 0.27 lb/MMBtu for Sandow Unit 4, and 0.20 lb/MMBtu for the Martin Lake units.

[Sargent & Lundy (0061) p. 13] The cumulative effect of EPA's errors is to substantially overstate the cost-effectiveness of the scrubber upgrades that it would require. Although we believe the starting estimates are not sufficient to properly quantify the 2015 costs associated with the scrubber upgrades at the Luminant units, we have calculated more accurate cost-effectiveness numbers by correcting the errors discussed above starting from the original estimates. Even just correcting these limited errors by EPA shows that, for all three of Luminant's plants with existing scrubbers, EPA has overstated by at least 2-3 times the cost-effectiveness of the upgrades EPA is proposing. In other words, our corrected $/ton values are 2-3 times higher than those relied on by EPA to justify its proposal. We believe that the adjusted cost-effectiveness numbers are conservative when considering that the starting estimates insufficiently capture the 2015 costs to upgrade the scrubbers. The specific values and calculations are provided in the confidential appendix to this report.

[Stamper (0068) p.10; Earthjustice (0067) p.37] Stamper stated that there are several aspects of EPA's SO_2 retrofit cost effectiveness analyses in which EPA applied overly conservative assumptions. Also, it appears that EPA used a different methodology in its wet FGD analysis than in its SDA cost analysis.

Specifically, Stamper stated that in the wet FGD analysis, EPA used the following information: First, EPA used a period of baseline emissions based on the three year average of annual emissions from 2009 to 2013,[28] excluding the years of maximum and minimum emissions. EPA also calculated gross heat rate from EPA's Clean Air Markets Database data based on a three year average excluding the maximum and minimum heat rates from 2009 to 2013. Second, EPA assumed an uncontrolled SO_2 emission rate based on the maximum calculated monthly SO_2 lb/MMBtu emission rate over 2009 to 2013.[29] Third, EPA used a 3-year average of gross load (MW-hours) over 2009 to 2013, excluding the maximum and minimum years of MW-hours generated.

In the SDA and DSI analyses, Stamper stated that the EPA used somewhat different information. While EPA continued to use a period of baseline emissions based on the three year average of annual emissions from 2009 to 2013 excluding the years of maximum and minimum emissions, EPA used a gross heat rate based on the maximum annual value from 2009 to 2013. Similar to the wet FGD analysis, EPA used the maximum monthly SO_2 rate over 2009 to 2013 to reflect uncontrolled emissions. However, EPA used the maximum annual gross load over 2009 to 2013 to project operation and maintenance costs.

Stamper stated that the EPA should be consistent in its methodologies for estimating costs and emission reductions between control technologies being evaluated for a source. Indeed, EPA should be consistent in its methodologies for estimating costs and emission reductions in all of its regional haze cost analyses. However, the methodologies that EPA applied in the Texas SO_2 control cost analyses are not consistent with how EPA has typically determined the cost effectiveness of pollution control technologies for retrofit controls.

Stamper stated that the EPA typically has determined cost effectiveness based on long term averages of emissions, uncontrolled emission rates, and capacity factors. For example, in evaluating SO_2 retrofit controls for the Corette Power Plant in Montana, EPA used an annual average actual SO_2 lb/MMBtu emission rate over three years to reflect uncontrolled SO_2 emissions for determining the capital and operations & maintenance costs of SO_2 controls.[30] EPA also determined the SO_2 removal efficiency based on the three year annual average SO_2 emission rate in lb/MMBtu (based on CAMD data) and based on an assumed SO_2 emission rate for the control technology being evaluated.[31] EPA then calculated the SO_2 emissions reduced from the three year average of SO_2 emissions (tons per year) multiplied by the SO_2 removal efficiency, which in turn was based on the three year average SO_2 rate in lb/MMBtu and the proposed SO_2 emission limit for the control technology being evaluated. EPA has evaluated NOx control cost effectiveness in the same manner, using the three year average of annual lb/MMBtu emission rates and the three year average of annual tons of NOx emitted in determining cost effectiveness of NOx controls.[32]

By using the highest monthly average SO_2 emissions rate over five years, Stamper stated that the EPA's methodology applied for these Texas reasonable progress controls would tend to overestimate the SO_2 control technology costs, especially the operations & maintenance costs, by overstating the typical uncontrolled SO_2 emission rate. That is because EPA's methodology determines the operational costs for a scrubber based on historical worst case sulfur content. With higher sulfur content coal, more reagent is needed to remove SO_2 and more scrubber waste is generated. For example, EPA's cost analysis for Monticello Unit 1 was based on an uncontrolled SO_2 rate of 1.[33] lb/MMBtu, whereas EPA's cost analysis for Big Brown Unit 1 was based on an uncontrolled SO_2 rate of 2.0 lb/MMBtu.33 Although these are similarly sized units (Monticello Unit 1 is 562.9 MW and Big Brown Unit 1 is 572.9 MW), the costs for limestone reagent and waste disposal are much lower at Monticello Unit 1 with its lower uncontrolled SO_2 rate than at Big Brown Unit 1. Specifically, costs for limestone reagent and waste disposal at Monticello Unit 1 were projected to be \$0.36/MWh and \$0.65/MWh respectively, whereas the costs for limestone reagent and waste disposal at Big Brown Unit 1 with higher sulfur coal were \$0.52/MWh and \$0.94/MWh respectively.[34] Further, a review of the average monthly SO_2 emission rates for Big Brown Unit 1 shows that EPA's assumed 2.0 lb/MMBtu uncontrolled SO_2 emission rate only occurred one month out of five years and, in fact, the average uncontrolled monthly SO_2 rate (i.e., average of all monthly averages over five years) was 1.44 lb/MMBtu.[35] EPA's approach of using the highest monthly SO_2 rate for determining the costs of the SO_2 controls thus overestimates the operational costs of the control by designing for a worst case coal.

Earthjustice et al., and Stamper stated that by using a historical maximum MW-hours generated, EPA overstated the operational costs. That is because the IPM cost module used by EPA estimates operational costs in terms of dollars per MW-hours generated. When EPA uses a higher than typical MW-hours generated in its costs analyses, the annual operational expenses will be higher than if based on a longer term annual average expected generation rate.

Stamper stated that the EPA's methods for estimating annual emission reductions in its cost effectiveness are based on historical data that are not internally consistent. For example, for the SDA and DSI analyses, EPA used a maximum annual gross heat rate from the years 2009 to 2013. Heat rate indicates the amount of British Thermal Units (Btus) of energy needed from the fuel burned at a specific unit to produce 1 kilowatt-hour, and is essentially a measure of the efficiency of the unit. The gross heat rate is, in turn, used to project the annual heat input to produce the projected annual level of generation (MW-hours). The annual heat input is then used to project future controlled SO_2 emissions, based on the assumed controlled SO_2 emission rate. By using a historical maximum annual gross heat rate, EPA thus overstates the annual heat input at the unit and, consequently, overstates the controlled tons of SO_2 emitted per year. Then, to determine the tons per year of SO_2 removed with the SO_2 control, EPA subtracted baseline emissions based on a 3-year average over 2009 to 2013 excluding the maximum and minimum years. Depending on how variable a unit's heat rate and generation rate has been over 2009 to 2013, this approach overstated the emission reductions with a particular control for some units, and it underestimated emission reductions for other units in comparison to determining the emission reductions from a control simply based on long term average heat rate, generation rate, and emissions.

For the wet FGD cost analyses, Stamper stated that the EPA used more of an apples-to-apples methodology, with all data used to project emission reductions with a control based on a 3-year average over 2009 to 2013 excluding the maximum and minimum years. However, EPA has not justified excluding the maximum and minimum years from a projection of heat rate, annual MW-hours generated, or baseline SO_2 emissions. There can be many different reasons for a maximum or minimum year of heat rate, generation, and/or SO_2 emissions at a unit. For example, heat rate is usually highest in the year or two before a turbine overhaul, which typically occurs every 5 to 10 years. SO_2 baseline emissions can be higher due to the increased heat rate and also due to increases in coal sulfur content. Generation can be higher one year over another due to an adjoining unit having an extended outage. EPA should account for those maximums and minimums in projecting emission reductions from a control by simply using a long term average of this data, as EPA has done in other control cost evaluations such as for the Corette power plant BART determination discussed above.

In summary, Earthjustice et al., and Stamper stated that EPA should use the same methodology in determining cost effectiveness of reasonable progress controls as it has used for BART cost effectiveness analyses (that is, in essence, basing all costs and emission reductions on long term average emission rates and capacity factors/generation rates). As will be shown further below, use of the EPA's historically-applied methodology shows that the retrofit SO_2 controls evaluated by EPA are even more cost effective than shown by EPA.

Footnotes:

[28] Note that, in EPA's Wet FGD Cost spreadsheet, SDA Cost spreadsheet, and DSI Cost spreadsheet, the "Annual Emissions" and "Monthly Emissions" tabs incorrectly indicate that SO_2, gross load, and gross heat rate are from 2009 to 2012. The formulas in the spreadsheets encompass 2009 to 2013, so the headings in these tabs should be corrected to state that the averages and maximums are from 2009 to 2013.

[29] Note that EPA's Spreadsheet of Wet FGC Costs (TX166-008-092_Costing_-Wet FGD_Cost_IPM_5-13_TX_Sources_Ver 2.xlsx) incorrectly states that the uncontrolled SO_2 rate is the "Avg of months with full operating time." EPA's spreadsheets for SDA costs and DSI costs make clear that EPA assumed the maximum monthly value from 2009 – 2013, and it is clear from a review of the emissions data that EPA also used the maximum monthly SO_2 rate in its wet FGD cost calculations.

[30] Copies of EPA's cost effectiveness spreadsheets for SDA, wet FGD, and DSI at the Corette Power Plant are attached as Exs. 10A, B, and C.

[31] It must be noted that EPA assumed too low of SO_2 removal efficiencies in its evaluation of cost effectiveness of SO_2 controls for the Corette Power Plant, as was discussed in detail in the Technical Support Document to Comments of Conservation Organizations, Proposed Montana Regional Haze FIP – June 15, 2012, at 94 to 101 (Ex. 30).

[32] *See,* e.g., EPA's NOx Cost Effectiveness Analyses for Jim Bridger Power Plant, EPA-R08-OAR-2012-0026-0085, attached as Ex. 12.

[33] *See* TX166-008-092_Costing_-_Wet_FGD_Cost_IPM_5-13_TX_Sources_ver_2.xlsx (in Docket ID EPA-R06-OAR-2014-0754-0008) at BB1 tab and M1 tab, cell E8 in each tab.

[34] *Id. at* cells C69 and C70 in each tab.

[35] *Id. at* "Monthly Emissions tab."

[Stamper (0068) p. 37] Stamper stated that the EPA determined the current SO_2 removal efficiencies of the wet scrubbers in operation at the 9 EGUs analyzed by EPA by first determining the uncontrolled SO_2 rate based on the percent sulfur in the coal and the types and amount of coal burned at each EGU. Cost TSD at 29. However, EPA's analysis assumes all of the sulfur in the coal is converted to SO_2, when typically about 2-5% of the sulfur in the coal falls out in the bottom ash in the boiler.[151] Further, as shown in EPA's analysis comparing its theoretical SO_2 emissions to monitored SO_2 emissions for unscrubbed units, EPA demonstrated that its estimation of uncontrolled SO_2 emissions actually overstates the uncontrolled SO_2 emission rate. Cost TSD at 30 (Table 15). To determine SO_2 removal efficiency of the existing scrubbers, EPA compared uncontrolled SO_2 emissions based on sulfur content and amount of coal burned to actual SO_2 emissions from CAMD. However, because EPA has likely overestimated the uncontrolled SO_2 emissions for the scrubbed units, that means EPA also likely overstated the current SO_2 removal efficiency of the scrubbers at the existing EGUs.

Stamper stated that the EPA acknowledged this issue, along with other potential issues, in its methodology to determine the SO_2 removal efficiencies of the existing wet scrubbers at the 9 EGUs evaluated by EPA. FIP Cost TSD at 31. All of this means it is likely that EPA has overestimated the current SO_2 removal efficiency of the existing scrubbers at the 9 EGUs evaluated for scrubber upgrades.

Footnotes:
151 U.S. EPA AP-42, Section 1.1 Bituminous and Subbituminous Coal Combustion, at 1.1-3.

Response: Although we cannot provide details here on many aspects of S&L scrubber upgrade comments for the reasons we outline below, we disagree with S&L that we misread their reports. In addition, S&L apparently implies we relied solely on its reports in concluding that the units in question should be controlled to the level we proposed. In fact the S&L reports were not the primary source of information we relied upon in proposing the control levels for the units in question, which can be discerned by reading our Cost TSD.[212]

The items that Luminant and S&L summarizes in this comment, and the information provided in its attached Sargent and Lundy (S&L) report, regarding our scrubber upgrade costs are detailed in a separate comment package submitted under the Confidential Business Information (CBI) provisions of 40 C.F.R.§ 2.203(b). Within those CBI comments, S&L also provides its own cost analyses for upgrading Luminant's scrubbers. We are unable to respond to many of these summarized scrubber upgrade comments here with any specificity, because doing so would involve citing and discussing in detail items that Luminant has claimed as CBI. Accordingly, many of our responses to the scrubber upgrade comments are contained within a separate document that is not a part of our posted docket, but will be available for review by Luminant. The responses to comments that do not contain CBI information are contained within this document.

With regard to our scrubber upgrade cost analysis, we generally disagree with Luminant that our analysis was flawed. We used Luminant's own information, backed by independent contractors hired by it, supplied by Luminant in response to our Section 114 requests for information. This included cost estimates from well-known and respected contracting firms with a history of many scrubber upgrades. In any event, criticisms regarding our use of this information are moot, because S&L has provided its own cost analysis (under the CBI protections), which it offers as a replacement to our own cost analyses. We have reviewed the scrubber upgrade cost analyses performed by S&L and adopted its methodology. However, we noted many errors and undocumented cost figures in its analyses. We corrected these errors and rejected some of the undocumented assertions and/or costs in S&L's cost analyses. Nevertheless, in order to produce a conservative scrubber upgrade cost analysis and set many of the issues that Luminant raises aside, we incorporated many of Luminant's cost items. The resulting costs for Luminant's scrubber upgrades increased slightly, resulting in a range of \$368/ton to 910/ton for all of the scrubber upgrades, well within a range that we believe is cost effective, given the significant visibility benefits that will result from the installation of those controls.

[212] See our Cost TSD, particularly Sections 6 and 7, which is heavily footnoted with the references we used to justify our proposed control levels.

We agree with Ms. Stamper that we employed conservative assumptions and data analyses techniques in our cost analyses. However, we disagree that we used different heat rates and gross loads in our wet FGD and versus our DSI and SDA cost analyses. This can be verified from an examination of the cost spreadsheets.[213] We also disagree that we deviated significantly from our previous cost effectiveness methodologies. We agree that in some cases we (and the states) have used the more simple method of establishing the historical uncontrolled emission rate of simply averaging annual averages of emissions. However, in the present case, we wanted to employ a more refined approach that would allow us to account for variations in emissions that could occur due to changes in coal blending, sulfur content, and capacity usage. This is especially important when designing a scrubber system, as it must be capable of addressing reasonably worst case operating conditions.[214] These types of considerations are not always necessary, especially for units with rather static operations and fuels. We believe that employing the more direct method the commenter suggests in our proposal would have led to unrepresentative emission profiles in some cases and potentially under designed scrubbers. The commenter's example for averaging the SO_2 emission rate for Big Brown would have had us design the scrubber based on an emission rate of 1.44 lbs/MMBtu fuel, as opposed to our use of a 2.0 lb/MMBtu value. This could result in the unit in question unable to comply with our SO_2 emission rate for the one month that resulted in that 2.0 lb/MMBtu emission spike. Hence, we established our uncontrolled emission rate by selecting the maximum monthly SO_2 emission rates. We acknowledge this methodology may result in a worse cost effectiveness calculation (higher $/ton).

We also acknowledge that we employed a maximum gross heat rate in all of our SDA, DSI, and wet FGD cost calculations and this had the effect, as the commenter notes, of maximizing the operational costs. We disagree with the commenter that our SO_2 baseline emission calculation methodology "overstated the emission reductions with a particular control for some units, and it underestimated emission reductions for other units in comparison to determining the emission reductions from a control simply based on long term average heat rate, generation rate, and emissions." As we discuss above, we do not believe that using input average values was the most appropriate option.

We agree with Ms. Stamper that some of our assumptions may appear to be internally inconsistent. However, our overall goal was to demonstrate that all of our proposed controls were cost effective, even if they were performed using conservative parameters and assumptions. We believe we have accomplished that goal.

We also agree with Ms. Stamper that in all of the cases in which we tested our calculation of the theoretical uncontrolled SO_2 calculation, the result was higher than the actual measured SO_2 emissions. We discuss this in our Cost TSD[215] and outline the possible reasons for this, which include those the commenter lists. This means that our calculation of the additional SO_2 tons removed when the existing scrubbers are upgraded to operate at 95% control are likely low.

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[213] See the files, "Wet FGD Cost IPM 5-13 TX Sources ver 2.xlsx," "SDA FGD Cost IPM 5-13 TX Sources ver 2.xlsx," "DSI FGD Cost IPM 5-13 TX Sources ver 2.xlsx,"

[214] As we note in other comments, unless an operator provides information to the contrary, we must base our emission baseline on historical data.

[215] See Table 15 of our Cost TSD and the text immediately before and after it.

Because this figure appears in the denominator of our cost effectiveness metric ($/ton), it means the resulting fraction is likely high, or overstated. In other words, were we to have the actual uncontrolled SO_2 emissions instead of having to rely on our theoretical calculations, we believe the cost effectiveness of our scrubber upgrades would actually be more attractive (lower $/ton). This is another area in which we strove to be conservative and demonstrate that even with many conservative cost assumptions, our analyses indicate that the scrubber upgrades we proposed are very cost effective.

Regarding S&L's assertions that we erred in using the EIA data to calculate our proposed scrubber upgrade control efficiency, we make the following points:

S&L states that we cannot assume that the coal sulfur content of the coals the facilities burn will remain constant into the future. We agree that we cannot predict what coals the facilities in question will burn, and it is not our intention to dictate that to them. Furthermore, as the quote from our BART Guidelines concerning the calculation of the emission baseline that we reproduced in a related comment indicates, the emission baseline calculations are based on actual emissions from the baseline period. The "baseline emissions rate should represent a realistic depiction of anticipated annual emissions." Lacking any commitment from the facilities in question concerning what coals they may choose to burn in the future, we believe it is appropriate to use the historical emissions as an indicator of future operations.

As our response above to Ms. Stamper indicates, we believe any error in our scrubber upgrade baseline SO_2 emissions due to our use of the EIA coal data will likely serve to worsen our cost effectiveness (higher $/ton) calculation. Thus, our use of the EIA coal data was likely conservative.

Regarding S&L's assertions that our proposed control level is too high, we note that our Cost TSD references many industry sources that conclude that a 95% control level for a scrubber upgrade is in fact a conservative assumption and that many scrubber upgrades have performed above this level while burning a variety of coals. We note in our proposal that we believe a 95% control assumption provides an adequate margin of error for any of the units for which we have proposed scrubber upgrades, such that they should be able to comfortably attain the emission limits we have proposed. However, the conservative nature of our SO_2 baseline calculations aside, for the operator of any unit that disagrees with us on this point, we proposed the following:

(1) The affected unit should comment why it believes it cannot attain the SO_2 emission limit we have proposed, based on a scrubber upgrade that includes the kinds of improvements (e.g., elimination of bypass, wet stack conversion, installation of trays or rings, upgraded spray headers, upgraded ID fans, using all recycle pumps, etc.) typically included in a scrubber upgrade.

(2) After considering those comments, and responding to all relevant comments in a final rulemaking action, should we still require a scrubber upgrade in our final decision making action we will provide the company the following option to seek a revised emission limit after taking the following steps:

(a) Install a CEMS at the inlet to the scrubber.
(b) Pre-approval of a scrubber upgrade plan conducted by a third party engineering firm that considers the kinds of improvements (e.g., elimination of bypass, wet stack conversion, installation of trays or rings, upgraded spray headers, upgraded ID fans, using all recycle pumps, etc.) typically performed during a scrubber upgrade. The goal of this plan will be to maximize the unit's overall SO_2 removal efficiency.
(c) Installation of the scrubber upgrades.
(d) Pre-approval of a performance testing plan, followed by the performance testing itself.
(e) A pre-approved schedule for 2.a through 2.d.
(f) Should we determine that a revision of the SO_2 emission limit is appropriate, we will have to propose a modification to our decision making to do so. It should be noted that any proposal to modify the SO_2 emission limit will be based largely on the performance testing and may result in a proposed increase or decrease of that value.

Although we conclude that our proposed control efficiencies remain conservative, we believe the above procedure will adequately address any errors, which we expect to be small, in our proposed control efficiency calculations. For the above reasons, we disagree with S&L that our proposed control efficiency is in error.

Comment: EPA over-estimation of SO_2 **emission reductions - biased methodology for estimating baseline emissions** [Sargent & Lundy (0061) p. 21]

In the report prepared for Luminant, S&L stated that the proposed approach by EPA to establish baseline emissions may not result in a realistic depiction of anticipated emissions from the existing sources, and is inconsistent with previous methodologies used by EPA for evaluating baseline emissions in other evaluations. The following table shows a comparison between the baseline emissions under EPA's approach (which uses the highest 3 of 5 years), baseline emissions calculated as a straight average of the 2009-2013 emissions data, baseline emissions calculated as a 3-year average of actual emissions from 2011-2013, and baseline emission calculated as a 5-year average of actual emissions from 2010 to 2014.

Table 3: Comparison of Baseline SO_2 Emissions for Un-Scrubbed Units

Unit	EPA Approach 3 Year Average* (tons)	5 Year Average (2009-2013) (tons)	3 Year Average 2011-2013 (tons)	5 Year Average 2010-2014 (tons)
Big Brown 1	30,667	30,606	30,990	29,179
Big Brown 2	30,814	30,638	31,467	30,033
Monticello 1	17,865	16,435	14,168	13,714
Monticello 2	16,429	15,458	12,163	12,548

S&L stated that EPA's approach using the highest 3 of 5 years fails to account for SO_2 emission reduction strategies that may have been implemented at an existing facility during the 2009-2013 baseline period. This is clearly the result for Monticello Units 1 & 2. In addition, by using the most recent data from 2010 to 2014 to calculate the 5-year average, SO_2 baseline emissions in all cases are lower than the 5-year average using data from 2009 to 2013. This illustrates that EPA's approach results in significantly higher baseline SO_2 emissions and does not provide a realistic depiction of anticipated emissions from the sources, contributing to EPA's overstating the cost-effectiveness of the new scrubbers.

Response: As in our scrubber upgrade baseline calculations, we eliminated the high low values from the 2009-2013 emission to better address the issues S&L raises in its other comments (variations in coal sulfur data, capacity usage, upgrades in equipment. etc.) and make the baseline more representative of plant operations: We believe our methodology for calculating the SO_2 baseline emissions for our proposed scrubber retrofits is in compliance with the Regional Haze Rule for the same reasons we outlined with regard to our scrubber upgrade baseline calculations. Regardless, the difference between our baseline calculations and a straight 2009-2013 average is small and would not change our proposed conclusion that the scrubber retrofits we proposed are cost effective.

Comment: Incorrect assumptions for estimating achievable SO_2 emission rates
[Sargent & Lundy (0061) p. 22]

S&L stated that EPA calculated SO_2 emission reductions based on the assumption that a retrofit wet FGD will achieve 98% reduction or a controlled SO_2 emission rate of 0.04 lb/MMBtu. In our experience, this assumption is unrealistic and cannot be sustained on a continuous, long-term basis. As a basis for its assumption, EPA cites the IPM wet FGD cost development document, which states: "The least squares curve fit of the data was defined as a 'typical' wet FGD retrofit for removal of 98% of the inlet sulfur. It should be noted that the lowest available SO_2 emission guarantees, from the original equipment manufacturers of wet FGD systems, are 0.04 lb/MMBtu."[63] However, EPA misinterprets this statement when it uses the guarantee emission rate to calculate long-term SO_2 emissions.

S&L asserted that EPA's proposal is far too stringent to be achievable with the retrofit of an existing unit. EPA's selection of a controlled emission rate of 0.04 lb/MMBtu is more consistent with the lowest achievable emission rate (LAER) applicable to newly-constructed units, rather than an emission rate achievable with retrofit controls installed on existing units. In fact, a controlled emission rate of 0.04 lb/MMBtu is significantly lower than the most aggressive BART SO_2 emission limits imposed by EPA on BART-eligible sources throughout the U.S.

According to S&L, a controlled SO_2 limit of 0.04 lb/MMBtu is not a realistic or sustainable value to maintain on a long-term basis when considering the normal variation in operation that occurs at all coal-fueled facilities. As noted in the IPM wet FGD document, the 0.04 lb/MMBtu emission rate corresponds to the lowest available SO_2 emission guarantees from wet FGD suppliers. Compliance with a vendor's guarantee value is typically demonstrated during very short term testing conducted at ideal operating conditions. Vendor guarantees do not reflect controlled emission rates that may be achievable on a consistent long-term basis as the unit operation varies from design conditions.

S&L noted that wet FGD control systems, like all large air pollution control systems, are not steady state control systems, and controlled SO_2 emissions will continually fluctuate in response to changing operating parameters. Operating parameters that may affect SO_2 emissions include the fuel sulfur content, boiler load, load changes, flue gas flow rate, and flue gas temperatures, all of which continually change during normal operation of the boiler. Figure 1 shows the hourly emissions data for Spruce Unit 1. Spruce Unit 1 is a 550 MW subbituminous coal-fired boiler equipped with wet limestone FGD. The FGD control system was installed in 1992, and upgraded in 2009. Figure 1 shows the normal fluctuation in controlled hourly SO_2 emissions from Spruce Unit 1, which is typical for all wet FGD control systems.

Figure 1: SO_2 Emission Permit Limits for Recent Wet FGD Projects [Figure not excerpted]

According to S&L, between January 1, 2012 and December 31, 2013, Spruce Unit 1 achieved an average controlled SO_2 emission rate of 0.055 lb/MMBtu (2-year average). During that same time period, the standard deviation in its controlled 30-day average SO_2 emission rate was 0.10 lb/MMBtu, approximately 20% greater than the long-term average, and the controlled SO_2 emission rate achieved at a 95% confidence level was 0.075 lb/MMBtu (0.02 lb/MMBtu above the long-term average). Based on our experience with other wet FGD control systems, fluctuations seen in the controlled SO_2 emission rate at Spruce Unit 1 are typical.

S&L stated that projecting future emissions using the anticipated control system vendor guarantee (i.e., 0.04 lb/MMBtu) as EPA did is overly aggressive and provides no margin for normal operating conditions or long-term operation. A reasonable margin between the vendor guarantee value or design target, and the projected actual long-term achievable emission rate is needed to allow for normal fluctuations in the controlled emissions. In S&L's opinion, an operating margin of at least 0.02 lb/MMBtu between the vendor guarantee and projected long-term emission rate is reasonable. In addition, it would be necessary to contact FGD suppliers to provide bids, on a case-by-case basis, that identify what outlet emission rates would be guaranteed on a 30-day rolling average to determine adequate outlet emission rates for compliance, rather than applying the lowest available emission rate guarantee in all cases.

S&L concluded that EPA's approach to estimating controlled SO_2 emissions is incorrect and based on a misunderstanding of the actual performance and operation of wet FGD technology. By using this approach, EPA is overestimating the tons of SO_2 removed and thus overstating the cost-effectiveness of the retrofit FGD control systems.

[Stamper (0068) p.15] Stamper stated that the EPA assumed SO_2 removal efficiencies of up to 98% control in its wet FGD analyses and up to 95% control in its SDA analyses. However, in no case did EPA assume a controlled wet FGD SO_2 rate of less than 0.04 lb/MMBtu or a controlled SDA SO_2 rate of less than 0.06 lb/MMBtu in its cost effectiveness analyses. EPA's rationale was that these were the lowest emission guarantees and this methodology was consistent with EPA's cost effectiveness calculations for the Oklahoma regional haze FIP. Cost TSD at 16, 21-22.

Stamper stated that the EPA's assumptions limiting the SO_2 removal efficiency based on the guaranteed permitted limits of 0.06 lb/MMBtu for an SDA and 0.04 lb/MMBtu for a wet FGD underestimated the actual SO_2 emission reductions that would likely occur with these SO_2 scrubbers. This is primarily a concern for those EGUs that burn or blend with low sulfur Powder River Basin coal (i.e., Coleto Creek 1, Tolk 171B and 172B, WA Parrish 5, 6, and 7, and Welsh 1, 2, and 3). Further, wet FGD systems can achieve greater than 99% SO_2 removal, and dry scrubbers can achieve greater than 95% SO_2 removal efficiency, as discussed further below.

According to Stamper, wet scrubbers are the most effective SO_2 control technology available. State-of-the-art wet scrubbers can achieve 98-99% removal efficiency. A prime example is the Chiyoda CT-121 FGD. Vendor information for this technology indicates that this scrubber has achieved 98-99% SO_2 removal even with low sulfur coal.[43] For example, the Chiyoda's bubbling jet reactor has consistently achieved >99% SO_2 removal during long-term operation at the Shinko-Kobe power plant in Japan. This facility consists of two 700-MW coal-fired utility boilers. The wet FGD was designed to achieve 0.014 lb SO_2/MMBtu (9 ppmv at 3% oxygen) on an instantaneous basis and has consistently exceeded this level of control while treating gases with inlet SO_2 concentrations of 1.78 lb/MMBtu.[44] This technology has been guaranteed by Chiyoda to achieve 99% SO_2 removal on three coal-fired boilers in Japan.[45]

Stamper stated that the Chiyoda CT-121 FGD has been demonstrated in the U.S. at the University of Illinois's Abbott power plant, Georgia Power's Plant Yates[46], Dayton Power & Light's Killen Unit 2,[47] and Plant Bowen Unit 3.[48] It has been licensed for installation on several additional units in the U.S., including the other three units at Plant Bowen in Georgia, the other units at Dayton Power & Light's Killen plant, Dayton Power & Light's Stuart plant, and AEP's Big Sandy Unit 2, Conesville Unit 4, Cardinal Units 1 and 2, and Kyger Creek, among others.[49] Black & Veatch and Southern Company are both U.S. licensees. Further, this technology also has shown to be very effective in removing fine particulates, oxidized and elemental mercury, and acid gases, and the technology uses less energy compared to traditional wet scrubbers.

Stamper noted that Mitsubishi, a vendor of scrubber systems, reports it has guaranteed SO_2 removal efficiencies up to 99.8 percent, including for coal-fired boilers.[50,51,52]

Stamper stated that Sargent & Lundy has indicated that the lowest achievable SO_2 emission rate with low sulfur Powder River Basin coal for a limestone forced oxidation (LSFO) wet scrubber would be 0.03-0.06 lb/MMBtu.[53]

Stamper stated that these SO_2 removal efficacy claims for wet scrubbers at coal-fired boilers burning lower sulfur coal have been demonstrated in practice. SO_2 emissions data was compiled for 2009 to 2013 to reflect newly operating and recently retrofitted wet FGD systems at EGUs that burn low sulfur coal. The results are in Table 3 below. All of these units burn Powder River Basin coal and have recently been retrofitted with wet FGD systems. As the table below demonstrates, wet FGDs at EGUs burning Powder River Basin coal can achieve much lower SO_2 emission rates than 0.04 lb/MMBtu.

Table 3. Annual Average SO2 Emission Rates at EGUs Equipped with Wet FGDs that Burn Low Sulfur Coal[54]

Plant	Unit	Annual Average SO2 Rate, lb/MMBtu
Iatan	1	0.007
Iatan	2	0.007
Boswell Energy Center	3	0.009
Muscatine	9	0.013
Pleasant Prairie	1	0.021
Pleasant Prairie	2	0.029

Thus, Stamper concluded that the EPA's assumption that a wet FGD could not achieve SO_2 rates lower than 0.04 lb/MMBtu is overly conservative, as demonstrated by the data presented above.

In addition, Stamper noted that recently constructed EGUs that burn Powder River Basin coal and that are equipped with SDAs have achieved lower SO_2 emission rates than the minimum 0.06 lb/MMBtu SO_2 rate assumed by EPA in its cost effectiveness analyses. The Newmont Nevada power plant (aka TS Power Plant), equipped with a dry lime FGD system, has achieved an annual average SO_2 rate of 0.037 lb/MMBtu over 2009 to 2013.[55] The Wygen II is also equipped with a dry lime scrubber and burns low sulfur coal, and is achieving annual average SO_2 rates of 0.047 lb/MMBtu.[56] And the Dry Fork Station which began operation in 2011 and is equipped with a dry lime scrubber is achieving an annual average SO_2 rate of 0.044 lb/MMBtu.[57]

Further, Stamper stated that a circulating dry scrubber can achieve even higher levels of SO_2 removal than an SDA and lower SO_2 emission rates. As discussed elsewhere in this document, EPA should have evaluated circulating dry scrubbers in its analyses of reasonable progress measures for the Texas EGUs.

In summary, Stamper contended that the EPA's assumed level of SO_2 control in its cost effectiveness analyses for SO_2 for wet FGD and SDA systems is likely conservative and does not reflect the full extent of SO_2 emission reductions that can be achieved with these control technologies. That means EPA's cost effectiveness calculations should be lower and the visibility improvements higher for several of the EGUs evaluated by EPA for reasonable progress controls.

Footnotes:
[42] *See*, e.g., Sargent & Lundy, IPM Model – Updates to Cost and Performance for APC Technologies, Dry Sorbent Injection for SO_2 Control Cost Development Methodology, March 2013, at 6.
[43] *See* Black & Veatch vendor brochure on CT-121, (Ex. 14).
[44] Yasuhiko Shimogama, Hirokazu Yasuda, Naohiro Kaji, Fumiaki Tanaka, and David K. Harris, Commercial Experience of the CT-121 FGD Plant for 700 MW Shinko-Kobe Electric Power Plant, Paper No. 27, presented at MEGA Symposium, Air & Waste Management Association, May 19-22, 2003, (Ex. 15).
[45] CT-121 FGD Process – Jet Bubbling Reactor, http://www.bwe.dk/fgd-ct121.html, (Ex. 16).
[46] Emission-control Technologies Continue to Clear the Air, Power, May/June 2002.
[47] *See* Black & Veatch, First Black&Veatch/Chiyoda Wet Flue Gas Desulfurization System in North America

Successfully Goes Operational.
[48] Blankinship, Steve, Go Take a Bath, Power Engineering, October 2008, available at http://pepei.pennnet.com/display_article/342997/6/ARTCL/none/none/1/Go-Take-a-Bath/.
[49] Chiyoda Licenses Its Flue Gas Desulfurization Technology in USA Newly for 5 Coal-Fired Generation Units, Press Release, May 2, 2005; Chiyoda Licenses its Flue Gas Desulfurization Process in USA for Georgia Power Owned 4 FGD Units, January 26, 2005.
[50] Jonas S. Klingspor, Kiyoshi Okazoe, Tetsu Ushiku, and George Munson, High Efficiency Double Contact Flow Scrubber for the U.S. FGD Market, Paper No. 135 presented at MEGA Symposium, Air & Waste Management Association, May 19-22, 2003, p.8, Table 4, (Ex. 17).
[51] Yoshio Nakayama, Tetsu Ushiku, and Takeo Shinoda, Commercial Experience and Actual-Plant-Scale Test Facility of MHI Single Tower FGD, (Ex. 18).
[52] Mitsubishi High SO_2 Removal Experience, (Ex. 19).
[53]*See* White Bluff Station Units 1 and 2 Evaluation of Wet vs Dry FGD Technologies, Rev. 3, October 28, 2008, prepared by Sargent & Lundy at 3-7. (Ex. 20).

Footnotes:
[63] Sargent & Lundy LLC, *IPM Model – Revisions to Cost and Performance for APC Technologies, Wet FGD Cost Development Methodology*, March 2013.

Response: All of the claims in this comment have been previously addressed in confidential expert reports in the Cinergy case[216], including achievable FGD SO_2 removal efficiency and the reliability of vendor guarantees for setting emission limits, based on CEMS data, published works, and deposition testimony of five major scrubber vendors.[217] These reports and SO_2 scrubber vendor depositions conclude that 98% to 99% SO_2 control has been achieved and is routinely achievable. These reports and depositions also conclude that vendor guarantees are a reliable basis for establishing emission limits. We cannot include these expert reports and depositions in our docket, because they are held confidential under a protective court order. However, we do include the testimony of Dr. Phyllis Fox, one of the government expert witnesses, in which she testifies, based on her expert report with Hal Taylor, that the removal efficiency of wet scrubbers can reach 99%. [218] These conclusions were upheld in court rulings in United States v. Cinergy Corp., 618 F. Supp. 2d 942, 947 and 961-962 (S.D. Ind. 2009).

[216] United States and Plaintiff-Intervenors States of New York, New Jersey, and Connecticut, Hoosier Environmental Council, and Ohio Environmental Council, Civil Action No. IP99-1693 C-M/S, United States, et al., v. Cinergy Corp., et al., In the United States District Court for the Southern District of Indiana, Indianapolis Division.
[217] Phyllis Fox and Hal Taylor, Expert Report of Phyllis Fox and Hal W. Taylor. Prepared on Behalf of Plaintiff United States and Plaintiff-Intervenors States of New York, New Jersey, and Connecticut, Hoosier Environmental Council, and Ohio Environmental Council, Civil Action No. IP99-1693 C-M/S, United States, et al., v. Cinergy Corp., et al., In the United States District Court for the Southern District of Indiana, Indianapolis Division, August 29, 2008; Phyllis Fox and Hal Taylor, Expert Rebuttal Report of Phyllis Fox and Hal W. Taylor, Prepared on Behalf of Plaintiff United States and Plaintiff-Intervenors States of New York, New Jersey, and Connecticut, Hoosier Environmental Council, and Ohio Environmental Council, Civil Action No. IP99-1693 C-M/S, United States, et al., v. Cinergy Corp., et al., In the United States District Court for the Southern District of Indiana, Indianapolis Division, October 14, 2008, 2008.
[218] United States and Plaintiff-Intervenors States of New York, New Jersey, and Connecticut, Hoosier Environmental Council, and Ohio Environmental Council, Civil Action No. IP99-1693 C-M/S, United States, et al., v. Cinergy Corp., et al., In the United States District Court for the Southern District of Indiana, Indianapolis Division. Trial Proceedings, Volume 2. Testimony of Dr. Phyllis Fox, beginning on vol. 2-302.

First, this comment argues that a "controlled SO_2 limit of 0.04 lb/MMBtu is not a realistic or sustainable value to maintain on a long term basis when considering the normal variation in operation that occurs at all coal-fired facilities." This is misleading as the proposed limit for retrofits is not "0.04 lb/MMBtu" on an instantaneous basis, as suggested in this comment, but rather is based on a "30-boiler-operating-day" (30-BOD) average.[219] A boiler operating day is any 24-hour period between 12:00 midnight and the following midnight during which any fuel is combusted at any time at the steam generating unit."[220] As explained in our FIP TSD (p. 31) and the proposed rulemaking, days are skipped when the unit is down, as for maintenance. This provides a margin of safety by eliminating spikes that occur at the beginning and end of outages, when the scrubber is not operating.[221] Regardless, all major scrubber vendors guarantee 99% SO_2 control and expect routine performance at this level. This level of control is confirmed under vendor guarantees by making simultaneous measurements of SO_2 at the inlet and outlet of the scrubber.

The emission limit that we have proposed for all wet scrubbed units, 0.04 lb/MMBtu, is based on 98% control, unless the resulting controlled limit fell below an outlet SO_2 level of 0.04 lb/MMBtu, in which case, we would have assumed the percentage control equal to 0.04 lb/MMBtu.[222] All of the calculated 98% control levels, except for Big Brown Unit 1, were lower than 0.04 lb/MMBtu, as shown in the following table. Thus, the limits we propose have built in margin.

Calculation of Wet Scrubber Limits

Unit	Proposed SO_2 Limit (lb/MMBtu)	Baseline (lb/MMBtu)	Control Level (%)	Margin (lb/MMBtu)
Big Brown 1	0.04	0.04	98	0
Big Brown 2	0.04	0.0392	97.91	0.00084
Monticello 1	0.04	0.0388	96.99	0.0012
Monticello 2	0.04	0.0387	96.83	0.0013
Coleto Creek 1	0.04	0.0383	95.65	0.0014

[219] 79 FR 74,822, Table 1; 74,884 (Dec. 16, 2014).
[220] 70 FR 39,172 (July 6, 2005).
[221] 79 FR 74,884 (Dec. 16, 2014).
[222] Cost TSD, p. 21; 79 FR 74,884 (Dec. 16, 2014). The proposed control level was calculated in the wet FGD spreadsheet in cell E13. First, we tested to see if 98% of the uncontrolled SO_2 rate would result in a value less than 0.04 lb/MMBtu. If it did, then a control level was calculated based on a reduction to 0.04. If it didn't, then the control level was set to 98%. The uncontrolled SO_2 rate itself was calculated based on the maximum monthly SO_2 rate from 2009-2014. This was calculated in the "Monthly Emissions" tab of the wet FGD spreadsheet. The maximum monthly value was used to ensure the scrubber was designed to address the dirtiest coal burned in the recent past.

Recent operating experience reported by Hitachi confirms that 99% SO_2 control is achievable.[223] Hitachi has guaranteed many units at 99% SO_2 control efficiency.[224] Hitachi has explained that 99% control on an "instantaneous basis" (not even a rolling average) is routinely achieved in Japan, where rolling averages are not allowed, and has stated that Hitachi is "comfortable with 98%" for PRB coals.[225] See also Stamper comment 0068, pp. 15-17. Alstom has guaranteed units at 99%, concluding the new Trimble County Unit 2 "can reliably achieve a high efficiency. 99.8% SOx removal could be expected."[226] Advatech, a joint venture of URS and Mitsubishi, likewise has built scrubbers guaranteed at 98% to 99%.[227] Advatech reports its highest SO_2 guarantee is 99.8%. Their experience list includes many units in Japan guaranteed at this level,[228] which must be met on an instantaneous basis.

Second, this comment asserts that vendor guarantees do not reflect controlled emission rates that may be achievable on a consistent long-term basis as the unit operation varies from design conditions." A survey of owners of FGD systems found that "[w]ith regard to FGD reliability, in every case except for one SDA system, performance overall met or exceeded owner expectation. Therefore, there is reason to believe that the FGD systems will perform as expected (albeit, with some specific components that may perform more or less reliably than other components.)."[229] Major scrubber vendors have testified in confidential depositions that they expect their scrubbers to meet guarantees, which typically have a built-in vendor margin of safety.

Further, vendors offer "make-right" guarantees that cover the life of the FGD and all operating conditions. Make-right guarantees restore a malfunctioning FGD to its design basis. Regardless, the vendor must protect its reputation. Scrubber vendors have a vested interest in maintaining their market position and customer base. We are not aware of any vendor that would walk away from an FGD that did not perform according to its guarantee (even after the guarantee period has ended).

Third, this comment argues that using the vendor guaranteed level of 0.04 lb/MMBtu is "overly aggressive and provides no margin for normal operating conditions or long-term operation." Variations in scrubber performance due to changes in coal quality, reagent quality, startups, shutdowns, and malfunctions are normally accommodated in permitting by specifying a sufficiently long averaging time, in this case, the 30-day BOD, which is specifically designed to

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223 B.C. Studley and others, Recent Operating Results of the Five New Wet FGD Installations for Ameren Corporation, Available at: http://www.psa.mhps.com/supportingdocs/forbus/hpsa/technical_papers/Recent%20Operating%20Results%20of%20the%20Five%20New%20Wet%20FGD%20Installations%20for%20Ameren%202011.pdf.
224 Hitachi Wet FGD Sample of Recent Installations (showing 99% guarantees at Boswell #3, Coffeen #1,2, Duck Creek #1, Sioux 1,2).
225 E-mail from Joseph Barba, Hitachi, to Phyllis Fox, January 31, 2007.
226 Alstom Responses to Questions, Trimble County Unit 2, October 25, 2004, BV-00000171.
227 Advatech, Double Contact Flow Scrubber, Available at: http://www.advatechllc.com/wp-content/uploads/2013/10/advatech-double-contact-flow-scrubber-brochure.pdf.
228 Advatech, Advanced Flue Gas Desulfurization, 2005.
229 James E. Staudt, Sikander R. Khan, and Manuel J. Oliva, Reliability of Selective Catalytic Reduction (SCR) and Flue Gas Desulfurization (FGD) Systems for High Pollutant Removal Efficiencies on Coal Fired Utility Boilers, MEGA Symposium, 2004, p. 17.

average out spikes. In general, averaging smooths out fluctuations in data.[230] We built further margin into the 0.04 lb/MMBtu limits, which are based on less than 98% control, except at Big Brown Unit 1, as summarized in –the above table. Finally, margin is built into the guarantee by the vendor.

Fourth, this comment attempts to support these claims by presenting seven years of SO_2 emission data for a single facility, Spruce Unit 1. Spruce Unit 1 is a 585-MW tangentially-fired Combustion Engineering boiler, designed to burn PRB coal, which started up in December 1992.[231]

The original SO_2 scrubber, designed for 70% SO_2 control, was started up in 1992 when the boiler came online. The scrubber was upgraded in 2009 by Alstom to achieve 95% SO_2 control at a cost of about $9 million.[232] However, the SO_2 emission limit of 0.04 lb/MMBtu that this comment is critiquing is proposed only for retrofit scrubbers, i.e., new scrubbers on existing boilers, not upgraded scrubbers. Thus, the Spruce data is misleading, as the performance of a scrubber upgrade may not be representative of the performance that can be achieved by a new scrubber retrofit on an existing unit. In fact, we assumed 95% control for our scrubber upgrade analyses, versus 98% control (not to go below 0. 04 lbs/MMBtu) for our scrubber retrofit analyses.

Fifth, the upgraded Spruce Unit 1 scrubber came on line in early 2009, just as the SO_2 allowance market it would have benefited from collapsed, removing the incentive to operate it at its design SO_2 efficiency.[233] As scrubbers are costly to operate (see O&M costs in our Cost TSD), and this unit has very high SO_2 permit limits,[234] CPS Energy has no incentive to operate the upgraded scrubber at its design basis.

The apparent poor performance of Spruce Unit 1 is not due to issues implied in this comment, but rather the lack of any requirement or incentive to do better. The 30-day BOD data demonstrate that in spite of these disincentives, this upgraded scrubber achieved a 30-day BOD emission rate of 0.07 lb/MMBtu, except when the scrubber was offline, from July 16, 2011 to August 26, 2011. The Spruce permit exempts "maintenance, startup, and shutdown periods" from compliance with emission limits.[235] In other words, the boiler can legally continue to

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[230] Thad Godish, Air Quality, Lewis Publishers, 2nd Ed. , 1991, p. 216, Figure 7.1; Richard W. Boubel, Donald L. Fox, Bruce Turner, and Arthur C. Stern, Fundamentals of Air Pollution, Academic Press, 3rd Ed., 1994, pp. 41 - 43.

[231] R. Peltier, J.K. Spruce Power Plant, Unit 1, San Antonio, Texas, POWER, October 15, 2008, Available at: http://www.powermag.com/j-k-spruce-power-plant-unit-1-san-antonio-texas/?pagenum=1.

[232] CPS, Corporate Sustainability Report 2010, p. 57, Available at: https://www.cpsenergy.com/content/dam/corporate/en/Documents/Sustainability_Report_2010.pdf.

[233] C. Hitaj and A. Stocking, Market Efficiency and the U.S. Market for Sulfur Dioxide Allowances, Working Paper 2014-01, Congressional Budget Office, January, 2014. See especially Figure 1. Available at: https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CCAQFjAAahUKEwi1w9HwsJDIAhVIJB4KHRAvB2Y&url=https%3A%2F%2Fwww.cbo.gov%2Fsites%2Fdefault%2Ffiles%2F113th-congress-2013-2014%2Fworkingpaper%2F45044-SO2MarketAnalysis_1.pdf&usg=AFQjCNHYiyaL3lTMimbRvluvI3DVa-T18w&cad=rja.

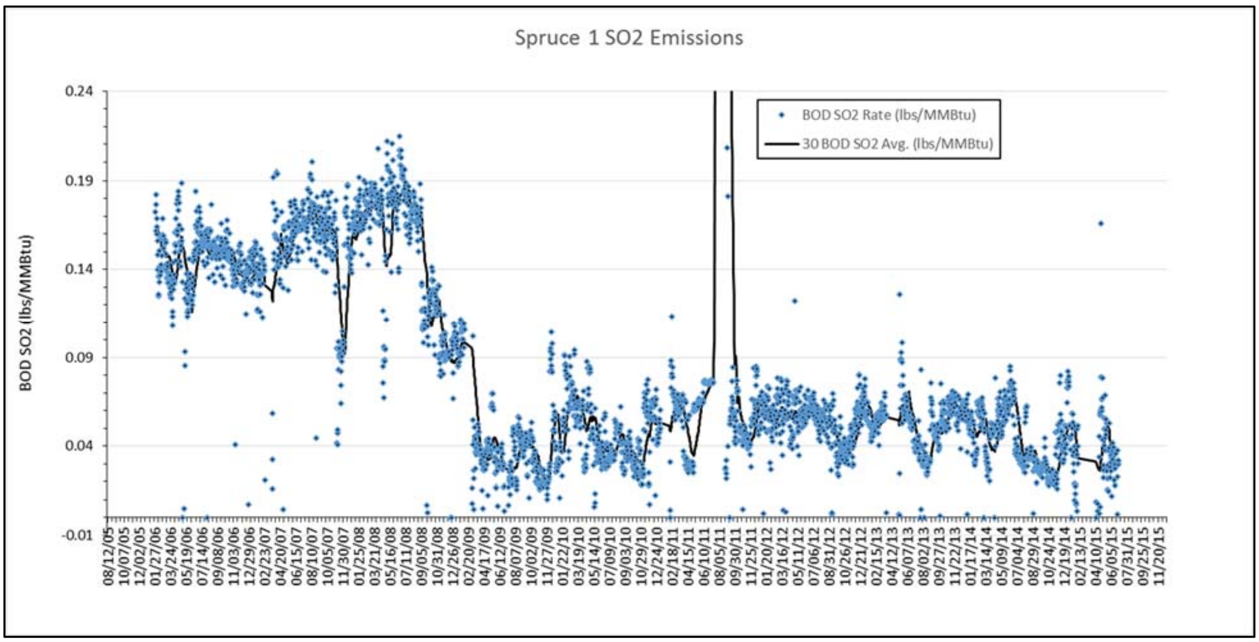
[234] Spruce Unit 1 Permit, Permit Numbers 18426 and PSDTX742M1, Special Conditions, Condition 8.

[235] Spruce Unit 1 Permit, p. 7, Condition 15.

operate while the control equipment is shutdown. The 0.07 lb/MMBtu achieved at Spruce Unit 1 when the scrubber was operating is well within the range of our proposed SO_2 limits for scrubber upgrades.

We are not proposing an SO_2 emission rate of 0.04 lb/MMBtu for any scrubber upgrade, as they may be less efficient than a new retrofit scrubber. Rather, we proposed SO_2 emission rates of 0.06 to 0.60 lb/MMBtu for scrubber upgrades. The 0.04 lb/MMBtu limit that is the subject of this comment was only proposed for new scrubbers on existing boilers or "retrofits".[236] Thus, the performance of Spruce Unit 1 is irrelevant for supporting the arguments made in this comment.

Sixth, we note that this comment visually distorts the performance of Spruce 1 by plotting conventional 30-day moving averages, rather than 30-day BOD averages, as proposed in the rulemaking. Further, the graph is plotted on a fine scale to accentuate fluctuations. We replotted it using a 30-day BOD average and a scale that includes the uncontrolled spike.[237] This analysis is shown in the figure below.



This plot shows that Spruce Unit 1 is achieving a 30-day BOD of 0.07 lb/MMBtu after the upgraded scrubber stabilized, except for the period from July 16, 2011 to August 26, 2011, when the scrubber was off-line, but the boiler continued to operate. This is allowed under Spruce's current permit to operate during "routine maintenance, startup, and shutdown". The EPA recently issued a final rule barring these SSM exemptions in state permits.[238]

Finally, Sargent & Lundy omits that there are units that demonstrate our proposed limits and control efficiencies have been and are being achieved on a routine basis. To demonstrate that the proposed wet scrubber SO_2 emission limits (0.04 lb/MMBtu) are achievable, we reviewed our

[236] 79 FR 74,822, Table 1 (Dec. 16, 2014).

[237] See "Selected BOD SO_2 Averages-3.xlsx," Tab "Spruce 1" in our docket.

[238] http://www.epa.gov/airquality/urbanair/sipstatus/emissions.html

Clean Air Market Database (CAMD) to identify similar coal-fired boilers that have met a a 30 BOD average SO_2 emission rate of 0.04 lb/MMBtu or better continuously for at least 1 year.

First, we downloaded all annual SO_2 data from 2007-2014, inclusive. This annual data was filtered to select only the units that met the following criteria:

- Electric utility only
- Coal burning only
- Avg. annual SO_2 rate < 0.045 lb/MMBtu
- Wet FGD only
- Operating time > 4,800 hours
- 12 months of reported data only
- Retrofit or upgraded scrubber

We next researched the subset of wet FGDs that met these criteria and eliminated units that used lime wet FGD, as it can achieve a higher SO_2 removal efficiency, but is generally more expensive due to the cost of lime. We only retained one lime FGD, Milton Young 1, as it is the only unit in our dataset that fires lignite coal. We found many units coded as using lime FGD in the CAMD database that in fact used limestone FGD. We also eliminated scrubbers installed on newly built units at the time of initial construction. Most of the scrubbers that met these criteria were retrofits, the target of our analysis, but some upgrades were included. We retained these to compare retrofit with upgrade experience.

We adopted this conservative criteria and methodology in order to quickly and easily demonstrate that in fact there are a number of similar units operating wet scrubbers comfortably below our proposed SO_2 emission limit. In so doing, we note there are a number of additional similarly configured units (e.g., Scherer 1) that have demonstrated their ability to operate for extended periods of time below our proposed control efficiency, but do not meet these criteria. We do not advocate that our criteria and methodology are the only way to demonstrate the operational effectiveness of any particular control, scrubbers or otherwise.

We used EIA information to determine the coal type burned at each facility and eliminated all units that did not burn PRB, lignite, or a blend of PRB or lignite with another coal type, which are the predominate fuels burned by the subject Texas plants. We also researched each plant to confirm the scrubber type, scrubber install date, design control efficiency, and permit limits, where available. The resulting list of plants is:

- Iatan Unit 1[239]
- Boswell Energy Center Unit 3[240]

[239] Robert Peltier, Plant of the Year: KCP&L's Iatan 2 Earns POWER's Highest Honor, POWER, August 1, 2011, Available at: http://www.powermag.com/plant-of-the-yearkcpls-iatan-2-earns-powers-highest-honor/.

[240] Retrofitting Boswell Energy Center, Power Engineering, September 1, 2010, Available at: http://www.power-eng.com/articles/print/volume-114/issue-9/Features/retrofitting-boswell-energy-center.html. See also: http://www2.epa.gov/enforcement/minnesota-power-settlement (requiring SO_2 emission rate of no greater than

- James H. Miller Units 1, 2, 3, and 4[241]
- Jeffrey Energy Center Units 1, 2, and 3[242]
- Milton Young Unit B1[243]
- Pleasant Prairie Unit 1 and 2[244]
- Sam Seymore (Fayette) Unit 1, 2,[245]and 3[246]
- Scherer Units 2, 3, and4[247]

We prepared graphs of these units showing the 30-day BOD SO_2 data superimposed on the measured daily data in lb/MMBtu. These graphs are included in our docket in the file "Selected BOD SO_2 Averages-3.xlsx." This file contains tabs corresponding to each of the above units, and a "Read Me" tab that explains our methodology.

0.030 lb/MMBtu at Boswell Units 3 and 4) and Consent Decree at http://www2.epa.gov/sites/production/files/2014-07/documents/minnesotapower-cd.pdf ("Minnesota Power shall continuously operate an FGD device at Boswell Unit 3 such that the unit achieves and maintains a 30-day rolling average emission rate for SO_2 no greater than 0.03 lb/MMBtu." and "No later than May 31, 2016, Minnesota Power shall continuously operate a new FGD device at Boswell Unit 4 such that the Unit achieves and maintains a 30-day rolling average emission rate for SO_2 no greater than 0.03 lb/mmBTU."

241 ADVATECH, Plant Miller – Wet FGD Retrofit Project, Available at: http://www.advatechllc.com/projects/air-quality-control-solutions/acid-gas-control/acid-gas-project-descriptions/southern-company-miller/. Title V Permit at: http://www.jcdh.org/EH/AnR/AnR13.aspx. Consent Decree at: http://www2.epa.gov/enforcement/alabama-power-company-clean-air-act-settlement.

242 Westar Energy Sulfur Dioxide Removal Project on First of Jeffrey Energy Center's Generating Units Fully Operation, August 11, 2008, Available at: http://www.energycentral.com/generationstorage/fossilandbiomass/news/vpr/5341/WESTAR-ENERGY-SULFUR-DIOXIDE-REMOVAL-PROJECT-ON-FIRST-OF-JEFFREY-ENERGY-CENTER-S-GENERATING-UNITS-FULLY-OPERATIONAL; Gail Reitenbach, WATER AWARDE: Jeffrey Energy Center's Constructed Wetland Treatment System, POWER, August 1, 2014, Available at: http://www.powermag.com/jeffrey-energy-centers-constructed-wetland-treatment-system/?pagenum=1; and Westar Energy, Jeffrey Energy Center Wetlands, Available at: https://www.westarenergy.com/jeffrey-energy-center-wetlands.

243 Burns & McDonnell, Milton R. Young Units 1 & 2, 2015, Available at: http://www.burnsmcd.com/Resource_/Project/2234/ProjectPdf/Milton-R-Young-Units-1-amp-2.pdf; MET, Wet FGD, Available at: http://www.met.net/wet-fgd-technologies-lime.aspx.

244 Steven Gebhart and others, Pleasant Prairie Power Plant Air Quality Control Upgrade Project, Pleasant Prairie, Wisconsin, POWER, October 15, 2007, Available at: http://www.powermag.com/pleasant-prairie-power-plant-air-quality-control-upgrade-project-pleasant-prairie-wisconsin/ See also: http://www.pleasantprairieonline.com/services/communitydevelopment/powerplant.asp

245 C. Frazer and others, Fayette Power Project Unit 3 FGD Upgrade: Design and Performance for More Cost-Effective SO_2 Reduction, Mega Symposium, 2010, Available at: http://www.babcock.com/library/documents/br-1845.pdf; LCRA Adds Scrubbers to Clean Sulfur Dioxide from Plant Emissions, August 1, 2011, Available at: http://www.statesman.com/news/news/local/lcra-adds-scrubbers-to-clean-sulfur-dioxide-from-1/nRc8M/.

246 Austin City Council, Audit Report, Fayette Power Project Scrubber Costs, October 3, 2006, Available at: Powerplant Upgrades Test New Technology, ENR Texas & Louisiana, April 18, 2011, Available at: https://austintexas.gov/sites/default/files/files/Auditor/au06113.pdf; http://texas.construction.com/texas_construction_projects/2011/0418_powerplantupgrades.asp; Fayette Power Project, Available at: http://www.lcra.org/energy/electric-power/facilities/fayette-power-project/Documents/fayette_power_project_2013_03_22.pdf.

247 ADVATECH, Plant Scherer – Wet FGD Retrofit Project, Available at: http://www.advatechllc.com/projects/air-quality-control-solutions/acid-gas-control/acid-gas-project-descriptions/southern-company-scherer/; ADVATECH, Double Contact Flow Scrubber, 2011, Available at: http://www.aecomprocesstechnologies.com/wp-content/uploads/2012/03/advatech-dcfs-brochure.pdf

The performance of each scrubber in our data set is summarized in the file, "Selected scrubber retrofit efficiencies.xlsx." The "Efficiencies" tab within this file reports vendor guaranteed control efficiency, achieved control efficiency, and the maximum 30-day BOD, excluding shakedown periods following initial startup of scrubber retrofits, and other items. This information supports our proposed SO_2 limits for both retrofits and upgrades. The 13 retrofit units have guaranteed control efficiencies of 95% to 99%, with eight of them guaranteed at 98% to 99%. These eight units are achieving 98% to 99% SO_2 control, with the exception of Scherer Unit 4, when calculated using our very conservative method explained in the "Read Me" tab.

We note that compliance with the vendor guaranteed SO_2 control efficiency is typically determined by simultaneously measuring scrubber inlet and outlet SO_2 emissions. As CAMD does not report and facilities generally do not measure inlet SO_2 CEMS data, our estimated control efficiencies are based on pre-scrubber retrofit SO_2 and post-scrubber retrofit 30-day BOD data, as explained in the "ReadMe" tab noted above. None of the eight units that are achieving 98% to 99% SO_2 control have permit limits that require operation at this level. However, several have entered into consent decrees that do require control efficiencies approaching these values.

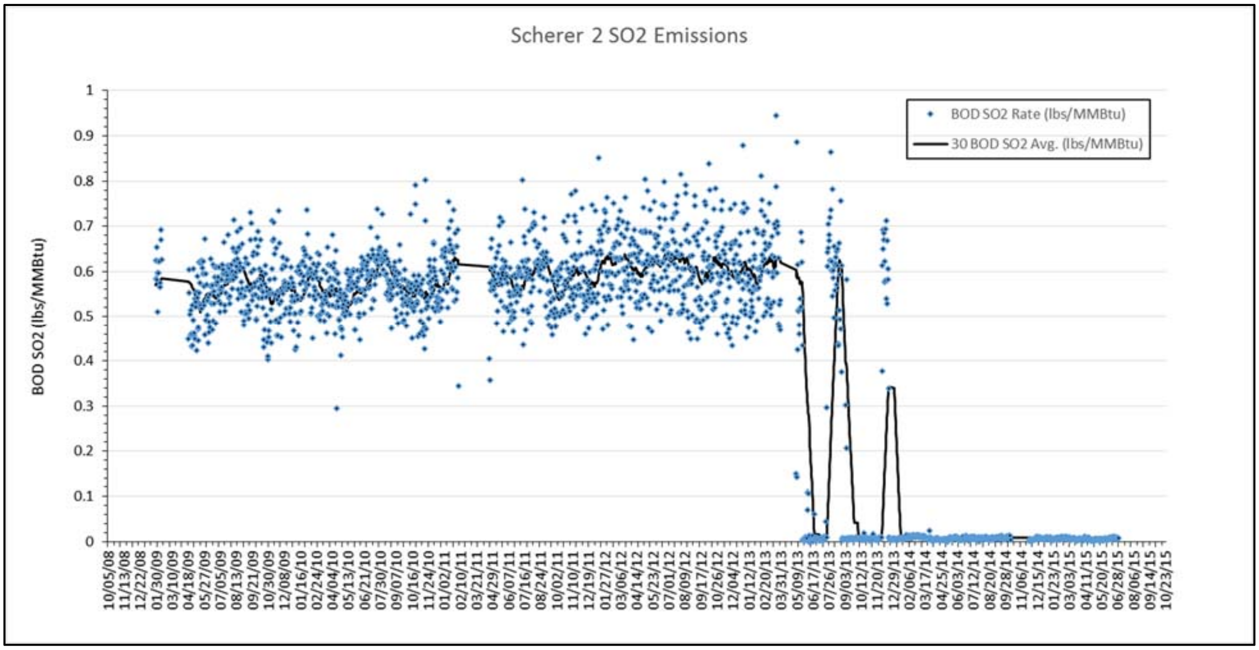
The maximum 30-day BOD, over the period of record when the scrubbers were operating, excluding scrubber "shakedown" periods, for retrofit FGDs designed to achieve 98% to 99% SO_2 control range from 0.02 lb/MMBtu at Iatan Unit 1 to 0.08 lb/MMBtu at Scherer Unit 3. Three of the units have achieved a maximum 30-day BOD equal to or less than our proposed SO_2 emission limit for scrubber retrofits of 0.04 lb/MMBtu:

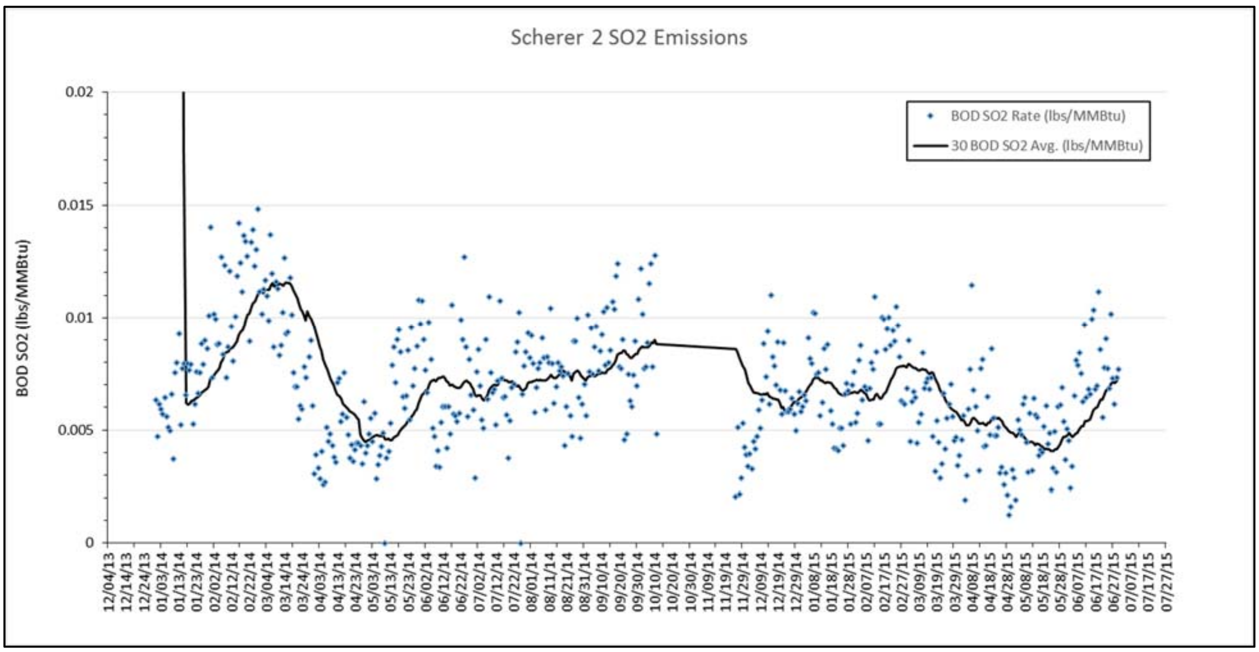
- Scherer Unit 2: 0.01 lb/MMBtu based on 485 data points
- Iatan Unit 1: 0.02 lb/MMBtu based on 2,004 data points
- Boswell Energy Center: 0.03 lb/MMBtu based on 1,881 data points

All of these units burn PRB coal and are operating at these levels without permit limits that require compliance at achieved levels. The best performers are discussed below.

Scherer Unit 2

Plant Scherer consists of four 818 MW, Combustion Engineering boilers that became operational in 1982, 1984, 1987, and 1989. All of the units burn PRB coal. All four units were retrofitted with wet scrubbers that became operational in late 2010 to 2014. All of the units have continuously operated below 0.01 lbs/MMBtu for months at a time. The maximum 30-day BOD at Unit 2, after scrubber shakedown, was 0.01 lb/MMBtu, with the majority of the 30-day BOD data points below this level. The compliant data set includes 423 continuous 30-day BOD data points, between March 2014 and June 2015, all less than or equal to 0.01 lb/MMBtu. See the figures below for Unit 2. The second figure shows the period just after the scrubber became operational, plotted on a finer scale to better display the scrubber's performance:





Scherer Units 1, 3, and 4 display similar levels of control capability.

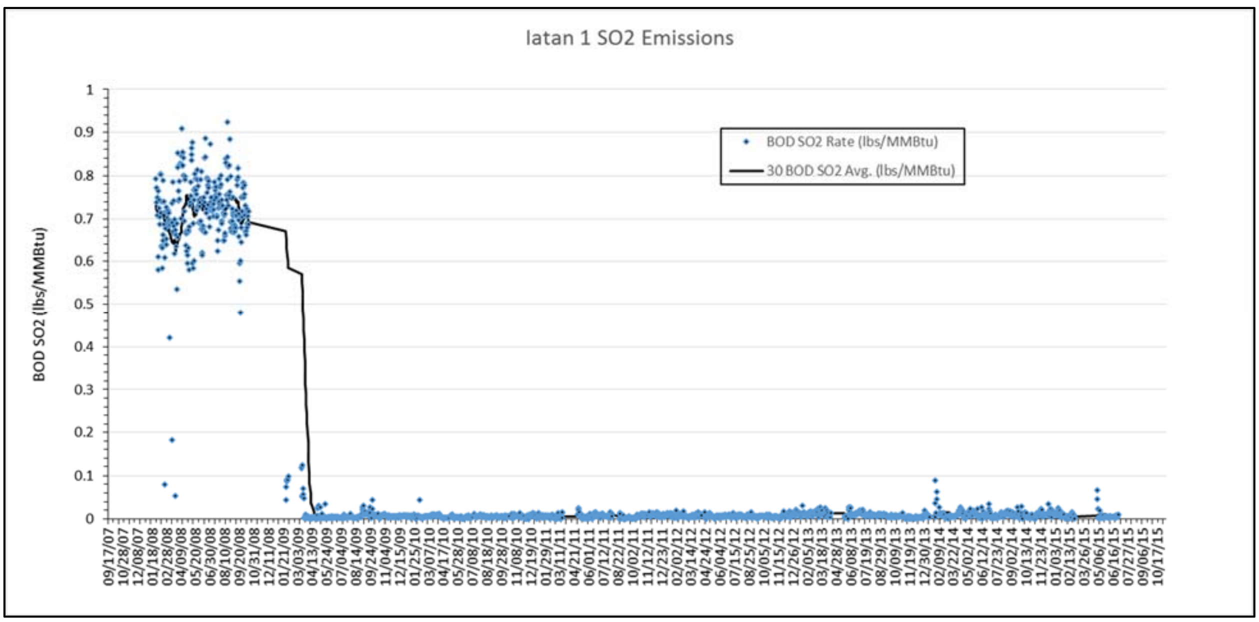
Iatan Unit 1(Retrofit Scrubber)

Iatan Unit 1 is an approximately 700-MW, PRB-fired, Babcock & Wilcox boiler that started up in 1980. This unit was retrofit with a wet scrubber in 2009 at the same time that new Iatan Unit 2 was built. The Iatan Unit 1 scrubber was installed to meet CAIR/CSAPR requirements for SO_2

emissions and as a requirement for the air permit for Iatan 2, under a settlement agreement with the Sierra Club. [248]

The design of the air quality control system for both existing Unit 1 and new Unit 2 was very similar, resulting in similar performance. "The entire post-combustion AQCS [air quality control system] for Iatan 1 is virtually identical to that of the new Iatan 2….The wet FGD systems, using the same size vessel on both units, routinely operate at 99% removal, producing SO_2 levels in the exhaust gas well below the 0.06 lb/MMBtu permit limits. Each vessel is equipped with five recycle pumps but usually runs only three or four, depending on operating conditions." Thus, while the Unit 1 scrubber is a retrofit, its performance is nearly identical to scrubber on new Unit 2.[249]

This is the best performing wet scrubber retrofit in the data set based on 6 years of continuous operation. The maximum 30-day BOD at this unit, after scrubber shakedown, was 0.02 lb/MMBtu, with the majority of the 30-day BOD data points far below this level. The compliant data set includes 2,004 continuous 30-day BOD data points, between April 2009 and June 2015, all less than or equal to 0.02 lb/MMBtu. See the figures below. The second figure shows the period just after the scrubber became operational, plotted on a finer scale to better display the scrubber's performance. This is much better performance than is required by Iatan Unit 1's operating permit, which limits SO_2 emissions to 0.07 lb/MMBtu, based on a conventional 30-day rolling average.[250]



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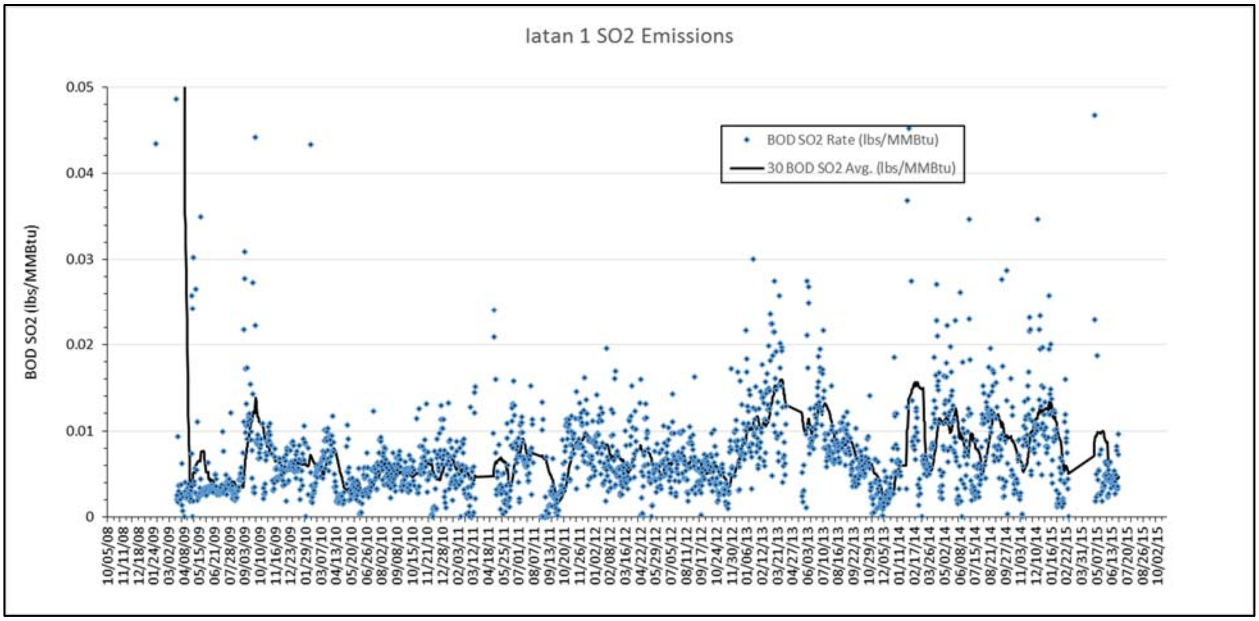
[248] **Empire District Electric Co – '10-Q' for 3/31/12 – R13, "Compliance Plan" and "SO_2 Emissions." Available at:**
http://www.secinfo.com/d11MXs.p1Zm2.1s.htm; State of Kansas, Air Quality State Implementation Plan, Regional Haze, October 26, 2009, Available at: http://www.kdheks.gov/bar/reghaze/KDHERegHaze.pdf.

[249] Robert Peltier, Plant of the Year: KCP&L's Iatan 2 Earns POWER's Highest Honor, POWER, August 1, 2011, Available at: http://www.powermag.com/plant-of-the-yearkcpls-iatan-2-earns-powers-highest-honor/.

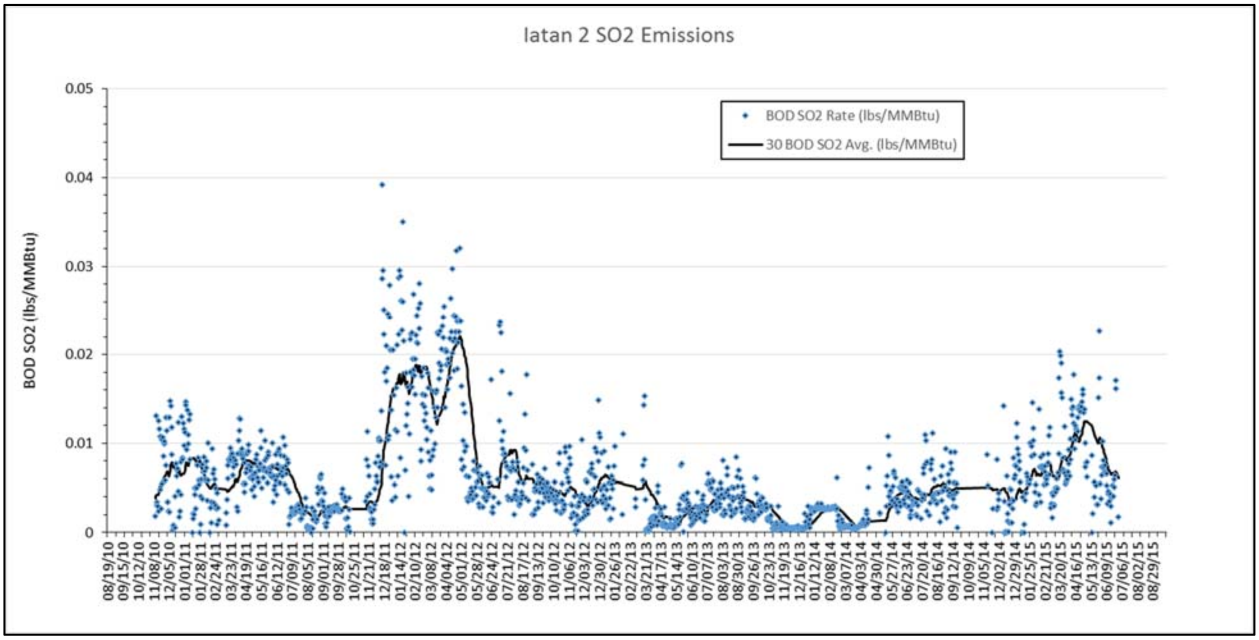
[250] Kansas City Power & Light, Iatan Generating Station, Permit No. 012006-019B.



Of note, the 30-day BOD SO_2 data for Iatan Unit 1 does not include the spikes found at some of the other units we reviewed. Iatan's operating permit does not include any exemptions from permit limits for startups, shutdowns, and malfunctions (SSM), while plants with frequent spikes include this exemption. The Iatan Unit 1 permit limits for all pollutants (except opacity) explicitly "include[ing] periods of start-up, shutdown and malfunction…"[251] Other plants with SSM exemptions in their permits have no obligation to operate their scrubbers during SSM events, resulting in the boiler continuing to run while the scrubber is offline for maintenance, creating spikes that are not related to scrubber performance.

Iatan 2, a new boiler and scrubber, displays a similar level of performance. Because it's scrubber pre-scrubber data is not available:

[251] Iatan Generating Station Permit Number: 012006-019A, July 13, 2007, p. 5, Note to Special Condition 2.E.



As can be seen from the above figures, both units have operated for years at a SO_2 emission rate below 0.01 lbs/MMBtu.

Boswell Energy Center Unit 3 (Retrofit Scrubber)

A wet scrubber was retrofit on existing (Clay) Boswell Energy Center Unit 3[252] in November 2009. It was designed by Hitachi to achieve 99% SO_2 control.[253] The existing permit to operate limits SO_2 emissions to 2.97 lb/MMBtu for a 1-hour average and 0.09 lb/MMBtu on a 30-day rolling average basis.[254] The unit has been operating far below these limits.

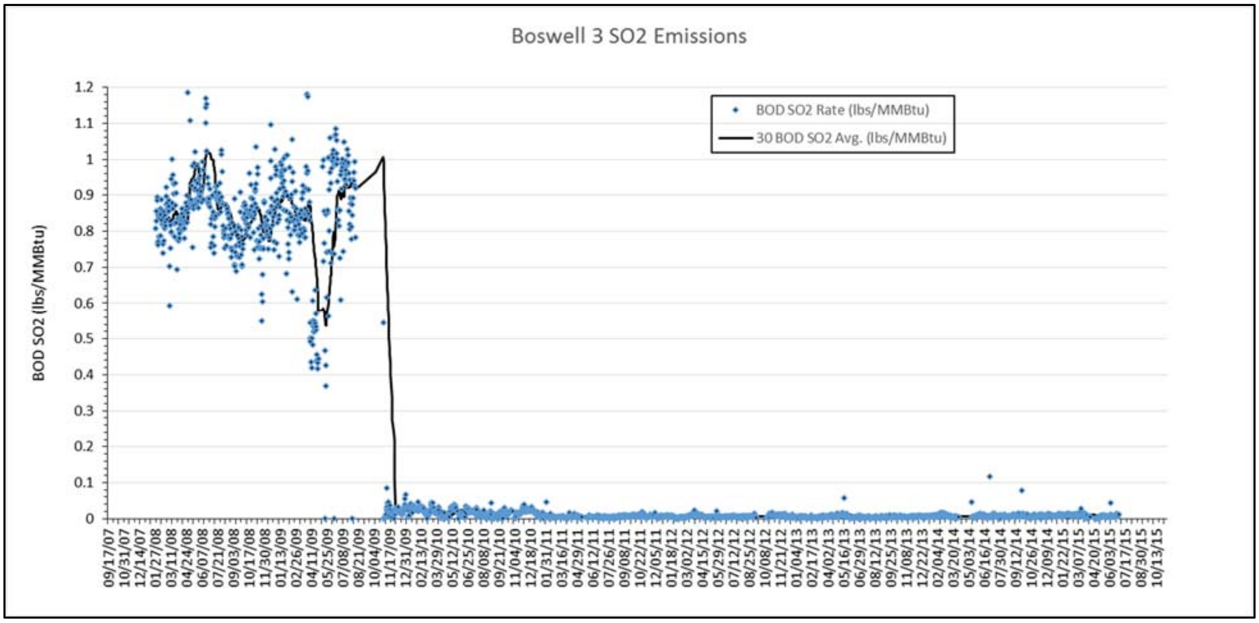
A subsequent 2014 Consent Decree reduced the Boswell SO_2 limit to 0.03 lb/MMBtu on a 30-day rolling average basis, as of the "date of entry" of the Consent Decree, which was filed on July 16, 2014.[255] This limit has been consistently met since stable scrubber operation began in December 2009. This limit reflects the judgment of EPA that a SO_2 limit of 0.03 lb/MMBtu on a 30-day rolling average basis is achievable.

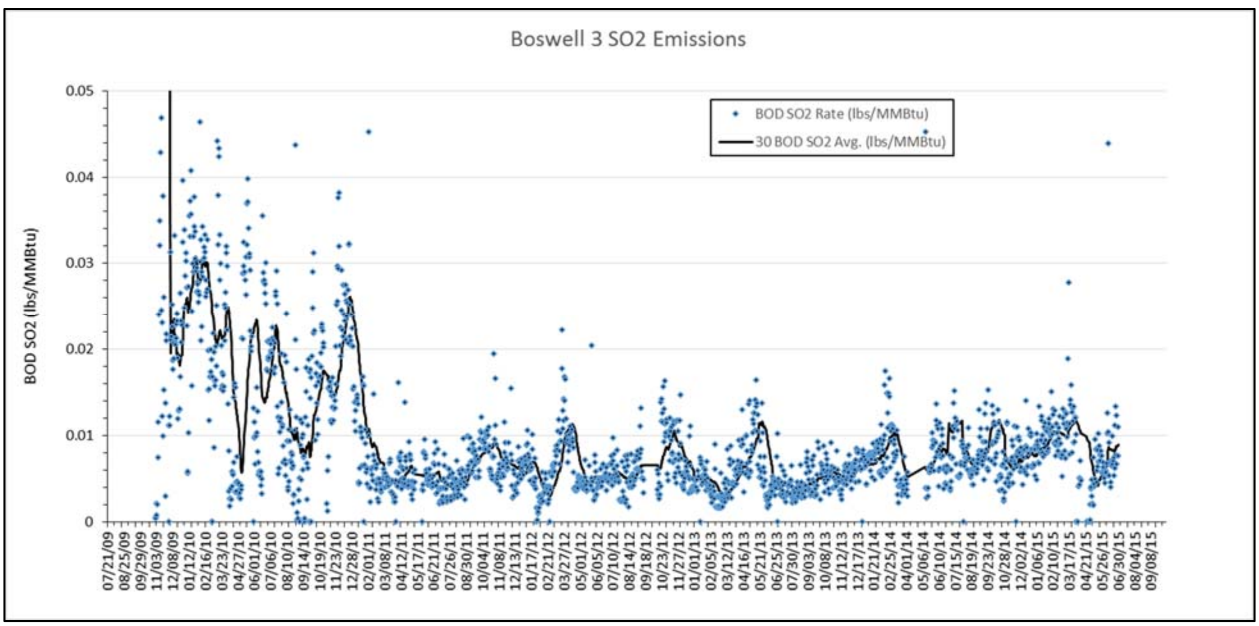
[252] Unit 3 is a 365-MW pulverized dry tangential-fired ABB Combustion Engineering boiler that fires PRB coal and started operating in 1973.
[253] Mitsubishi Hitachi Power Systems, Flue Gas Desulfurization, Available at: http://www.psa.mhps.com/products/environmental_products/fgd/.
[254] Minnesota Power Inc – Boswell Energy Center, Air Permit No. 06100004-007, Major Amendment, June 13, 2013, pdf 14.
[255] Consent Decree at http://www2.epa.gov/sites/production/files/2014-07/documents/minnesotapower-cd.pdf ("Minnesota Power shall continuously operate an FGD device at Boswell Unit 3 such that the unit achieves and maintains a 30-day rolling average emission rate for SO_2 no greater than 0.03 lb/MMBtu." and "No later than May 31, 2016, Minnesota Power shall continuously operate a new FGD device at Boswell Unit 4 such that the Unit achieves and maintains a 30-day rolling average emission rate for SO_2 no greater than 0.03 lb/mmBTU.")

The Consent Decree limit (0.03 lb/MMBtu 30-day rolling average) is much lower than the SO_2 limit proposed for wet FGD retrofits (0.04 lb/MMBtu 30-day BOD average).[256] A 30-day rolling average is more conservative (i.e., harder to meet) than the 30-day BOD average proposed in this rulemaking. Further, 0.03 is lower than 0.04. Thus, the Boswell Energy Center Consent Decree requires an SO_2 emission limit that is more aggressive than any of the limits proposed by EPA to satisfy reasonable progress. This 0.03 lb/MMBtu 30-day rolling average limit is currently being achieved.

The SO_2 CEMS data for Boswell Unit 3 is shown in the figures below. The second figure shows the period just after the scrubber became operational, plotted on a finer scale to better display the scrubber's performance. These figures demonstrate that the proposed 0.04 lb/MMBtu 30-day BOD for retrofit scrubbers under the Texas FIP has been met with a significant margin at this unit for over five years or for 1,881 individual continuous 30-day BOD data points.

[256] 79 FR 74,822 (Dec. 16, 2014).





The cluster of spikes between January and December 2010, which are all less than or equal to 0.03 lb/MMBtu, are characteristic of scrubber shakedowns, during which the plant learns how to operate the scrubber and installation issues are resolved. Thereafter, this scrubber has consistently operated at a 30-day BOD of 0.01 lb/MMBtu, four times lower than required in the proposed Texas FIP.

The SO_2 CEMS data for Boswell Unit 3 for the period December 2009 through June 2015 further indicates that this retrofit scrubber has achieved 99% SO_2 reduction, determined from measured

SO_2 prior to and after scrubber installation. This is consistent with its 99% SO_2 guarantee.[257] The maximum 30-day BOD is 0.03 lb/MMBtu since stable operation of the scrubber started in November 2009. This is less than required for retrofit units under the proposed Texas FIP. The majority of the BOD values are substantially lower than this maximum.

Jeffrey Energy Center (Scrubber Upgrade)

Jeffrey Energy Center consists of three 720 to 750 MW, pulverized coal, dry bottom ABB Combustion Engineering boilers that are permitted to combust either liquid and/or solid fossil fuel. The existing wet scrubbers on Jeffrey Energy Center Units 1-3[258] were rebuilt and upgraded in 2008 to 2009 by Burns & McDonnell to achieve a minimum of 95% SO_2 control. The project included replacing the module internals including mist eliminators; adding forced oxidation; eliminating flue gas bypass; increasing limestone grinding capacity; and adding a gypsum dewatering system. Induced draft fans were upgraded and ductwork was replaced. The existing stack was modified for wet-stack operation.[259]

These units are operating under a Consent Decree[260] that requires that they achieve 97% SO_2 reduction and an SO_2 emission limit of 0.07 lb/MMBtu, both on a 30-day rolling average basis. The operating permit also includes an SO_2 limit of 0.8 lb/MMBtu for each unit, no averaging time specified, and no SSM exemptions. As of January 1, 2014, they also must meet a SO_2 emission limit of 0.15 lb/MMBtu as a 30-day rolling average, excluding periods of startup, shutdown and malfunction under a Regional Haze Agreement between Westar Energy, Inc. and KDHE.[261] They are currently meeting the percent reduction requirement.

Nearly five years of continuous operating data demonstrate that these three units have consistently exceeded their 95% SO_2 removal guarantee, achieving 97% to 98% SO_2 control relative to the original scrubber baseline.

The highest 30-day rolling BOD at these units since the upgraded scrubbers achieved stable operation in 2008 to 2009 is 0.06, 0.05, and 0.09 lb/MMBtu, at Units 1, 2, and 3 respectively.

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[257] The guaranteed SO_2 efficiency is calculated from the scrubber inlet and outlet SO_2 concentrations. The CAMD CEMS data is only for the outlet. Thus, we estimated the control efficiency from the average pre-scrubber and post-scrubber emissions, as explained in the "ReadMe" in the file, "Selected scrubber retrofit efficiencies.xlsx" in our docket

[258] Units 1, 2, and 3 are 720 to 750 MW pulverized coal dry bottom ABB Combustion Engineering boilers that started operations in 1978, 1980, and 1983, respectively. They burn PRB coal and were equipped with 60% efficient Combustion Engineering SO_2 scrubbers on startup.

[259] Burns & McDonnell, Jeffrey Energy Center Units 1, 2 & 3 Upgrade Project, 2015, Available at: http://www.burnsmcd.com/Resource_/Project/1244/ProjectPdf/Jeffrey-Energy-Center-Units-1-2-3-Upgrade-Project.pdf.

[260] Consent Decree, United States of America and State of Kansas v. Westar Energy, Inc., U.S. District Court for the District of Kansas, Civil Action No. 09-CV-2059 JAR/DJW, Lodged with federal court: 75 FR 4,847 (January 15, 2010). Available here: http://www2.epa.gov/enforcement/consent-decree-westar-energy-inc-civil-action-no-09-cv-2059-jardjw.

[261] Kansas Department of Health and Environment (KDHE), Air Emission Source Class I Operating Permit, Jeffrey Energy Center, January 28, 2002, p. 25, Condition 6 and p. 28, Condition 14.

This performance is generally better than the proposed SO_2 BART limits for scrubber upgrades (0.06-0.60 lb/MMBtu).[262]

Startup, Shutdown, and Maintenance Exemptions

Many of the units that we did not specifically discuss, including all of the Miller units, and Scherer units 3 and 4, have large spikes that correspond to periods when the boiler was operating, but the scrubber was off-line. See, for example, "Selected BOD SO_2 Averages-3.xlsx," Tab: Scherer 4, the period 8/15/12 to 9/20/12. These (and other) plants with similar spikes have permits that exempt periods of startup, shutdown, and malfunction (SSM), allowing the boiler to continue to operate when the control equipment is offline.

The Title V Permit for the Scherer units[263] exempts many operating conditions, allowing the control equipment to shutdown while the boilers continue to operate. The Scherer permit limits SO_2 to 95% control on a 30-day rolling average basis, except it allows the boilers to operate without scrubbers during: (1) restarts; (2) periods of startup; (3) periods of shutdown; (4) periods of scheduled and/or preventative maintenance of control technology equipment if such maintenance cannot reasonably be performed during a scheduled outage; (5) periods of malfunction of the EGU or control technology; and (6) during certain testing and research periods. The scrubber on Scherer Unit 2 came on line in January 2014 and has only operated post-shakedown for 485 days. Its performance thus far is spectacular (maximum 30-day BOD = 0.01 lb/MMBtu), indicative of what the other longer-operating Scherer scrubbers could achieve, but for the SSM exemption periods when the scrubbers go offline, and the boilers continue to operate.

The spikes that diminish performance are generally not due to limitations of the scrubbers, but rather the failure of the facility to properly schedule adequate and timely maintenance to limit SO_2 emissions. All scrubbers require periodic maintenance. A facility without SSM exemptions will plan maintenance to avoid scrubber shutdowns during boiler operation, as demonstrated by the performance of Iatan Unit 1, discussed above.

Similarly, the Title V permit for Miller Units 1 - 4[264] limits SO_2 emissions to 1.2 lb/MMBtu (a very high limit, roughly double to its coal sulfur content[265]), with compliance only by stack test. The SO_2 permit condition includes this exception: "The FGD may be placed in bypass mode, provided all SO_2 emissions limitations are met." In other words, it can be turned off at will, as

[262] 79 FR 74,822, Table 1 (Dec. 16, 2014).
[263] Scherer Steam-Electric Generating Plant, Part 70 Operating Permit, Permit Number: 4911-207-0008-V-03-0, May 8, 2012, Condition 3.4.14.
[264] Alabama Power Company, J. H. Miller, Jr. Steam-Electric Generating Plant, Major Source Operating Permit, For Units 1 & 2, p. 16, Condition 2: "The FGD may be placed in bypass mode, provided all SO_2 emissions limitations are met." For Units 3 & 4, p. 23, Condition 2: "The FGD may be placed in bypass mode, provided all SO_2 emissions limitations are met." Permit Available at: http://www.jcdh.org/EH/AnR/AnR13.aspx.
[265] From EIA-923, available here: http://www.eia.gov/electricity/data/eia923/
The 2014 sulfur content ranges from 0.23 to 0.31% and the coal heat content is approx. 17.7 MMBtu/ton. Converting to uncontrolled SO_2: (0.31% sulfur) X (1 ton/17.7 MMBtu) X (2,000 lbs/ton) X (2 molecules SO_2/1 molecule S) X (1/100%) = 0.7 lbs/MMBtu.

long as it burns low sulfur coal. As the typical coal that is burned at this facility contains about 0.7 lb/MMBtu of SO_2, this condition effectively allows the scrubbers to shutdown while the boilers continue to operate. This pattern is seen in the CEMS data for all four of the Miller units, which have similar SSM exemptions. Thus, we do not report the maximum 30-day BOD for any of these units in the "Efficiencies" tab of "Selected scrubber retrofit efficiencies.xlsx" document, as the CEMS data are not representative of scrubber performance.

The scrubbers on Miller Units 3 and 4 additionally have to meet a 30-day rolling average SO_2 control efficiency of 95%, which drops to 90% if coal with more than 1% sulfur is burned, to comply with a consent decree. However, the 30-day rolling average removal efficiency "shall exclude all emissions that occur during any period of malfunction…".[266] Further the Miller scrubbers are designed to achieve 98% SO_2 control, while the permit only requires that they achieve 90% to 95% SO_2 control, depending upon coal quality. The CEMs data includes many spikes when the boiler is operating but the scrubbers were not. Thus, the apparent poor performance of these scrubbers is not due to poor scrubber performance, but the failure of the permit to adequately limit emissions. The data summarized above indicates that similar scrubbers achieve much better performance when there are no SSM exemptions.

Finally, some of the spikes appear to be due to unspecified errors. For instance, in the Miller 1 data, the daily SO_2 average for 6/22/14 is 3.25 lb/MMBtu. This is likely a bad data point, as it is way above the SO_2 baseline from the PRB coal the Miller units have historically burned. Other graphs have similar spikes that exceed the sulfur content of coal quality.

Thus, we disagree with S&L that our proposed scrubber retrofit SO_2 emission limits are not realistic or maintainable on a long-term basis. We agree with Ms. Stamper that it may be possible that many of the scrubber retrofit units can achieve greater control efficiencies than we proposed. Greater control efficiencies would result in a more favorable cost effectiveness (lower $/ton) and more visibility improvement. This is another area in which we strove to be conservative and demonstrate that even with many conservative cost assumptions, our analyses indicate that the scrubber retrofits we proposed are cost effective.

Comment: [Sargent & Lundy (0061) p. 24] S&L reviewed the approach EPA takes in its proposed disapproval of Texas's regional haze SIP and proposed FIP, including EPA's determination of costs for retrofit FGD scrubbers and scrubber upgrades, and EPA's evaluation of annual SO_2 emission reductions. Our analysis identifies several areas where EPA overstates the cost-effectiveness ($/ton of SO_2 removed) of the scrubber upgrades and control technology retrofits that EPA would require in its FIP. As discussed in this analysis, cost-effectiveness is influenced by two variables: the total annualized cost of the upgrades or retrofit controls ($/yr) and the corresponding reduction in annual SO_2 emissions (tons per year "tpy"). EPA's approach does not accurately calculate either variable. In its approach, EPA understated the annualized cost of the control systems and overstated the tons of SO_2 that would be removed by its FIP-imposed scrubber retrofits and upgrades.

Response: For the reasons described in our individual responses to S&L's and Luminant's

[266] Miller Permit, pp. 22-23, Conditions 2 and 3.

specific comments, we disagree that our cost analyses were significantly flawed. We have made some changes in response to these and other comments we have received. We find that the cost effectiveness of the scrubber upgrades is validated and the technical record demonstrates that the controls are very cost effective in comparison to typical SO_2 controls we have approved or required in FIPs. We find that the scrubber and retrofits are cost effective and lie well within a range we have found to be cost effective in previous approvals and other FIPs we have required. The issues raised generally by S&L are addressed more specifically in our responses to other comments.

Comment: Actual visibility changes associated with scrubber upgrades at Limestone will be lower than EPA's projections. [NRG (0078) p. 12]

NRG argued that even the minuscule visibility changes described in EPA's proposal are overstated, as they rely on an assumed emission rate of 0.08 lbs SO_2/MMBtu from each of the Limestone units. As documented in the attached confidential report by Sargent & Lundy, it is not reasonable for EPA to require the units to achieve the proposed 0.08 rate on the basis of a scrubber upgrade. Any visibility improvement attributed to the scrubber upgrade would need to be based on a higher limit that reflects the constraints imposed by the current design and arrangement of the existing scrubbers and expected increases in the sulfur content of the plant's fuel supply, as described in the attached confidential report by Sargent & Lundy.[41] Thus, scrubber improvements at Limestone would achieve far lesser reductions than EPA has estimated, further diminishing the already-imperceptible visibility changes that EPA has modeled in support of the proposed new limits.

Footnote:
[41] Sargent & Lundy LLC, *S&L Comments to EPA Assessment of Limestone FGD Capability* (Apr. 15, 2015) ("Sargent & Lundy Report"), at 9.

Response: The items that NRG summarizes in this comment, and the information provided in its attached Sargent and Lundy (S&L) report, regarding our scrubber upgrade costs are detailed in a separate comment package submitted under the Confidential Business Information (CBI) provisions of 40 C.F.R.§ 2.203(b). Within those CBI comments, S&L also provides its own cost analyses for upgrading NRG's scrubbers. We are unable to respond to many of these summarized scrubber upgrade comments here with any specificity, because doing so would involve citing and discussing in detail items that Luminant has claimed as CBI. Accordingly, many of our responses to the scrubber upgrade comments are contained within a separate document that is not a part of our posted docket, but will be available for review by NRG. The responses to comments that do not contain CBI information are contained within this document. We disagree with NRG's assertion that scrubber upgrades at the Limestone facility are not capable of achieving the SO_2 emission limits we proposed. Our reasoning is detailed within these same CBI response to comments.

Comment: There are significant technical issues with the proposed emissions limits. [EEI (0076) p. 5-7]

EEI stated that the unit specific limits in EPA's proposed FIP also present significant technical concerns and may not be achievable in all cases, or would require more significant operational and engineering challenges than EPA has considered.

According to EEI, for example, EPA is proposing that Southwestern Public Service's Tolk Facility retrofit dry flue gas desulfurization (FGD) equipment in order to meet a proposed sulfur dioxide (SO_2) emissions limitation of 0.06 lbs/MMBtu on a 30-day rolling average. Id. at 74,822. The scrubber retrofits would not be in place by the end of the first planning period in 2018. Further, it also is not clear that the Tolk facility will be able to achieve a SO_2 emissions limitation of 0.06 lbs/MMBtu. The installation of a dry FGD system at the Tolk Facility will stress the already scarce local water resources of western Texas, as dry FGD systems (in contrast to their name) require significant amounts of water in order to run effectively and operate efficiently. The Tolk facility is in an area that already is stressed for water use; adding a dry FGD system will introduce a significant new draw on the water resources near the facility that might not be sustainable. EEI urges that EPA seriously consider the significant technical comments filed by Southwestern Public Service regarding issues and concerns about the impacts of the proposal on its Tolk facility and the surrounding community.

EEI noted that EPA also is requiring that Luminant retrofit several facilities with FGD systems and upgrade other FGD systems in order to meet more stringent SO_2 limits at Big Brown 1-2, Martin Lake 1-3, Monticello 1-3 and Sandow 4 units. Id. Similar to Southwestern Public Service's Tolk facility, the retrofitted equipment cannot be completed within the first planning period. Moreover, the stringent SO_2 limits that EPA is proposing for Luminant's units are neither consistent with "reasonable progress" nor reflective of the state's consideration of several factors, including available technology and costs that are specified in EPA regulations. See 40 C.F.R. § 51.301. Specifically, EPA's proposed emissions rate of 0.04lbs. SO_2/MMBtu for many of Luminant's existing units is as stringent as the lowest achievable emission rate (LAER) for new units, rather than values typically applied to existing units, and is more stringent than Best Available Retrofit Technology (BART) limits that EPA has recently approved for existing EGUs. EEI urges EPA to consider the significant technical comments filed by Luminant regarding issues and concerns about the impacts of the proposal on their facilities.

Response: This comment includes a number of issues raised in more detail elsewhere. Please see our responses to those more specific comments. As to the achievability of a 0.06 lb/MMBtu SO_2 emission limit on a 30-day rolling average by the Tolk dry scrubbers, see our response to similar comments in our previous Oklahoma FIP.[267] In that FIP, we finalized the same emission limit of 0.06 lbs/MMBtu on a 30 BOD average for 6 coal fired units that burned coal that is very similar to Tolk's and were of a similar size and configuration. We justified those limits based on the same SDA technology (although Xcel is free to choose any technology that meets our proposed SO_2 limit), using a combination of industry publications and real world monitoring data. Much of that information is summarized in our response to a comment to that action[268] and in our TSD.

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[267] 76 FR 81728.

[268] Response to Technical Comments for Sections E. through H. of the Federal Register Notice for the Oklahoma Regional Haze and Visibility Transport Federal Implementation Plan, Docket No. EPA-R06-OAR-2010-0190, 12/13/2011. See comment and response beginning on page 91.

Comment: Commenter 0054-54 stated that scrubbers are 99 percent efficient and should have SO_2 limits more stringent than 0.04 to 0.06. The commenter stated that 0.2 for Shadow 4 and 0.6 for San Miguel is unacceptable. The commenter suggested with these changes the annual SO_2 reduction would probably increase to 500,000 tpy which would benefit three states (Texas, Oklahoma, and Arkansas).

[Earthjustice (0067) p.25] Earthjustice et al., stated that Texas underestimated the effectiveness of scrubbers. Texas's analysis assumed that scrubbers would reduce a source's sulfur dioxide pollution by 90%. But as EPA shows, scrubbers can achieve 95%-98% control efficiencies. *Id.* at 74,840. As a result, Texas overestimated the costs and underestimated the visibility benefits of scrubbers.

Response: We agree with the commenters that in some cases, SO_2 scrubbers are capable of a higher control efficiency. For the reasons we have outlined in our responses to specific comments we received on our proposed control level, and the need for the units in question to attain our proposed emission limits on the basis of a 30 day boiler operating average, we believe that our proposed level of control is appropriate.

Comment: EPA Assumed Too High of SO_2 Removal Efficiencies with DSI.
[Stamper (0068) p.17]

Stamper stated that the EPA evaluated DSI at control effectiveness levels of 50%, at 80% for those EGUs equipped with electrostatic precipitators (ESPs), and at 90% for those EGUs equipped with baghouses. FIP TSD at 12. The example Complete Cost Estimate for a DSI System in the Sargent & Lundy IPM DSI Cost Development Methodology does indicate maximum SO_2 removal targets of 80% using milled trona for units with ESPs and 90% using milled trona for units with baghouses.[58] However, the Sargent & Lundy documentation also identifies several potential issues that can affect the SO_2 removal efficiency of DSI, including the particulate control technology (with baghouses achieving higher SO_2 removal efficiencies "by virtue of the filter cake on the bags, which allows for a longer reaction time between the sorbent solids and flue gas"), the temperature of the flue gas, the unit size, and the uncontrolled SO_2 rate.[59] Moreover, the Sargent & Lundy documentation states that, with an ESP, 40% to 50% SO_2 control is typically achieved without an increase in PM emissions, and 70-75% control is typically achieved in a baghouse without an increase in PM emissions.[60]

In fact, Stamper stated that it appears that Sargent & Lundy suggests the use of the higher SO_2 removal efficiencies in projecting the costs for DSI to account for all of the variables that impact the SO_2 removal efficiency of a DSI system, because the sorbent feed rate is the "bulk" of the DSI system costs.[61] However, as stated in the Sargent & Lundy documentation, a coal-fired boiler will not likely achieve 80% to 90% SO_2 removal efficiencies with the use of DSI without an increase in PM emissions. Such an increase in PM emissions would likely trigger new source review permitting requirements and best available control technology (BACT), which would require the replacement of ESPs with baghouses or, for those EGUs with baghouses, upgrades to existing baghouses, to meet BACT. It does not appear that EPA took into account the costs for increased particulate matter control in its evaluation of DSI at 80-90% SO_2 removal efficiencies. Thus, the true cost effectiveness of DSI to achieve 80-90% should be based on higher capital and operational costs.

Stamper stated that the EPA has acknowledged these issues in determining the cost effectiveness of DSI technology to control SO_2 emissions, and has requested further information from the owners of EGUs that have performed DSI testing. Cost TSD at 4-7. In fact, Luminant has found that a very high sorbent injection rate was necessary to achieve "modest" levels of SO_2 removal, and the sorbent injection had negative impacts on plant operation. Cost TSD at 8. As a result, EPA determined that DSI was not a feasible alternative for the Luminant facilities (Big Brown and Monticello). *Id.* Yet, in spite of these unknowns, EPA evaluated DSI at 80-90% SO_2 removal efficiencies which EPA is not sure can be achieved at these units, and EPA also failed to account for the costs of improved PM controls that would likely be necessary under the NSR permit requirements triggered with the increased particulate emissions resulting from use of DSI to achieve 80-90% SO_2 control.

According to Stamper, even the amount of sorbent to be injected to meet 50% SO_2 removal efficiency could cause particulate emission increases and opacity problems at EGUs, especially those with ESPs such as at the Welsh units.[62] Thus, it is questionable whether 50% removal can be achieved without causing other operational problems or increases in PM emissions at EGUs with ESPs.

Stamper stated that the other potential impacts from a DSI system include the impacts on the fly ash handling system, which may need modifications or to be operated more frequently to handle the increased fly ash.[63] While EPA included costs for increases in fly ash disposal (Cost TSD at 8-9), it is not clear that EPA also included costs for upgrades to fly ash handling systems to handle increases in fly ash.

Further, as stated by EPA, Stamper noted that the addition of trona in the fly ash increases the water solubility of the waste, and an upgraded landfill may be required as a result. Cost TSD at 10. Indeed, a recent study of the physical and chemical characteristics of fly ash produced from plants with trona injection found that trona injection increased fly ash solubility, pH, and leachability of anionic elements such as fluoride, sulfate, and chloride, as well as arsenic and selenium.[64] EPA should evaluate this issue further and include the costs for any necessary landfill upgrades in its DSI cost analyses.

According to Stamper, given all of the unknowns with the costs and efficacy of DSI to reduce SO_2 at the unscrubbed Texas EGUs evaluated by EPA, it is imperative that EPA adequately justify its assumptions about the technical feasibility of achieving the assumed 80-90% control efficiency with DSI. It is not clear that DSI could reliably achieve 80-90% removal (or even 50% SO_2 removal) without upgrades to PM controls, fly ash handling, and/or landfills. Without further documentation, EPA should not have evaluated DSI at an SO_2 removal efficiency any higher than 50%.

Footnotes:
[58] Sargent & Lundy, IPM Model – Updates to Cost and Performance for APC Technologies, Dry Sorbent Injection for SO_2 Control Cost Development Methodology, March 2013, at 7. (Ex. 23).

[59] *Id. at* 1-2.
[60] *Id. at* 2.
[61] *Id.* at 2.
[62] Not only can the sorbent injection increase particulate emissions due to increased particulate loading, but sorbent injection can changes the resistivity of the particulate emissions which could alter the ESP's ability to remove particulate emissions. *See* Fischer, Diane and Preston Tempero, Black&Veatch, Early Lessons Learned from Implementation of Dry Sorbent Injection Systems, 2012, at 4 (Ex. 24).
[63] *Id. at* 4.
[64] Jianmin Wang, et. al., Leaching Behavior of Coal Combustion Products and the Environmental Implication in Road Construction, A National University Transportation Center at Missouri University of Science and Technology, NUTC R214, April 2011. (Ex. 68).

Response: We agree with the commenter that we may have assumed DSI control efficiencies that are greater that can actually be achieved. We have seen individual DSI control efficiencies that are in the range we have assumed. However, these high levels of control are highly site specific and depend on conditions (e.g., long duct runs) that may not be present at the units in question. Our assumption of conservatively high control efficiencies maximized the favorability of the DSI cost effectiveness (lower $/ton) and maximized DSI visibility improvement, but we did so mindful that the technical record for our proposal was pointing us to different control options with superior, yet still cost effective control efficiencies. This is another area in which we strove to be conservative and demonstrate that even with many conservative cost assumptions, our analyses indicate that the scrubber retrofits we proposed are more cost effective and a demonstrably more favorable control option than DSI.

Comment: EPA Should Have Evaluated a Circulating Dry Scrubber NID™ Control Option. [Earthjustice (0067) p.38, Stamper (0068) p.19]

Earthjustice et al., and Stamper stated that the EPA should have evaluated the cost effectiveness of a NID™ system at 98% control using the SDA cost module in its evaluation of SO_2 control technologies. Earthjustice noted that Stamper provides analyses of application of the NID™ system for several of the Texas EGUs, demonstrating that it is the most cost-effective option in many instances. Earthjustice et al., and Stamper stated that the EPA should have also conducted an evaluation of circulating dry scrubbers, which can meet SO_2 removal efficiencies of 98% or greater over a wide range of uncontrolled SO_2.

Stamper noted that the EPA evaluated only DSI, SDAs, and wet scrubbers for SO_2 pollution controls. EPA should have also conducted an evaluation of circulating dry scrubbers, which Sargent & Lundy have indicated can meet SO_2 removal efficiencies of 98% or greater over a wide range of uncontrolled SO_2 rates.[65] Sargent & Lundy reported in their August 2010 SDA FGD Cost Development Methodology that the lowest SO_2 emission guarantees for a circulating dry scrubber are 0.04 lb/MMBtu.[66]

Stamper stated that the Alstom Novel Integrated Desulfurization system (NID™), which is based on the J-reactor,[67] has been selected as the most cost effective scrubber option when compared to other technologies in several recent evaluations including Flint Creek (558 MW)[68], Homer City (2 x 660 MW)[69], Indian River (440 MW, operating)70, Brayton Point Unit 3 (630 MW)[71], and Boswell Unit 4 (535 MW).[72] It is also currently in use as a polishing scrubber on three

circulating fluidized bed (CFB) boilers: Seward Units 1 and 2 (2 x 285 MW), Gilbert Unit 3 (300 MW), and Spurlock Unit 4 (300 MW).[73]
Stamper stated that the NID™ system, like the conventional DFGD, integrates a baghouse with the absorber.[74] According to Alstom, some of the benefits of a NID™ system are: low capital investment and maintenance costs, low power consumption, high SO_2 removal and high removal efficiencies of SO3 and hazardous air pollutants.[75] Alstom has installed more than 60 NID™ systems worldwide, and is in the process of installing NID™ systems at three coal-fired power plants in the U.S. which include the Brayton Point Unit 3, Indian River Unit 4, and for two units at Homer City power plant.[76]

Stamper stated that the Southwestern Electric Power Company (SWEPCO) has proposed to install a NID™ system at the Flint Creek Power Plant in Arkansas. Flint Creek is a 528 MW unit that burns low sulfur Powder River Basin coal of 0.8 lb/MMBtu uncontrolled SO_2 rates.[77] After evaluating several SO_2 control systems, SWEPCO selected a NID™ system for SO_2 control for the following benefits of a NID™ system: lowest capital and operation and maintenance costs on a 30-year cumulative present worth basis, lowest water consumption, lowest auxiliary power usage, lowest reagent usage, smallest footprint, best for mercury reduction with activated carbon injection, best for SO3 removal, and best for future National Pollution Discharge Elimination System (NPDES) permit compliance.[78]

Stamper noted that, in comments submitted by several conservation organizations on EPA's proposed Montana regional haze FIP, extensive analysis and documentation was provided to show that the annual costs of a NID™ circulating dry scrubber system would be about 1-2% lower than the annual costs of an SDA.[79] Thus, the SDA IPM cost module provides a conservative estimate of the costs of a NID™ system, but should be used with an assumed 98% SO_2 removal efficiency.

Stamper stated that not only is a NID™ circulating dry scrubber less costly than an SDA and as efficient as a wet scrubber for SO_2 removal, but there are numerous other benefits to a circulating dry scrubber system like a NID™ system as previously stated. Those include smaller footprint, easier installation, integrated baghouse for improved control of particulate emissions (especially fine particulate) and numerous other pollutants including mercury and SO3, low power consumption, lowest reagent use, and lower water use.[80]

Footnotes:

[65] *See*, e.g., Sargent & Lundy, IPM Model – Updates to Cost and Performance for APC Technologies, SDA FGD Cost Development Methodology, Final March 2013, at 1 (Ex. 25).

[66] Id.

[67] Lawrence Gatton, Alstom Power, Next Generation NID for PC Market, Coal-Gen, August 17-19, 2011. (Ex. 26).

[68] *See* February 8, 2012 Direct Testimony of Christian T. Beam on behalf of Southwestern Electric Power Company, In the Matter of Southwestern Electric Power Company's Petition for a Declaratory Order Finding that Installation of Environmental Controls at the Flint Creek Power Plant is in the Public Interest, Before the Arkansas Public Utilities Commission, Docket 12-008-U (Ex. 29).

[69] *See* "Alstom to supply NID™ emission control system for the Homer City Generating Station," 4/13/12 Alstom press release, available at http://www.alstom.com/press-centre/2012/4/alstom-to-supply-nidtm-emission-control-system-for-the-homer-city-generating-station/.

[70] Id.

[71] Id.

[72] *See* "Alstom emission control system to cut environmental footprint of Minnesota Power's largest power plant,"

available at http://www.alstom.com/press-centre/2013/8/alstom-emission-control-system-to-cut-environmental-footprint-of-minnesota-powers-largest-power-plant/

[73] Black & Veatch, LG&E/KU – Mill Creek Station, Phase II Air Quality Control Study, Air Quality Control Validation Report, March 4, 2011, Revision D – Issued for Project Use, p. 5-16 (Ex. 27).

[74] *See* Alstom Brochure, NID™ Flue Gas Desulfurization System for the Power Industry at 3 (Ex. 28).

[75] *Id. at* 4.

[76] *See* "Alstom to supply NID™ emission control system for the Homer City Generating Station," 4/13/12 Alstom press release, available at http://www.alstom.com/press-centre/2012/4/alstom-to-supply-nidtm-emission-control-system-for-the-homer-city-generating-station/.

[77] *See* February 8, 2012 Direct Testimony of Christian T. Beam on behalf of Southwestern Electric Power Company, In the Matter of Southwestern Electric Power Company's Petition for a Declaratory Order Finding that Installation of Environmental Controls at the Flint Creek Power Plant is in the Public Interest, Before the Arkansas Public Utilities Commission, Docket 12-008-U, at 5, 18. (Ex. 29).

[78] *Id. at* 19-21.

[79] *See* Technical Support Document to Comments of Conservation Organizations, Proposed Montana Regional Haze FIP – June 15, 2012, at 59-65 (Ex. 30). *See also* Sargent & Lundy, White Bluff Station Units 1 and 2, Evaluation of Wet vs. Dry FGD Technologies, Prepared for Entergy Arkansas, Inc., Rev. 3, October 28, 2008 (Ex. 20); Sargent & Lundy, Big Sandy Plant Unit 2, Order-of-Magnitude FGD Cost Estimate, Volume 1 – Summary Report, September 29, 2010 (Ex. 31).

[80] *See*, e.g., Alstom Brochure, NID™ Flue Gas Desulfurization System for the Power Industry at 3 (Ex. 28). *See also* February 8, 2012 Direct Testimony of Christian T. Beam on behalf of Southwestern Electric Power Company, In the Matter of Southwestern Electric Power Company's Petition for a Declaratory Order Finding that Installation of Environmental Controls at the Flint Creek Power Plant is in the Public Interest, Before the Arkansas Public Utilities Commission, Docket 12-008-U, at 5, 18. (Ex. 29).

Response: We agree that the Alstom NID circulating dry scrubber is a promising SO_2 control option. We reviewed the NID in our preliminary work but ultimately decided not to evaluate it as a reasonable progress control because we had no relevant operating data and no method to estimate costs. This comment cites only to vendor literature and fails to provide any cost or operating data similar to what we analyzed in response to other comments to validate the ability of the wet FGD to meet our proposed SO_2 emission limits.

The comment cites to proposed NIDs at Flint Creek (2016[269]), Homer City 1 & 2 (2016), Indian River Unit 4 (2011), Brayton Point Unit 3 (2013), and (Clay) Boswell Unit 4 (2016). We researched each one of these facilities and learned that only Indian River Unit 4 and Brayton Point Unit 3 are currently operating.

We download the SO_2 CEMS data for these two facilities from CAMD, computed 30-day BOD averages, achieved SO_2 control efficiencies, and determined the maximum 30-day BODs. This analysis is present in our final docket.[270] Neither of these units is performing at the level of a wet FGD – 98% SO_2 control or 0.04 lb/MMBtu.

Indian River Unit 4 has achieved only 86% SO_2 removal based on a design level of 96%, rather than our target of 98% using wet FGD.[271] The maximum 30-day BOD is 0.94 lb/MMBtu and the

[269] Parenthetical dates are projected or actual startup dates, as reported in the McIlvaine Utility Tracking System or in CAMD.

[270] See "Selected NID BOD SO_2 Averages.xlsx."

[271] Burns & McDonnell, Indian River Unit 4, http://www.burnsmcd.com/Resource_/Project/1302/ProjectPdf/Indian-River-Unit-4.pdf.

lowest 30-day BOD, representing its best performance, is 0.07 lb/MMBtu. Brayton Point Unit 3 has achieved 94% SO_2 removal and the maximum 30-day BOD is 0.16 lb/MMBtu. Brayton Point Unit 3 is scheduled for shutdown in 2017.[272] Further, these facilities are not similar to the Texas units as they burn bituminous coal with higher sulfur contents than most of the units in the Texas FIP.[273]

Thus, the limited available SO_2 CEMs data for these two NIDs indicate that they are not yet achieving the same performance as a conventional wet FGD or the dry FGD that we evaluated for Tolk. However, this technology is promising, and we will continue to monitor NID performance for consideration in the next round of SIPs, when the technology has more relevant operating history.

The other NIDs cited in this comment are "polishing" scrubbers on circulating fluidized bed boilers, which are not similar boiler types. Further, none of them burn PRB coal. Seward burns high sulfur waste coal; Gilbert Unit 3 burns high sulfur bituminous coal; and Spurlock Unit 4 burns high sulfur bituminous coal and switchgrass.[274]

Finally, we note that as NID technology is theoretically capable of achieving the same SO_2 control efficiency as the wet FGD scrubber retrofits that we evaluated, the facilities in question are free to choose NID or any other technology to satisfy their emission limits. Thus, if the NID is as claimed in this comment — low capital investment and maintenance costs, low power consumption, and high removal of hazardous pollutants for about the same cost— plant owners will select the NID over wet FGD. Thus, including NID in our evaluation would not have changed our proposed SO_2 emission limits for any facility except potentially Tolk.

In the case of Tolk, a NID scrubber could theoretically yield a lower SO_2 emission limit for a similar cost and thus would potentially be more cost effective than a dry FGD. However, as we note above, we do not have any relevant SO_2 CEMS data for a similar facility, i.e., SO_2 emission data for a pulverized coal fired boiler burning low sulfur PRB coal, to demonstrate that a higher control efficiency than the 95% we proposed assuming SDA is achievable using NID at Tolk. The only available CEMs data so far demonstrates that the SDA is able to achieve lower SO_2 emissions than the NID. Thus, we have no basis for proposing a NID at Tolk.

Comment: EPA's Assumed 95% Control with Scrubber Upgrades is Reasonable, and the Control Level Could Be Higher for Some EGUs. [Stamper (0068) p. 35]

Stamper stated that the EPA assigned a "presumptive scrubber upgrade target" of 95% SO_2 control. Cost TSD at 28. Given that wet scrubbers can achieve 98-99% SO_2 control, a

[272] Dorothy Davis Ballard, Brayton Point Coal-Fired Power Plant Confirmed for Shut Dow by 2017, Power, January 29, 2014, http://www.pennenergy.com/articles/pennenergy/2014/01/brayton-point-coal-fired-power-plant-confirmed-for-shut-down-by-2017.html.

[273] http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=8&ved=0CFEQFjAHahUKEwifqrrXvc_HAhWFjw0KHQL9Cc8&url=http%3A%2F%2Fpennwell.websds.net%2F2013%2Fbangkok%2Fpga%2Fpapers%2FT2S4O1-paper.pdf&ei=GkXiVZ-1GoWfNoL6p_gM&usg=AFQjCNFWrXl39kOm6Ya_4YnvwtYZItZDOQ&cad=rja

[274] http://www.ekpc.coop/pressreleases/2009%20press%20releases/2009-04-01_Spurlock4_commercial_start.pdf

presumptive 95% control target for the EGUs with existing wet scrubbers is more than reasonable.

First, Stamper stated that it must be noted that EPA's proposed SO_2 emission limits are based on 95% control assuming all of the sulfur in the coal is emitted as SO_2. As discussed above, 2-5% of the sulfur in the coal typically falls out in the bottom ash of a coal-fired boiler. Thus, EPA's proposed SO_2 emission limits reflect somewhat less than 95% control.

Second, Stamper stated that the with all of the available options to improve SO_2 removal with physical and/or operational changes to the existing wet scrubbers at the Texas EGUs evaluated by EPA for scrubber upgrades, 95% control or better should be achievable. Indeed, the technology used in modern wet FGD systems that can achieve 98%-99% control can be incorporated into older wet FGD systems.[135] Many of the improvements in state-of-the-art wet FGDs are based on improving the liquid-to-gas contact and residence time, and thus adding wall rings and/or scrubber trays and new designs of spray headers that ensure more complete contact with the flue gas[136] can be often be readily incorporated into existing wet FGD systems. Further, chemical additives can be added to the scrubber slurry to enhance SO_2 removal. Older generation mist eliminators can be replaced with modern mist eliminator designs that more effectively wash the mist eliminators and prevent solids deposition, which ultimately makes the wet scrubber work more efficiently.[137] Further, existing wet FGDs can be converted to the limestone forced oxidation system that is currently the most common system for wet FGDs.[138] Thus, the technology of today's wet FGD systems can in many cases be incorporated into older scrubbers to raise SO_2 removal efficiencies to the control levels expected with a new FGD system.

Stamper suggested, for example, the wet FGD scrubber at Unit 3 of the Fayette Power plant was upgraded to achieve an emission limit that was reflective of 95.5% SO_2 removal without any scrubber bypass while burning 1% sulfur Powder River Basin coal[139]. The original wet scrubber was designed to achieve 90% control with up to 20% bypass, while burning high sulfur lignite coal.[140] Prior to the upgrade, the unit was achieving approximately 81% to 84% SO_2 removal.[14]1 To meet an SO_2 limit reflective of 95.5% control and no bypass, it was decided that the most cost effective solution for Fayette Power Unit 3 was to install one tray in each FGD absorber, increase the number of spray nozzles for each spray level, replace the original turning veins, and convert the chimney to wet stack operation.[142] The performance testing results of the upgraded wet scrubber greatly exceeded the 95.5% SO_2 removal efficiency target, achieving on average 99.2% SO_2 removal efficiency (based on scrubber inlet and scrubber outlet testing).[143]

Stamper noted that Babcock Power provided evaluations of two sets of upgrades to the Mill Creek Unit 1, 2, and 4 wet FGD systems (which Unit 3 would be routed to): 1) to enable the wet FGD to achieve 96% SO_2 removal efficiency and 2) to achieve 98% SO_2 removal efficiency[144]. It was first determined that Units 1 and 2 FGD scrubbers could achieve a maximum of 88% SO_2 removal and the Unit 3 scrubber could be expected to achieve a maximum of 91% SO_2 removal without modifications.[145] It was next determined that these three scrubbers could achieve 96% SO_2 removal efficiency with changes to spray nozzles, the addition of wall baffles, removing existing spargers, an increase in recycle pump capacity to handle an increase in liquid-to-gas ratio, and installation of agitators and oxidation air lancers on reactor tanks.[146] Last, it was determined that these scrubbers could achieve 98% SO_2 removal with additional modifications.

In general, Stamper noted that those modifications included changes in spacing of spray levels, changes in the types of spray level nozzles, changes in the angles of spray nozzles, increasing number of spray nozzles, staggering of spray header layout, adding wall baffles, along with increasing the liquid-to-gas ratio and recycle pump capacity and other modifications.[147] Babcock Power predicted SO_2 removal efficiencies in excess of 98% with these modifications.[148] It was estimated that the wet FGD upgrades to achieve 96% removal would cost $10.5 to $14 million per unit, and upgrades to achieve 98+% removal would cost $20 to $33 million per unit.[149] This reflects a range of installation costs of $32/kW to $75/kW. Ultimately, it appears that the owners of the Mill Creek units are opting to install new scrubbers at Units 1 and 2 and just upgrade the Unit 3 scrubber.[150]

For all of these reasons, Stamper concluded that the EPA's presumption that those EGUs with existing scrubbers can meet 95% SO_2 removal with scrubber upgrades is a reasonable assumption.

Footnotes:
[135] Moretti, Albert L., State-of-the-Art Upgrades to Existing Wet FGD Systems to Improve SO_2 Removal, Reduce Operating Costs and Improve Reliability, Presented to Power-Gen Europe, Cologne, Germany, June 3-5, 2014, at 1-2 (Ex. 45).
[136] *Id. at* 5-6.
[137] *Id. at* 6-7.
[138] *Id. at* 7-8.
[139] Frazer, C., A. Jayaprakash, S.M. Katzberger, Y.J. Lee, B.R. Tielsch, Fayette Power Project Unit 3 FGD Upgrade: Design and Performance for More Cost-Effective SO_2 Reduction, presented to EPRI Power Plant Air Pollutant Control Mega Symposium, August 30 – September 2, 2010, Baltimore, MD, at 1 (Ex. 46).
[140] Id.
[141] *Id. at* 2.
[142] *Id. at* 3.
[143] *Id. at* 6.
[144] *See* February 2011, Babcock Power, LG&E Services Company Contract No. 501654, Mill Creek FGD Performance Upgrade Study, Assess the feasibility of upgrading the Mill Creek Units 1 & 2 FGD's and upgrading the existing Mill Cree 4 FGD and utilizing it for Mill Creek Unit 3 (Ex. 47).
[145] *Id. at* 2.
[146] *Id. at* 3-6.
[147] *Id. at* 6-10.
[148] *Id. at* 11.
[149] *Id. at* 6 and 10.
[150] *See* https://lge-ku.com/our-company/community/neighbor-neighbor/mill-creek-generating-station.

Response: We agree with the commenter that it may be possible, with the exception of San Miguel, that many of the scrubber upgrade units can achieve greater control efficiencies than we proposed. Greater control efficiencies would result in a more favorable cost effectiveness (lower $/ton) and more visibility improvement. This is another area in which we strove to be conservative and demonstrate that even with many conservative cost assumptions, our analyses indicate that the scrubber upgrades we proposed are very cost effective.

11.e. Use of IPM cost algorithms

Comment: [Sargent & Lundy (0061) p. ES-2] For the proposed retrofit FGD control systems, S&L reviewed the Technical Support Document (TSD) developed by EPA to support the proposed FIP, as well as EPA's reliance on its IPM model to estimate the capital costs, cost-effectiveness, and controlled SO_2 emissions associated with the proposed control technologies. Our review identified several areas where EPA's analysis is inconsistent with its own guidance and deviates from the approach taken in previous reasonable progress evaluations. EPA's approach does not provide an accurate representation of the actual costs that would be incurred by Luminant to install and operate the retrofit FGD control systems, and does not provide an accurate accounting of the SO_2 emission reductions achievable with the controls. The following items were identified by S&L as significant flaws in EPA's approach to establishing the control technology costs and achievable emission rates proposed in the FIP.

1. S&L stated that EPA failed to follow its own guidelines and the cost estimating methodology described in the Office of Air Quality Planning and Standards (OAQPS) Control Cost Manual to develop capital costs for the retrofit technologies:

- Although EPA claims that it relied on the methods and principals contained within the Control Cost Manual in developing its individual control technology cost estimates for the FGD retrofit units, in fact, EPA relied on the IPM cost algorithms to calculate capital costs. The IPM cost algorithms, which were developed by S&L for EPA, do not provide unit-level cost estimates. Moreover, reliance on the IPM cost algorithms is inconsistent with the Regional Haze cost impact assessment guidelines in 40 CFR Part 51 Appendix W ("Guidelines for BART Determinations Under the Regional Haze Rule"), which EPA claims to rely on for its FIP.

2. S&L stated that, by relying on the IPM cost algorithms, EPA did not adequately evaluate and account for the total capital investment associated with retrofitting FGD technology at the Luminant units. The IPM cost modules were developed to provide generic order-of-magnitude costs for various air quality control technologies that can be applied to the electric power generating industry on a system-wide basis and can significantly underestimate capital costs on a unit-specific basis due to the following limitations:

- The IPM model does not account for site-specific location constraints or variation in operating parameters such as flue gas temperature, which is applicable at Big Brown and Monticello, both of which would impact the retrofit costs of FGD at these stations.
- The IPM cost algorithms do not address regional labor productivity, taking into account project location, local workforce characteristics, local unemployment and labor availability, project complexity, local climate, and working conditions.
- The IPM cost modules only include costs for "minor physical and chemical wastewater treatment." Future regulatory standards proposed by EPA will likely require more significant waste water treatment than assumed by IPM.
- Indirect capital costs included in the IPM cost modules do not account for all project-related indirect costs a facility would incur to install a retrofit control and do not include all indirect capital costs allowed by the Control Cost Manual such as project contingency.

- EPA excluded Owner's Costs and AFUDC from its estimates. However, Owner's Costs and AFUDC are real costs that the owner will incur and should be included in EPA's estimate of total capital investment.

Response: This comment is a summary of detailed comments presented elsewhere. Please see our responses to those comments.

Comment: EPA's approach to evaluating cost-effectiveness of retrofit proposed FGDs - EPA's flawed reliance on the IPM cost algorithms [Sargent & Lundy (0061) p. 14]

S&L reviewed the Technical Support Document (TSD) developed by EPA in support of its proposed FIP as well as EPA's use of the IPM model to develop capital costs and cost effectiveness estimates for the proposed retrofit FGD control technology. Our review identified several areas where EPA deviated from its approach in previous regional haze evaluations. In addition, S&L reviewed EPA's use of the IPM model and cost algorithms used by EPA to estimate capital costs and cost-effectiveness of the retrofit FGD controls. EPA's analysis is in conflict with its own guidelines, and is inconsistent with the approach EPA took to develop capital costs in other regional haze evaluations.

According to S&L, in its proposal, EPA claims that it "relied on the methods and principals contained within the EPA Air Pollution Control Cost Manual (the Control Cost Manual)[31] in developing cost estimates for the individual units that EPA is targeting in this proposal.

The cost estimating procedure described in the Control Cost Manual consists of five steps:

(1) obtaining the facility parameters and regulatory options for a given facility;
(2) roughing out the control system design;
(3) sizing the control system components;
(4) estimating the cost of these individual components; and
(5) estimating the costs (capital and annual) of the entire system.[32]

S&L stated that the Control Cost Manual describes the equipment and other direct costs that are typically included in an estimate of the Total Capital Investment (TCI) required to install a given control technology. The Manual defines TCI to include all costs required to purchase equipment needed for the control system (purchased equipment cost), the costs of labor and materials for installing that equipment (direct installation costs), costs for site preparation and buildings, and certain other costs (indirect installation costs).[33] TCI also includes costs for working capital and off-site facilities. [34] Direct installation costs include costs for foundations and supports, erecting and handling the equipment, electrical work, piping, insulation, and painting. Indirect installation costs include costs such as engineering costs; construction and field expenses (i.e., cost for construction supervisory personnel, office personnel, rental of temporary offices, etc.); contractor fees (for construction and engineering firms involved in the project); start-up and performance test costs (to get the control system running and to verify that it meets performance guarantees); and contingencies.[35]

S&L stated that the manual includes specific chapters for a number of air pollution control systems. Each chapter includes a process description, sizing or design procedures, procedures for estimating capital and annual O&M costs, and cost estimating example problems.[36] However, the Control Cost Manual states that it "does not directly address the controls needed to control air pollution at electrical generating units (EGUs) because of the differences in accounting for utility sources."[37] In fact, the Manual specifically states that for certain control systems (e.g., specifically SCR reactors and FGD units) it deviates from its standard approach of providing study level costs and, instead, provides a description of the factors that influence TCI for the analyst to consider.[38] The Manual takes this approach because "the control in question is either so large or so site-specific in design that suppliers design, fabricate, and construct each control according to the specific needs of the facility." [39]

According to S&L, although EPA claims in its proposal that it relied on the methods and principals contained within Control Cost Manual in developing its individual control technology cost estimates, in the supporting Cost TSD EPA stated that "[i]n order to estimate the costs for DSI, SDA scrubbers, and wet FGD scrubbers, we programmed the DSI, SDA, and wet FGD cost algorithms, as employed in version 5.13 for our IPM model."[40]

S&L stated that the IPM model and the Control Cost Manual provide two entirely different approaches to calculating control system capital costs. IPM is described by EPA as a multi-regional, dynamic, deterministic linear programming model used by EPA to analyze system-wide impacts of air emissions policies on the U.S. electric power sector in the 48 contiguous states and the District of Columbia.[41] The model has been used by EPA to analyze impacts associated with proposed regulatory programs such as the Clean Air Interstate Rule (CAIR) and Mercury and Air Toxics Standard (MATS). The primary purpose of the model is to provide forecasts of least-cost capacity expansion, electricity dispatch and emission control strategies for meeting energy demand and environmental, transmission, dispatch and reliability constraints. The model includes cost modules for various air quality control technologies, and, as previously discussed, S&L developed the cost algorithms used in the IPM model to estimate costs associated with DSI, SDA, and wet FGD control systems.[42] The IPM model is not referred to in either the Control Cost Manual or the BART Guidelines as an acceptable tool to develop site specific estimates.

S&L stated that the cost algorithms in the IPM model were developed based on a statistical evaluation of cost data available from various industry publications, and do not take into consideration site-specific cost or constructability issues.[43] The cost modules are intended to provide "typical" retrofit costs for a unit located within 500 feet of sea level.[44] The cost modules provide a capital, engineering, and construction cost (CECC) subtotal, which includes the purchased equipment costs, installation costs, and certain indirect capital costs (e.g., engineering and construction management, labor adjustment, and contractor profit and fees). Additional costs and financing expenditures, including Owner's home office costs and AFUDC, are included, as applicable, to calculate the Total Project Cost (TPC) or TCI.

According to S&L, the primary purpose of the IPM cost modules is to provide generic order-of-magnitude costs for various air quality control technologies that can be applied to the electric power generating industry on a system-wide basis, not on an individual unit basis. By necessity, the cost algorithms were designed to require minimal site-specific information available from publicly available sources. Inputs to the IPM DSI, SDA, and WFGD capital cost algorithms are limited to gross unit size (MW), fuel type, unit heat input or heat rate, and an SO_2 removal efficiency. In addition, a subjective retrofit factor can be applied for control technologies installed on existing units.

S&L noted, because of the limited number of site-specific inputs, the IPM cost algorithms provide order-of-magnitude control system cost estimates, but do not provide case-by-case project-specific cost estimates meeting the requirements of the BART Guidelines, nor do the IPM equations incorporate the cost estimating methodology described in the Control Cost Manual.

S&L concluded that EPA's use of IPM is thus not an appropriate choice for the unit-specific analysis it claims to be conducting in its proposal. By relying on the IPM cost modules to calculate DSI, SDA, and WFGD costs, EPA did not adequately evaluate and account for potential project-specific site constraints or balance-of-plant (BOP) costs that Luminant would incur to install and successfully operate the FGD control systems EPA is proposing. In addition, using the IPM cost algorithms to calculate FGD control system capital costs is inconsistent with the case-by-case BART cost analysis described in the BART Guidelines for at least two reasons.[45] First, the IPM model does not account for unit-specific design and operating parameters that can affect control system design and costs. Second, the IPM cost equations do not take into consideration site-specific conditions that could affect the BOP costs that a facility would incur to install and operate the control system.

<u>Footnotes:</u>
[31] Technical Support Document for the Cost of Controls Calculations for the Texas Regional Haze Federal Implementation Plan, "Cost TSD", Section 2, page 2.
[32] Control Cost Manual, Section 1, Chapter 2, page 2-23.
[33] *Id. at* page 2-5.
[34] *Id*.
[35] *Id.*
[36] Control Cost Manual, Section 1, Chapter 1, page 1-5.
[37] Control Cost Manual, Section 1, Chapter 1, page 1-3,
[38] *Control Cost Manual*, page 2-27.
[39] *Id.*
[40] Cost TSD, Section 2, page 3.
[41] *See*, EPA website: www.epa.gov/airmarkt/progsregs/epa-ipm/
[42] *See*, e.g., IPM Model- Updates to Cost and Performance for APC Technologies Wet FGD Cost Development Methodology, Sargent & Lundy LLC, March 2013 ("IPM-Wet FGD Cost Methodology")
[43] IPM-Wet FGD Cost Methodology, pg. 1
[44] *Id*., at pg. 2.
[45] S&L does not endorse EPA's use of the BART Guidelines for its analysis for Texas's reasonable progress SIP submission, but is merely pointing out the internal inconsistencies in how EPA conducted its analysis—claiming at times to follow the BART Guidelines, while at times ignoring them.

Response: S&L accuses us of not following our Control Cost Manual. On the contrary, as we stated in our Cost TSD, we "relied on the methods and principals contained within the EPA Air Pollution Control Cost Manual (the Cost Control Manual, or Manual)…" Our Cost TSD goes on to explain that by this, it means the general costing methodology, namely the use of the overnight costing method.[275] We did not assert that we followed the five-step cost estimating procedure cited in this comment. This five step procedure is simply a way of organizing the cost. The same information can be organized in different, equally legitimate ways. Further, this organizational method is not required under the BART Guidelines. In fact, the BART Guidelines themselves are not required, as we are not conducting a BART determination, but rather a reasonable progress analysis.

The BART Guidelines state: "In order to maintain and improve consistency, cost estimates should be based on the OAQPS Control Cost Manual, where possible."[276] This statement is footnoted to indicate: "You should include documentation for any additional information you used for cost calculations, including any information supplied by vendors that affects your assumptions regarding purchased equipment costs, equipment life, replacement of major components, and any other element of the calculation that differs from the *Control Cost Manual*." The Cost TSD and the Section 114 information satisfy this requirement.

The five-step general cost estimating procedure cited in this comment is not a rigid method that must be used to determine costs, but rather just a general costing procedure. The specific steps vary with the control technology, which can be ascertained by inspecting subsequent technology chapters in the Control Cost Manual. See, for example, the chapter on SCR, which does not follow this five step procedure.

Regardless, the Control Cost Manual does not include any method for estimating the costs of any of the SO_2 control methods evaluated in this action. In fact, the Table of Contents of the Control Cost Manual indicates that the chapter on "Wet and Dry Scrubbers for SO_2," two of the three controls EPA costed, is a "planned chapter." This chapter was never developed.[277] The Table of Contents does not even include a section on DSI, because DSI was not widely used when the Control Cost Manual was last updated in 2002. Thus, it is not possible to use the Control Cost Manual to cost DSI and dry and wet scrubbers, except through the overnight cost methodology and the other general principles contained therein. As a consequence, faced with having to perform cost analysis on applicable control technology, we elected to use the only publically available current SO_2 costing models, the cost models developed by S&L for use in our IPM.

This is similar to the strategy the states themselves employed in the development of their own SIPs. For instance, as explained in the Texas SIP[278]:

> The TCEQ used the control strategy analysis completed by the CENRAP as the starting point for the analysis of additional controls. The CENRAP analysis used the EPA AirControlNET tool to develop cost per ton estimates for the relevant pollutants. The TCEQ reviewed this information and made changes based on

[275] Cost TSD, p. 2.
[276] 70 FR 39166.
[277] Control Cost Manual, Table of Contents, Section 5.2, Chapter 2, footnote 2.
[278] Revisions To The State Implementation Plan (SIP), Concerning Regional Haze, Texas Commission On Environmental Quality, P.O. Box 13087, Austin, Texas 78711-3087, Project No. 2007-016-SIP-NR, Adopted, February 25, 2009 (Texas Regional Haze SIP). Page 10-4.

> knowledge of the particular facilities and agency experience with implementing ozone control strategies. The analysis focused on moderate cost controls for sources that were likely to contribute to visibility impairment at Class I areas.

And further:[279]

> CENRAP used the latest revised version of the EPA AirControlNET model (Alpine 2007) to analyze potential add-on control device strategies. AirControlNET is a control technology analysis tool developed to support the EPA in analyses of air pollution policies and regulations. The tool provides data on emission sources, potential pollution control measures and emission reductions, and the costs of implementing those controls. Every available SO_2 and NOX control strategy in AirControlNET was run against the electric generating units (EGUs) and non-EGU point source inventories to develop a master list of available incremental control strategies for the entire CENRAP 36 kilometer domain.

The CENRAP states, including Texas, used the results of the AirControlNET model to estimate the costs of the same types of controls as we did, and like us, used the results to inform their decisions of whether controls were warranted for specific units. Texas summarized the results of that effort for selected facilities in Tables 6 and 7 of Appendix 10-1 of its Regional Haze SIP. We have not maintained the AirControlNET model for a number of years and it was not available to use in the development of our proposal.

Thus, the only relevant portion of the Control Cost Manual to our present work is the general methodology chapter, Chapter 2: Cost Estimation: Concepts and Methodology. We did adopt the Control Cost Manual general cost methodology, the overnight method, as we did in all of our previous FIPs. As explained in the Cost TSD, we modified the IPM cost models to use the overnight cost method by removing AFUDC and owners costs and to additionally calculate cost effectiveness, rather than just total capital and O&M costs.

This comment asserts that the IPM model is not cited in either the CCM or the BART Guidelines as evidence that it is not "an acceptable tool to develop site specific costs." These models were developed by Sargent & Lundy, under contract to EPA.[280] They were first published in 2010,[281] after the last Control Cost Manual modification (2002) and after the BART Guidelines were published in 2004.[282] Thus, it is illogical to expect the IPM cost algorithms to be cited in either the Control Cost Manual or the BART Guidelines. Regardless, the absence of a specific cite to a

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[279] Texas Regional Haze SIP. Page 10-7.

[280] Section 5. Emission Control Technologies, Explaining: "EPA Base Case v.4.10 includes a major update of emission control technology assumptions. For this base case EPA contracted with engineering firm Sargent and Lundy to perform a complete bottom-up engineering reassessment of the cost and performance assumptions for sulfur dioxide (SO_2) and nitrogen oxides (NOX) emission controls."
Available at: http://www.epa.gov/airmarkets/documents/ipm/Chapter5.pdf.

[281] See Chapter 5 at http://www.epa.gov/airmarkets/programs/ipm/BaseCasev410.html.

[282] 40 CFR Part 51: Regional Haze Regulations and Guidelines for Best Available Retrofit Technology (BART) Determinations; Proposed Rule, 69 FR 25,184 (May 5, 2004).

model in the Control Cost Manual is not evidence that the model is not acceptable. We have discretion to select the best tool for the job.

We have used IPM cost models to estimate BART costs in other similar rulemakings including our Arizona Regional Haze Federal Implementation Plans[283] the Wyoming Regional Haze Federal Implementation Plan,[284] and to supplement our analysis in the Oklahoma Federal Implementation Plan.[285] As explained in the Arizona rulemaking: "EPA's Clean Air Markets Division contracted with engineering firm Sargent and Lundy to perform a complete bottom-up engineering reassessment of the cost and performance assumptions for SO_2 and nitrogen oxides NOx emission controls."[286]

This comment also confuses "the IPM model" and the cost models that are inputs to the IPM model. The comment asserts that the IPM model and the Control Cost Manual provide two entirely different approaches to calculating control system capital costs. In supporting this argument, it states: "IPM is described by EPA as a multi-regional, dynamic, deterministic linear programming model used by EPA to analyze system-wide impacts of air emissions policies on the U.S. electric power sector in the 48 contiguous states and the District of Columbia." This is an accurate description of "IPM model", but not of the cost models that generate input to the IPM.[287] The models used to generate these cost inputs are not "multi-regional, dynamic, deterministic linear programming models" but rather conventional costing models that use the same general methods set out in the Control Cost Manual to estimate total capital and O&M costs based on various design parameters. We only used the control technology cost models, not the IPM model itself.

Accuracy of IPM Cost Algorithms for Site-Specific Costs Estimates

This comment argues that the IPM model only provides "…"typical" retrofit costs for a unit located within 500 feet of sea level" and "generic order-of-magnitude costs," implying they are not acceptable for unit-specific cost estimates for the individual plants included in this rulemaking. However, this comment contradicts itself, by first stating the IPM model provides typical retrofit costs for a "unit" and then asserting it doesn't project "unit" costs. We believe these cost models are adequate for projecting unit-level control costs for the purpose of conducting the type of cost-benefit analysis we have done in our proposal. For instance, S&L's own documentation for the wet FGD cost model states the following:

> The 2004 to 2006 industry cost estimates for wet FGD units from the "Analysis of MOG and LADCO's FGD and SCR Capacity and Cost Assumptions in the Evaluation of Proposed EGU 1 and EGU 2 Emission Controls" prepared for Midwest Ozone Group (MOG) were used by Sargent & Lundy LLC (S&L) to develop the wet FGD cost model. In addition, S&L included data from "Current

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283 77 FR 42852 (July 20, 2012).

284 Memorandum from Jim Staudt to Dough Grano, EPA, Re: Review of Estimated Compliance Costs for Wyoming Electricity Generating Units (EGUs) – Revision of Previous Memo, February 7, 2013, EPA-R08-OAR-2012-0026-0086_Feb 7 2013 .

285 76 FR 81728 (December 28, 2011).

286 77 FR 42852 (July 20, 2012)

287 http://www.epa.gov/airmarkets/programs/ipm/index.html.

> Capital Cost and Cost-effectiveness of Power Plant Emissions Control Technologies" prepared by J. E. Cichanowicz for the Utility Air Regulatory Group (UARG) in 2010. The cost increases reported from 2007 to 2008 by G. W. Sharp in "Update: What's That Scrubber Going to Cost?" published in Power Magazine, March 2009 were also considered. The published data was significantly augmented by the S&L in-house database of recent wet FGD projects. Cost data from the various sources showed similar trends versus generating capacity. Escalation based on the CEPI was deemed acceptable. All data sources were combined so as to provide a representative wet FGD cost basis. The data was converted to 2012 dollars based on the Chemical Engineering Plant Index (CEPI) data. Additional proprietary S&L in-house data from 2007 to 2012 were included to confirm the index validity. Finally, the cost estimation tool was benchmarked against recent wet FGD projects to confirm the applicability to the current market conditions.

As discussed above, S&L used real world cost data to construct its cost algorithms and confirm its validity. These cost models have been updated and maintained since their introduction in 2010 and have been continuously used by EPA since that time. These control costs are based on databases of actual control project costs and account for project specifics such as unit size, coal type, gross heat rate, retrofit factor, and require unit specific inputs such as reagent cost, waste disposal cost, auxiliary power cost, labor cost, gross load, and emission information. We believe that the IPM cost models provide sufficiently accurate, study-level, unit-specific costs for regulatory cost analysis such as required for BACT, BART, and reasonable progress.

Case-by-Case Analyses

This comment argues that the use of IPM algorithms is "inconsistent with the case-by-case BART cost analysis described in the BART Guidelines" because: (1) it does not account for unit-specific design and operating parameters and (2) it does not consider site-specific conditions that could affect balance of plant costs.

First, we did not conduct a BART analysis—our cost analyses were conducted under the reasonable progress and long-term strategy provisions of the Regional Haze Rule. We looked to our BART Guidelines for assistance in certain aspects of our analysis:[288]"We are therefore relying on our BART Guidelines for assistance in interpreting those reasonable progress factors, as applicable." Many aspects of a BART analysis are not applicable. Also, this comment redefines "case-by-case" as used in "case-by-case BART". BART means "an emission limitation based on the degree of reduction achievable through the application of the best system of continuous emission reduction for each pollutant which is emitted by . . . [a BART-eligible source]. The emission limitation must be established, on a case-by-case basis, taking into consideration the technology available, the costs of compliance, the energy and non-air quality environmental impacts of compliance, any pollution control equipment in use or in existence at the source, the remaining useful life of the source, and the degree of improvement in visibility…."[289] In this context, case-by-case refers to each pollutant at each emission unit. We

[288] FIP TSD page 6.
[289] 70 FR 39163.

applied the IPM cost models for SO_2 at each emission unit using unit-specific inputs. Thus, the "case-by-case" requirement of the definition of BART is satisfied.

Second, we accounted for "unit-specific design and operating parameters" by using unit- and site-specific data as we discussed in our COST TSD.[290] Every input parameter to our DSI, SDA and wet FGD was presented and discussed. In many instances, the sensitivity of the cost model to particular inputs was also reviewed. For certain key parameters such as trona, lime and limestone costs, we presented information that documented our selections. We requested site-specific information from each facility in our Clean Air Action Section 114 Information Requests. Further, we invited feedback from the affected facilities as to the selection of these input parameters, but received little response.

Accuracy of IPM Cost Estimates

This comment asserts that the IPM cost models provide only "order of magnitude" control cost estimates. However, as the Control Cost Manual explains, the sole input required for making an "order of magnitude" estimate is "the control system's capacity (often measured by the maximum volumetric flow rate of the gas passing through the system)."[291] Such an estimate, for example, could be obtained from the cost reported in dollars per megawatt ($/MW) or dollars per million BTUs fired ($/MMBtu), metrics that are widely reported in the literature. A quick look at the many inputs to the IPM cost models[292] demonstrates that they provide more accurate estimates than "order of magnitude." The Control Cost Manual indicates that "the costs and estimating methodology in this Manual are directed toward the "study" estimate with a nominal accuracy of +/-30% percent."[293] This is the long-standing rule of thumb for cost estimate accuracy used by the EPA for regulatory cost effectiveness analyses.[294]

Site-Specific Inputs

This comment also argues: "the cost algorithms were designed to require minimal site-specific information available from publicly available sources. Inputs….are limited to gross unit size (MW), fuel types, unit heat input or heat rate, and an SO_2 removal efficiency. In addition, a subjective retrofit factor can be applied for control technologies installed on existing units." Comment --, p. 16.

This list of site-specific inputs is incomplete as we note above. The SO_2 cost models also include other site-specific inputs including: type of coal, coal factor, lime rate, waste rate, auxiliary power, makeup water rate, reagent cost, waste disposal cost, auxiliary power cost, makeup water cost, operating labor rate, elevation, interest rate, equipment lifetime, and DSI reagent, among others. See site-specific input values highlighted in yellow in the Cost TSD,

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290 See discussion beginning in Section 2, where we present our cost analyses methodology and in Sections 3, 4, and 5, where we go over every input value.
291 Control Cost Manual, p. 2-3.
292 See Cost TSD, Sections 3, 4, and 5 and Tables 6 (DSI), 6 (SDA), and 10 (WFGD).
293 Control Cost Manual, p. 2-3.
294 EPA, New Source Review Workshop Manual, Draft, October 1990, p. B.35.

Table 2 (DSI inputs), Table 6 (SDA inputs), and Table 10 (Wet FGD inputs). This large number of site-specific inputs is a clear demonstration that these cost models provide more accurate estimates than "order-of-magnitude,"[295] which only require a single parameter as the input. We specifically solicited comments on the inputs we used to our cost analyses. We received few comments objecting to our inputs and we have addressed these in our responses to other comments.

Lastly, we have enough confidence in the basic methodology behind the S&L cost algorithms that in our recent proposal for updating the SCR chapter of the Control Cost Manual,[296] we presented an example costing methodology that is based on the IPM S&L SCR algorithms, which were developed using a similar methodology to the wet FGD, SDA, and DSI cost algorithms discussed herein For the reasons we describe above, we disagree with S&L that our modifications to and use of the cost algorithms it has supplied us are inappropriate for use in regional haze control cost analysis.

Comment: Site-specific conditions affecting FGD retrofit costs
[Sargent & Lundy (0061) p. 17]

As described in the report prepared for Luminant, S&L stated that the IPM cost algorithms generate order-of-magnitude costs for a typical control system installation project; however, the IPM cost modules are not set-up to account for site-specific retrofit challenges and unique BOP impacts, design conditions that vary from the standard conditions used as the basis of the cost algorithms, and regional impacts on labor costs. Examples of site-specific issues that would affect the cost of a retrofit FGD control system include the quantity of existing equipment and duct work that must be demolished and relocated to provide space for the FGD control system; demolition and relocation of existing electrical equipment, water piping, and underground equipment and utilities; modifications that may be required to the existing ash handling systems; replacement of the existing induced draft (ID) fan or booster fan modifications; and modifications/upgrades to the existing auxiliary power system. All of these issues must be evaluated on a site-by-site basis, and can significantly affect the cost of a retrofit control system project. By using IPM, EPA's cost estimates do not account for these items.

S&L stated that the IPM cost modules attempt to account for retrofit difficulty by applying a subjective retrofit factor to the capital cost estimate.[46] To establish a unit-specific retrofit factor, the analyst should, at a minimum, review the existing site layout, develop a conceptual level general arrangement for the retrofit control system, and identify potential site constraints. EPA did not conduct this type of analysis when it developed its cost estimates for the Texas generating units; rather, EPA simply assigned a retrofit factor of 1.0 to all retrofit SO_2 control technologies at all plants, noting that "[b]ecause we are not aware of any significant retrofit issues at any of the facilities we evaluated, we adopted the default retrofit value of 1.0, which represents an average retrofit difficulty, for all the units we evaluated."[47] EPA provides no sound basis for making this assumption for all of the units at issue.

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[295] Control Cost Manual, p. 2-3.
[296] 80 FR 33515.

According to S&L, the BART Guidelines state that the cost analysis should take into account any site-specific design or other conditions identified above that affect the cost (70 FR 39166). By using the IPM cost algorithms, and using the default retrofit factor of 1.0, EPA failed to account for any site-specific conditions that may affect the control system costs.

S&L noted that the Big Brown Units 1 & 2 and Monticello Units 1 & 2 have site-specific constraints that affect the cost of a retrofit FGD control system. For example, at Big Brown the new FGD systems would have to be located north or east of the existing generating units because of constraints towards the south (cooling water intake) and west (exiting switchyard). The relatively remote location of the retrofit FGD control system would require significantly more duct work than the typical FGD arrangement, increasing the cost of the project. Similarly, there are site constraints at Monticello given the location of the cooling lake (west of power block), existing ash ponds (east of power block), and the existing coal pile. The impacts of these site constraints on the cost of a retrofit FGD control system would have to be determined during preliminary engineering and development of a conceptual level control system general arrangement. EPA's analysis fails to take this into account.

In addition to site constraints and constructability issues, S&L noted that the type of fuel fired and the unit-specific boiler operating conditions will affect the cost of a retrofit FGD control system. These design parameters affect the volume of flue gas at the scrubber inlet and the sizing of the scrubber vessels. The IPM cost modules include a "coal factor" for the type of fuel fired, but are not designed to account for unit-specific boiler operating conditions. The default coal factor for lignite-fueled units is set at 1.07, which is intended to account for the approximate 7% increase in flue gas volume on lignite-fueled units compared to bituminous coal-fueled units. However, flue gas volume is also a function of boiler operation and flue gas temperatures at the scrubber inlet. FGD control systems on units with higher flue gas temperatures must be designed to handle higher flue gas volumes.

Based on S&L's review of operating data from Big Brown Units 1 & 2 and Monticello Units 1 & 2, flue gas temperatures at the scrubber inlets can range from 360°F to 370°F. The flue gas temperatures are significantly higher than the generic design value of 300°F, which the IPM model applies to all units. An increase of 60 to 70°F at the scrubber inlet would increase flue gas volume by approximately 10%.[48] This unit-specific operating parameter is not captured by the IPM algorithms, but would significantly affect scrubber sizing and costs.

S&L stated that another example of a project-specific cost that is not adequately accounted for in the IPM cost equations is labor productivity. In addition to the labor adjustment in the IPM cost modules (to account for 6 x 10 hours days and per diem costs), the capital cost estimates must account for labor productivity in the area of the proposed project. Labor productivity is an important component of any large multi-year construction project, and is designed to account for the project location, local workforce characteristics, local unemployment and labor availability, project complexity, local climate and working conditions. It is common practice on large construction projects to apply a productivity factor to account for local worker productivity and construction site conditions. Industry experience also shows that retrofit projects and congested site conditions can adversely affect labor productivity. Labor productivity must be evaluated on a project-by-project basis, and can have a significant impact on overall project costs, increasing labor costs for the project by 15% or more.

Footnotes:
46 IPM Model – Updated to Cost and Performance for APC Technologies, Wet FGD Cost Development Methodology,
Sargent & Lundy, March 2013, page 4.
47 Cost TSD, Section 3.1, page 5.
48 $Increase = \left[\frac{V_2 - V_1}{V_1}\right] 100$ where $V_2 = V_1 \left(\frac{T_2}{T_1}\right)$ according to the ideal gas law, when $P_1 = P_2$.
These equations can be combined, $Increase = \left[\frac{T_2}{T_1} - 1\right] 100$, where T is in degrees Rankine (T = °F + 460)

Response: This comment asserts that "IPM cost modules are not set-up to account for site-specific retrofit challenges and unique BOP [balance of plant] impacts, design conditions that vary from standard conditions used as the basis of the cost algorithms, and regional impacts on labor costs."

However, retrofit issues are built into the IPM cost models, as they are based on retrofits of control equipment on existing facilities,[297] all of which have retrofit challenges relative to a similar installation on a new facility. Thus, these models already incorporate increased costs due to site constraints, in many cases, much greater than exist at the subject Texas plants, which have no reported retrofit issues. The subject Texas units, for example, are generally not located in congested urban areas and have adequate space to locate add-on scrubber technology, which is located at the tail-end of the plant, outside of the congested interior. Thus, retrofit constraints are very minor. Thus, we adopted the average retrofit factor of one, based on our analysis of CBI information and aerial photographs. In fact, an average retrofit factor of one represents an overestimate of actual costs for some units as demonstrated by comparisons of site-specific cost estimates prepared for specific plants with IPM cost model estimates.

The Tolk units, for example, have no retrofit issues, based on field visits by Xcel consultants, yet EPA selected a retrofit factor of 1, which assumes an average level of retrofit difficulty. The response to the Section 114 request for the Tolk units included the results of site visits that did not identify any retrofit issues. TOLK_0000148/150. These site visits conclude: "The area available for retrofit of emissions control equipment is sufficient for all systems under consideration. There are no overhead obstructions, one electrical duct bank underground that may have to be relocated." TOLK_0000150. B&M concluded similarly. TOLK_0000373. Thus, the use of a retrofit factor of one for these units overestimates cost, as they have no retrofit issues.

We evaluated confidential site-specific information submitted in response to our Section 114 requests to verify these inputs. Our cost analysis evaluation of scrubber retrofits was necessarily very site specific and required a close reliance on CBI data. However, in performing our scrubber retrofit cost analysis, we were able to employ a model that was in the public domain, yet could be configured to produce reasonably conservative results. As we discuss below, we are aware that a number of our input values are high in comparison to their CBI counterparts,

297 S&L March 2013, SDA Cost Model, p. 1 (based on "typical" SDA FGD retrofit), p. 2 (cost could increase significantly for "congested sites"); S&L March 2013, Wet FGD Cost Model, p. 1 (based on "typical" wet FGD retrofit), p. 2 (cost could increase significantly for "congested sites").

resulting in conservative analyses.

Affected facilities were free to provide comments on all aspects of our proposed decision. Any affected facility could have provided us with site-specific and documented information to address any errors and/or omissions they believed existed in our proposed rulemaking.

However, the comments we received mostly fail to provide any site-specific information that would enable us to conclude our proposed cost estimates contain errors and to revise our cost estimates. Rather, the comments allege general deficiencies without providing site-specific cost information. The exceptions are addressed elsewhere in these comments.

S&L, for example, commenting on behalf of Luminant, provided general comments such as: (1) the Big Brown FGDs "would require significantly more duct work than the typical FGD arrangement" (without stating how much more, where the ductwork is located, or its cost, compared to the assumption in the cost models); (2) the Monticello units have site constraints (which were not identified); and (3) labor productivity "could" increase labor costs by "15% or more" (without indicating whether it actually would increase at the Luminant or any other units). We note that labor rates disclosed in the CBI materials were generally much lower than the default value we used in the IPM cost models, eliminating any concerns about underestimates due to labor productivity.

S&L also provided a list of general examples of retrofit issues, including space for the FGD system; demolition and relocation of existing electrical equipment; water piping and underground equipment and utilities; modifications to the ash handling system; replacement of induced draft fans, etc. However, S&L failed to provide any site-specific information to allow us to address these items, such as estimated cost or length of duct work that would allow us to revise cost estimates, a revised retrofit factor to address site congestion, and site specific labor productivity estimates. Also, in our analysis of the material submitted to us as part of our Section 114 request, we reviewed several scrubber retrofit reports by S&L and other engineering firms. In no case, were any unusual retrofit issues identified. In contrast, we did receive specific, actionable information regarding our proposed scrubber upgrade costs. We reviewed that information and revised those costs accordingly.

Regardless, these types of issues result in small increases in costs that are well within +/-30% accuracy and do not affect cost effectiveness conclusions due to the conservative nature of our estimates, as demonstrated elsewhere in these responses. They also are not required for study level estimates, which are based on "rough sketches," "preliminary sizes", "approximate sizes," "rough estimates," etc.[298]

Further, our cost estimates are upper-bound estimates that encompass these site-specific issues because we intentionally and consistently made assumptions throughout our analyses to assure conservatively high cost estimates and cost effectiveness values, including:

- We selected maximum inputs from 2009 to 2013 for the inlet SO_2 rate (Cost TSD, p. 11), gross heat rate, gross load (Cost TSD, p. 10), and percentage lignite, assumed to

[298] Control Cost Manual, p. 2-3.

be 100% (Cost TSD, p. 16), even if these values didn't appear in the same year of data. Cost TSD, p. 2.

- We backstopped SO_2 control efficiency by limiting the SO_2 emission rate to reported vendor guarantees. However, CEMs data presented in our response to other comments indicates that many units are consistently achieving SO_2 emission rates much lower than vendor guarantees.

- The costs are reported in 2012 dollars, rather than 2013 dollars, which underestimates all costs by about 3%, because the CEPCI index for 2013 (567.3) is less than the index for 2012 (584.6). Cost TSD, p. 3.

- We used the default auxiliary power cost of $0.06/kWh, even though the CBI materials indicated the true power cost for most units was considerably less. Cost TSD, p. 10.

- We used default labor rates of $60/hr, even though the CBI materials indicated actual labor rates were typically lower. Cost TSD, p. 10.

- We used water costs that were higher than typically reported in the CBI information.

- For units that burned blended fuels, our scrubber design was based on 100% lignite, which results in a conservative estimate, since a scrubber based on burning lignite is more expensive than one based on burning PRB.

- Our costs were based on single unit scrubber retrofits. However, in all cases we reviewed in the CBI materials in which two or more units underwent scrubber retrofit cost analysis, substantial savings were achieved by sharing reagent preparation areas. We did not assume these cost savings.

Finally, S&L asserts operating data from Big Brown Units 1 & 2 and Monticello Units 1 & 2 indicate that the flue gas volume would be 10% greater than assumed in the IPM cost model, without supporting this estimate by providing its data and calculations. The comment further asserts that the model applies a generic design value of 300 F to all units.

First, we do not believe that the IPM cost model estimate costs using a flue gas volume estimated based on a generic design temperature of 300 F, but rather it estimates costs from regression equations based on actual completed projects that include retrofit difficulties. The documentation for the IPM model contains no evidence that the IPM model applies a "generic design value of 300 F" to all units.

Second, even assuming this were true, there are a number of factors affect the volume of gas flow that passes through a scrubber system, other than temperature. These include the amount of in-leakage in the system (which often increases due to inefficient or worn seals in the air preheater) and the type and characteristics of the coal that is being burned.

We re-examined two of the scrubber retrofit reports for Big Brown we received in response to our Section 114 requests,[299] which were issued by S&L in 2004 and 2007. The 2004 report indicated that the design flue gas flow rate at the scrubber inlet was approximately 19.7% less than that in the 2007 report. Both reports indicated that the reference temperature at the inlet was 370°F—the same temperature S&L references in its comment, and both were at the same pressure. Thus, even if the IPM model assumes a lower than actual scrubber inlet temperature, its own reports show a change of almost twice the effect it cites at the same inlet temperature for the same unit.

We note that although these two scrubber retrofit reports assume lignite/PRB blends, the resulting coal characteristics are slightly different, which undoubtedly accounts for some of this difference. However, the HHV of the coal in the 2004 report was much lower than that in the 2007 report, which all else being equal, should have resulted in more of it being burned to supply the same heat to the boiler, and in turn producing a higher flue gas flow rate. However, the flue gas volume of the 2004 report was much lower. Consequently, Luminant's own data apparently contradicts with the correlation it has presented. We conclude that S&L's temperature comparison is too simple to properly characterize the situation, and we do not believe that S&L has established that we erred in our cost analysis due to an under estimation of the flue gas volume. Nevertheless, we will address S&L's concern:

S&L states, "The default coal factor for lignite-fueled units is set at 1.07, which is intended to account for the approximate 7% increase in flue gas volume on lignite-fueled units compared to bituminous coal-fueled units. However, the gas volume is also a function of boiler operation and flue gas temperature at the scrubber inlet. FGD control systems on units with higher flue gas temperatures must be designed to handle higher flue gas volumes." As we note in our Cost TSD and above, we were conservative in the selection of many of our cost model inputs. One of these conservative inputs was our decision to use assume a lignite coal factor of 1.07 for the units that blended PRB coal with lignite (such as the ones in question), even though a lesser value would have been justified. Thus, we have already at least partially addressed S&L's concern here. Nevertheless, going one step further and even increasing this already conservative coal factor by an additional 10% would increase the cost effectiveness for a wet FGD at Big Brown Unit 1 from $1,255/ton to $1,302/ton and at Big Brown Unit 2 from $1,257/ton to $1,304/ton, an insignificant 4% to 6% increase,[300] well within the +/- 30% accuracy for a regulatory cost analysis.

S&L further asserts labor productivity could increase labor costs by 15% or more. Labor productivity is built into the cost models. S&L provides no evidence that the labor productivity at the Big Brown and Monticello sites would be different from the assumptions in the cost models. Furthermore, we have no reason to suspect that site conditions would be any worse or that laborers in Texas would be less productive than elsewhere. However, again assuming for sake of argument that labor productivity is 30% lower in Texas than at all the other facilities

[299] LUMINANT_000277496.pdf and LUMINANT_REGHAZ_1-000001183 to -000001257.pdf.

[300] The increase in cost effectiveness was calculated by increasing the coal factor from 1.07 to 1.07x1.1 = 1.18, but otherwise using all of the other wet FGD inputs in the file "Wet FGD Cost IPM 5-13 TX Sources ver 2.xlsx," which is present in our docket.

incorporated in the cost models, this, again would have a de minimus impact on cost effectiveness. This would increase the cost effectiveness for a wet FGD at Big Brown Unit 1 from $1,255/ton to $1,271/ton and at Big Brown Unit 2, from $1,257/ton to $1,273/ton, a 1% to 4% increase[301].

Assuming both changes together, which as we conclude above is not warranted, the increase in flow rate and the decrease in labor productivity, the cost effectiveness of a wet scrubber at Big Brown Unit 1 would increase from $1,255/ton to $1,318/ton and at Big Brown Unit 2, from $1,257/ton to $1,321/ton, or by 5% to 8%. These increases are very small, well within the +/- 30% accuracy required for a regulatory cost analysis and do not change our proposed decision making. The cost effectiveness values remain highly cost effective. In fact, we believe that our cost estimates compare quite favorably to a number of Luminant SDA and wet FGD scrubber retrofit studies Luminant has claimed as CBI that we have reviewed as a result of our Section 114 requests.

Comment: Wastewater treatment costs associated with WFGD
[Sargent & Lundy (0061) p. 18]

In the report prepared for Luminant, S&L stated that The Control Cost Manual defines "Total Capital Investment" as including "all costs required to purchase equipment needed for the control system." [49] In general, supporting facilities are assumed to already be installed at an existing facility; however, costs for supporting facilities should be included in the cost estimate if additional or unique facilities are needed to support the operation of the control system and are not already installed at the facility.[50]

Examples of supporting facilities that would be required to successfully operate a wet FGD control system include wastewater treatment systems and solid waste disposal facilities.[51] The extent of wastewater treatment required will be a function of the characteristics of the wastewater and the wastewater discharge limits applicable to the specific facility and receiving water. The IPM cost module includes costs only for "minor physical and chemical wastewater treatment."[52] However, wastewater treatment standards proposed by EPA, and anticipated to be published as a final rule in 2015, will likely require significantly more advanced treatment of FGD wastewaters. As proposed by EPA, these regulations would require both physical and biological treatment of FGD wastewaters to meet the proposed standards. Advanced FGD wastewater treatment could add $30-$40 million to the cost of a retrofit WFGD control systems. Because dedicated advanced wastewater treatment will be required to meet the proposed effluent guidelines for FGD wastewaters, these costs should be included in an evaluation of the cost-effectiveness of a retrofit WFGD control systems.

<u>Footnotes:</u>
[49] CCM, Section 1, Chapter 2, pg. 2-5.
[50] Id., at pg. 2-5 and 2-6.
[51] For example, on page 2-32 of the CCM EPA states: "Though often overlooked, there can be a significant cost associated with treating and/or disposing of waste material captured by a control system that neither can be sold nor

[301] The increase in cost effectiveness was calculated by increasing the labor rate from $60/hr to $60/hr x 1.3 = $78/hr, but otherwise using all of the other wet FGD inputs in the file, "Wet FGD IPM 5-13 TX Sources ver 2.xlsx."

recycled to the process. Liquid waste streams, such as the effluent from a gas absorber, are usually processed before being released to surface waters. The type and extent of this processing will, of course, depend on the characteristics of the effluent. For example, the waste can first be sent to one (or more) clarifiers, for coagulation and removal of suspended solids. The precipitate from the clarifier is then conveyed to a rotary filter, where most of the liquid is removed. The resulting filter cake is then disposed of, via landfilling, for example."

[52] IPM – Wet FGD Cost Methodology, pg. 2.

Response: A wet FGD generates a wastewater stream that must be either evaporated, recovered, or sent to the existing wastewater treatment plant. S&L indicates that the wet FGD cost module only includes costs for "minor physical and chemical wastewater treatment." S&L indicates that proposed wastewater treatment standards "will likely require significantly more advanced treatment of FGD wastewaters." These potential future costs, which are currently unknown and undocumented, cannot be included in our cost analyses. Further, other options are available, including zero liquid discharge systems and the selection of a SO_2 control technology that are capable of achieving our proposed limits without generating a wastewater stream, such as the NID, which we believe is capable of achieving our proposed emission limits, and has been selected in some recent evaluations.

As we note in a response to another comment, the IPM cost algorithms we have incorporated into our cost model include databases of actual control project costs. S&L states in the documentation for its wet FGD cost documentation:

> The 2004 to 2006 industry cost estimates for wet FGD units from the "Analysis of MOG and LADCO's FGD and SCR Capacity and Cost Assumptions in the Evaluation of Proposed EGU 1 and EGU 2 Emission Controls" prepared for Midwest Ozone Group (MOG) were used by Sargent & Lundy LLC (S&L) to develop the wet FGD cost model. In addition, S&L included data from "Current Capital Cost and Cost-effectiveness of Power Plant Emissions Control Technologies" prepared by J. E. Cichanowicz for the Utility Air Regulatory Group (UARG) in 2010. The cost increases reported from 2007 to 2008 by G. W. Sharp in "Update: What's That Scrubber Going to Cost?" published in Power Magazine, March 2009 were also considered. The published data was significantly augmented by the S&L in-house database of recent wet FGD projects.

In the article S&L references above, "Update: What's That Scrubber Going to Cost?" the author states that the following regarding the survey used to gather the scrubber information:

> The survey instructions requested that respondents define project costs for their just-completed, current, under construction, and/or planned FGD projects and that they include the following line items, at a minimum, so that comparable data were reported that could be compared across projects:
>
> - Project design costs
> - New stack and ductwork costs
> - Reagent prep method and costs
> - Absorber island/reactor technology costs

- Site prep costs
- Wastewater treatment costs
- Balance-of-plant costs
- Other direct costs (such as engineering and project management)
- Associated boiler work (such as boiler modifications and draft fans)

As above, one of the surveys that fed cost data into S&L's algorithms appears to have incorporated any applicable wastewater treatment costs. The other articles cited by S&L do not state the degree to which wastewater treatment may have been incorporated into the reported costs.

We specifically requested input from affected facilities on the cost of wastewater treatment for wet FGD systems. However, S&L failed to demonstrate that a supplemental wastewater treatment facility was needed, and provided no documentation of the costs it cites.

In addition, S&L failed to disclose that there are other, less costly options. A zero liquid discharge treatment system is another viable option that has been selected as the least cost alternative by other facilities.[302]

We do not believe that S&L has established that we erred in our cost analysis by not including an additional wastewater treatment allowance, other than what is built into the model. We are not even clear if the costs S&L cites to would apply to the facility or to the units individually. Nevertheless, even assuming each Luminant unit would incur an additional capital cost of $40 million for a new wastewater treatment system, the cost effectiveness of the Big Brown units would only increase by about 8%[303] and the Monticello units by 10%. The revised cost effectiveness values remain highly cost effective, including when combined with a 10% increase in flue gas and a 30% increase in labor costs. Again, even assuming these unproven, undocumented costs, our proposed decision making regarding the units in question would remain unchanged.

Comment: Indirect capital costs [Sargent & Lundy (0061) p. 19]

In the report prepared for Luminant, S&L stated that total capital costs are defined in the Control Cost Manual to include all costs required to purchase and install equipment needed for the control system, as well as certain other indirect capital costs.[53] EPA calculated indirect capital costs based on factors provided in the IPM cost modules. Indirect capital costs included in the IPM equations include:

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302 Aquatech, Project Profile: Aquatech Supplies Zero Liquid Discharge Treatment for FGD System at the Iatan Generating Station, Available at: http://www.aquatech.com/wp-content/uploads/66.-KCPL-ZLD.pdf; Aquatech, Project Profile, Aquatech Provides Wastewater Treatment Solution for New Hampshire's Largest Coal Power Plant, Available at: http://www.aquatech.com/wp-content/uploads/81.New-Hampshire-Merrimack.pdf. See also: Water and Wastewater Treatment Technology Update, March 1, 2015, Available at: http://www.powermag.com/water-and-wastewater-treatment-technology-update/?pagenum=1.

303 The cost effectiveness at Big Brown Unit 1 would increase from $1,255/ton to $1,362/ton and at Big Brown 2 from $1,257/ton to $1,363/ton. The cost effectiveness at Monticello 1 would increase from $1,937/ton to $2,123/ton and at Monticello 2 from $2,170/ton to $2,373/ton.

- Engineering & Construction Management: 10% of the Base Module Cost
- Labor Adjustment: 10% of the Base Module Cost
- Contractor Profit/Fees: 10% of the Base Module Cost
- Owner's Costs: 5% of the Total CECC
- Allowance for Funds During Construction (AFUDC): 10% of the TPC

S&L noted that indirect capital costs included in the IPM cost modules do not account for all project-related indirect costs a facility would incur to install a retrofit control, and do not include all indirect capital costs allowed by the Control Cost Manual. For example, the IPM model does not estimate, and EPA did not include, any project contingency.

S&L stated that indirect capital costs are defined in the Control Cost Manual to include "costs such as; construction and contractor fees, startup and testing, inventory capital, and any process and project contingency costs."[54] Indirect installation costs include engineering costs; construction and field expenses (i.e., cost for construction supervisory personnel, office personnel, rental of temporary offices, etc.); contractor fees (for construction and engineering firms involved in the project); start-up and performance test costs; contingencies; and costs for working capital and offsite facilities.[55]

According to S&L, cost estimating examples included in the Control Cost Manual for all major air pollution control systems include contingency as an indirect capital cost. For example, the selective catalytic reduction (SCR) cost example includes a process contingency calculated at 5% of direct costs and a project contingency calculated at 15% of total direct and indirect costs.[56] Contingency is intended to represent unforeseeable elements of cost, particularly in fixed investment estimates, which previous experience has shown to be statistically likely to occur, and should be applied to those items that could incur a reasonable but unanticipated increase in projects costs.[57] The Control Cost Manual allows the analyst to include both process and project contingencies, as applicable, in an estimate of the indirect capital costs. By excluding contingency from its calculation of total capital costs, EPA failed to follow the methodology described in the Control Cost Manual, and failed to include an important line-item in the capital cost calculations.

S&L noted that EPA excluded Owner's Costs from the IPM cost modules based on its conclusion that these costs "are disallowed by the 'overnight' cost method used in the Control Cost Manual."[58] The U.S. Energy Information Administration (EIA) defines overnight cost as "an estimate of the cost at which a plant could be constructed assuming that the entire process from planning through construction could be completed in a single day." EPA argues that the concept is useful to avoid any impact of financing issues and assumptions on estimated costs; however, Owner's costs do not represent costs associated with project financing. In fact, the EIA explicitly includes Owner's Costs in its capital cost estimates for electricity generating plants.[59] As discussed previously, Owner's Costs are real costs that the owner will incur during the project and are typically included in cost estimates prepared for large air pollution control retrofit projects.

Based on S&L's experience on large air pollution control system projects and given the nature of the work being proposed by EPA, it is reasonable to estimate Owner's Costs using a factor of 5% of the total direct costs, and it is incorrect to exclude Owner's Costs from the cost estimate. By excluding Owner's Costs from its calculation of total capital costs, EPA failed to follow the methodology described in the Control Cost Manual (even though EPA said it was following the Manual), and failed to include an important line-item in the capital cost calculation.

According to S&L, AFUDC accounts for the time value of money associated with the distribution of construction cash flows over the construction period, which for an FGD system could be spread over a construction period of 36 months or more. Total Capital Investment, as defined in the Control Cost Manual, includes all costs required to purchase equipment needed for the control system (purchased equipment costs), the costs of labor and materials for installing that equipment (direct installation costs), costs for site preparation and building, working capital, and off-site facilities.[60] The EIA notes that overnight capital costs "serve as a starting point for developing the total cost of new generating capacity" and that "other parameters also play a key role in determining the total capital costs."[61] Lead time is identified by the EIA as one of the most notable parameters affecting total capital costs, as "[p]rojects with longer lead times increase financing costs."[62] Although the EIA starts with overnight cost estimates, other parameters, including financing, lead time, and inflation of material and construction costs play a key role in determining total capital costs.

As S&L discussed previously, AFUDC can represent a significant cost on large construction projects with long project durations. Thus, including AFUDC in the capital cost estimate is consistent with the constant dollar approach described in the Control Cost Manual, and excluding AFUDC from the cost estimate will underestimate the total capital requirement for capital intensive projects with extended project durations. By excluding AFUDC from its calculation of total capital costs, EPA failed to follow the methodology described in the Control Cost Manual, and failed to include an important line-item in the capital cost calculation.

Footnotes:
[53] Control Cost Manual, Section 1, Chapter 2, page 2-5.
[54] *See*, Control Cost Manual, Section 4.2, Chapter 1, page 1-32; and Chapter 2, page 2-43.
[55] *Id*.
[56] *See*, Control Cost Manual, Section 4.2, Chapter 2, page 2-44.
[57] *See*, e.g., Control Cost Manual, Section 1, Chapter 2, page 2-30.
[58] Cost TSD, Section 3.2, page 11, f/n 23.
[59] EIA, "Updated Capital Cost Estimates for Utility Scale Electricity Generating Plants," April 2013, pg. 2.
[60] Control Cost Manual, Section 1, Section 2, page 2-5.
[61] EIA, "Updated Capital Cost Estimates for Utility Scale Electricity Generating Plants," April 2013, pg. 3
[62] *Id.*

Response: This comment discusses in general the various factors included in indirect costs in the IPM cost models and in the Control Cost Manual, but only specifically identifies project contingency, AFUCD, and owners costs as omitted from the IPM cost models but included in the Control Cost Manual.

Project Contingency

This comment claims that the Control Cost Manual requires project contingency, citing an example from the SCR chapter, which it asserts is excluded from the IPM cost models. The Control Cost Manual does not “require” a contingency but rather states: “Due to the uncertain nature of many estimates, analysts may want to add an additional contingency (i.e., uncertainty) factor to their estimate. However, the retrofit factor is a kind of contingency factor and the cost analyst must be careful to not impose a double penalty on the system for the same unforeseen conditions.”[304] As the subject controls are all retrofits, an “average” retrofit contingency is built into the estimates produced by the IPM cost models. As discussed elsewhere, EPA’s costs are based on worst-case assumptions. Thus, no further contingency is required.

Further, under the overnight cost estimating method in the Control Cost Manual, contingency has a specific definition: "A contingency factor should be reserved (and applied to) only those items that could incur a reasonable but unanticipated increase but are not directly related to the demolition, fabrication, and installation of the system. For example, a hundred year flood may postpone delivery of materials, but their arrival at the job site is not a problem unique to a retrofit situation."[305]

In contrast, S&L urges a definition of "contingency" based on a different concept used in so-called “all-in” costing, which is not used for regulatory cost analyses. Sargent and Lundy urges this definition: “unforeseeable elements of cost, particularly in fixed investment estimates, which previous experience has shown to be statistically likely to occur, and should be applied to those items that could incur a reasonable but unanticipated increase in project costs.” This definition is inappropriately cited to the Control Cost Manual, Chapter 1, p. 2-30, which is actually the definition for the overnight method, but is inaccurately cited by S&L. The overnight cost methodology in the Manual does not contemplate contingency for changes in fixed investment estimates that are statistically likely to occur because the costs are based on current prices.

The Control Cost Manual specifically excludes unanticipated increases due to demolition, fabrication, and installation of the system. In contrast, S&L claims the Control Cost Manual mandates a contingency to all project and process costs, including demolition, fabrication, and installation, in direct contradiction to the fundamental definition in the Manual.

Thus, we believe that no change is required.

AFUCD and Owner’s Cost

AFUDC and owner’s costs are not valid costs under the Control Cost Manual. Please see our other responses to comments elsewhere concerning these issues for more details.

Comment: [Earthjustice (0067) p. 37; Stamper (0068) p.10] Earthjustice et al., and Stamper stated that the EPA provided much of the details on its SO_2 upgrade and retrofit cost effectiveness analyses in its Technical Support Document for the Cost of Controls Calculations for the Texas Regional Haze Federal Implementation Plan (Cost TSD), EPA-R06-OAR-2014-0754-0008. For those units without a scrubber, EPA used version 5.13 of its Integrated Planning

[304] Cost Control Manual, Sec. 2.5.4, p. 2-30.
[305] Control Cost Manual, Sec. 2.5.4, p. 2-30.

Model (IPM) to determine the capital and operations & maintenance costs for the retrofit SO_2 controls of DSI, SDA, and wet FGD. Cost TSD at 3. EPA then determined cost effectiveness based on the methods and principles of the EPA Air Pollution Control Cost Manual. The IPM control costs are based on databases of actual pollution control project costs.27 Thus, the IPM cost modules provide a solid basis for estimating control costs in a cost effectiveness analyses. However, Earthjustice et al., stated that the EPA was overly conservative in its SO_2 cost effectiveness analyses in projecting emission reductions. EPA's approach of using the highest monthly SO_2 rate for determining the costs of the SO_2 controls overestimates the operational costs of the control by designing for a worst case coal. With higher sulfur content coal, more reagent is needed to remove SO_2, and more scrubber waste is generated.

Footnote:
[27] *See*, e.g., Sargent & Lundy, IPM Model – Updates to Cost and Performance for APC Technologies, Wet FGD Cost Development Methodology, Final March 2013, at 1 (Ex. 9).

Response: We agree with Earthjustice that our scrubber retrofit cost methodology basis was sound. We also agree, for the reasons we have detailed in our responses to other comments, that we made many conservative assumptions in our cost effectiveness calculations.

11.f. $/deciview

Comment: The Costs of EPA's Proposal Are Extreme and Unjustified.
[Luminant (0061) p. 3]

Luminant stated that the EPA disregards the law of diminishing returns. The costs that EPA's proposal would impose are staggering and well out of proportion to the imperceptible "visibility benefits" that EPA projects. EPA calculates that its proposed emission limits would require just four Texas companies to spend $2 billion for so-called "visibility improvements" that no person will be able to detect.[13] The vast majority of this cost that EPA projects—over $1 billion—would be borne by Luminant alone under EPA's proposal. This is patently unreasonable and contrary to any notion of "reasonable progress." EPA's own regional haze guidance says that "a dollar-per-deciview calculation" is the more "meaningful" way to determine reasonable progress,[14] yet, tellingly, EPA refuses to provide that calculation here. In our comments, we provide the dollar-per-deciview values that EPA failed to provide, and they demonstrate that EPA's proposal goes well past the point of efficient and reasonable improvements in visibility and is substantially more costly than measures that EPA has found to be not required in other states for reasonable progress.

Footnotes:
[13] See EPA, Technical Support Document for the Cost of Controls Calculations for the Texas Regional Haze Federal Implementation Plan (Cost TSD) 24-5 (Nov. 2014) ("Cost TSD") (scrubber retrofit capital costs); id. at 55 (scrubber upgrade costs). See also 79 Fed. Reg. at 74,876–77 (same).
[14] EPA, Guidance for Setting Reasonable Progress Goals Under the Regional Haze Program 5-2 (June 1, 2007) ("EPA Reasonable Progress Guidance"), available at http://tinyurl.com/EPARPguidance.

[Luminant (0061) p. 134] Luminant noted, in its decision, EPA claims that its proposal "reduced down to an analysis of whether, in light of the balance between the cost of control and visibility benefits of control at each source, additional SO_2 controls should be installed on each of certain large coal fired EGUs in Texas in order to improve the visibility at these Class I areas."[828] EPA further claims that "[t]he modeled benefits that would result from the installation of those controls are reviewed, and the cost of controls are weighed against their projected visibility benefits at a number of Class I areas."[829]

Yet, Luminant noted that nowhere in its proposal does EPA actually balance or compare the costs it would impose with the visibility benefits it believes would be achieved. There is no actual cost-benefit analysis to be found, and thus no basis for EPA's claim that the controls it would require are cost-effective. There is a simple way to do this—instead of assessing the costs on a dollar-per-ton basis, EPA could have evaluated costs on a dollar-per-deciview basis. As EPA explains in its own reasonable progress guidance: "Therefore, in assessing additional emissions reduction strategies for source categories or individual, large scale sources, simple cost effectiveness estimates based on a dollar-per-ton calculation may not be as meaningful as a dollar-per-deciview calculation, especially if the strategies reduce different groups of pollutants."[830]

According to Luminant, EPA, however, does not conduct a cost-per-deciview analysis to support its proposal. EPA thus fails to follow its own guidance and fails to explain why it has departed from its guidance on this point. Indeed, EPA does exactly what it warned states against—it has provided "simple cost effectiveness estimates based on a dollar-per-ton calculation" instead of the more "meaningful" "dollar-per-deciview calculation."[831] EPA looks at costs (in its Costs TSD), and it separately looks at deciviews (in its FIP TSD), but it never joins the two, at least not in any document in the record. Nor does EPA support its claim of cost-effective visibility improvement with any data or benchmarks. EPA's only analysis of costs and benefits is superficial and impossible to validate. For example, EPA says "scrubber retrofits for the Big Brown units" are "cost effective" and the projected visibility benefits are "significant."[832] Yet, it never looks at costs in relation to benefits or attempts to quantify a cost/benefit ratio, much less make comparisons of that metric as between units or control equipment. Indeed, the data that EPA presents is incomplete and does not allow for any meaningful comparison among control options.[833] Amazingly, EPA "specifically solicit[s] comments on the appropriateness of . . . scrubber retrofits" at the Monticello, Coleto Creek, and Tolk units "[i]n recognition of their ***lesser cost/benefit ratio***,"[834] but EPA fails to explain or provide what EPA believes is the cost/benefit ratio for those units (or any other units). EPA has thus denied the public the opportunity to provide meaningful comment on what is apparently a cornerstone of its proposal.

According to Luminant, that EPA scrupulously avoids revealing the "cost/benefit ratio" that it has apparently calculated, but failed to reveal, is telling.[835] Although it is impossible to know what "cost/benefit ratio" EPA is using to make its decision on which units to regulate and which not, a basic comparison between costs and visibility benefit shows that EPA's proposed costs are patently unreasonable. This is evident from simply comparing EPA's own estimates of cost and visibility benefits. Table 14 compares the capital costs of the scrubber retrofits that EPA would impose on Luminant units versus the visibility benefit as calculated by EPA.

TABLE 14: EPA'S ESTIMATED COSTS VERSUS ADJUSTED MODELED VISIBILITY IMPROVEMENT FROM ADDITIONAL SO_2 CONTROLS AT LUMINANT UNITS AGAINST 2018 BACKGROUND (DECIVIEWS, 20% WORST DAYS, HIGH CONTROLS)[836]

Unit	EPA's Estimated Cost (Capital Cost Only)	BIBE Modeled Visibility Improvement (deciviews, average 20% worst days)	GUMO Modeled Visibility Improvement (deciviews, average 20% worst days)	WIMO Modeled Visibility Improvement (deciviews, average 20% worst days)
Big Brown Unit 1 (new scrubber)	$256,032,000	0.0228	0.0266	0.0880
Big Brown Unit 2 (new scrubber)	$259,141,000	0.0229	0.0267	0.0883
Monticello Unit 1 (new scrubber)	$250,804,000	0.0055	0.0068	0.0507
Monticello Unit 2 (new scrubber)	$254,177,000	0.0051	0.0063	0.0465

Luminant noted that, as seen in Table 14, the capital costs alone that EPA estimates are in the ***hundreds of millions of dollars*** for individual units, whereas the projected benefits are in the ***hundredths of a deciview***, and in some cases ***thousandths of a deciview***. When annual operating costs are included, the cost numbers go even higher. Nowhere does EPA cite, and we have been unable to locate, any instance in which EPA or a state has determined that such miniscule visibility benefits (not health benefits) justify such staggering costs. Indeed, EPA has recently determined that visibility improvements of 0.04 deciview are "minimal" and do not justify more stringent controls even at a small additional incremental cost.[837] Here, EPA does not even assert in its proposal that these negligible benefits justify the cost. They do not. EPA's proposal is unreasonable on its face and arbitrary and capricious.

Luminant asserted, unlike EPA, Texas did consider costs in relation to visibility benefit and explained its analysis. Using cost figures and estimated visibility benefits ***very similar to EPA's***, Texas determined that the massive costs were not reasonable for the imperceptible benefit.[838] EPA does not take issue with Texas's cost or visibility improvement estimates. Instead, EPA would simply reach a different conclusion from essentially the same data about what is "reasonable." But this is not EPA's role under the statute and regulations. As EPA itself has explained, "[t]here is no particular threshold for determining significance of visibility benefit in the regional haze rule."[839] Further, "States have latitude to determine these thresholds," and "[a]s long as this evaluation is done adequately and the states provide a reasoned basis for their decisions, ***EPA will defer to the state***."[840] EPA has forgotten its own practices and standards here. Texas fully explained and supported its cost effectiveness analysis, pursuant to EPA's regulations and guidance, and EPA does not find otherwise. EPA must approve Texas's submission.

Footnotes:
[828] FIP TSD at 2.
[829] Id. at 11.
[830] Reasonable Progress Guidance at 5-2. More recently, EPA has affirmed that "dollars per deciview is one of several metrics that can be used to analyze cost of visibility improvement . . . ." 77 Fed. Reg. at 40,156.
[831] Reasonable Progress Guidance at 5-2.

[832] FIP TSD at 31.
[833] For example, EPA apparently has modeled, but it fails to consider or report, the visibility benefits from less costly scrubber upgrades that it is requiring. 79 Fed. Reg. at 74,883 (reporting estimated deciview improvement from only 95% control efficiency upgrades, but not less costly upgrades EPA modeled). Thus, EPA failed to consider, for example, whether 90% SO_2 removal at Martin Lake would yield similar deciview improvement or would have a similar cost/benefit ratio.
[834] FIP TSD at 31 (emphasis added).
[835] For example, in creating Table A.6-4 for its FIP TSD. , which EPA says provides the deciview improvement for the controls it is requiring, EPA removed (without explanation) the "$/ton" column from the docket spreadsheet TX116-007-_33_Vis_modeling_summary, which would have presented both cost and "benefits" together and allowed for calculation of a dollar-per-deciview figure.
[836] Source for visibility figures: 79 Fed. Reg. at 74,881; FIP TSD at A-68 to A-70; TX116-007-_33_Vis_modeling_summary (("WFGD" tab, baseline set as "3yr average 2009-2013 (eliminate max and min)," "2018 environ (PSAT run)"). Source for cost figures: Cost TSD at 24.
[837] 80 Fed. Reg. 18,944, 18,994 (Apr. 8, 2015).
[838] 2009 Texas SIP Narrative at 10-6 to 10-7.
[839] 77 Fed. Reg. 40,150, 40,156 (July 6, 2012) (approval of Nebraska SIP).
[840] Id. (emphasis added).

[Luminant (0061) p. 137] Luminant stated, given EPA's failure to provide cost-per-deciview calculations to back up its so-called "cost/benefit" analysis, we asked NERA Economic Consulting to calculate the cost-per-deciview of EPA's proposal for each Texas unit that EPA proposes to regulate in its FIP.[841] Consistent with EPA's prior practice, NERA conducted its analysis using annualized cost per deciview considering the Class I area that EPA contends would see the most visibility improvement (Wichita Mountains). NERA also considered the cumulative improvements that EPA contends would occur at the other Class I areas at issue. Viewed in either manner, the cost-per-deciview values for EPA's proposed FIP are enormous and patently unreasonable. As calculated by NERA (based on EPA's data and assumptions), for the proposed scrubber upgrades (which are the only measures that EPA concedes can be in place by the end of this planning period), the cost-per-deciview of EPA's proposal ranges from $129 million per deciview to $651 million per deciview, depending on the unit, considering the visibility improvement that ENVIRON modeled at Wichita Mountains.[842] The numbers are significantly larger when considering the smaller improvements ENVIRON modeled at Big Bend and Guadalupe Mountains.[843] As we explain in Section 14, because, as EPA concedes, the scrubber retrofits cannot be in place during this planning period, EPA has no authority to impose them in a FIP. Thus, the benefits of those retrofits cannot justify EPA's proposal. But even if the benefits of the scrubber retrofits could be considered, the hypothetical cost-effectiveness of EPA's proposal is ***worse*** when the retrofits are included. As calculated by NERA (again, based on EPA's own cost and benefit data), the cost-per-deciview of EPA's proposal ranges from $429 million per deciview to $1.3 billion per deciview considering the visibility improvement that ENVIRON modeled at Wichita Mountains.[844] Again, the numbers are significantly larger when considering the smaller improvements ENVIRON modeled at Big Bend and Guadalupe Mountains.[845] NERA's analysis and calculations are set out fully in their report, a copy of which is attached to these comments and incorporated herein by reference.

As these enormous cost-per-deciview values further illustrate, Luminant asserted that EPA's proposal is unreasonable and would impose costs that are well out of proportion to the alleged benefits. Indeed, as we explain elsewhere in these comments, EPA has understated the costs and overstated the benefits of its proposal. Thus, the real cost-per-deciview of EPA's proposal would be substantially higher than calculated by NERA, which used EPA's claimed values.

Footnotes:
841 See NERA Economic Consulting, Technical Comments on Economic Issues in EPA's Proposed Regional Haze Federal Implementation Plans for Oklahoma and Texas (April 20, 2015) ("NERA Report").
842 NERA Report at 6.
843 Id. at 8.
844 Id. at 11.
845 Id. at 11–14.

[NERA (0061) p. 4] In the report prepared for Luminant, NERA stated that EPA's cost effectiveness analysis in its proposed FIP is based entirely on an evaluation of the estimated dollars per ton of reduction in haze-forming emissions.[6] Repeatedly, in EPA's FIP technical support documents (TSD), the unit "$/ton" is noted in brackets after the use of the term "cost effectiveness,"[7] and it is the unit reported in tables for cost effectiveness.[8] EPA is clearly considering costs, not in relation to the visibility benefit produced, but in relation to the tons of SO_2 reduced.[9]

However, NERA noted that an economically-correct concept of "effectiveness" is the extent to which people will benefit from additional controls. When the regulatory goal is visibility improvement in Class I areas, benefits should be considered based on the improvement in visibility per dollar spent, not the reduction in emissions. Although reductions in haze-forming emissions do have some connection to improvement in visibility in Class I areas, not every ton of emission has the same impact on visibility, and thus not every ton of emission has the same impact on benefit. In addition to having different visibility impairment impacts per unit of atmospheric concentration due to their different physical and chemical properties, the visibility effectiveness of each ton reduced depends on the location of the emission source with respect to the Class I area, the characteristics of that source, and prevailing atmospheric conditions that disperse those emissions in different directions, among other variables.

According to NERA, in other words, not every ton is equally "effective" in reducing visibility impairment, and thus dollars per ton reduced is not a reliable indicator of cost effectiveness. To measure cost effectiveness, one should look at the cost of visibility improvement per deciview (dv) rather than per ton of emission reduction. This distinction is made by EPA itself in its *Guidance* for how to set RPGs:

> *Therefore, in assessing additional emissions reduction strategies for source categories or individual, large scale sources, simple cost effectiveness estimates based on a dollar-per-ton calculation may not be as meaningful as a dollar-per-deciview calculation…*[10](emphasis added)

However, NERA asserted that EPA has not provided a dollar per deciview calculation or any discussion of it in its proposed FIP for Texas. Nevertheless, the data necessary to make these calculations are all available in the proposed FIP and associated TSDs, and we make those calculations in this report. EPA has not explained how it would calculate a dollar per deciview value for purposes of its proposal, and thus we are unable to evaluate or comment on EPA's methodology.

According to NERA, for the rest of this report, we will use the term "cost effectiveness" to refer specifically to dollars per deciview. Except where otherwise noted, it will be computed as the annualized cost of a proposed control (or set of controls) divided by the amount of deciview improvement that it will provide on the average of the 20% worst-visibility days, at the Class I area that EPA contends is most impacted (*i.e.*, WIMO in this case).[11]

NERA noted, because the record contains the necessary information to compute dollars per deciview, there is no reason for EPA to use the unreliable metric of dollars per ton to assess cost effectiveness of alternative potential controls under the reasonable progress analysis. In the next section, we explain how the information EPA has put into the record can be used to perform an economically-valid cost-effectiveness analysis in lieu of the unreliable dollars per ton criterion. EPA could have and should have calculated the economically-correct measure of cost effectiveness but inexplicably EPA did not.

Footnotes:
[6] 79 Fed. Reg. at 74,884.
[7] See for example, FIP TSD, pp. 12 and 30.
[8] FIP TSD, Tables 4, 6, 8, 10, 12, and 14.
[9] Multiple different types of emissions can contribute to visibility reduction. Some types reduce visibility in the chemical form in which they are originally emitted, while other types of emissions first must be converted in the atmosphere into new compounds that then reduce visibility, and contribute to regional haze. The different types of haze-forming emissions result in different levels of impact on visibility impairment per unit of atmospheric concentration due to their different physical and chemical properties. The proposed FIP focuses on potential controls on emissions of SO_2, which reduce visibility only after transformation in the atmosphere into sulfates. Other haze-forming emissions include NO_x dust, fly-ash, soot (elemental carbon), and some volatile organics. The proposed FIP does not propose controls on any of these other haze-forming emissions.
[10] EPA, *Guidance for Setting Reasonable Progress Goals under the Regional Haze Program*, Office of Air Quality Planning and Standards, Research Triangle Park, NC, June 1, 2007 (rev). More recently, EPA has affirmed that "dollars per deciview is one of several metrics that can be used to analyze cost of visibility improvement . . . ." 77 Fed. Reg. at 40,156.
[11] Sometimes the cost per deciview may be computed as the dollars divided by the sum of all deciview changes at every Class I area at issue. The "cumulative" dollars per deciview will always be smaller than the cost per deciview at the most-impacted area. The important point is that comparisons of costs per deciview should always be computed using the same approach.

[NERA (0061) p. 5] In the report prepared for Luminant, NERA first addressed the cost-effectiveness calculations for the set of upgrades that represent the only controls described in the proposed FIP that could legally be mandated by EPA during the first regional haze planning period. This is done using (1) the air quality modeling results that were developed by ENVIRON for CENRAP (and which were relied on by Oklahoma and Texas for their SIP submissions and used by ENVIRON in its modeling for EPA), and (2) the revised visibility benefits that EPA developed in its review. As we show, even if EPA's revised estimates of air quality contributions were to be used, the proposed reasonable progress control requirements remain profoundly inconsistent with the economic cost-effectiveness thresholds EPA has utilized and relied upon in other states.

[NERA (0061) p. 6] In the report prepared for Luminant, NERA noted that Table 1 contains information for each of the seven upgrade projects in the proposed FIP. Data on the SO_2 reductions and the change in deciviews in each Class I area (for the average of the 20% worst visibility days at each respective Class I area) come from EPA TSDs and supporting spreadsheets. Estimates of the annualized total costs are also based on EPA information.[13] The estimates in Table 1 are based on the CENRAP modeling that was originally performed for the Texas SIP using source emissions projected to occur in 2018 and which EPA uses to calculate its proposed RPGs for 2018 for these three areas.

NERA noted, using EPA's data, the dollars per deciview for each individual control does vary from unit to unit, even though the estimated dollars per ton is presumed the same in every case (*i.e.*, $500/ton). The cost effectiveness, based on benefits at the most affected Class I area, WIMO, ranges from $129 million per deciview to $651 million per deciview, depending on the unit. In the bottom row, the aggregated cost of all the upgrades and their aggregated cost effectiveness is shown to be $364 million per deciview of improvement at WIMO.

Table 1: The max and cumulative cost effectiveness ($/dv) of the proposed FIP scrubber upgrades based on EPA's proposed Reasonable Progress Goal (CENRAP modeled 2018 emissions) [Table not excerpted]

NERA noted that the deciview impact at WIMO for each upgrade in Table 1 is between 0.008 dv and 0.033 dv, depending on the unit. The aggregate deciview improvement of all these upgrades at the maximally-impacted area on the 20% worst-visibility days of the year is 0.141 dv, as can be seen in the bottom row of the table, and this is the value that EPA proposes for setting the RPG for Wichita Mountains.[14] Thus, Table 1 represents the true cost-effectiveness of EPA's proposal, and it also shows the specific deciview improvement EPA relies on to justify its RPGs. The specific deciview impact for each of the individual upgrades is never reported in the proposed rule or supporting TSDs but can be obtained by careful examination of EPA's supporting spreadsheets.[15]

NERA noted that even the aggregate amount of change in visibility at the maximally-impacted area from all seven upgrades is not physiologically possible to perceive,[16] which means that the *actual* economic value of this change in the RPG is likely zero. Although EPA predicts that two other Class I areas will potentially benefit from the controls it would require, Table 1 shows that the other two Class I areas are so distant that their coincidental visibility improvement from these same controls would be miniscule: less than 0.04 dv in aggregate at either BIBE or GUMO. These benefits most certainly could not be viewed as justifying any of these upgrades over the case at WIMO, as the economic cost effectiveness for any single one of those upgrades is much worse: ranging from $369 million per deciview to $3.7 *billion* per deciview, depending on the unit.

NERA also noted that the last column of Table 1 provides the cost per deciview if computed for the *cumulative* impact to all three Class I areas of interest in the proposed FIP. As is mathematically necessary, it is smaller than the cost effectiveness for the maximally-impacted area; the estimate for the aggregate of all seven upgrades is $249 million per cumulative deciview.

Footnotes:
[13] Note these are just estimates and not the values calculated by EPA using confidential business information. We did not review the confidential business information or EPA's unit-specific calculations. Per the FIP TSD, EPA

states that the "cost effectiveness was less than $600/ton" (FIP TSD at page 27). Further, EPA has used $500/ton as an "approximate cost/placeholder" based on confidential business information data (see cells D61 to D69 in the worksheet labeled "summary table" in "TX116-007- 33 Vis modeling summary.xlsx" in EPA Docket Folder (http://www regulations.gov/#!documentDetail;D=EPA-R06-OAR-2014-0754-0007)). Thus, like EPA, we used $500/ton as an approximate figure. The fact that we use EPA's estimates to demonstrate the lack of cost effectiveness of those proposed controls does not imply that we are endorsing them.

[14] See cell D8 in the worksheet labeled "proposal total vis 2018" in "TX116-007- 33 Vis modeling summary.xlsx" in EPA Docket Folder (http://www.regulations.gov/#!documentDetail;D=EPA-R06-OAR-2014-0754-0007).

[15] Specifically, when one opens the EPA docket file cited in the prior footnote, the tab called "dv summary" shows dv changes based only on "Estimated deciview improvement from actual emissions (3-yr average annual emissions 2009-2013 eliminating min and max year)." However, the values in the tables shown in that tab are linked to more detailed results in other tabs called "SDA," "WFGD" and "WFGD_upgrade." In these other tabs, there is a dropdown box to select the baseline of emissions. The version of the file in the docket has those drop-down boxes set on the option "3yr average 2009-2013 (eliminate max and min)." However, a user can change the option to "2018" to reflect the modeling results provided to EPA by ENVIRON prior to EPA's adjustments. When "2018" is selected in each of those tabs, the deciview impacts are recalculated using the CENRAP projected 2018 emissions, and one can then observe the unit-specific upgrade deciview impacts that are in Table 1 and which add up to the 0.141 aggregate value that EPA is using as the basis for its proposed RPG for Wichita Mountains.

[16] The Regional Haze Rule "establishe[d] the deciview (dv) as the principal metric for measuring visibility," which is "a useful measure for tracking progress in improving visibility, because each deciview change is an equal incremental change in visibility perceived by the human eye." 77 Fed. Reg. at 30,249.

[NERA (0061) p. 8] NERA, in its report prepared for Luminant, stated that EPA also provides alternative visibility impact estimates based on adjusted emission levels, even though these estimates do not form the basis of EPA's proposed FIP. Even using EPA's visibility estimates based on adjusted emissions (*i.e.*, EPA uses the 3-year average annual tons per year based on 2009-2013 actual emissions, after eliminating the two years with the highest and lowest reported emissions), the dollars per deciview remains extremely high (*i.e.*, is extremely cost-ineffective). Those calculations are provided in Table 2. Note that the unit-specific deciview impacts in Table 2 are the ones that EPA is using to justify these upgrades (*i.e.,* they are the values that appear in the Federal Register[17]) but that these are not consistent with the calculation of the 0.141 dv value that EPA proposes for setting the RPG for WIMO based on the scrubber upgrades.[18] *These* unit-specific deciview impacts aggregate to a 0.281 dv impact shown on the bottom row of Table 2.

According to NERA, using these revised deciview impact estimates, which EPA apparently believes is the best case for its proposal, the cost effectiveness based on benefits at the highest-impacted Class I area (WIMO) ranges from $142 million per deciview to $223 million per deciview, depending on the unit. In the bottom row, the aggregated cost of all the upgrades and their aggregated cost effectiveness is shown to be $183 million per deciview of improvement at WIMO.

NERA stated, even in this case, the upgrades would provide only 0.03 dv to 0.06 dv of impact at the maximally-affected Class I area. In aggregate, all of the upgrades combined produce a maximum of 0.28 dv of improvement. Thus, despite EPA's re-analyses to increase the purported visibility benefit of its proposal, this is still not a humanly perceptible amount of change[19] and, again, the actual economic value of such a change in the RPG is likely zero.

NERA noted that although EPA predicts that two other Class I areas will potentially benefit from the controls it would require, the table shows that the other two Class I areas are so distant that their coincidental visibility improvement from these same controls would be miniscule: less than

0.07 dv in aggregate at either BIBE or GUMO even using EPA's higher emissions assumption. These benefits most certainly could not be viewed as justifying any of these upgrades over the case at WIMO, as the economic cost effectiveness for any single one of those upgrades is much worse: ranging from $338 million per deciview to $1.6 *billion* per deciview.

NERA noted that the last column of Table 2 provides the cost per deciview if computed for the *cumulative* impact to all three Class I areas of interest in the proposed FIP. As is mathematically necessary, it is smaller than the cost effectiveness for the maximally impacted area; the estimate for the aggregate of all seven upgrades is $123 million per cumulative deciview if using EPA's adjusted emission levels.

Table 2: The max and cumulative cost effectiveness ($/dv) of the proposed FIP scrubber upgrades based on EPA's alternative approach (3-year average annual tons per year (2009-2013), eliminating min and max years) [Table not excerpted]

Footnotes:
[17] Tables 34, 35 and 36 in 79 Fed. Reg. at 74,881-2.
[18] Tables 43 and 44 in 79 Fed. Reg. at 74,887.
[19] See footnote 16.

[Associations (0059) p. 17-19] The Associations stated that the EPA's proposed FIP for Texas is also arbitrary and capricious because the costs of the emissions controls that EPA would require are excessive in comparison to the minimal visibility benefits that they would provide. In evaluating the costs of the proposed emission control requirements, EPA disregards its own guidance and appears to apply only a cost per ton methodology that fails to account for important differences in the emissions that impair visibility as well as the role that location and other facility-specific factors can play in determining the effect that emissions controls will have on visibility in the Class I areas that are the focus of the regional haze provisions. As a result, EPA singles out a handful of sources that would be required to spend billions of dollars to install emissions controls that would result, at most, in miniscule improvements in visibility in Class I areas that would be imperceptible to observers.

The Associations noted, unlike generally applicable emissions standards that are designed to improve air quality everywhere, the regional haze provisions are focused specifically on a limited number of Class I areas throughout the country. As a result, not all emissions reductions will have the same impacts on visibility in Class I areas. Key factors such as the type of pollutant at issue, distance from Class I areas, and prevailing winds can all affect the degree to which certain emissions will contribute to visibility impairment and, as a result, the visibility benefits that will be produced by reducing those emissions. In other words, not every ton of emissions reductions is the same. Recognizing this fact, EPA explains in guidance that "in assessing emission reduction strategies for source categories or individual, large scale sources, simple cost effectiveness estimates based on a dollar-per-ton calculation may not be as meaningful as a dollar-per-deciview calculation, especially if the strategies reduce different groups of pollutants." EPA, *Guidance for Setting Reasonable Progress Goals Under the Regional Haze Program* 5-2 (June 1, 2007). EPA has reaffirmed that view in subsequent SIP reviews, stating its belief "that dollars per deciview is one of several metrics that can be used to analyze cost of visibility improvement." 77 Fed. Reg. 40,150, 40,156 (July 6, 2012). That is, because of distance, wind patterns and other relevant meteorological factors, even emissions that might be quite inexpensive to reduce may have no meaningful impact on downwind visibility.

The Associations stated that the EPA fails to apply its own guidance in evaluating the cost effectiveness of its proposed FIP. While EPA provides an evaluation of dollars per ton of emissions reduction, 79 Fed. Reg. at 74,876-77, T. 32, it makes no effort to connect those costs to actual visibility benefits. Instead, EPA simply asserts, without providing a detailed cost/benefit comparison that emissions controls at individual units are "cost effective" and that visibility benefits are "significant." *See* EPA, *FIP Technical Support Document* at 31. In fact, while EPA separately evaluates the cost of the proposed FIP and the visibility benefits, it never compares them directly in an attempt to evaluate the cost effectiveness of the proposed controls. *See generally* EPA, *FIP Technical Support Document*; EPA, *Cost Technical Support Document*. Instead, EPA asserts that the Unfunded Mandates Reform Act, which requires a written cost benefit analysis, does not apply. 79 Fed. Reg. at 74,889-90. By failing to include the relevant cost benefit analysis in the record, it is impossible to verify EPA's assertion that in preparing the FIP, "the cost of controls [were] weighted against their projected visibility benefits at a number of Class I areas." EPA, *FIP Technical Support Document* at 11.

According to the Associations, had EPA conducted a proper dollars per deciview cost benefit analysis, it would be readily apparent that the emission controls in the proposed FIP are not cost effective. In total, EPA projects that installing the proposed emission controls at six facilities would cost approximately $1.8 billion. *See* 79 Fed. Reg. at 74,876-77, T32. However, the effect of those emission controls on nearby Class I areas would be imperceptible to the human eye. In fact, in 2018 the visibility conditions would improve at Big Bend from 16.6 to 16.57 deciviews and at Guadalupe Mountains from 16.3 to 16.26 deciviews. *See id.* at 74,887. In other words, EPA proposes to impose enormous costs to improve visibility by a few hundredths of a deciview. Even by EPA's own metrics these costs are excessive in comparison to the benefits. Indeed, the human eye cannot detect changes in visibility of less than one deciview and, under EPA's own statistical standards, these 2018 "improvements" would be treated as nonexistent.[4] That is why, in another FIP proposal, EPA recently concluded that a similar incremental visibility improvement was minimal and could not justify the much smaller difference in cost between wet and dry SO_2 scrubbers. EPA, *Arkansas FIP Proposal, Prepublication Version* 160-61 (Mar. 6, 2015). Imposition of such massive costs without achieving any cognizable visibility benefit during the interim planning period cannot be considered cost effective. Thus, in light of the statutory obligation to consider the costs of compliance, 42 U.S.C. § 7491(g)(1), EPA's proposed FIP is unreasonable, arbitrary, and capricious.

Commenter's Reference:
[4] U.S. EPA, Technical Support Document for Demonstration of the Transport Rule as a BART Alternative 24, n.24 (Dec. 2011), Docket ID No. EPA-HQ-OAR-2011-0729-0014 ("All differences that are < 0.05 [deciviews] were rounded down to 0.0 and are considered to be no degradation").

Response: At various points in their comments the commenters either wrongly imply we used the $/ton metric as the sole indicator of whether a particular control was justified, or that we did not consider the visibility improvement from those controls. We carefully compared the cost effectiveness of our proposed controls to their modeled visibility benefits. We disagree that the \$/dv metric is more meaningful than our use of the \$/ton metric in conjunction with our consideration of the visibility benefit from the installation of controls. As we note in our Oklahoma FIP:[306]

> [T]he BART Guidelines require that cost effectiveness be calculated in terms of annualized dollars per ton of pollutant removed, or \$/ton.[307] OG&E provided a \$/deciview analysis for its units and comparable BART determination performed by us. In our analysis for our BART FIP for OG&E and AEP/PSO, we did not evaluate \$/deciview. We explain that the BART Guidelines list the \$/deciview metric as an optional cost effectiveness measure that can be employed along with the required \$/ton metric for use in a BART evaluation. The metric can be useful in comparing control strategies or as additional information in the BART determination process; however, due to the complexity of the technical issues surrounding regional haze, we have never recommended the use of this metric as a cutpoint in making BART determinations. We note that to use the \$/deciview metric as the main determining factor would most likely require the development of thresholds of acceptable costs per deciview of improvement for BART determinations for both single and multiple Class I analyses. We have not developed such thresholds for use in BART determination made by us. As OG&E acknowledges, EPA did not use this metric as part of its proposed BART determinations for either the Four Corners Power Plant FIP in AZ, or the San Juan Generating Station FIP in NM. Generally speaking, while the metric can be useful if thoughtfully applied, we view the use of the \$/deciview metric as suggesting a level of precision in the calculation of visibility impacts that is not justified in many cases. While we did not use a \$/deciview metric, we did, however, consider the visibility benefits and costs of control together, as noted above by weighing the costs in light of the predicted visibility improvement.

Our decision was reviewed and upheld in Oklahoma v. EPA, 723 F.3d 1201 by the Tenth Circuit which ruled:

> Oklahoma first suggests EPA should not have rejected the visibility analysis it conducted in the SIP, which used the dollar-per-deciview method. This argument is misguided. The EPA rejected the SIP because of the flawed cost estimates. When promulgating its own implementation plan, it did not need to use the same metric as Oklahoma. The guidelines merely permit the BART-determining authority to use dollar per deciview as an optional method of evaluating cost effectiveness. *See* 40 C.F.R. pt. 51 app. Y(IV)(E)(1).[308]

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[306] Response to Technical Comments for Sections E. through H. of the Federal Register Notice for the Oklahoma Regional Haze and Visibility Transport Federal Implementation Plan, Docket No. EPA-R06-OAR-2010-0190, 12/13/2011, pdf 116.

[307] 70 FR 39167.

[308] We note, however, that in both its final rule and in its brief the EPA asserts that the guidelines require the use of the dollar-per-ton metric in evaluating cost effectiveness. The guidelines themselves are a bit unclear. In the section on cost effectiveness, the guidelines mention only the dollar-per-ton metric. 40 C.F.R. pt. 51 app. Y(IV)(D)(4)(c).

> And in the final rule, the EPA explained why it did not use the dollar-per-deciview metric used by Oklahoma. "Generally speaking, while the metric can be useful if thoughtfully applied, we view the use of the $/deciview metric as suggesting a level of precision in the calculation of visibility impacts that is not justified in many cases." 76 Fed.Reg. at 81,747. The EPA has never mandated the use of this metric, and has not developed "thresholds of acceptable costs per deciview improvement." *Id.* While the federal land managers have developed thresholds, these thresholds were apparently developed without input from the EPA and without notice-and-comment review. EPA Br. at 54 n. 13. In light of this, we do not find it arbitrary or capricious that the EPA chose not to use the dollar-per-deciview metric in evaluating BART options in creating the FIP. We therefore also conclude that any argument by the petitioners that the dollar-per-deciview measurement proves the scrubbers are not cost effective lacks merit. *See* Pet. Reply Br. at 16.

We see no reason, despite the fact that the facilities we evaluated in our proposed TX/OK FIPs were done under the reasonable progress and long-term strategy sections of the Regional Haze Rule, to deviate from our view of the dollar per deciview metric here. We also note that the use of the dollar per deciview metric is further complicated in the present case due to our use of CAMx modeling. As we discuss in our proposal and elsewhere in our response to comments, there is no way to directly compare the CAMx modeling we used in our proposed TX/OK FIPs with previous CALPUFF modeling results used for BART because of differences in the models, model inputs, and metrics used.[309] Many of these differences result in CAMx modeled visibility impacts and benefits to be much lower than CALPUFF modeled visibility impacts and benefits relied on in other actions. For example, one difference between the two model analyses is that CALPUFF modeling is focused on the *maximum* impact from the modeled source, whereas the CAMx modeling is focused on the *average* impact over the 20% worst days as determined by the monitored data during the baseline. Consequently, even if we were to use the dollar per deciview metric in our TX/OK FIPs, we would be unable to effectively compare the results based on our CAMx modeling against other modeling and cost analyses, the vast majority of which employed CALPUFF. The commenter's estimates do not consider these differences.

We disagree with Luminant and other commenters that we did not balance the cost of our proposed controls with their modeled visibility benefits. This information is prominently discussed in both our FIP TSD and in our Federal Register notice. For instance, Appendix A of our FIP TSD very thoroughly develops our modeling strategy and concludes with a comparison of the visibility improvement we expected to result from the controls we proposed. We review this information in the in Section 7 of the main body of our FIP TSD, and in Sections 8 and 9, we compare that visibility benefit to its cost effectiveness in proposing our control set.

However, the guidelines later state that in evaluating alternatives, "we recommend you develop a chart (or charts) displaying for each of the alternatives" that includes, among other factors, the cost of compliance defined as "compliance — total annualized costs ($), cost effectiveness ($/ton), and incremental cost effectiveness ($/ton), and/or any other cost-effectiveness measures (such as $/deciview)." Id. app. Y(IV)(E)(1) (emphasis added).

[309] FIP TSD at A-35

Luminant and other commenters have made several comparisons to our previous actions. We address those comments in the consistency section of this document.

Additionally, EPA was not required under Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), Pub. L. 104–4, to provide a written cost-benefit analysis because, as a threshold matter, the proposal is not a "rule" for purposes of Title II of UMRA. Therefore, the requirements of UMRA do not apply to the proposal. Specifically, 2 U.S.C. Section 1502(1) provides that all terms in Title II of UMRA have the meanings set forth in 2 U.S.C. Section 658, which in turn further provides that the terms ''regulation'' and ''rule'' have the meanings set forth in 5 U.S.C. Section 601(2). Under 5 U.S.C. Section 601(2), ''the term 'rule' does not include a rule of particular applicability relating to. . . facilities.'' Because this proposed rule is a rule of particular applicability relating to eight named facilities, EPA has determined that it is not a ''rule'' for the purposes of Title II of UMRA.

In summary, we reject the commenters' assertions that we did not properly compare the cost effectiveness of our proposed controls to their modeled visibility benefits. We also reject the commenters' assertions that this type of comparison requires the $/dv metric. Even if we had placed emphatic focus on the $/dv metric, we would have had no ability to compare its results to previous actions by either us or the states, because of the inability to reliably compare deciviews from our CAMx modeling to CALPUFF modeling, which was the modeling platform most often used in previous BART and reasonable progress/long-term strategy analyses.

12. Cost versus visibility benefit

Comment: The proposed scrubber retrofits are even less cost effective than the upgrades [NERA (0061) p. 11]

In its report prepared for Luminant, NERA stated that the proposed FIP also includes seven scrubber retrofits, although the visibility benefits from these cannot be included as justification for EPA's FIP, which covers only the first regional haze planning period that ends in 2018 and EPA acknowledges that none of them can be operational before the end of 2018. These controls therefore fail under the statutory factor to consider the time necessary for compliance. Nevertheless, because EPA seems to justify its proposal based on estimated benefits from these controls, we have examined their cost-effectiveness as well. NERA found that the retrofits also cannot be justified because they entail an even higher dollar per deciview cost.

NERA noted that table 3 presents EPA's estimates of the costs of each of these seven proposed retrofits, and their modeled impact on deciviews at each of the three Class I areas discussed in the proposed FIP. EPA justifies five of the retrofits based on their contributions to haze at WIMO, and those have cost effectiveness estimated between $559 million per deciview and $868 million per deciview with respect to their maximally-impacted area, WIMO. EPA justifies two of the retrofits (the spray dryer absorbers, or SDAs, at the Tolk units) based on their contributions to haze at GUMO, and those cost $1.1 to $1.3 billion per deciview with respect to that maximally-impacted area. The aggregate visibility improvement on the 20% worst days at WIMO from these seven retrofits is projected to be 0.304 dv, which is also imperceptible. The aggregate deciview impact at the other two Class I areas is about one-third of the impact at WIMO.

NERA stated, even if EPA's alternative emission values were to be used, the cost effectiveness of the proposed retrofits with respect to their highest-impact areas ranges from $429 million per to over $1.3 billion per deciview, as shown in Table 4. Note that the unit-specific deciview impacts in Table 4 are the ones that EPA is using to justify these retrofits (*i.e.,* they are the values that appear in the Federal Register[20]), but that these are not consistent with the calculation of the 0.304 dv value that EPA uses to calculate its proposed RPG for Wichita Mountains "[a]ssuming all controls in place by 2018," which EPA itself admits cannot be accomplished.[21] *These* unit-specific deciview impacts aggregate to a 0.331 dv impact shown on the bottom row of Table 4.

Again, NERA noted that the visibility improvement is less than humanly perceptible: a combined benefit of 0.331 dv for the average of the 20% worst days at WIMO, and about one-third that at either of BIBE or GUMO.

According to NERA, the last columns of Tables 3 and 4 provide the cost per deciview if computed for the *cumulative* impact to all three Class I areas of interest in the proposed FIP. As is mathematically necessary, these are smaller than the cost effectiveness for the maximally impacted area. The estimates for the aggregate of all seven retrofits are $467 million and $430 million per cumulative deciview, using the CENRAP 2018 projected emissions or EPA's adjusted unit emission levels, respectively. Again, the fact that we use EPA's estimates to demonstrate the lack of cost effectiveness of those proposed controls does not imply that we are endorsing them. We simply find that, even under EPA's best case, the proposed controls are cost-<u>in</u>effective.

Table 3: The max and cumulative cost effectiveness ($/dv) of the proposed FIP scrubber retrofits (CENRAP modeled 2018 emissions) [Table not excerpted]

Table 4: The max and cumulative cost effectiveness ($/dv) of the proposed FIP scrubber retrofits based on EPA's alternative approach (3-year average annual tons per year (2009-2013), eliminating min and max years) [Table not excerpted]

<u>Footnotes:</u>
[20] Tables 34, 35, and 36 in 79 Fed. Reg. at 74,881-2.
[21] Table 44 in 79 Fed. Reg. at 74,887.

Response: We agree with NERA that our proposed scrubber retrofits are less cost effective (higher $/ton) than our proposed scrubber upgrades. This is completely normal and expected, since a scrubber upgrade uses most of the existing scrubber system.

We believe all of our proposed controls are cost effective, which is particularly demonstrated by our close examination of the applicable values for the cost per ton of emission reduced. We disagree with NERA that our proposal to require the operation of controls beyond 2018 violates either the Clean Air Act or our Regional Haze Rule and we address that issue in responding to a separate comment. We also disagree with the commenter that the Regional Haze Rule requires that controls result in perceptible visibility improvement. Also, we did not use the metric NERA uses—dollar per deciview—because we do not believe it is an appropriate point of focus when there are, as in this case, demonstrated impacts and controls demonstrated to be cost effective on a cost/ton basis. We direct NERA to our responses to other comments in which we respond to these specific issues in more detail.

Comment: CCP stated that the EPA rejected TCEQ's cumulative approach in favor of a unit-specific approach. As above, this rejection was improper and TCEQ's cumulative approach is actually more consistent with the statute, regulations, and even EPA's guidance. But even under a unit-specific approach, EPA's analysis and conclusions are deficient. In the Proposed Rule, EPA "propose[s] to find . . . that a scrubber installation on the CCP unit would also yield significant visibility benefits." 79 Fed. Reg. 74,882. CCP disagrees with this proposed determination. EPA's model significantly overstates the visibility improvements on which EPA is basing its proposal. When properly adjusted to account for this recognized over-prediction bias, the impacts from Coleto Creek Unit 1 are insufficient to justify installation of controls. CCP's own modeling further demonstrates the lack of impact of emissions from Coleto Creek Unit 1 on visibility conditions and the lack of an improvement in visibility that can be attributed to the proposed controls.

Response: We describe why we proposed to disapprove the TCEQ's four factor analysis in our proposal[310]:

> The TCEQ constructed a large potential control set consisting of a mix of large and small sources, located at various distances from Class I areas, with a large geographical distribution. Because of the variation in size, type, and location of these sources, the potential to impact visibility and potential benefit from controls at a given Class I area can vary greatly between the identified sources. This potential control set identified by the TCEQ included controls on some sources that would likely result in significant visibility benefits, but also included controls on many sources with much less anticipated visibility benefits. Because it only estimated the visibility benefit of all the controls together, the TCEQ was not able to assess the potential benefit of controlling individual sources with significant, and potentially cost-effective, visibility benefits. Also, we believe that individual benefits were masked by the inclusion of those controls with little visibility benefit that only served to increase the total cost figures. For example, the TCEQ identified SO_2 controls at Big Brown to be approximately $1,500/ton, significantly less than its $2,700/ton threshold. These controls were estimated to achieve greater than 40,000 tpy SO_2 emission reductions. Despite this evidence in the record of an identified cost-effective control that results in large emission reductions, and source apportionment modeling identifying large impacts from EGU sources in northeast Texas, the TCEQ did not separately evaluate the visibility benefit from the implementation of this control, or appropriately weigh the four reasonable progress factors in determining the reasonableness of this individual control.

310 79 FR 74838.

For the reasons described above, we believe that the TCEQ's four factor analysis was flawed. We disagree that the TCEQ's approach can be approved or that it is consistent with the CAA, our guidance, or our regulations. The comment that our model overestimates the anticipated visibility improvement from controls and that the commenter's modeling demonstrates a lack of visibility impacts from the source are addressed in a separate comment response. In brief response here, we disagree with the comment and believe we used the appropriate model and model results in our determination that controls on Coleto Creek unit 1 will yield significant visibility benefits at Wichita Mountains and Big Bend.

Comment: Luminant provided a summary of EPA's analysis of the costs of controls for the "smaller subset" of Texas sources that it selected through its visibility analysis. [Luminant (0061) p. 45]

Luminant explained that for the 21 coal-fired generating units that EPA identified at Step 5 of its visibility analysis (plus San Miguel), EPA subsequently conducted a cost analysis for the additional SO_2 controls that it had determined yielded significant visibility benefits.[316] For the 10 units equipped with scrubbers, EPA "calculate[d] the costs of upgrading that scrubbing system."[317] For the 11 units without scrubbers, EPA "calculate[d] the costs for DSI [dry sorbent injection], dry scrubbing, and wet scrubbing."[318] In performing these calculations, EPA says it "relied on the methods and principles contained within the EPA Air Pollution Control Cost Manual."[319] However, as discussed below, EPA's analysis deviated significantly from the Control Cost Manual that it claimed to be relying on, and its cost estimates substantially understate the costs and overstate the potential for SO_2 reductions.

For the 10 units with scrubber systems already installed and in operation, EPA's analysis assumed: 1) that the existing system had already been upgraded to an SO_2 removal efficiency of at least 95%, or could be upgraded to that level with "proven equipment and techniques"; 2) that scrubber bypasses could be "eliminated" and the additional flue gas could be treated by system at 95% removal efficiency or greater; and 3) that additional changes necessary to eliminate bypass (including adding fan capacity, upgrading the electrical distribution system, and conversion to a wet stack) could be performed using "proven equipment and techniques."[320] With these assumptions—which, as we discuss below, EPA does not support—EPA calculated the costs and concluded that "in all cases, the cost effectiveness was less than \$600/ton" of SO_2 removed.[321] EPA conceded that its "calculations of scrubber efficiency may contain some error" that required "adjustments" to its cost-per-ton estimates, but it explained that regardless of the "error in calculating the true tons of SO_2 removed," "we would still propose to upgrade these SO_2 scrubbers."[322] In other words, the actual cost-per-ton was ultimately irrelevant to EPA's decision.

For the 11 units without scrubbers, EPA calculated the costs of DSI (at both 50% and 90% removal), dry scrubbing, and wet scrubbing. The SO_2 removal efficiencies that EPA analyzed for dry scrubbing and wet scrubbing varied from unit to unit, without explanation.[323] EPA used the results of its costs estimates to compare the different types of controls to each other.[324] EPA concluded that, for all but one of the units, "the cost-effectiveness of DSI was worse (higher \$/ton) than either SDA or wet FGD" and that "[a]t the higher 80% or 90% level of control, the cost-effectiveness of DSI was worse than either SDA or wet FGD in all cases."[325]

"Consequently," EPA explained, "we are not proposing that DSI be installed at any unit."[326] As between dry scrubbing (SDA) and wet scrubbing (FGD), EPA found that "[t]he capital cost of wet FGD is higher than SDA by approximately 8-13%."[327] But EPA found that "the cost-effectiveness ($/ton) of wet FGD was better than SDA in all cases except for the Tolk and Welsh units,"[328] "mainly due to the greater level of control (98% maximum versus 95% maximum) of wet FGD over SDA…."[329]

Ultimately, EPA concluded that "[g]iven the greater visibility improvement of wet FGD over SDA, we propose to base our cost/benefit reasonable progress and long-term strategy determination on wet FGD, except for the Tolk units, due to their potential water issue."[330] For example, with respect to Luminant's units, EPA found that the capital cost for a wet scrubber at Big Brown Unit 1 would be $256,032,000, and the capital cost for dry scrubbing would be $226,656,000.[331] The so-called "greater visibility improvement," according to EPA, from the additional $29.4 million for the wet scrubber at Big Brown Unit 1 was projected to be 0.001 deciview at Big Bend and Guadalupe Mountains and 0.003 deciview at Wichita Mountains (2018, 20% worst days).[332] For Monticello Unit 2, the capital cost difference between dry scrubbing and wet scrubbing was approximately $26 million,[333] and the so-called "greater visibility improvement" would be zero at Big Bend and Guadalupe Mountains and 0.001 deciview at Wichita Mountains (2018, 20% worst days).[334] However, EPA does not actually compare the costs for the projected visibility improvement between the different controls at the different units.

Footnotes:
316 Cost TSD at 1.
317 Id.
318 Id.
319 Id. at 2.
320 Id. at 55.
321 Id.
322 79 Fed. Reg. at 74,885.
323 Id. at 74,876.
324 Id. at 74,884. EPA explained that it followed the Control Cost Manual and used the "overnight" method of cost estimation for this reason. Cost TSD at 2.
325 79 Fed. Reg. at 74,884.
326 Id.
327 Cost TSD at 25.
328 79 Fed. Reg. at 74,884.
329 Cost TSD at 25.
330 79 Fed. Reg. at 74,884 (emphasis added).
331 Cost TSD at 24.
332 79 Fed. Reg. at 74,881–82.
333 Cost TSD at 24.
334 79 Fed. Reg. at 74881–82.

Response: We take no position on Luminant's narrative of our proposal. Regarding the remainder of Luminant's comments, as we discuss in our FIP TSD[311]:

We present a reasonable progress and long-term strategy cost analyses for those

[311] FIP TSD, page 11.

> units being analyzed for DSI or scrubber retrofits in which we assess the cost of DSI, SDA, and wet FGD. The modeled benefits that would result from the installation of those controls are reviewed, and the cost of the controls are weighed against their projected visibility benefits at a number of Class I areas. We then propose which units should install SO_2 control equipment and the control level those units should achieve. Please see our Cost TSD for more detail on how we performed the cost analysis and Appendix A to this TSD for more details about how we conducted our visibility analysis.

We note that elsewhere we have addressed Luminant's objection to our consideration of visibility in proposing the reasonable progress and long-term strategy aspects of our FIP. As we explain elsewhere in our responses to comments, we believe that we properly considered visibility in proposing whether additional controls should be installed by the affected facilities. Nevertheless, as we also noted in our FIP TSD, our proposal to required controls was heavily influenced by the generally greater cost effectiveness offered by wet FGD over SDA:[312]

> With the exception of Tolk, all of the scrubber retrofits were analyzed on the basis of both SDA and wet scrubbers. The SDA level of control was assumed to be a maximum of 95% not to go below 0.06 lbs/MMBtu. The wet FGD level of control was assumed to be a maximum of 98% not to go below 0.04 lbs/MMBtu. As we discuss in our Cost TSD, the cost-effectiveness ($/ton) of wet FGD was better than SDA in all cases except for the Tolk and Welsh units, which burn Power River Basin (PRB) coal. However, even in those cases, the cost-effectiveness of wet FGD was only 0.5 to 0.8% greater than SDA. Given the greater visibility improvement of wet FGD over SDA, we propose to base our cost/benefit reasonable progress and long-term strategy determination on wet FGD, except for the Tolk units, due to their potential water issue.

As we indicate above, we examined cost in the form of cost effectiveness ($/ton) which with visibility are the familiar metrics we have long used to assess BART. The cost-effectiveness calculations for the controls are based on the tons reduced and the estimated annualized cost of controls, which not only considers capital costs, but also operational expenses. The asserted cost differences provided by the comment do not consider the additional costs of operating and maintaining the control equipment. The annualized costs of operating SDA was greater than WFGD for all the evaluated units. Thus, the capital costs of wet FGD may be higher as Luminant notes, but the cost effectiveness was generally more favorable (lower $/ton) due to the greater control (more tons reduced) and lower operating costs of wet FGD. Furthermore, as we indicate above, the visibility benefits from wet FGD were greater than those from SDA. In summary, wet FGD was more cost-effective than SDA in terms of $/ton and provided for more visibility benefit at all the units evaluated for scrubber retrofits at Big Brown, Monticello, Coleto Creek, and Parish. At Tolk and Welsh, wet FGD is only slightly less cost-effective (0.3 to 0.8% greater) than SDA, but produces visibility benefits 3 to 4% larger. We therefore disagree with Luminant that we did not properly consider cost of controls at each unit.

Luminant is incorrect in stating that "the SO_2 removal efficiencies that EPA analyzed for dry

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312 FIP TSD page 30.

scrubbing and wet scrubbing varied from unit to unit, without explanation." We explained that the SDA level of control was assumed to be a maximum of 95% not to go below 0.06 lbs/MMBtu and the wet FGD level of control was assumed to be a maximum of 98% not to go below 0.04 lbs/MMBtu.[313]

As to the comment that the actual cost-per-ton for scrubber upgrades was ultimately irrelevant to our decision, we disagree with the comment and address it fully in a separate response to comment.

Comment: [NERA (0061) p. 3] In a report prepared for Luminant, NERA stated that:

In any reasonable decision process, but especially in light of EPA's regional consistency regulations, [5] measures that involve exceptionally cost-ineffective controls in some States when compared to those required in other States should have other extenuating benefits, such as highly absolute perceptible benefits, if they are still to be required.

- No such extenuating benefits have been or can be identified for the proposed reasonable progress controls in Texas.
- Even when considered *in aggregate*, neither the seven FGD upgrades nor the seven scrubber retrofits are projected to produce a visibility improvement at any Class I area that nears 0.5 deciviews.

[NERA (0061) p. 19] Furthermore, we find they are inconsistent with the cost-to-benefit ratio that EPA has utilized in other States, and there are no discernible differences in the benefits that they might provide to Class I areas that Texas sources are projected to affect. Such inconsistency in how regulations are devised and applied to different states is arbitrary and unlawful. This inconsistent application imposes an unfair social cost burden on certain populations of the country, while providing no discernable difference in visibility. It is also in conflict with EPA's own regional consistency regulations.

In sum, NERA concluded that EPA's justifications for its proposed incremental control measures are logically flawed, legally inappropriate, and also – as documented in these comments – unjustified under standard economics principles for policy evaluation.

Footnotes:
[5] 40 C.F.R. § 56.5(a)(2) (requiring that EPA regional offices "shall assure that actions taken under the act . . . [a]re as consistent as reasonably possible with the activities of other Regional Offices")

[Xcel Energy (0064) p. 1] SPS owns and operates the Tolk Generating Station near Muleshoe, Texas, which EPA proposes to regulate under the FIP. The Tolk Generating Station operates two coal-fired, steam-electric generating units with a total power production capacity of 1,067 megawatts. EPA's Proposal concludes that retrofitting both Tolk units with dry scrubbers to control emissions of SO_2 is an appropriate control application to demonstrate reasonable progress, despite imperceptible visibility improvements in the Class I areas analyzed in this

[313] 79 FR 74876 (December 16, 2014)

Proposal.

Response: For the reasons we have discussed in our responses to other comments, we disagree with NERA that our proposal included cost-ineffective controls or that we are in conflict with our consistency regulations. We also disagree that NERA has properly characterized Section 56.5, which states:

> §56.5 Mechanisms for fairness and uniformity—Responsibilities of Regional Office employees.
>
> (a) Each responsible official in a Regional Office, including the Regional Administrator, shall assure that actions taken under the act:
>
> (1) Are carried out fairly and in a manner that is consistent with the Act and Agency policy as set forth in the Agency rules and program directives,
>
> (2) Are as consistent as reasonably possible with the activities of other Regional Offices, and
>
> (3) Comply with the mechanisms developed under §56.4 of this part.
>
> (b) A responsible official in a Regional Office shall seek concurrence from the appropriate EPA Headquarters office on any interpretation of the Act, or rule, regulation, or program directive when such interpretation may result in inconsistent application among the Regional Offices of the act or rule, regulation, or program directive.
>
> (c) In reviewing State Implementation Plans, the Regional Office shall follow the provisions of the guideline, revisions to State Implementation Plans—Procedures for Approval/Disapproval Actions, OAQPS No. 1.2-005A, or revision thereof. Where regulatory actions may involve inconsistent application of the requirements of the act, the Regional Offices shall classify such actions as special actions.

As can be seen, there is no reference to "should have other extenuating benefits, such as highly absolute perceptible benefits." Also, for the reasons we have discussed in a number of other responses to comments, we disagree that our proposal is inconsistent with the cost-to-benefit ratio we have utilized in other states. As we have noted and discussed in separate response to comment, the results of the CAMx modeling we have utilized in our proposal cannot be directly compared to the results of CALPUFF modeling, which has been utilized in the vast majority of other BART and reasonable progress/long-term strategy actions because of differences in the models, model inputs, and metrics used.[314] Many of these differences result in CAMx model results to be much lower than CALPUFF modeling results relied on in other actions. Thus, we disagree with NERA that our "justifications for [our] proposed incremental control measures are logically flawed, legally inappropriate." Lastly, NERA has not provided any reference for it

[314] FIP TSD at A-35

assertion that our proposal is "unjustified under standard economics principles for policy evaluation." We believe our proposal adheres to all applicable law, our regulations, and our guidance.

Comment: EPA's Proposal Would Achieve No Detectable Change in Visibility.
[Luminant (0061), p. iii, 3]

[Luminant (0061), p. 3] Luminant stated that the overall change in visibility that EPA would mandate in 2018 (which, again, has already been achieved) is miniscule and provides no reasonable basis for EPA's proposed emission controls. The human eye can generally only detect a change of 1.0 deciview or more. Yet, EPA projects that its proposal would, at most, improve visibility in 2018 (the interim date at issue) at Big Bend by 0.03 of a deciview, at Guadalupe Mountains by 0.04 of a deciview, and at Wichita Mountains by 0.14 of a deciview. (79 FR 74887) Not only is this level imperceptible to any visitor at these Class I areas—and well out of proportion to the massive projected costs—the required "improvements" at Big Bend and Guadalupe Mountains round to zero, under EPA's own convention of rounding to the nearest tenth of a deciview.

[Luminant (0061), p. iii] Luminant stated that perhaps the most glaring problem with EPA's alternative is that it would produce no perceptible changes in visibility beyond what Texas's plan achieves in this planning period, but at a cost of approximately $2 billion more. The vast majority of these costs, EPA concedes, are for measures that cannot even be implemented by the interim goal of 2018 and are thus outside the agency's authority to impose in the first place.

Luminant stated that the regional haze program is not a health-based program that requires emission reductions at any cost and on any schedule conceived by EPA, but instead is a program designed to achieve reasonable incremental improvements in visibility at specific areas over a long-term horizon. Yet EPA's replacement proposal for Texas would not achieve any noticeable visibility improvements in the three Class I areas in Texas and Oklahoma.

Luminant noted that visibility is measured in deciviews. Anything less than one deciview generally can't be perceived by the human eye. As the table below shows, EPA's alternative would, under EPA's own estimate, result in imperceptible changes in visibility measured in tenths and hundredths of a deciview.

Summary of Visibility Improvement Provided by Luminant (0061)

EPA'S PROPOSAL ACHIEIVES NO DISCERNABLE IMPROVEMENT

Class I Area	State Established Goal (2018) (20% worst days)	EPA Proposed Goal (2018) (20% worst days)	Difference Between State Goal and EPA Proposed Goal
Big Bend (TX)	16.60 dv	16.57 dv	0.03 dv
Guadalupe Mountains (TX)	16.30 dv	16.26 dv	0.04 dv
Wichita Mountains (OK)	21.47 dv	21.33 dv	0.14 dv

In other words, EPA would force $2 billion in costs on a few Texas companies in hopes of achieving imperceptible improvements in visibility.

Luminant stated that although no one will discern the difference from EPA's proposal, every person in Texas will be exposed to increased costs of electricity and risks to reliability. There is no form of cost-benefit analysis that could justify such an approach, and, unsurprisingly, EPA does not even try to offer one.

[Luminant (0061) p. 60] Luminant stated, in other words, the basis upon which EPA would second-guess Texas's reasonable progress analysis—and for which it would impose billions of dollars in emission control measures on a handful of select Texas sources—is stated in the hundredths of a deciview: 0.03 deciview improvement at Big Bend and 0.04 deciview improvement at Guadalupe Mountains. And in terms of achieving the national goal of natural visibility conditions, EPA's proposal would have no meaningful benefit, under even EPA's calculations. EPA projects that its RPGs would achieve natural visibility at Big Bend in the year 2198 (compared to 2206 with no further controls); at Guadalupe Mountains in the year 2163 (compared to 2169 with no controls); and at Wichita Mountains in the year 2095 (compared to 2101 with no controls).[429]

Footnote:
[429] See TX116-007-_33_Vis_modeling_summary ("2018 RPG calcs").

[Associations (0059) p. 17-19] Indeed, the human eye cannot detect changes in visibility of less than one deciview and, under EPA's own statistical standards, these 2018 "improvements" would be treated as nonexistent.[4]
Commenter's Reference:
[4] U.S. EPA, Technical Support Document for Demonstration of the Transport Rule as a BART Alternative 24, n.24 (Dec. 2011), Docket ID No. EPA-HQ-OAR-2011-0729-0014 ("All differences that are < 0.05 [deciviews] were rounded down to 0.0 and are considered to be no degradation").

[NERA (0061) p. 19] NERA stated that EPA's proposed FIP for Texas includes upgrades for existing FGDs as well as retrofits of SO_2 scrubbers on electricity generating units in Texas. However, even in aggregate, EPA projects these upgrades/retrofits would cause no perceptible improvement on visibility in Class I areas in the region. The actions in the proposed FIP for Texas are either infeasible to implement within the first planning period (*i.e.*, the scrubber retrofits), and/or not cost effective from an economic perspective of producing actual benefits to people who live near or visit Class I areas.

The TCEQ argued that reductions to sources that do not have any perceptible impact are not effective regardless of their cost. The regional haze program is designed to improve visibility. The analysis approach completed by the TCEQ was to determine potential, cost -effective controls that would have a perceptible impact on visibility at a Class I area. The program was not designed to make reductions because reductions were possible, nor is that required by either the CAA or the RHR.

[Texas Governor (0066) p.1-2] The Texas Governor stated that this dispute boils down to a fight over so-called "decisiveness, more accurately, a fight over *fractions* of a "deciview." "A deciview is a haze index derived from calculated light extinction, such that uniform changes in haziness correspond to uniform incremental changes in perception across the entire range of conditions, from pristine to highly impaired." 40 C.F.R. section 51.301. The human eye only can detect a change in haziness of 1.0 or more deciviews. E.g., 79 Fed. Reg. 58,302, 58,303. EPA nonetheless proposed to FIP the State of Texas because it wanted to reduce haziness at Big Bend by merely *0.12 deciviews* and at the Guadalupe Mountains by merely *0.15 deciviews*---reductions that fall dramatically below the threshold of visibility. 79 Fed. Reg. 74,818, 74,887 tbl. 44.

According to the Texas Governor, EPA's actions are unlawful on its own terms. The Clean Air Act gives EPA authority only over the "impairment of visibility." 42 U.S.C. section 7491(a)(1).. And "visibility," of course, extends only to the things that humans can see with their naked eyes. e.g., Webster's Third New International Dictionary 2557 (1981) ("visible" means "capable of being seen"; "visibility" means "the degree or extent to which something is visible . . . [by] the observer's eye unaided by special optical devices"). The statute obviously does not give EPA authority to regulate *invisible* haze, which falls far below the 1.0-deciview threshold.

AECT stated that each of the projected total visibility improvements is much less than 0.5 dv, which, it is critical to note, EPA has previously determined is the appropriate visibility improvement threshold against which to compare the predicted visibility improvement due to an individual source installing additional emissions control for reasonable progress purposes.[22]

Footnotes:
[22] 77 Fed. Reg. at 30464

NRG stated that even if EPA's modeling and emissions inventories were accepted, additional controls would be unjustified because there would be no change to visibility as a result of EPA's proposed control measures. At most, EPA projects that its proposed controls would result in a 0.284 deciview visibility improvement associated with NRG's facilities.[1] This is a visibility change that is less than one-third of what the human eye can detect.

NRG stated that scrubber upgrades at NRG's Limestone plant would not meaningfully improve visibility even if EPA's analysis were taken at face value. EPA's modeling results suggest that upgrading the Limestone units' scrubbers to achieve 95% control would result in a visibility change of no more than 0.284 deciview compared to what EPA has described as average natural conditions, and no more than 0.057 deciview compared to EPA's projection for 2018. *See* 79

Fed. Reg. at 74,883. Such deciview changes are imperceptible to the human eye, as a single (1.0) deciview is the lowest level of visibility change that the human eye can detect.

Response: We disagree with Luminant and others that the Regional Haze Rule requires that controls on a source or group of sources result in perceptible visibility improvement.[315] As we noted in our TSDs, we derived much of our approach to analysis of control costs and visibility impacts from the BART Guidelines. In a situation where the installation of BART may not result in a perceptible improvement in visibility, the visibility benefit may still be significant, as explained by the Regional Haze Rule:[316]

> Even though the visibility improvement from an individual source may not be perceptible, it should still be considered in setting BART because the contribution to haze may be significant relative to other source contributions in the Class I area. Thus, we disagree that the degree of improvement should be contingent upon perceptibility.

We accordingly disagree that selection of control measures should be contingent upon perceptible visibility improvement. As we stated in our previous rulemaking addressing the BART determinations in Oklahoma:[317]

> Given that sources are subject to BART based on a contribution threshold of no greater than 0.5 deciviews, it would be inconsistent to automatically rule out additional controls where the improvement in visibility may be less than 1.0 deciview or even 0.5 deciviews. A perceptible visibility improvement is not a requirement of the BART determination because visibility improvements that are not perceptible may still be determined to be significant.

The Regional Haze Rule recognizes this on a basic level when it requires that a source with a 0.5 dv impact at a Class I area "contributes" to visibility impairment and must be analyzed for BART controls.[318] Because it is generally recognized that a 1.0 dv change in visibility is just barely perceptible, controlling such a source will not result in a perceptible visibility change. Consequently, even though the visibility improvement from an individual source may not be perceptible, it should still be considered because the contribution to haze may be significant relative to other source contributions in the Class I area. Thus, in our visibility improvement analysis, we have not considered perceptibility as a threshold criterion for considering improvements in visibility to be meaningful. Rather, we have considered visibility improvement in a holistic manner, taking into account all reasonably anticipated improvements in visibility, and the fact that, in the aggregate, improvements from controls on multiple sources will contribute to visibility progress towards the goal of natural visibility conditions. Visibility impacts below the thresholds of perceptibility cannot be ignored because regional haze is produced by a multitude of sources and activities which are located across a broad geographic area. In this action, as discussed below, we found that the required cost-effective controls reduce

[315] It is generally recognized that a change in visibility of 1.0 deciview is humanly perceptible.
[316] 70 FR 39104, 39129
[317] 76 FR 81739.
[318] Moreover, BART determining authorities are free to establish thresholds less than 0.5 dv.

visibility impairment from those sources with the largest visibility impacts and result in meaningful visibility benefits towards the goal of natural visibility conditions. Furthermore, as we have noted and discussed in separate response to comment, the results of the CAMx modeling we have utilized in our proposal cannot be directly compared to the results of CALPUFF modeling, which has been utilized in the vast majority of other BART and reasonable progress/long-term strategy actions, because of differences in the models, model inputs, and metrics used.[319] Many of these differences result in CAMx modeled visibility impacts and benefits that are much lower than the CALPUFF modeled visibility impacts and benefits relied on in other actions.

We also note that Luminant provides incorrect estimates of cost with respect to visibility. The commenter presents estimated visibility benefits of only the scrubber upgrades but then contrasts them to the total cost of scrubber upgrades and scrubber retrofits combined. The scrubber upgrades are only a fraction of the total cost (less than 20% of the total capital costs) and the visibility benefits due to the scrubber upgrades are only a fraction of the total anticipated visibility benefit from all required controls.

We disagree with the commenters that the projected visibility improvements at Big Bend of 0.03 dv and Guadalupe Mountains of 0.04 dv should round to zero. The commenter refers to the air quality modeling analysis performed in support of the determination that the trading programs in CSAPR achieve greater reasonable progress towards the national goal of achieving natural visibility conditions in Class I areas than source-specific Best Available Retrofit Technology (BART) in the 28 states covered by CSAPR.[320]

For the specific purposes of the CSAPR analysis, we determined it was appropriate in considering if visibility conditions degraded between projected visibility conditions for a future year baseline and projected visibility conditions under CSAPR at a Class I area, that a difference of less than 0.05 dv should be considered no degradation. The emission levels and the geographic scope of these two scenarios are vastly different. The modeled SO_2 reductions from the CSAPR were ~3.8 million tons per year and NOx reductions were ~125,000 tons per year. The analysis showed a large visibility benefit of up to 5.7 dv at Class I areas located close to the where the emissions reductions occurred, in the Eastern U.S. However, the CSAPR analysis also examined visibility impacts at all of the Class I areas in the continental U.S. In the Western U.S. (hundreds of miles from where the emissions reductions occurred), there were very small differences in visibility between the two scenarios, some of which were in the 0-0.05 dv range. Given the very large differences in emissions between the CSAPR scenarios and the large distances between these Class I areas and the regions with the largest anticipated emission reductions, we determined it was appropriate to consider a difference between the scenarios of less than 0.05 dv as no degradation for the purposes of demonstrating that visibility does not decline in any Class I area under CSAPR.

In contrast, in the Texas FIP, we are focused on assessing the visibility benefit of emission reductions from a small group of sources at the nearest Class I areas. The emissions reductions

319 FIP TSD at A-35.

320 U.S. EPA, Technical Support Document for Demonstration of the Transport Rule as a BART Alternative (Dec. 2011), Docket ID No. EPA-HQ-OAR-2011-0729-0014.

in this case are 100,000 tons of SO_2 from scrubber upgrades and 130,000 tons of SO_2 from 7 scrubber retrofits. Because the number of sources and the emission reductions are much smaller, a different threshold in determining significance of visibility benefits is appropriate. A visibility difference due to reductions of 3.8 million tons of SO_2 and 125,000 tons of NO_x spread over thousands of facilities is very different than a reduction of 100,000 tons spread over 7 units or a total of 230,000 tons spread across 14 units. Beyond what has been applied in practice in various SIPs and FIPs, there is no visibility deciview significance threshold that exists in regulation or guidance. As a result, we interpret the visibility improvement from the modeling results on a case-by-case basis. We believe that it is appropriate to apply different interpretations of rounding conventions based on the circumstances of the emissions reductions scenario(s) and geographic scope of the analysis.

Furthermore, the commenter presents estimated visibility benefits of only a subset of required controls, the scrubber upgrades, and not the total visibility benefit of all required controls. The estimated benefit of all required controls is 0.12 dv at Big Bend and 0.12 at Guadalupe Mountains. We also note that our estimates for the amount of visibility benefit from the required controls based on consideration of recent actual emission levels rather than the 2018 CENRAP projected emissions is 0.07 dv due to the scrubber upgrades at both Big Bend and Guadalupe Mountains, and 0.17 dv (Big Bend) and 0.20 dv (Guadalupe Mountains) when considering all required controls. Therefore, even though we do not agree with the commenter that the CSAPR rounding convention is appropriate, the estimated visibility benefits in this case exceed 0.05 dv.

We disagree with commenters that the visibility benefits from controls are miniscule. We observe that several comments that are critical of the extent of the visibility benefits have cited only to benefits from the scrubber upgrades, omitting the total anticipated visibility benefit from all required controls. As we discuss in the FIP TSD and in separate response to comments, we believe it is necessary to consider visibility benefits based on “clean” natural background conditions to assess the full potential for visibility benefits from controls. For example, we estimated that the required controls provide for over 3 dv improvement at Wichita Mountains when estimated using a “clean” background. On a “dirty” background approach based on 2018 CENRAP projected visibility conditions, we estimate all required controls would improve projected visibility conditions in 2018 by 0.45 dv over the visibility conditions projected by CENRAP and Texas and an estimated 0.62 dv improvement in visibility when considering recent actual emissions (values are for the 20% worst days). The required controls result in a greater than 5% improvement in overall visibility conditions at Wichita Mountains on the 20% worst days. We also estimate that the required controls are a significant acceleration of the final goal, reducing the number of years to meet natural visibility by 25 to 30 years at Big Bend and Guadalupe Mountain.

The CENRAP modeling showed that Texas sources have significant visibility impacts at Wichita Mountains and the Texas Class I areas. Our analysis identified those point sources with the largest contributions to visibility impairment at these Class I areas and the required controls reduce visibility impairment from those sources with the largest impacts where controls were determined to be available and reasonable for this first planning period. For example, the Monticello and Big Brown facilities are projected to contribute approximately 1.3 Mm^{-1} and 1.2 Mm^{-1}, respectively to visibility impairment on the 20% worst days at Wichita Mountains in 2018 based on the CENRAP 2018 projected emissions for these facilities. This is 1.7% and 1.5% of the total visibility impairment at Wichita Mountains. In our FIP TSD we noted that Texas used an impact extinction level threshold of 0.5 Mm^{-1} (a level less than half of the estimated impact from the Monticello or Big Brown facilities) from all sources in a state as a threshold for inviting a state to consult. Oklahoma selected a threshold of 1.0 Mm^{-1} to determine which states should consult in analyzing visibility impairment at Wichita Mountains. We also noted that the largest projected contribution from all point sources within a state at Wichita Mountains after Texas (14%) is Oklahoma at 3.9%. In other words, elimination of all point sources in Oklahoma would result in less visibility benefit (3.9%) than the required controls (greater than 5%). As these facts demonstrate, the identified facilities have significant impacts on visibility conditions. Our technical record makes it equally plain that the required controls reduce impacts from these sources and result in meaningful visibility benefits towards the goal of natural visibility conditions.

We disagree with Luminant that our proposal will result in reliability issues and address that comment in more detail elsewhere in our responses to comments.

Comment: [Luminant (0061) p. 63] Luminant stated that Texas's consideration of visibility benefits, in relation to cost, in its four-factor analysis was reasonable. Texas's reference to a 0.5 dv threshold (also used in the BART context) was a reasonable choice. As EPA itself has explained, "States have wide latitude to determine [the] thresholds" "for determining significance of visibility benefit in the regional haze rule."[447] Indeed, EPA has said that states may consider a threshold cut-off as high as 1.0 deciview improvement for an individual source, below which the source would not be regulated.[448]

According to Luminant, Texas's choice of 0.5 deciview as a benchmark for total visibility improvement (from all sources) to use in its four-factor analysis was reasonable and consistent with EPA guidelines. Under the BART Guidelines, a source "contributes to any visibility impairment," and thus becomes subject to BART, if it has an impact greater than 0.5 deciview at any Class I area.[449] It is thus logical that a level of visibility improvement at a single Class I area that is less than the threshold at which a source becomes subject to BART in the first place would be deemed insignificant for all sources. Indeed, in other regional haze actions, EPA has "defer[red]" to states' consideration of the 0.5 deciview threshold.[450] And given Congress's special emphasis on BART sources,[451] Texas's reference to the BART 0.5 deciview threshold to evaluate reasonable progress for the first planning period was conservative, and Texas could reasonably determine that total visibility benefits below the BART threshold for an individual source should be deferred until a later planning period for reasonable progress. Moreover, even absent reference to the BART threshold, it was eminently reasonable for Texas to reject as unreasonable the enormous costs that would be required to achieve what EPA itself concedes would be an imperceptible change in visibility.[452]

Footnotes:
[446] Id. at 9.
[447] 77 Fed. Reg. at 40,156.
[448] Id. at 40,156 n.14.
[449] See 70 Fed. Reg. at 39,161.

[450] 77 Fed. Reg. at 40,156.
[451] 42 U.S.C. § 7491(b)(2)(B) (carefully defining the universe of sources that must install BART and requiring compliance with BART "as expeditiously as practicable").
[452] Further, even if Texas's use of 0.5 deciview as a reference point were not appropriate, that does not justify EPA's use of other thresholds and metrics, found nowhere in the regulations or guidance (as discussed in Section VII.C), to decide which sources to regulate in its FIP and by how much.

Response: The first quote Luminant references is only partially reproduced and is inaccurate. The full and actual quote from our guidance is:

> There is no particular threshold for determining significance of visibility benefit in the regional haze rule. Significance is a source- and Class I-specific evaluation, meaning that it depends on how much visibility improvement is needed at the Class I area(s), how much a specific source impacts the Class I area(s), and the cost effectiveness and potential visibility improvement of available control options. States *have latitude* to determine these thresholds,[321] providing support and a reasonable and adequate basis for why they selected the thresholds, and to determine BART and reasonable progress controls, in consultation with other impacted states. As long as this evaluation is done adequately and the states provide a reasoned basis for their decisions, EPA will defer to the state.

As can be seen from the full and accurate representation of our guidance, states have some latitude to determine thresholds of visibility significance. However, states also have an obligation to, "[provide] support and a reasonable and adequate basis for why they selected the thresholds, and to determine BART and reasonable progress controls, in consultation with other impacted states." In our proposal, we describe why we believe the TCEQ's four factor analysis, which includes the consideration of visibility benefits, was flawed[322]:

> The TCEQ constructed a large potential control set consisting of a mix of large and small sources, located at various distances from Class I areas, with a large geographical distribution. Because of the variation in size, type, and location of these sources, the potential to impact visibility and potential benefit from controls at a given Class I area can vary greatly between the identified sources. This potential control set identified by the TCEQ included controls on some sources that would likely result in significant visibility benefits, but also included controls on many sources with much less anticipated visibility benefits. Because it only estimated the visibility benefit of all the controls together, the TCEQ was not able to assess the potential benefit of controlling individual sources with significant, and potentially cost-effective, visibility benefits. Also, we believe that individual benefits were masked by the inclusion of those controls with little visibility

[321] 14 BART guidelines at 70 FR 39170: However, we believe the States have flexibility in setting absolute thresholds, target levels of improvement, or de minimis levels since the deciview improvement must be weighed among the five factors, and States are free to determine the weight and significance to be assigned to each factor. For example, a 0.3, 0.5, or even 1.0 deciview improvement may merit stronger weighting in one case versus another, so one ''bright line'' may not be appropriate.
[322] 79 FR 74838.

> benefit that only served to increase the total cost figures. For example, the TCEQ identified SO_2 controls at Big Brown to be approximately $1,500/ton, significantly less than its $2,700/ton threshold. These controls were estimated to achieve greater than 40,000 tpy SO_2 emission reductions. Despite this evidence in the record of an identified cost-effective control that results in large emission reductions, and source apportionment modeling identifying large impacts from EGU sources in northeast Texas, the TCEQ did not separately evaluate the visibility benefit from the implementation of this control, or appropriately weigh the four reasonable progress factors in determining the reasonableness of this individual control.

We believe that the TCEQ's consideration of visibility benefits was flawed because the visibility benefits of controls on individual sources or the group of sources with the largest visibility impacts controls was masked by the TCEQ's methodology. Following our guidance, we are unable to defer to the state in this case. Texas' evaluation was not done adequately, and the evaluation did not contain a reasonable consideration of costs and visibility, leading to an unreasoned basis for the decisions made with that analysis.

We further disagree with Luminant that Texas' choice of a 0.5 dv visibility threshold, including the manner in which it was applied, was proper in its analysis. First, the quote Luminant reproduces from our BART Guidelines was based on CALPUFF modeling and not CAMx modeling. Texas extrapolated results from CAMx modeling to estimate the visibility improvement due to all the identified controls in their analysis and then compared it to a threshold developed for CALPUFF modeling. As we state in the FIP TSD and discuss in detail in our response to comments, "[a] common metric used in BART visibility modeling using CALPUFF is the BART screening level of 0.5 del-dv used by most states for screening out facilities from further BART consideration. However, there are a number of factors that make the two analyses uniquely different and not comparable, invalidating the use of the BART screening metric, or other such comparisons with modeled visibility impacts for RP with CAMx or CMAQ." In the FIP TSD and in separate responses to comments we discuss the differences in the models, model inputs, and metrics used.[323] Many of these differences contribute to CAMx modeled visibility impacts and benefits for reasonable progress being much lower than the CALPUFF modeled visibility impacts and benefits for BART relied on in other actions. As detailed in the FIP TSD, these differences include the emission rates modeled, the metrics used and whether the deciview impacts are calculated based on "clean" natural background conditions or a "dirty" background based on degraded visibility conditions projected for 2018. The CALPUFF emissions modeled for BART are representative of maximum emission rates and are therefore usually significantly larger (often in the range of double) than average emission rates used in CAMx modeling for a reasonable progress analysis. One of the main metric differences is that the CALPUFF analysis for BART utilizes a clean background and compares the 8th highest daily maximum impact from the specific source modeled to compare against a 0.5 dv threshold to indicate significant impacts while the visibility benefit that was estimated by Texas to assess the benefit of additional controls for reasonable progress was based on a "dirty" or degraded background and average benefits over the 20% worst days observed by the monitor at the Class I area which may or may not be inclusive of the highest impact days from the specific

[323] FIP TSD at A-35 and modeling section of the this document

source modeled with CALPUFF for BART. As we discuss in detail in the FIP TSD, because the deciview metric is a logarithmic function of extinction, visibility impacts and improvement calculated based on "dirty" conditions are substantially lower than those calculated based on natural "clean" conditions.[324] These differences were not considered in Texas' selection of threshold. We note that Texas did calculate visibility impacts compared to natural visibility conditions and focused on the maximum impact from the modeled sources in their BART visibility analysis, which also relied on CAMx photochemical modeling, to determine the significance of visibility impacts from BART sources for BART screening purposes. However, in assessing the benefit of additional controls for reasonable progress, Texas only considered visibility benefits averaged over the 20% worst days based on a "dirty" or degraded background.

The difference between comparing visibility improvement on a "clean" and "dirty" background is analogous to comparing the change in sound volume that would occur if one person stopped singing loudly in an empty room (clean background) to the change that would occur if one person stops singing loudly in a room crowded with a 100 people singing loudly (dirty background). In both cases, to return the room to natural background sound level, the individual singers must be addressed, but there will be little or no perceptible difference in volume when one singer in the crowded room stops singing. To carry the analogy further, our analysis was designed to identify the Texas sources with the greatest visibility impact (the loudest singers) and address them in this first planning period.

Second, the 0.5 dv threshold in the context of BART is used to assess the maximum total visibility impact from all BART units at a facility. If the impact from all the BART sources at a facility is above the threshold, then each BART unit must be evaluated for controls, and therefore the visibility improvement anticipated from controls would be less than 0.5 dv on a facility basis, and much less than 0.5 dv on a unit specific basis for BART sources with multiple BART units. For these reasons, the BART threshold of 0.5 dv has no relation to the analysis Texas performed and is inappropriate. We also note that we discuss in the preamble to the final Regional Haze Rule and Guidelines for BART Determinations that a threshold less than 0.5 dv may be appropriate.[325]

Even setting aside Texas' approach of aggregating sources with varying impacts on visibility, the use of a 0.5 dv threshold as applied by Texas for determining the significance of visibility benefits of all controls combined would have ensured that little visibility improvement would occur during this planning period. Texas and Oklahoma acknowledged in their SIP submittals that sources in Texas have a large impact on visibility at the Wichita Mountains; indeed, the visibility impacts at this Class I area from Texas point sources are several times greater than the

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[324] FIP TSD at A-38. "For example, see Figure A.3-5 which shows the del-dv change due to a 10 (1/Mm) change at both the 2018 projected extinction level ["dirty background"] and the 2064 natural visibility conditions ["clean background"] extinction level for the Wichita Mountains. In the 'dirty background' case the 10 (1/Mm) yields a 1.26 del-dv, whereas in the 'clean background' case the same 10 (1/Mm) yields a 3.86 del-dv improvement. In this example, the 'clean background' situation yields a del-dv improvement 3 times greater than the 'dirty background' for the same level of extinction improvement.

[325] "…, if there were 100 sources each changing visibility by 0.1 deciviews, the total impact would be a 10-deciview change in visibility. In this hypothetical example, all 100 sources would be contributing, in equal amounts, to substantial visibility impairment..,." 70 FR 39121.

impacts from Oklahoma's own point sources. Based on CENRAP 2018 modeling, all point sources in Texas combined have a visibility impact in terms of light extinction of 10.58 Mm-1 at the Wichita Mountains, which based on "dirty" 2018 CENRAP projected background conditions equals a 1.34 dv impact for the 20% worst days. Therefore, adopting the 0.5 dv threshold, using Texas' approach to assessing reasonable progress measures, would require the identification of a control set large enough (and with a correspondingly large total cost) to address over one-third of the total impacts from all Texas point sources, before the visibility benefit would be considered significant. To put this into context, achieving the national goal at the Texas Class I areas will require just over ten deciviews of improvement (approximately a reduction in light extinction of 35 Mm-1), a task that EPA has estimated could reasonably take until 2064. Given that the Regional Haze Rule recognizes that improving visibility is an iterative process that will take many years, declining to establish any additional measures to ensure reasonable progress until Texas could identify a combined set of cost-effective and affordable controls that could achieve 0.5 dv or more improvement is unreasonable, especially when there are cost-effective and affordable controls that result in meaningful visibility improvements towards the goal of natural conditions. We also note that delaying even incremental action during this first planning period pushes out the likely date of achieving natural conditions well past 2064.

We respond to comments concerning the metrics and thresholds used in our analysis in elsewhere in a separate response to comment where we address comments on modeling.

Comment: [Luminant (0061) p. 69] According to Luminant, EPA's asserted justification for requiring a source-specific analysis of potential visibility benefits of individual controls at a small number of Texas units is fundamentally flawed. EPA claims that, in TCEQ's analysis, "individual benefits were masked by the inclusion of those controls with little visibility benefit that only served to increase the total cost figures."[490] As noted, visibility benefit is not one of the statutory factors that TCEQ was required to consider, as EPA concedes,[491] and thus may not form the basis of EPA's disapproval.[492] Further, EPA's speculation is not supported by the record. As its sole example of alleged "masking," EPA cites potential controls at Luminant's Big Brown Plant, which it says could reduce SO_2 emissions by more than 40,000 tons per year at a cost of $1,500 per ton.[493] EPA suggests, but does not assert, that reducing 40,000 tons per year would have a meaningful impact on visibility at Texas's two Class I areas (the only two areas for which Texas was required to perform a reasonable progress analysis) and that the benefit of additional controls on Big Brown's units were masked by Texas's source category analysis. Yet, EPA's own analysis demonstrates that the visibility impacts of Big Brown's SO_2 emissions at Big Bend and Guadalupe Mountains are negligible and in fact fall ***below*** EPA's own regulatory "threshold" of 0.3% extinction.[494] Thus, EPA's own analysis shows that the "masking effect" that EPA cites as the justification for disapproving Texas's four factor analysis and RPGs for Big Bend and Guadalupe Mountains (the only Class I areas for which Texas was required to conduct a reasonable progress analysis) simply does not exist.

Footnotes:
[490] 79 Fed. Reg. at 74,838.
[491] TX SIP TSD at 18 ("[V]isibility is not an explicitly listed factor to consider when determining whether additional controls are reasonable . . . .").
[492] Luminant Generation, 675 F.3d at 925.
[493] 79 Fed. Reg. at 74,838.
[494] FIP TSD at A-49 to A-52, tbl.A.4-4. Indeed, this is true for all of Luminant's units that EPA is proposing to

regulate. Id.

Response: We disagree with the comment. As we discuss in a separate response to comment, we do not believe that a source-specific analysis is required and our disapproval of the Texas reasonable progress analysis is not based on a failure to complete a source-specific analysis. We also discuss how we and Texas considered visibility benefits in the determination of reasonable controls in a separate response to comment. We believe that the manner that Texas considered visibility benefits and determined that no controls were reasonable was unreasonable. In a separate response to comment we discuss the flaws in the Texas analysis and our reasons for disapproving portions of the Texas regional haze SIP regarding reasonable progress and long-term strategy.

In our proposal we explain that one of the flaws in the Texas analysis is how the four factors were weighed. Regarding that we state:

> The TCEQ constructed a large potential control set consisting of a mix of large and small sources, located at various distances from Class I areas, with a large geographical distribution. Because of the variation in size, type, and location of these sources, the potential to impact visibility and potential benefit from controls at a given Class I area can vary greatly between the identified sources. This potential control set identified by the TCEQ included controls on some sources that would likely result in significant visibility benefits, but also included controls on many sources with much less anticipated visibility benefits.

Because the TCEQ only estimated the visibility benefit of all the controls together, it was not able to assess the potential benefit of controlling those individual sources or groups of sources with significant, and potentially cost-effective, visibility benefits. We provide the example of Big Brown to illustrate that based on the available information from CENRAP and Texas, it was clear that a subset of the sources identified by Texas deserved additional scrutiny to determine if reasonable controls were available. However, this is not the "sole example" in which the contribution of individual sources were masked.[326] As we discuss in our proposal and elsewhere in our response to comments, Texas and we agreed that it was reasonable to focus on impacts from point sources for this planning period. The CENRAP source apportionment modeling shows that visibility impairment from EGU sources in northeast Texas (this includes Big Brown) are a large portion of the total visibility from point sources. At the Wichita Mountains, 46.7% of the total visibility impairment due to all point sources in Texas is due to just EGUs in the northeast portion of the state. This is 6.53% of the total visibility impairment at Wichita Mountains. At Big Bend and Guadalupe Mountains, 43.6% and 31.0% of the total visibility impairment from all Texas point sources are due to EGUs in the northeast portion of the state. The control cost analysis presented in the Texas regional haze SIP shows that reductions of 42,105 tpy of SO_2 from an EGU in northeast Texas (Big Brown) can be achieved at a cost of approximately \$1,500/ton, a cost much lower than the \$2,700/ton threshold selected by Texas to identify cost-effective controls. A reduction on 42,000 tpy of SO_2 would be a reduction of 12% of the total projected emissions from all EGUs. We also note that reductions of 35,000 tpy of SO_2 from another EGU in northeast Texas (Monticello units 1 and 2) can be achieved at a cost of

[326] See Tables 6 and 7 of Appendix 10-1 of the Texas Regional Haze SIP for other examples.

approximately $1,800/ton. Therefore, the available information demonstrates that cost-effective controls for specific sources that would result in very large emission reductions (>20% of the total EGU emission in the state) are available for the source type (EGUs) and region (northeast Texas) that are shown to be responsible for a significant portion of the visibility impairment at impacted class I areas. Our determination at this point within our review of the Texas analysis was that reducing 40,000 tons per year at an EGU in northeast Texas may have a meaningful impact on visibility conditions and that the potential benefit of additional controls on Big Brown's units were masked by Texas's analysis that only estimated the benefit of all controls within a large source set that included a wide range of source types, locations, and potential for visibility benefits, and compared this total visibility benefit to the total costs of controls.

Our additional analysis reveals that impacts from the sources we identified as having the largest visibility impacts, including Big Brown, are significant. Our technical record makes it equally plain that the required controls reduce impacts from these sources and result in meaningful visibility benefits towards the goal of natural visibility conditions. As discussed in the FIP TSD and in response to comments elsewhere in this document, we evaluated visibility benefits at Wichita Mountains and determined that the visibility improvements for controls at Big Brown, Monticello and Coleto Creek were significant. We also concluded that scrubber installations on Big Brown 1 and 2 would also yield significant benefits at the Guadalupe Mountains, and that a scrubber installation on the Coleto Creek unit would also yield significant visibility benefits at Big Bend.[327] The visibility impairment from Texas point sources is significant, and as our analysis shows, a significant portion of this impairment can be addressed by controlling a small number of sources. For example, controls on just four units at Tolk and Big Brown are estimated to reduce visibility impairment due to all Texas point sources at the Guadalupe Mountains by approximately 13%. All required controls combined are estimated to reduce visibility impairment at the Guadalupe Mountains from all Texas point sources by approximately 22%. The identified facilities have significant impacts on visibility conditions.

We note that an RPG analysis, even though it is used to make a demonstration and establish the RPGs for in-state class I areas, specifically, is part of the technical foundation for consultation and other aspects of what is needed to meet LTS requirements. As such, the flawed RPG analysis undermined both state's SIPs. Big Brown is subject to control under the FIP both because those controls would have reasonably been required under a proper RPG analysis but also because those controls would have been expected in an appropriately-informed consultation setting. We note that, while flawed, the Texas analysis did consider visibility impacts and potential benefits at the Wichita Mountains and other Class I areas in other states in evaluating the sources for additional controls. In our FIP, we appropriately considered visibility impacts not only at the Texas Class I areas, but also at the Wichita Mountains. We address comments concerning the need to evaluate controls to address visibility impairment in downwind states in a separate response to comment.

Furthermore, Luminant is incorrect in stating that the unit level contributions to extinction fall below the 0.3% threshold we established to identify sources for additional control analysis. The impacts of Big Brown units at recent emission levels (2008-2012) exceed 1% of the total

[327] FIP TSD at page 28.

visibility impairment at Wichita Mountains and are 0.326% at Big Bend. Impacts at Guadalupe Mountains are 0.282%. We disagree with the commenter that units with impacts below this threshold are “negligible.” As discussed in a separate response to comment, we established this threshold to identify those units with the largest visibility impacts for additional control analysis. We also considered additional information to determine whether or not sources near this threshold should be included in our analysis.

We address comments regarding our use of visibility in the legal section of this document where we respond to comments concerning reasonable progress and long-term strategy.

Comment: [TCEQ/PUCT (0056) p. 3-4] The TCEQ stated that the projected visibility improvement from the proposed FIP requirements are imperceptible at all three Class I areas. The EPA's modeling analysis projects that the combined effect of all the proposed scrubber upgrades (for seven individual units at four sites) will achieve at most only an imperceptible improvement of 0.14 deciviews at Wichita Mountains. Even smaller improvements are projected for Big Bend and Guadalupe Mountains, 0.03 and 0.04 deciviews, respectively. Tables 44 and 45 in the preamble exaggerate the potential benefits of the EPA's proposed FIP and are irrelevant to the approvability of the 2009 RH SIP.

The TCEQ stated that both Table 44: *Calculated RPGs for 20% Worst* Days ... and Table 45: *Anticipated Visibility Benefit ...* should be removed from the final action because they tabulate calculated benefits that will not occur by 2018, the only year that is appropriate for evaluating the visibility impacts of proposed controls. The 2018 visibility conditions that the 2009 RH SIP will produce are the appropriate starting points for evaluating the effects of the EPA's proposed FIP. Table 45 misleads a reader to believe that the EPA's proposed FIP action would produce a 0.62 deciview improvement in visibility at Wichita Mountains. Instead of calculating a benefit from the air quality that the 2009 RH SIP would produce in 2018, Table 45 misleads the reader by calculating "benefits" from 2011 through 2013 emissions, long before the 2009 RH SIP is fully effective instead of from 2018.

The TCEQ stated that Table 43 in the Preamble presents the calculated benefits in 2018 that could result from the EPA's proposed FIP. However, the potential 0.14 deciview improvement at Wichita Mountains is almost certainly an overstatement of the incremental benefit from the proposed FIP in 2018 because SO, emission reductions are occurring due to other requirements, and the actual SO, emissions will likely be lower than those in the CENRAP 2018 emissions projections.

The TCEQ explained that typically, a person can perceive a one (1.0) deciview change in visibility impairment. Visibility differences of 0.14, 0.04, and 0.03 deciview are imperceptible.

Table 1. Visibility Data (in Deciviews)[3]			
	Big Bend	Guadalupe Mountains	Wichita Mountains
Baseline Visibility Impairment 2000 – 2004	17.30	17.19	23.81
State-established RPG for 2018	16.60	16.30	21.47
Incremental 2018 Improvement from EPA's Proposed FIP Scrubber Upgrades	0.03	0.04	0.14
EPA-proposed RPGs for 2018	16.57	16.26	21.33
Current Visibility 2009 - 2013	16.30	15.30	21.20

Also, the TCEQ stated that the potential improvement from the proposed FIP is 2% or less of the total impairment projected to exist in 2018 on the most impaired 20% days and even that is likely an overestimate of the FIP's potential benefit because the EPA's analysis does not consider the reductions that will occur from other federal programs, such as the Mercury and Air Toxics Standards (MATS) rule and the implementation of the sulfur dioxide (SO_2) National Ambient Air Quality Standard (NAAQS).

The TCEQ stated that the actual effects of the EPA's proposed FIP are correctly represented in Table 43, which includes the only controls that could be in place by the end of 2018, which is the end of the first regional haze planning period established by the RHR.

The TCEQ asserted that the EPA does not have an appropriate basis for adopting the proposed FIP given that current monitored visibility is better than the EPA calculates the proposed FIP would achieve in 2018 and that the potential visibility improvements from the proposed FIP are both small and uncertain.

Commenter's Reference:
[3] From Table 43, (79 FR84887), and the Western Regional Air Partnership-Technical Support System (WRAP-TSS)

Response: As discussed in depth in a separate response to comment**,** the Regional Haze Rule does not require that controls result in perceptible visibility improvement. As we address in response to comments above, the potential visibility improvements from the FIP are neither small nor uncertain. Instead, the controls will assure large reductions of haze-causing pollutants at those sources identified as having the largest visibility impacts and result in measureable and important visibility improvements from a State having a large number of sources and ample opportunities for making progress by improving controls at lesser-controlled sources. For example, all required controls are estimated to reduce visibility impairment by greater than 5% at Wichita Mountains. We address the TCEQ's comments concerning Tables 44 and 45, consideration of recent actual emissions, and anticipated future emission reductions due to other requirements in separate responses to comments where we address comments on modeling. We disagree with the comment that Tables 43, 44, and 45 in the proposal exaggerated, or otherwise misled readers; these tables present available modeling data and related information, using appropriate available inputs. There are potentially different methods of displaying the benefits that would be obtained, but Tables 43, 44, and 45, were useful for our study of the issues and were provided as part of the information made available for public comment. This information should be examined with a correct understanding of their contributing data set and context.

As discussed elsewhere where we address comments concerning controls that are anticipated to implemented beyond 2018, we disagree with commenters who consider it inappropriate for controls to be required after the planning period because corresponding visibility benefits may not be realized during the planning period. The fact that benefits of such controls may not be realized within the first planning period does not affect our determination that the controls are necessary nor deprive us of our authority to impose the requirements. We cannot agree that 2018 is the only year that is the appropriate year for evaluating the visibility impacts of proposed controls. The comment appears to suggest that the effects of the FIP can only be correctly represented by showing controls that could be in place by the end of 2018. This is flatly wrong. It suggests that we "represent" our action in a way that ignores the thoroughly studied benefits that are achievable through the implementation of FIP controls. Our analysis, including the analysis of the visibility benefits of scrubber retrofits, showed that cost-effective controls were in fact available that resulted in significant visibility benefits and provided for meaningful improvements in visibility conditions at the Class I areas of interest. Because these retrofits are not anticipated to occur before 2018, we evaluated the visibility benefit from them separately, however this does not impact the fact that they are reasonable controls.

We address comments concerning recent monitoring data elsewhere in this response to comments document.

Comment: [TCEQ/PUCT (0056) p. 11] The TCEQ disagreed with the EPA's approach of requiring emissions reductions at certain sites, not necessarily because the reduction had any perceptible improvement in visibility at a Class I area, but because emissions from that source may be significant when compared to other sources.

The TCEQ noted that Texas analyzed emissions reductions using four factor analysis, as required by the EPA's RHR (64 FR 35766). Emissions reductions were estimated for sources with the potential suite of controls selected using a $2,700 per ton threshold. A four factor analysis was performed on this group of sources; no perceptible visibility improvement was determined. The goal of the regional haze program is to focus on reasonable progress towards visibility improvement at each Class I area, not to target reductions at specific sources. The EPA appears to have performed its control analysis in the proposed FIP in a reverse-logic form. It targeted reductions at larger-emitting sources, only because they are larger emitting, not through an application of the reasonable progress four factor analysis on potential controls when considering perceptible progress towards achieving natural visibility.

Response: The TCEQ appears to have concluded that perceptibility of visibility benefit is a necessary criterion for control. Please see our response to other comments in which we disagree with this premise. A goal of the regional haze program is that the state's SIP for each planning period make reasonable progress toward the national goal of a return to natural visibility conditions in 2064. This requires that large sources of visibility impairing pollution which have available cost effective controls that result in significant visibility improvement—like the ones we proposed to control—are in fact controlled. We disagree with the TCEQ that we targeted larger emitting sources because they are larger emitting. We identified those sources with the greatest potential to impact visibility conditions at Class I areas.   We evaluated all point sources considering the distance those sources were from Class I areas and the level of emissions to identify those sources close enough to a Class I area or with large enough emissions to potentially impact visibility at a Class I area, just as Texas did in their analysis. We did that in order to identify those sources with the greatest potential to impact visibility from the thousands of potential sources in Texas. We then performed visibility modeling on that smaller set, and performed a four factor analysis on the subset of sources that exhibited the largest visibility impacts. We believe our proposed approach of identifying the largest impacting sources for additional control analysis is logical and consistent with the CAA and the Regional Haze Rule. Furthermore, as we discuss elsewhere, the Texas analysis that is flawed because it includes emission reductions at certain sites that produce very little visibility benefit. Inclusion of these controls serve only to increase the total cost of controls in the Texas analysis. We discuss our methodology to identify those sources with the largest visibility impacts in depth in the FIP TSD and in response to comments on modeling.

Comment: [Texas Governor (0066) p. 1] The Texas Governor explained that the EPA's proposed decision to partially disapprove Texas's state implementation plan ("SIP") and to promulgate a federal implementation plan ("FIP") would do nothing to improve visibility in Big Bend or the Guadalupe Mountains. Moreover, EPA's proposed actions would impose more than $2 billion in compliance costs on Texans. Whatever EPA's motivation, the results of the "regional-haze" rule are absurd, arbitrary, capricious, and contrary to law.

[Texas Governor (0066) p.1-2] The Texas Governor explained that cost alone renders the FIP unlawful. EPA has a statutory obligation to "take [] into consideration the costs of compliance." 42 U.S.C. section 7491(g)(1). Yet EPA's FIP makes no mention of how much its additional controls will cost. EPA staff have confirmed that those controls will cost at least *$2 billion* - all for reductions in haziness that are 1/8th the magnitude that would be visible to the naked eye. EPA cannot comply with Section 7491(g)(1) by asking its staff to make informal, back-of-the-envelope guesstimates. Nor can it comply with the statute by dictating such unreasonably large expenditures for invisibly small benefits.

Response: We disagree with the Governor of Texas that our proposal would do nothing to improve the visibility of the Texas Class I Areas. Our objective is to improve the visibility at Texas and other Class I areas, and this accords with the Congressional purpose embodied in the CAA and the Regional Haze Rule. In finalizing our action, we necessarily disagree that our action is arbitrary, capricious, and contrary to law. We further disagree that we did not mention how much our proposed controls will cost. The costs for our proposed scrubber retrofits are listed in our Cost TSD and are summarized in our proposal. As we explained in our Cost TSD and our proposal, we could not list the costs for our proposed scrubber upgrades because they were based on information claimed by the respective companies as being Confidential Business Information. As discussed in depth in a separate response to comment, we disagree with the commenter that the Regional Haze Rule requires that controls result in perceptible visibility improvement

Comment: The proposed FIP is arbitrary, capricious, and an abuse of discretion because, based on EPA's analyses, it would have no perceptible or meaningful effect on visibility conditions in any Class I area. p. 28-30]

UARG argued that for EPA's proposed rule to justify the enormous costs that compliance with its scrubber upgrade and retrofit requirements would impose, the rule must produce a significant improvement in visibility conditions in the Class I areas that are the subject of the regional haze program. The proposed rule demonstrates, however, that its visibility benefits (if any) will be negligible. Those vanishingly small improvements do not support the emission control requirements that EPA seeks to impose at great cost.

UARG stated that the EPA's source apportionment modeling results demonstrate the minimal effects of emissions from the units EPA assesses on visibility in Big Bend, Guadalupe, and Wichita Mountains. *See* 79 Fed. Reg. at 74,839. The highest percentage contribution to total visibility impairment for the 20 percent worst days at Big Bend is the Sommers Deely Spruce facility (also known as the Calaveras Plant) at 0.57 percent. *Id. at* 74,839, Table 12. That facility would not be subject to control requirements under the proposed rule, but the facility with the second\ highest percentage contribution to the 20 percent worst days at Big Bend (*i.e.*, Coleto Creek) would be subject to control requirements under the proposed rule even though its contribution, as modeled by EPA, is less than one-half of one percent – a mere 0.44 percent. *Id.* And the highest percentage contribution to total visibility impairment for the 20 percent worst days at Guadalupe is Tolk Station at 0.65 percent. *Id. at* 74,839, Table 13. That these minuscule contributions should be targeted by EPA for regulation is irrational on its face.

UARG noted that this conclusion is also supported by EPA's calculation, in deciviews, of the visibility improvement that would result from installation or upgrading of scrubbers at the various facilities it has chosen to assess. EPA proposes to find that scrubber installations are appropriate for Big Brown units 1 and 2, Coleto Creek, Tolk units 171B and 172B, and Monticello units 1 and 2. 79 Fed. Reg. at 74,881-82 & Tables 34-36. Installation of scrubbers at these units does not result in perceptible visibility improvement at any Class I area. On a unit-by-unit basis, estimated visibility improvements are less than 0.5 deciview, EPA's criterion for contribution to visibility impairment. *See id*. Even on a facility-wide basis – and even when measured against natural conditions – the vast majority of the visibility improvements that EPA projects come nowhere near EPA's 1.0-deciview threshold of perceptibility. *See id*. The same is true for the visibility effects of scrubber upgrades that EPA has modeled, which fall far below the 0.5- deciview contribution benchmark with respect to every unit evaluated. *Id. at* 74,883 & Table 37. EPA's proposed conclusion that these visibility improvements justify new emission controls is unreasonable.

Given the negligible visibility benefit that EPA projects to result from the proposed rule's requirements, and the evidence showing that those requirements will not – and are not needed to – achieve visibility benefits at any Class I area, the huge costs that this rule would impose cannot be justified. EPA should, therefore, withdraw the proposed rule and should instead approve the Texas and Oklahoma regional haze SIP provisions in full.

Response: As discussed in depth in a separate response to comment, we disagree with UARG that the Regional Haze Rule requires that controls result in perceptible visibility improvement. We also discuss in a separate response to comment that the use of a 0.5 dv threshold, a threshold applied to BART single-source visibility impact analysis using CALPUFF modeling, is an inappropriate comparison or threshold to apply to visibility improvement estimated by CAMx modeling due to differences in models, model inputs, and metrics used.

We disagree that a contribution to total visibility impairment of 0.44% or 0.65% on the 20% worst days from a single source is minimal. As discussed elsewhere in this document, we identified a threshold of 0.3% contribution to total visibility impairment on a unit-level basis to identify the sources with the largest visibility impacts. Visibility impairment from the single unit at Coleto Creek accounts for approximately 2% of the total impact from all Texas sources and over 6% of the total visibility impact from the over 1,600 Texas point sources at Big Bend. Of the group of sources identified by Texas and us to evaluate for controls due to their impacts, point sources of SO_2 and NOx, controlling one unit at Coleto Creek addresses 6% of this visibility impact. Controls on Big Brown's two units addresses another 6%. The recommended controls address 23.4% of impact from all Texas point sources at Big Bend (based on 2018 CENRAP projected emission levels). We agree that the Sommers-Deely-Spruce facility is modeled to have larger visibility impacts at Big Bend. However, the two units responsible for roughly 80% of these visibility impacts are scheduled to shutdown in 2018. Emissions for the 2 units at Tolk account for nearly 8% of the total Texas point source impact at Guadalupe Mountains. The recommended controls 25.74% of impact from all Texas point sources at Guadalupe Mountains (based on 2018 CENRAP projected emission levels).

Coleto Creek's impact in initial modeling is 0.216 Mm^{-1} on BIBE and Tolk is 0.302 Mm^{-1} on Guadalupe Mountains. We compared this to the threshold Texas used of 0.5 Mm^{-1} to determine which states to invite for consultation due to their impacts on Big Bend and Guadalupe Mountains. In other words, if all emission sources from all source categories within a neighboring state impacted the Class I areas by more than 0.5 Mm-1, that state was invited to consult in order to discuss if reasonable controls were available to reduce this impact. The impacts from these individual sources in Texas, approach that threshold level, and there is an obligation to address the impacts with sensible controls. As we discuss in detail where we address modeling comments, we identified those sources with the largest visibility impacts to evaluate for additional controls. As these facts demonstrate, the identified facilities have significant impacts on visibility conditions. Our technical record makes it equally plain that the required controls reduce impacts from these sources and result in meaningful visibility benefits towards the goal of natural visibility conditions.

Comment: Costs of Compliance and Visibility Improvements [GCLC (0063) p. 14-15]

GCLC stated, the costs of compliance, especially for units required to retrofit with new scrubbers, are astronomical and could likely force the shutdown of the impacted EGUs. BART standards, which EPA uses as guidance, were never intended to be a vehicle to shut down an existing source with decades of remaining useful life. A technology is not a cost-compliant "available retrofit" if it forces the shutdown of the unit.

According to GCLC, regarding scrubber upgrades, EPA believes that "any reasonable amount of visibility improvement due to their installation justifies their cost."[66] In other words, EPA does not even consider cost-effectiveness as a factor in its analysis. But this is not the purpose or intent of regional haze rules, which clearly require a more measured approach to assessing cost impacts. As demonstrated by EPA's own data, the net effect on visibility is virtually imperceptible statewide - there is no "reasonable amount of visibility improvement." This is compared to costs that total in the aggregate of over $2 billion. [67]

GCLC suggested, considering the "degree of improvement in visibility," compared to the costs of compliance, EPA should avoid imposing the limitations contemplated in the FIP. The simplest cost-benefit analysis would demonstrate this. However, one of the key reasons EPA failed to appropriately consider the costs of compliance is because, apparently, EPA never actually attempted to balance or compare the costs of the rule with the alleged visibility impacts. EPA's analysis was merely superficial, reviewing costs in one TSD (i.e. the Cost TSD) and visibility improvements (i.e., the FIP TSD) without making any real comparison. If EPA had, it would realize that there is no way EPA could claim that the controls are cost effective.

<u>Footnotes:</u>
[66] Proposed FIP, 79 Fed. Reg. at 74884.
[67] TCEQ, TCEQ Response to EPA's Proposed Action on Regional Haze Plan, Nov. 24, 2014. Available at: http://www.tceq.state.tx.us/news/releases/11-14-eparegionhaze. (Last modified: Nov. 24, 2014).

Response: We have not seen any credible evidence thus far from any commenter, including the affected facilities, that our proposal would force any unit to shut down. However, faced with the expense of installing controls and other business considerations, facilities could conceivably decide to retire units instead of installing the controls. Such a situation does not, in and of itself, conflict with the CAA or our Regional Haze Rule. Our proposed controls were evaluated according to the criteria in Section 308(d)(1)(i)(A) which charges us to "consider 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, and include a demonstration showing how these factors were taken into consideration in selecting the goal." We did exactly that. We concluded that cost effective controls were available for 14 uncontrolled or under controlled units, and that these controls would result in significant visibility benefits at Class I Areas. These same controls have been installed at dozens of similar coal fired power plant units across the United States. We disagree with GCLC that we did not balance the cost of the controls against their visibility benefits. Our proposal summarizes the information present in our Cost and FIP TSDs and contrasts the costs to their modeled visibility benefits.[328] As discussed in depth in a separate response to comment, we also disagree with the commenter that the Regional Haze Rule requires that controls result in perceptible visibility

[328] See our proposal beginning on page 74881.

improvement.

As to the comment that the actual cost-per-ton for scrubber upgrades was ultimately irrelevant to our decision, we disagree with the comment and address it fully in a separate response to comment.

Comment: The Visibility Impacts Do Not Justify the Proposed Control Levels and the Proposal Will Require Significant Costs to Consumers. [EEI (0076) p. 8]

EEI noted that EPA's own analysis in the proposed rule shows that the units EPA has identified as required to install additional controls or upgrade existing controls as part of the FIP have a very minimal impact of far less than one deciview on the target areas' visibility See 79 Fed. Reg. at 74,887, Table 45.

[EEI (0076) p. 9] EEI stated that the Agency's proposed FIP- per EPA's own estimate-will require the investment of approximately $2 billion dollars in retrofits and upgrades, resulting in increased consumer costs for Texas energy consumers. See 79 Fed. Reg. 74,876-77. The retrofit cost estimates EPA used for Southwestern Public Service's Tolk facility are inaccurately low and not based on Tolk's site-specific circumstances. Specifically, the proposal does not reflect the significant capital cost of water upgrades that would be necessary to operate proposed dry scrubbers at this location.[6] EPA's proposed FIP will impose far greater costs on utilities and customers than estimated in the Agency's proposal.

Footnotes:
[6] Comments submitted by Luminant explain the many ways in which EPA has understated the costs, and overstated the benefits, of the controls that EPA proposes for Luminant units.

Response: We disagree with EEI that our proposal will not result in significant visibility benefits. As discussed in depth in a separate response to comment, we disagree with the commenter that the Regional Haze Rule requires that controls result in perceptible visibility improvement. We believe the visibility benefits we have proposed are necessary in order for Texas and other Class I areas to make reasonable progress toward the national goal of a return to natural visibility by 2064. This goal requires that states make steady progress with each SIP submittal. We address our cost analysis for Tolk in another response.

Comment: [Xcel Energy (0064) p. 6, 7] Xcel Energy expressed multiple concerns with the FIP that EPA has proposed for Texas to address regional haze ("Proposal"). Fundamentally, the Proposal partially rejecting the Texas SIP is contrary to the clear allocation of authorities and obligations under the CAA, and is arbitrary and capricious. The Proposal will produce no visibility benefits beyond what Texas provided in its SIP. Further, because of EPA's refusal to acknowledge and address international emission sources, EPA's FIP will never result in natural background visibility levels, as required by the CAA. Even if every stationary source in Texas were to cease operating tomorrow, Texas' Class I areas would be, and remain, above the uniform rate of progress under either the Texas SIP or EPA's Proposal.

Xcel Energy requested that EPA adopt a final rule that approves the Texas Regional Haze SIP's reasonable progress analysis and conclusions, or at least concludes that installation of dry scrubbers at Tolk should not be required in light of the extremely low modeled deciview benefit and the high cost of installing entirely new scrubbers.

Response: Please see our more detailed responses to these general comments in other responses. In general, we disagree with Xcel that our proposal is contrary to the clear allocation of authorities and obligations under the CAA, and is arbitrary and capricious. We also disagree that our proposal will not produce visibility benefits beyond what was proposed in the Texas SIP. We do agree that international emissions are a significant source of visibility impairment in Texas. However our proposal does not in any way expect Texas to make up for those emissions. Our action requires the control of particular Texas sources that due to their own emissions were impacting the visibility at Texas and other state Class I areas. For the reasons we have outlined in our proposal, we cannot fully approve the Texas regional haze SIP. Please see our responses to other specific comments regarding the control of the Tolk power plant.

Comment: The costs of compliance of EPA's proposal are unreasonable [AECT (0074) p. 6-7]

AECT stated that the CAA, EPA's Regional Haze rules, and EPA's guidance support evaluation of the reasonable progress costs of compliance factor by considering the total cost of the additional emissions controls at the identified EGUs relative to the visibility improvement that modeling predicts would result from such additional controls. Evaluating the cost of compliance of EPA's Proposal in that manner shows that its cost of compliance is clearly unreasonable, and, thus, EPA's Proposal is not supportable.

According to AECT, EPA calculates that its Proposal would require just four Texas companies to spend approximately $1.8 billion for additional SO_2 emissions controls for their EGUs.[19] AECT, however, believes that the costs those companies would have to spend for such additional SO_2 emissions controls would be greater than $2 billion. In addition, EPA's projected total visibility improvements that would result by 2018 in each of the three Class I areas due to the addition of such SO_2 emissions controls are only 0.03 dv for Big Bend, 0.04 dv for Guadalupe Mountains, and 0.14 dv for Wichita Mountains.[20] Each of those projected total visibility improvements is much less than 1.0 dv, which is the degree of visibility improvement that can be detected by the eyes of most humans.[21]

AECT noted, based on the foregoing, regardless of whether the total cost for additional SO_2 emissions controls for the identified EGUs is $1.8 billion or greater than $2 billion, the cost of compliance of EPA's Proposal is clearly unreasonable, and, thus, EPA's Proposal is not supportable.

Footnotes:

[19] See EPA, Technical Support Document for the Cost of Controls Calculations for the Texas Regional Haze Federal Implementation Plan at 24-25 (Nov. 2014) (scrubber retrofit capital costs); Id. at 55 (scrubber upgrade costs)

[20] 79 Fed. Reg. at 74887, Table 43

[21] 77 Fed. Reg. at 30250

[22] 77 Fed. Reg. at 30464

Response: We have adjusted these costs slightly in response to comments we have received. However, for the reasons we have discussed in response to more specific comments, we disagree that our proposed costs of compliance are unreasonable. As discussed in depth in a separate response to comment, we disagree with the commenter that the Regional Haze Rule requires that controls result in perceptible visibility improvement. As presented in our proposed action, FIP TSD and in separate responses to comments, we believe these controls result in significant visibility benefits and provide for progress towards meeting the goal of natural visibility conditions at the impacted Class I areas.

We note that AECT provides incorrect estimates of cost with respect to visibility. The commenter presents estimated visibility benefits of only the scrubber upgrades but then contrasts them to the total cost of scrubber upgrades and scrubber retrofits combined. The scrubber upgrades are only a fraction of the total cost (less than 20% of the total capital costs) and the visibility benefits due to the scrubber upgrades are only a fraction of the total anticipated visibility benefit from all required controls. Furthermore, as we discuss in the FIP TSD and in separate response to comments, we believe it is necessary to consider visibility benefits based on "clean" natural background conditions to assess the full potential for visibility benefits from controls.[329] We estimated that the required controls provide for over 3 dv improvement at Wichita Mountains when estimated using a "clean" background and result in improving projected visibility conditions in 2018 by 0.45 dv over the visibility conditions projected by CENRAP and Texas and an estimated 0.62 dv improvement in visibility in 2018 when considering recent actual emissions. The required controls result in a greater than 5% improvement in overall visibility conditions at Wichita Mountains on the 20% worst days. We also estimate that the required controls are a significant acceleration of the final goal, reducing the number of years to meet natural visibility by 25 to 30 years at Big Bend and Guadalupe Mountain.

Comment: EPA's proposed FIP does no better at achieving the URP and visibility improvement than Texas' SIP yet imposes billions of dollars in costs.
[Xcel Energy (0064) p. 21]

Xcel Energy suggested that it would be one thing for EPA to reject the Texas SIP for failing to meet the RPG if EPA has a plan that would lead to natural visibility more quickly. But EPA's plan does no better than the Texas SIP. Under the Texas SIP, the visibility impairment is projected to be at 16.36 dv on the 20% worst days at Guadalupe Mountains in 2018. *See* Figure 1 above. EPA's FIP purports to lower this number to 16.21 dv; a not perceptible 0.09 dv difference. *!d.* Both Texas and EPA would leave Guadalupe Mountains significantly above the URP.

Xcel Energy argued that EPA's FIP also does nothing to accelerate the final goal of natural visibility levels. EPA's FIP purports to reach natural visibility levels at Guadalupe Mountains only after 141 years and, at Big Bend, only after 173 years. 79 Fed. Reg. at 74,887, Table 44. It is absurd and clearly arbitrary for EPA to reject the Texas SIP for setting inadequate RPGs and

[329] FIP TSD at A-37

then impose on the state and its sources costly control requirements that, at best, theoretically achieve the statutory goal 141 to 173 years in the future. In fact, unless EPA addresses the emissions from Mexico, EPA's theoretical, long-term improvements are not possible. The entire state of Texas could shut down and move away and visibility in these Class I areas would not improve.

Response: Our FIP addresses the emissions from uncontrolled and under controlled sources in Texas that are impacting Class I areas. The cost effective control of these emissions does not demand shutdowns in Texas or relocation from Texas. Having determined that controls would be cost effective, the FIP controls are of a type and magnitude that are demonstrably critical for making reasonable progress. We agree that impacts from Mexico also contribute to the haze problem in Texas Class I areas. Nothing in the regional haze rule or our FIP is calculated to hold Texas accountable for emissions from Mexico. We agree those emissions need to be addressed to achieve natural visibility, but our agreement on this point does not in any way relieve Texas of the obligation to make reasonable progress, including through controls, and particularly through the emissions addressed with controls through our FIP.

Comment: EPA's Proposal to Require Installation of Scrubbers at Tolk Would Produce Miniscule Visibility Benefits. The predicted improvement would produce no discernible visibility benefit. [Xcel Energy (0064) p. 6-7, 28; 0053-24 and 0054-4]

[Xcel Energy (0064) p. 6-7] Xcel Energy referred to the proposed SO_2 scrubbers for Tolk (approximately $400 million in capital), and stated that the visibility benefits from the proposed scrubbers at Tolk are miniscule at best while EPA is imposing these costs immediately on Xcel Energy and its customers. For instance, at Guadalupe Mountains, the required dry scrubber on Tolk 1 would produce a modeled visibility benefit of approximately 0.022 deciviews for the 20% worst days, roughly 1/50 the level for human perception. At the same time, international sources of visibility impairment, which vastly exceed the contributions of Tolk, and indeed all Texas point sources in combination, are left untouched such that there will be no discernable visibility benefit resulting from the entire FIP.

[Xcel Energy (0064) p. 28] Xcel Energy noted, in the FIP TSD, EPA has estimated a total deciview improvement of 0.763 over the average natural conditions clean background for the Guadalupe Mountains National Park based on CAMx modeling. FIP TSD, at A-76, Table A.6-5 - Net benefit of Proposed Controls on 2018 Visibility Projections. This estimated deciview improvement is the cumulative improvement that would result from EPA's proposed controls, consisting of scrubber upgrades on seven units and scrubber retrofits for seven units. This analysis is the main reason the Tolk units are proposed to be controlled in the proposed FIP. EPA is proposing to require facilities in Texas to spend billions of dollars through the addition and/or upgrade of control devices when the collective visibility improvement from such facilities will not be perceptible.

Xcel Energy stated that the deciview scale was selected by EPA as the measure of visibility improvement in the RHR specifically because by definition each deciview reflects "perceptible changes" in visibility. *See* Proposed RHR 62 Fed. Reg. 41,138, 41,145 (July 31, 1997) ("A one deciview change in haziness is a small but noticeable change in haziness under most circumstances when viewing scenes in mandatory Class I Federal areas."). Accordingly, *by EPA's own standard,* a total deciview improvement at the Guadalupe Mountains of 0.763 dv from the installation of controls at the selected Texas facilities would not be perceptible to the human eye. Further, studies have since demonstrated that not only is the deciview scale not uniform in perception over a wide range of visibility conditions, but a 1-deciview change in visibility is not even perceptible to the human eye for observation. *See* Appendix A to comment 0064, "Just-Noticeable Differences in Atmospheric Haze," Ronald C. Henry, Department of Civil and Environmental Engineering, University of Southern California, Los Angeles, Air & Waste Manage. Assoc. (2002).

In addition, Xcel Energy stated that observations and air modeling for the haziest days suggest that there is not a clear downward or upward trend in regional haze for the Guadalupe Mountains, Big Bend, or the Wichita Mountains Class I areas. *See* Appendix B to comment 0064. For the Guadalupe Mountains, the clearest days show a downward trend of -0.09 dv/yr (reduction). Overall, there is variation of ± 2 to 3 deciviews over the last 21 years. Therefore, EPA's estimated deciview improvement for average natural conditions at Guadalupe Mountains associated with the addition of dry scrubbers on the Tolk units (0.182), while clearly imperceptible, also is insignificant compared to the natural variation in background regional haze over the last 20 years. *See* 79 Fed. Reg. at 74,882, Table 36.

Response: We disagree with the commenter that the visibility benefits from emission reductions at Tolk are miniscule. The commenter states that visibility benefit from controls on Tolk unit 1 are 0.022 dv for the 20% worst days at Guadalupe Mountains, but this value is based on a "dirty" 2018 background. As we discuss in detail elsewhere, a "dirty" background approach underestimates the visibility benefits of controls and a "clean" background approach is necessary to fully assess the potential benefit from controls. Based on consideration of a "clean" background, we estimated the benefit at Guadalupe Mountains from SDA controls on Tolk's units 1 and 2 to be 0.087 dv and 0.095 dv, respectively on the 20% worst days. The visibility benefit from controlling these two units is almost equal to the anticipated benefit of controls on Big Brown units 1 and 2 of 0.105 dv each at Guadalupe Mountains. Required controls at Tolk and Big Brown address the largest individual visibility impacts from Texas point sources at Guadalupe Mountains. Controls on Tolk alone address approximately 8% of the total impact from Texas point sources at Guadalupe Mountains. Based on our evaluation of the four factors, including comparison of cost to the anticipated visibility benefit, we determined that these controls are reasonable and provide for significant improvement towards the goal of natural visibility conditions. We also note that the estimated visibility impact[330] from the two Tolk units based on recent actual emissions is estimated to be 0.281 Mm^{-1}, compared to a threshold of 0.5 Mm^{-1} applied to all emission sources in a state selected by Texas to determine which states would be invited to consult due to their impacts on Texas Class I areas.

We agree with the commenter that annual monitored visibility conditions can vary and can be impacted by events such as dust storms and wildfires that vary in frequency and intensity from year to year. Therefore, we focus on a 5-yr average in assessing current or baseline visibility

[330] Based on 2009-2013 annual emission levels See "No Control" worksheet in Vis modeling summary.xlsx available in the docket for this action.

conditions. We disagree with the commenter's apparent assertion that variability in monitored visibility conditions somehow relieves the state from the requirements of implementing reasonable controls towards the goal of natural visibility conditions.

We address comments concerning no perceptible visibility benefits and visibility impairment from international emissions in separate responses to comments.

Comment: The highest cost controls are proposed for Tolk for the least amount of visibility improvement. [Xcel Energy (0064) p. 34]

Xcel Energy stated that even using EPA's costs estimates for installation of dry scrubbers at Tolk, the Proposal would impose on Tolk the highest cost of the scrubber retrofits contemplated for the lowest visibility benefit modeled for any unit for which EPA proposes controls. The Tolk units were modeled at barely over EPA's declared 0.3% threshold for light extinction, and yet would have the most expensive scrubber installation. Other units for which EPA proposes controls under a 0.5% modeled light extinction impact are upgrades to existing scrubbers, which are many times less expensive than building entirely new scrubbers. In addition, EPA did not propose controls for units which modeled barely under EPA's chosen screening level, even though much less costly scrubber upgrades were an available option. These points are illustrated in the chart in Appendix E.

Given the extremely low modeled deciview impact and the high cost of installing entirely new scrubbers, Xcel Energy stated that the EPA's proposal to require scrubbers on Tolk cannot be considered "reasonable" and will not result in any perceptible "progress." The emission reductions achieved would be simply overwhelmed by international contributions and natural dust, and diluted by Tolk's substantial distance (over 330 km) well northeast of the Guadalupe Mountains National Park. Additionally, as discussed above, given that EPA underestimated the costs of dry scrubbers for Tolk, the Proposal is even more unreasonable than the chart in Appendix E to comment 0064 demonstrates.

Response: Please see our responses to other comments concerning elements of our analysis of Tolk's scrubber cost. We believe that even considering the revisions we have made to Tolk's scrubber cost analysis, the significant visibility benefits justify the cost of these controls. See our response to other comments where we disagree that perceptibility is a threshold requirement of visibility improvement and address comments concerning international emissions.

Comment: [CCP (0075) p. 2] The Proposed Rule provisions that specifically target Coleto Creek Unit 1 are even more unwarranted. Coleto Creek Unit 1 is over 550 kilometers from the nearest Class I area. The actual impact of the unit's emissions on haze in those areas, considering the well-known bias of EPA models to over-predict impacts at such large distances, is negligible and the controls required under the proposed FIP will not result in any improvement in visibility by the end of the current planning period in 2018 nor any appreciable visibility improvement thereafter. Still, the EPA proposes approximately $300 million in controls at Coleto Creek Unit 1 based on flawed models and generic assumptions that fail to consider the legally required unit-specific factors and time for compliance. Time and time again EPA has declined to impose controls under its regional haze authorities on units that have actual impacts on Class I areas less than those of Coleto Creek Unit 1.

Response: Please see our responses to other comments concerning elements of our analysis of Coleto Creek's scrubber cost, and estimated visibility improvement. CCP does not specify here the actions for which it alleges inconsistency. However, as we discuss in our proposal and elsewhere in our response to comments, we disagree that our action is inconsistent with previous determinations made under regional haze. Furthermore, there is no way to directly compare the CAMx modeling we used in our proposed TX/OK FIPs with previous CALPUFF modeling results due to differences in models, model inputs, and metrics. Therefore, comparisons to previous actions that depended on CALPUFF modeling is not valid. We note that Coleto Creek did provide CALPUFF modeling results as part of their comments. We address this modeling analysis in a separate response to comment.

Comment: Big Bend, Guadalupe Mountains, and Other Impacted Class I Areas.
[Earthjustice (0067) p.11]

Earthjustice et al., stated that in finalizing the proposed FIP for Texas and Oklahoma, EPA has a unique opportunity—and an obligation—to protect air quality by reducing emissions from Texas's numerous facilities which are responsible for visibility impacts and other air quality degradation in Class I areas in Texas, Oklahoma, Arkansas, New Mexico, Louisiana, Colorado, and Missouri.[6] Emissions from Texas sources impact two in-state Class I areas: Big Bend National Park and Guadalupe Mountains National Park. Both national parks are located in west Texas and contain spectacular scenic views that draw visitors from across the United States and around the world. "Big Bend National Park is known for its scenic beauty, which ranges from stark seemingly barren wastelands to majestic forested mountains to gigantic canyons."[7] Guadalupe Mountains National Park is an "internationally significant" park, in part, because of its "[s]pectacular scenery," which is a "major attraction for visitors."[8] Guadalupe Mountains is home to the highest summit in Texas, as well as the culturally significant peak, El Capitan, which has been used as signal peak by travelers and settlers for hundreds—perhaps thousands—of years.[9]

Earthjustice et al., stated that air pollution from Texas sources mars the unique scenic views at both Big Bend and Guadalupe Mountains. The National Park Service has acknowledged that "[t]he scenic beauty of Big Bend National Park is often spoiled by haze that obscures its many vistas."[10] This haze is primarily caused by nitrogen oxides (NOx), sulfur dioxide (SO_2), and particulate matter (PM) pollution from power plants and other anthropogenic sources. *See, e.g.*, EPA, Federal Implementation Plan Technical Support Document at A-17 [hereinafter "FIP TSD"]. For example, at Big Bend, baseline visibility impairment on the most impaired days is 17.3 deciviews (dv). *Id. at* 34; *see also* 79 Fed. Reg. at 74,832. These baseline visibility conditions are far worse than natural visibility conditions at Big Bend, which are 7.16 dv, according to EPA. FIP TSD at 34, Table 19. Similarly, according to EPA, at Guadalupe Mountains, baseline visibility impairment on the most impaired days is 17.19 dv, while natural visibility is 6.65 dv. *Id*.

Earthjustice et al., stated that emissions from Texas sources also impair visibility at Class I areas in other states. As EPA explains in its proposed FIP, Texas sources cause significant visibility impairment at the Wichita Mountains Wilderness Area in Oklahoma that are "several times greater than the impact from Oklahoma's own point sources." 79 Fed. Reg. at 74,822. Texas sources also cause visibility impairment at Caney Creek Wilderness Area in Arkansas and many other out-of-state Class I areas, including, but not limited to, Carlsbad Caverns National Park, Bandelier National Monument, and the Salt Creek and White Mountain Wilderness Areas in New Mexico; Great Sand Dunes, Rocky Mountain, and Mesa Verde National Parks in Colorado; Upper Buffalo Wilderness Area in Arkansas; Hercules-Glades and Mingo Wilderness Areas in Missouri; and Breton Wilderness Area in Louisiana. *Id. at* 74,830; Texas SIP at 1-5, 11-7 to 11-28.

Footnotes:

[6] Sierra Club also submits the following two reports for background. These reports rely on EPA emissions data to detail the disproportionate level of harmful SO_2 pollution released by Texas power plants covered by this rule in comparison to other sources in other states. Benchmarking Air Emissions of the 100 Largest Electric Power Producers in the United States (May 2014), available at http://www.nrdc.org/air/pollution/benchmarking/files/benchmarking-2014.pdf; Daniel Cohan, Addressing pollution from legacy coal power plants in Texas (June 2013), available at http://www.dallas-cms.org/news/coalplants.pdf.

[7] Nat'l Park Serv. (NPS), *Big Bend National Park General Management Plan* 103 (2004), *available at* http://www.nps.gov/bibe/parkmgmt/gmp.htm. [Documents are attached to comment 0067 - Items 9 and 10]

[8] NPS, *Guadalupe Mountains National Park Draft General Management Plan* 152 (2008), *available at* http://parkplanning.nps.gov/documentsList.cfm?parkID=69&projectID=11120.

[9] *Id. at* 5.

[10] NPS, *Understanding Haze in Big Bend National Park, available at* http://www.nps.gov/bibe/learn/nature/upload/Bravo_Fact_Sheet.pdf.

Response: We agree that the Regional Haze Rule requires that states and we take certain prescribed steps to protect and improve visibility at Class I areas. We also agree that the visibility impairment at Texas' Class I areas is partly due to power plant and other anthropogenic sources. Lastly, we agree that power plants in Texas impair the visibility of Class I areas not only in Texas, but in other states as well.

Comment: The Regional Haze Program's Public Health, Welfare, and Economic Benefits.
[Earthjustice (0067) p.12], et al

Earthjustice et al., explained that in addition to improving visibility, pollution reductions under EPA's regional haze plan for Texas will yield significant public health, economic, and other environmental benefits.

Earthjustice et al., explained that EPA's proposed FIP would result in billions of dollars in public health benefits. According to Earthjustice et al., the same pollutants that cause visibility impairment also cause significant public health impacts. Nitrogen oxides are precursors to ground level ozone, which is associated with respiratory diseases, asthma attacks, and decreased lung function. Similarly, sulfur dioxide increases asthma symptoms, leads to increased hospital visits, and can form particulates that aggravate respiratory and heart diseases and cause premature death.[11] Both NOx and SO_2 react with ammonia, moisture, and other compounds to form fine particulate matter that can cause and worsen respiratory diseases, aggravate heart disease, and lead to premature death.[12] PM can penetrate deep into the lungs and cause a host of health problems, such as aggravated asthma, chronic bronchitis, and heart attacks.[13] In 2005, EPA valued the regional haze program's BART health benefits nationally at $8.4 to $9.8 billion annually.[14]

Earthjustice et al., stated that Dr. George D. Thurston, a professor of Environmental Health at the New York University School of Medicine, and a nationally-renowned expert in the field, conducted a health risk analysis of EPA's FIP. Dr. Thurston found that EPA's proposed SO_2 emissions reductions will significantly reduce the serious public health toll imposed by Texas coal-burning power plants on residents of Texas and Oklahoma, as well as residents of Arkansas, Colorado, Illinois, Kansas, Louisiana, Mississippi, Missouri, and New Mexico. [See the Written Report of George D. Thurston Regarding the Public Health Benefits of EPA's Proposed Rulemaking Regarding Texas and Oklahoma Regional Haze (Apr. 18, 2015) submitted as comment 0071]. Thurston estimates that EPA's proposed SO_2 reductions for the 14 EGUs in Texas will save at least 316 lives *each year*, and prevent thousands of asthma-related or cardiovascular events and hospitalizations every year. *Id. at* Tables 1-2 provided by commenters 0067 and 0071. Dr. Thurston "conservatively estimate[s]" the total public health-based economic benefits associated with these reductions will be at least $3 billion each year. *Id.* 24-26.[15]

Earthjustice et al., stated that these are *annual* benefits, meaning that "ten years from the compliance date, the health benefits and valuations of the proposed controls will be roughly ten times" that estimate, before adjustment for a discount rate, as appropriate. *Id.* 26.

Additionally, Earthjustice et al., stated that if EPA requires SO_2 emission reductions at W.A. Parish and Welsh, as they the agency to do, the health-related economic benefits of the proposed FIP increase by another $1.1 billion each year. *Id. at* 17, Table 3 provided by commenters 0067 and 0071. The health-related monetary benefits associated with SO_2 reductions at Texas's three largest sources of SO_2 pollution—Big Brown, Martin Lake, and Monticello—will alone be more than $2 billion across the ten states most affected by Texas pollution. *Id.*

According to Earthjustice et al., Dr. Thurston arrived at these estimates by relying on air quality modeling conducted by Dr. H. Andrew Gray, an expert in air modeling, who used EPA's standard air quality modeling methodology to (1) "estimate the incremental $PM_{2.5}$ concentrations attributable to each source unit affected by this EPA action," (2) "model[] gridded annual average $PM_{2.5}$ concentrations for the high [*i.e.*, current actual] and low emission [*i.e.*, EPA proposed SO_2 emission limit] scenarios," and the (3) "estimate[d] the incremental $PM_{2.5}$ concentration at each county in Texas and its surrounding states for the control scenarios." Thurston Decl. 23. (See comment 0070 p.25 summarized below for details on Dr. Gray's modeling of incremental $PM_{2.5}$ concentrations.) Dr. Thurston then used the EPA-approved health risk modeling program, called BenMAP, to translate these pollution reductions into human health outcomes. Thurston Decl. at 23-24. As Dr. Thurston summarized in the following tables, even when applying the most conservative estimate of mortality—one comparable to the estimate EPA relied upon in 2005, to evaluate the regulatory impacts of the Regional Haze Rule—the public health benefits and avoided medical costs associated with

EPA's Regional Haze FIP are considerable.

Tables 1, 2 and 3 provided by commenters 0067 and 0071

Table 1. Health Benefits From EPA's Proposed Federal Plan[16]

Health Endpoint	Expected Number Per Year Avoided*	Total Dollar Valuation (2010$)**
Respiratory Hospital Admissions (Kloog et al., 2012; Zanobetti et al., 2009)	59[a]	$1,869,000
Cardiovascular Hospital Admissions (Bell et al., 2008; Peng et al., 2008; Peng et al., 2009; Zanobetti et al., 2009)	58[a]	$2,210,000
Acute Bronchitis (Dockery et al., 1996)	639	$307,000
Acute Myocardial Infarction, Nonfatal (Pope et al., 2006; Sullivan et al., 2005; Zanobetti et al., 2009; Zanobetti & Schwartz, 2006)	38[b]	$4,732,000[c]
Emergency Room Visits (Glad et al., 2012; Mar et al., 2010; Slaughter et al., 2005)	187[b]	$80,000[a]
Asthma Exacerbation Symptoms (Mar et al., 2004; Ostro et al., 2001)	12,021[b]	$694,000
Upper Respiratory Symptoms (Pope et al., 1991)	11,606	$386,000
Lower Respiratory Symptoms (Schwartz and Neas, 2000)	8,140	$171,000
Minor Restricted Activity Days (Ostro & Rothschild, 1989)	302,891	$20,669,000
Work Days Lost (Ostro et al., 1987)	51,228	$7,634,000
Chronic Bronchitis (Abbey et al., 1995)	251	$110,000,000[c]
Mortality, All Causes (Krewski et. al, 2009)	314	$3,021,190,000
Mortality, All Causes (Lepeule et. al, 2012)	714	$6,869,213,000
Mortality, All Causes (Laden et al., 2007)	893	$8,588,894,000

* Rounded to nearest whole number.

** Rounded to nearest $1000.

a Pooled effects with averaging approach, as per EPA BenMap default setting.

b Pooled effects with random/fixed effects approach, as per EPA BenMap default setting.

c Pooled effects with summation approach, as per EPA BenMap default setting.

Table 2. State-By State Total Valuation of Annual Health Benefits of EPA Proposed FIP Applied to Seven Power Plants At Issue*
(Applying Krewski et al., 2009 for mortality)

State	Total Dollar Valuation (2010$)**
AR	$175,816,000
CO	$6,512,000
IL	$121,183,000
KS	$112,378,000
LA	$117,847,000
MS	$47,128,000
MO	$202,471,000
NM	$11,314,000
OK	$327,701,000
TX	$2,047,591,000
Total	$3,169,941,000

* Big Brown, Coleto Creek, Limestone, Martin Lake, Monticello, Sandow, Tolk
** Rounded to nearest $1000.

Table 3. Plant-By Plant Total Valuation of Annual Health Benefits of EPA Proposed FIP
(Applying Krewski et al., 2009 for mortality)

Electric Generating Station	Total Dollar Valuation (2010$)**
Big Brown	$927,440,000
Coleto Creek	$253,765,000
Limestone	$248,613,000
Martin Lake	$690,304,000
Monticello	$681,602,000
Sandow	$278,718,000
Tolk	$89,501,000
Parish*	$748,913,000
Welsh*	$346,853,000

** Parish and Welsh power plants are presented here only for comparison with the other 7 plants listed, but are not included in Tables 1 or 2.*
** Rounded to nearest $1000.

Earthjustice et al., stated that the figures above are conservative estimates of the health and economic benefits of EPA‘s proposed FIP. For the reasons explained in Dr. Thurston‘s analysis, these projections likely underestimate the benefits of EPA’s rule. Applying a realistic adjusted mortality estimate, EPA’s proposed FIP for Texas and Oklahoma could save as many as 893 lives each year, and up to $8.5 billion annually in public health-based economic costs associated with the treatment of the thousands of respiratory and cardiovascular events and hospitalizations that occur each year across the ten states affected by the SO_2 emissions from these 14 units in

Texas. *Id. at* Table 1.
Earthjustice et al., stated that the results of Dr. Thurston's analysis of EPA's proposed FIP are hardly surprising given the extensive and ever-growing scientific literature showing strong correlations between exposure to air pollution from coal-fired power plants and adverse health impacts to human beings. Dr. Thurston's findings show that EPA's proposed FIP will result in significant public health-related economic benefits. Contrary to arguments advanced by several of the affected facilities, EPA's FIP does not simply protect aesthetic values. The rule will result in significant, quantifiable public health benefits across a large swath of the central United States.

Dr. Gray (0070) performed modeling to provide inputs to the health impacts analysis by Dr. Thurston (0071).

Dr. Gray noted that to estimate the Class I area visibility impacts associated with Texas point source emissions, EPA Region 6 relied on the results of CAMx dispersion modeling.[28] The EPA developed two emission scenarios for the 21 Texas source units, corresponding to high and low control levels, which were modeled using projected 2018 emission estimates for all other sources. For each of the high and low emissions scenarios, each individual source unit was removed ("zeroed out") one at a time, and the model was re-run. The difference between the modeled concentrations from all sources and from all sources minus each zeroed out source unit provided an estimate of the incremental contribution of each individual source. The modeled PM species concentrations that were contributed by each individual source unit were then used by EPA to estimate the visibility impacts associated with each source unit (using the most recent IMPROVE equation to compute extinction), for both the high and low control levels.

The model results for the high and low control levels for each source were used by EPA to estimate the visibility impacts under various emission scenarios, including 2018 baseline (no additional controls), and also for EPA's proposed control strategy (consisting of WFGD retrofits on five units, SDA retrofits on two units, upgraded WFGD on seven units; see FIP TSD Section 7). The modeled concentration impacts (and extinction impacts) were observed to vary linearly with the SO_2 emissions level for each source. EPA performed a linear regression analysis using the modeled impacts for high and low control levels on each source unit along with earlier 2018 baseline facility-wide model results. The regression slopes (change in extinction per ton of SO_2 emissions) were then used to interpolate or extrapolate the model results in order to estimate impacts for different emission levels at each source unit.

Dr. Gray noted that a similar scaling approach was used to estimate the incremental $PM_{2.5}$ concentrations attributable to each source unit in his assessment of the health effects associated with Texas point source emissions. The modeled gridded annual average $PM_{2.5}$ concentrations for the high and low emission scenarios, together with the zeroed-out model results, were used to estimate the incremental PM2.5 concentration at each county centroid in Texas and the surrounding states. The first step was to extract the modeled $PM_{2.5}$ concentrations for each grid cell from the CAMx derived Modeled Attainment Test Software (MATS) output files. The MATS files contain the simulated concentrations of sulfate (SO_4), nitrate (NO_3), ammonium (NH_4), elemental carbon (EC), organic compounds (OC), and crustal material (CRUSTAL). $PM_{2.5}$ concentrations were calculated as the sum of these components. A list of unit/source numbers was provided (see comment 0070). Concentrations were provided for the following scenarios:[29,30]

- 2018LowBase: 2018 simulation with low controls on 21 units
- 2018Low.zoxx (where xx is 02 to 22): 2018 low control scenario without source 02, 03, 04... 22
- 2018HighBase: 2018 simulation with high controls on 21 units
- 2018High.zoxx (where xx is 02 to 22): 2018 high control scenario without source 02, 03, 04 ... 22

A total of 88 files were prepared (44 for the 12- km grid, and 44 for the 36-km grid). Each file contains the grid cell number (i, j location) and the modeled annual average $PM_{2.5}$ concentration for that grid cell and scenario.

The next step was subtracting the "zo"[31] from the "all source" $PM_{2.5}$ concentrations to determine each source's contribution, for both high and low control scenarios. This was done separately for the fine (12-km) and coarse (36-km) gridded receptors.[32] Then the fine and coarse grid $PM_{2.5}$ concentrations were linearly scaled to EPA's baseline emissions levels (EPA estimated the "current" baseline as the average of actual 2009-2013 CEM emissions, eliminating the maximum and minimum average years) and also to EPA's proposed control levels. EPA's proposed control strategy included controls on units 02 through 15 (i.e., not including Parish and Welsh). For this health assessment, the benefits of WFGD retrofits on Parish and Welsh were also included.

The resulting gridded $PM_{2.5}$ concentrations for the baseline and control scenarios were then interpolated to each county centroid, using a 1/R2 interpolation of the four closest fine or coarse grid modeled receptors. The $PM_{2.5}$ concentrations contributed by each facility at each county centroid were tabulated for the baseline and control scenarios. These $PM_{2.5}$ data were subsequently used to estimate the health effects corresponding to each emission scenario. The modeled low and high emission levels, as well as the baseline emissions and proposed SO_2 emission reductions for each modeled source unit is shown in Table 1. Note that EPA's proposed control plan does not include controls on Parish and Welsh; the SO_2 emission rates for these two facilities under EPA's proposed control plan would reflect no emission reductions and would therefore be equal to the baseline levels shown in the third column of the table. The controlled emissions for Parish and Welsh (assuming WFGD scrubber retrofits on Parish Unit 5, 6, and 7 and Welsh Units 1, 2, and 3; and a WFGD upgrade on Parish Unit 8) were evaluated to determine the additional health effects associated with including retrofit controls on these two facilities.

SO_2 Emission Rates from Dr. Gray's Analysis
(Table 7 from comment 0070)

	SO_2 emissions (tpy)			Control Scenario		
Source Unit	Low	High	Baseline		% Reduction	(tpy)
Big_Brown_1	20,107.64	1,675.64	30,667.22	WFGD	0.980	613.56
Big_Brown_2	13,342.79	1,667.85	30,814.37	WFGD	0.979	645.69
Coleto_Creek_1	9,838.94	1,492.34	16,059.31	WFGD	0.957	698.53
Limestone_lim_1	7,422.61	2,474.20	10,912.51	WFGD upgrade	0.950	2,466.51
Limestone_lim_2	5,229.94	2,614.97	11,946.36	WFGD upgrade	0.950	2,615.36
Martin_Lake_1	19,277.73	3,855.55	24,494.93	WFGD upgrade	0.950	3,705.93
Martin_Lake_2	11,652.05	3,884.02	21,580.42	WFGD upgrade	0.950	3,663.42
Martin_Lake_3	7,444.15	3,722.08	19,940.02	WFGD upgrade	0.950	3,551.02
Monticello_1	13,685.89	1,355.30	17,864.78	WFGD	0.970	537.07
Monticello_2	9,200.89	1,345.64	16,429.35	WFGD	0.968	521.90
Monticello_3	3,530.81	1,851.27	13,856.61	WFGD upgrade	0.950	1,570.61
Sandow_4	22,978.12	4,595.62	22,289.21	WFGD upgrade	0.950	4,625.21
Tolk_171b	7,450.19	1,209.35	10,031.39	SDA	0.917	836.31
Tolk_172b	4,520.10	1,103.07	11,033.65	SDA	0.908	1,018.17
Parish_WAP5	10,943.82	1,396.72	14,157.29	WFGD	0.950	708.14
Parish_WAP6	7,422.94	1,419.24	15,306.80	WFGD	0.954	703.57
Parish_WAP7	8,107.70	1,244.01	12,334.97	WFGD	0.951	601.68
Parish_WAP8	1,790.38	1,371.38	2,585.88	WFGD upgrade	0.950	835.88
Welsh_1	5,892.87	1,110.16	8,083.91	WFGD	0.925	610.12
Welsh_2	3,973.62	1,117.20	8,255.51	WFGD	0.922	647.04
Welsh_3	5,014.24	1,123.85	8,608.80	WFGD	0.925	649.54

Footnotes:

[28] Snyder, E., Feldman, M., and Kordzi, J., *Technical Support Document for the Oklahoma and Texas Regional Haze Federal Implementation Plans (FIP TSD)*, U.S. Environmental Protection Agency Region 6, Dallas, TX, November 2014.

[29] Environ. 2014. "2018 Low-control and High-control CAMx Simulations, Texas Regional Haze Evaluation." Memorandum to Ellen Belk, EPA Region 6. Prepared by Uarporn Nopmongcol, Greg Yarwood, and Tanarit Sakulyanotvittaya, Environ International Corporation, Novato, California. August 12, 2014. Electronic file included in the docket as "Memo_TXHAZE_2018low_highControls_CAMx_12Ausg14.docx"

[30] High and low control levels were (arbitrarily) selected by EPA corresponding to differing levels of SO_2 emission reduction for each modeled unit.

[31] "zo" refers to the set of model results with each individual source removed, or "zeroed out".

[32] See Figure 1 of Environ. 2014. "2018 Base Case CAMx Simulation, Texas Regional Haze Evaluation." Memorandum to Ellen Belk, EPA Region 6. Prepared by Uarporn Nopmongcol and Greg Yarwood, Environ International Corporation, Novato, California. September 7, 2013. Electronic file included in the docket as "Memo_TXHAZE_2018CAMx.7Sept13.docx"

Footnotes:

[11] EPA, Health – Sulfur Dioxide, *available at* http://www.epa.gov/air/sulfurdioxide/health.html.

[12] EPA, Health – Nitrogen Dioxide, *available at* http://www.epa.gov/air/nitrogenoxides/health.html.

[13] EPA, Health – Particulate Matter, *available at* http://www.epa.gov/air/particlepollution/health.html.

[14] EPA, Fact Sheet – Final Amendments to the Regional Haze Rule and BART Guidelines, *available at* http://www.epa.gov/visibility/fs_2005_6_15.html. It is important to note that EPA's study focused primarily on the BART component of the Regional Haze Rule. EPA, Regulatory Impact Analysis for Final Clean Air Visibility Rule of the Guidelines for Best Available Retrofit Technology (BART) Determinations Under the Regional Haze

Regulations, EPA-452/R-05-004 (June 2005), *available at* http://www.epa.gov/oar/visibility/pdfs/bart_ria_2005_6_15.pdf. Moreover, EPA's study "assumes that BART-eligible EGUs affected by the Clean Air Interstate Rule (CAIR) (March 2005) have met the requirements of this rule. Thus, no additional controls for EGUs beyond CAIR are anticipated or modeled for the 28 State plus District of Columbia CAIR region." *Id. at* 2-6. Similarly, the model assumed that "no additional SO_2 controls for sources located in States of Arizona, Utah, Oregon, Wyoming, and New Mexico or Tribal lands located in these States due to agreements made with the Western Regional Air Partnership (WRAP)." Finally, EPA's analysis assumed that SO_2 BART emission limits of only .15 lbs/MMBtu, as opposed to the lower limits in the proposed rule, and also assumed that no facilities with existing scrubbers would need further reductions. *Id. at* 7-2, Table 7-1. As a result, EPA's 2005 study likely underestimates significantly the health benefits of the regional haze program. [15] Thurston derived this estimate using an EPA-approved health risk modeling program, in which mortality change is the product of the projected change in air pollution, exposed population, incidence of mortality, and a "mortality effect estimate." Id. at 12-13. The mortality effect estimate is an estimate of the percentage change in mortality due to a one unit change in ambient air pollution. Epidemiological studies are a well-established source for such estimates. In this analysis, Thurston relied primarily upon a mortality effects estimate that is consistent with the estimate used by EPA in the agency's 2005 nationwide analysis of the health benefits of Guidelines for Best Available Retrofit Technology (BART) Determinations Under the Regional Haze Regulations. As Thurston explains, this estimate is a conservative (i.e., low) mortality effect estimate because it only accounts only for reductions in fine particulate matter and not the co-benefits associated with reduced SO_2 and other pollutants.

[16] Reproduced from the Thurston Report, Table 1, Annual Multi-State Human Health Effects and Monetary Valuations Associated With the PM2.5 Air Pollution Avoided by Applying the Federal Implementation Plan for Regional Haze and Interstate Transport of Pollution Affecting Visibility in Oklahoma and Texas.

Multiple public hearing commenters (0053-8, 0053-41, 0053-61, 0053-62, 0054-1, 0054-2, 0054-9, and 0054-46) described health effects and co-benefits.

Commenter 0053-8 (Public Citizen) supported strengthening the rules because it will improve the health of residents statewide and support tourism to national parks in Texas. Much of the haze that tourists encounter in Big Bend National Park comes from NOx, SO_2, and PM from coal-fired power plants that crosses state lines and makes Texans sick. According to statistics from the Clean Air Task Force, coal-fired generation costs Texans over $2.5 billion a year in hospital admissions, treatment for conditions such as chronic bronchitis and asthma, and costs related to premature death resulting from exposure to coal pollution. According to the same study, 330 people in Texas will die a year from exposure to this toxic soup of chemicals, but this is an improvement from previous years as in 2000 there were 369 deaths in the Dallas/Fort Worth area alone from coal-fired pollution.

Commenters 0053-8, 0053-61, and 0054-2 noted that the EPA has estimated that implementation of the regional haze plan would prevent 1,600 premature deaths, 2,200 nonfatal heart attacks, and over 1 million lost school/work days due to pollution-related illnesses.

Commenter 0053-8 noted that constituents found in haze are detrimental to the health of Texans, including children, people with asthma, and the elderly. Exposure to these constituents can contribute to increased respiratory illnesses, decreased lung function, increased risk of cardiac arrest, and premature death. The sulfate found in haze also contributes to acid rain formation. Fine particles that are found in haze are especially damaging to lungs and circulatory systems and are even carcinogenic. Long-term exposure to fine particles are associated with the development of chronic bronchitis and the worsening of symptoms in people who have COPD, coronary artery disease, asthma, and diabetes.

Commenter 0053-41 supported strong rules to end air pollution and improve visibility in national parks. The most critical impacts of allowing our air to be polluted with PM, SO_2, and NOx are the health problems, especially respiratory illnesses, which these pollutants cause. Since the early 1980s scientists have linked urban haze in the Dallas/Fort Worth area to east Texas coal plants. The cost of this pollution comes in the form of medical bills, lost productivity, lost educational opportunity, and sometimes even loss of life.

Commenter 0053-62 noted that coal-plant haze is an esthetic problem and SO_2 poses health effects. The commenter noted that Monticello, Martin Lake, and Big Brown are on the list of affected coal plants (Luminant's dirtiest old technology), and contended that emissions from those coal plants are particularly bad for people's health. The commenter stated that, through their work on the Beyond Coal campaign, they met people living around Texas coal plants who suffer different ailments.

Commenter 0054-1 supported the EPA's recommendations and stated that cleaning up haze and SO_2 emissions will help clean the air in DFW. It has been proven that Monticello, Martin Lake, and Big Brown affect DFW in air quality and in turn the health of our families and all those who live there. Retrofitting plants with scrubbers and other pollution controls are likely to not only affect the levels of NOx to the tune of 228,000 tons but will also likely reduce NOx and VOCs, which cause smog, CO_2, and mercury.

Commenter 0054-2 stated that children are at greatest risk from air pollution because they're more likely to be outside. Their lungs are still developing. Asthma attacks one out of every ten school children in the U.S., and this is the number one health issue that causes kids to miss school.

Commenter 0054-9 stated that Dallas/Fort Worth is the second highest region for ozone pollution in the United States, and 1200 people die from ozone poisoning every year in Texas. Five Texas power plants are major contributors to SO_2 and NOx and are several times higher than number six in the whole country. The commenter supported EPA in adopting tighter haze standards to protect our health.

Commenter 0054-46 supported the rule and encouraged the EPA not to capitulate to the power corporations in consideration of people's health, children's health, wildlife, and the views.

[Jeannie McDaniel, OK House of Representatives (0080) p. 2] OK Representative McDaniel stated that there are important public health co-benefits of the EPA proposal. For example, the 14 coal boilers covered by the regional haze rule emit 35% of the ozone-causing NOx pollution from all the 121 power plants in Texas. In addition, the 14 coal boilers covered by the regional haze proposal emit 26% of the carbon emissions from all the power plants in Texas. Just replacing these 14 coal boilers with clean energy will get the state 2/3 of the way to meeting the EPA's target in the Clean Power Plan for carbon emissions from Texas.

Commenter 0053-11 (Air Alliance Houston) supported the proposed rule and stated that the welfare benefits of the rule are not trivial. The national parks and wilderness areas bring billions of dollars in commerce (tourism) every year and provide psychological and health benefits to people. The commenter suggested that that all benefits be considered in the cost-benefit analysis for the rulemaking.

Commenter 0053-62 stated that pecan farms across the street from Austin's LCRA Fayette power plant were reunited by SO_2 from that plant, ruining people's livlihoods. The SO_2 deposits on the top of the leaves and also comes in to the leaves from the stomata underneath, and over about 20 years it killed entire pecan groves.

Commenter 0054-2 stated that the haze pollution in wilderness areas is far more serious than just providing a beautiful view of our national parks and wildlife areas because the poisonous haze kills flora and fauna.

Response: We appreciate the commenters' concerns regarding the potential adverse health effects and resulting benefits of air pollution controls to improve air quality In Class I areas. We generally agree that the same emissions that cause visibility impairment can also cause health related problems, such as respiratory ones. Although our action addresses visibility impairment, we note that there is the potential for improvements in human health through reductions in regional concentrations of visibility impairing pollutants. We generally agree with Representative McDaniel, Dr. Thurston, Earthjustice and the other commenters that in addition to improving visibility, pollution reductions under our proposal will yield significant public health, economic, welfare, and other environmental benefits. Thus, because our FIP will lead to emissions reductions, there will be co-benefits for public health. However, for purposes of this action, we are not specifically considering these health based benefits under this visibility program. Therefore to the extent that the focus of Dr. Thurston's report was to address the health effects of our proposal, we do not specifically respond to it as our Regional Haze program targets visibility impairment only.

More specifically, EPA also recognizes the role that protecting visibility in national parks and wilderness areas has to tourism throughout the state. Reducing regional haze will help ensure that views in these parks and wilderness areas are preserved, and will continue to support tourism. Further, we appreciate the comment regarding the negative ecosystem impacts of visibility impairing emissions. We agree that visibility impairing pollutants can have negative impacts on ecosystems, however, for purposes of this Regional Haze action, we are not authorized to consider these ecosystem impacts. Therefore, while we note the potential for co-benefits to ecosystem health resulting from our action today, we have not taken these potential benefits specifically into account in this action. Lastly, we acknowledge that today's action may have positive economic impacts, as described by Commenter. We agree that our Class I areas and other national parks and wilderness areas are a source of jobs and contribute to the economies of their respective states. We also agree the visibility at Class I areas must be improved according to our instructions from Congress as codified in the Clean Air Act but we cannot specifically take these types of potential economic benefits into account in our action.

Comment: Wilderness areas and State parks. Commenter 0053-32 pointed out that we are not only dealing with Class I properties here but wilderness areas. There is designated wilderness at Guadalupe Mountains National Park and proposed wilderness at Big Bend National Park. Part of wilderness is clean air and far vistas. The National Park Service cannot manage these areas as wilderness unless the EPA acts and requires action which the TCEQ will not require.

Commenter 0053-32 also pointed out that in addition to national Class I and wilderness areas, State parks will benefit (e.g., Big Bend Ranch State Park, Davis Mountains State Park, and Chinati Mountain State Park).

Response: We understand that Class I areas also include wilderness areas. We agree that although the regional haze program targets Class I areas, other scenic areas such as state parks will likely co-benefit as well.

Comment: The Aggregate Visibility Benefits of Controls Texas Considered Are Significant. [Earthjustice (0067) p.22]

Earthjustice et al., noted that Texas concluded that no reasonable progress controls are necessary in part because of Texas's conclusion that the visibility benefits would be too low. But Texas's analysis is both unsupported and inaccurate. The analysis is unsupported because the record is devoid of any analysis that Texas may have undertaken to determine whether the projected visibility improvement would be significant relative to the costs. Instead, Texas merely asserts that the projected benefits are too low to justify the costs of controls. EPA cannot approve a state plan that is neither supported by the record nor well-reasoned. *See Oklahoma*, 723 F.3d at 1206-12; *North Dakota*, 730 F.3d at 761.

Earthjustice et al., stated that Texas references a threshold of "perceptibility" and also the threshold of 0.5 dv sometimes used to determine whether a source is subject to BART. Neither threshold justifies Texas's failure to consider cost-effective controls. As EPA appropriately explains, "perceptibility" is not a determining factor in establishing the significance of visibility impacts or benefits. 79 Fed. Reg. 74,840.

According to Earthjustice et al., the implied use of a 0.5 deciview threshold, taken from the BART Guidelines, is likewise inappropriate. First, the BART Guidelines identify 0.5 dv as the highest threshold to use to determine whether a source should be analyzed for BART controls. The BART Guidelines do not suggest using 0.5 deciviews as a threshold for determining when visibility improvement is significant enough to warrant requiring controls. Indeed, both states and EPA have required controls that provide benefits of less than 0.5 dv. *See, e.g.*, FIP TSD at A-75 (mentioning controls required in Wyoming and Arizona that would provide a visibility benefit less than 0.5 deciviews). Second, even in the context of determining whether a source is subject to BART, EPA guidelines urge states to consider thresholds lower than 0.5 dv, especially where there are a large number of sources having impacts on a given Class I area, 40 C.F.R. pt 51 App. Y § III(A), as is clearly the case with Texas's 1600+ point sources.

Moreover, Earthjustice et al., stated that Texas never acknowledged that the magnitude of visibility improvement from reasonable progress controls will always appear much lower than they do in the BART context because of the differences between the modeling process used to evaluate reasonable progress and modeling used to evaluate whether a source is subject to

BART. As discussed in the attached Gray Report (comment 0070), the modeling differs in three fundamental ways: (1) the background visibility conditions against which improvement is measured; (2) whether the impact on the worst twenty percent of days is measured versus the maximum impact; and (3) whether the emissions input into the model are based on annual average emissions or on the maximum 24- hour emissions. Texas appears to have judged the benefits from reasonable progress controls to be too small without ever having adjusted for these fundamental differences between modeling the visibility improvement from reasonable progress versus BART controls.

In the table below (from comment 0067), Earthjustice et al., noted that EPA translated its reasonable progress modeling results from a "dirty" background (one that considers the impacts of all sources together, thereby lowering the impact of any one source) into results from a "clean" background (one that considers each source individually against a natural background). This example addresses only one of the three main differences described above between Texas's reasonable progress modeling and typical BART modeling that can make reasonable progress controls appear to provide a smaller benefit.

Table 4 from comment 0067

Table 4. Estimated Visibility Improvement from EPA's Proposed Controls[31]

	Improvement at Big Bend, Guadalupe, and Wichita Mountains	
	2018 "Dirty" Background	Average Natural Conditions, "Clean" Background
Proposed Scrubber Retrofits and Upgrades	.984	4.439

31 EPA, FIP TSD at A-76.

When translated in this way, Earthjustice et al., stated that the benefits Texas evaluated are on the same order of magnitude as EPA's. 79 Fed. Reg. 74,837. EPA's table reproduced above shows that when compared to natural background visibility conditions, the benefits Texas evaluated in the aggregate would have been above its implied threshold of 0.5 dv, even without accounting for the differences in metrics and emission rates between Texas's modeling and typical BART analyses. The use of a 0.5 dv threshold is not appropriate in this context, but the benefits that Texas dismissed were significant even by that flawed standard. Moreover, when the visibility improvement is translated from the results based on a dirty background to a clean background, the results are nearly five times as large. Texas, however, appears to have considered only the visibility improvement modeled against a dirty background.

Earthjustice et al., summarized that Texas's analysis is unreasonable because the thresholds advanced lack substantiation or merit, and the benefits dismissed are significant. To the extent that Texas relied on a threshold of 0.5 dv, its analysis was flawed because the threshold itself is inappropriate; the BART Guidelines mention 0.5 deciviews for evaluating whether baseline impacts are significant enough to warrant an analysis of potential BART controls, not to evaluate whether the benefits of controls are significant enough to require the controls, Moreover, the BART Guidelines suggest a maximum threshold of 0.5 deciviews for use with a different type of modeling than is used for modeling reasonable progress controls. Even if 0.5 deciviews were an appropriate threshold, the benefits of the controls Texas considered would be at least 0.5 deciviews when accounting for the differences between its reasonable progress modeling and typical BART modeling. Finally, Texas's analysis was flawed because it inappropriately dismissed visibility benefits as being too low to be "perceptible" when in fact perceptibility is not an acceptable threshold.

Response: We agree with Earthjustice that many areas of Texas' regional haze SIP were inadequate. We agree, as we discuss in another response to comments, that a threshold of perceptibility for visibility improvement is not appropriate for the acceptability of a control. We similarly agree that the BART threshold of 0.5 is not appropriate for use in our proposal for all of the reasons Earthjustice cites. As we discuss in our proposal and elsewhere in our response to comments, there is no way to directly compare the CAMx modeling we used in our proposed TX/OK FIPs and used by Texas in its SIP to estimate the visibility benefit from controls with previous CALPUFF modeling results and thresholds established with respect to those results due to differences in the model, model inputs, and metrics used. Therefore, comparisons to CALPUFF-derived thresholds are not appropriate.

Comment: EPA Should Disapprove Texas's Determination that No Source is Subject to BART. [Earthjustice (0067) p.57]

Earthjustice et al., stated that Texas identified 126 sources as BART-eligible or potentially BART eligible. *See* SIP at 9-2 to 9-4; 79 Fed. Reg. at 74,845-47. Yet Texas ultimately concluded that no BART eligible source is subject to BART. SIP at 9-10.[66] Texas's determination is based in part on the unsupported selection of 0.5 deciviews as the threshold for contribution to visibility impairment. In addition, Texas's analysis for the ExxonMobil Beaumont refinery unlawfully uses future, projected emissions as the baseline rather than actual emissions. For these reasons, EPA must disapprove Texas's determination as to the sources subject to BART.

Earthjustice et al., stated that Texas adopted 0.5 deciviews as the threshold for "contribution" to visibility impairment. SIP Volume I at 10-4. If a source's 98th percentile, baseline impact was below 0.5 deciviews at each affected Class I area, the source was deemed not subject to BART. But Texas provided no justification for using a 0.5 deciview threshold. There is no documentation in the record as to how or why Texas selected this threshold, and there is no legal support for such threshold. EPA's BART Guidelines do not authorize states automatically to use a 0.5 deciview contribution threshold. Instead, the BART Guidelines state only that "any threshold that you use for determining whether a source 'contributes' to visibility impairment should not be higher than 0.5 deciviews." 40 C.F.R. pt. 51, App. Y, § III(A)(1). In the next sentence, the Guidelines instruct each state that it “should consider the number of emissions sources affecting the Class I areas at issue and the magnitude of the individual sources’ impacts.” *Id.* There is no evidence in the record that Texas ever conducted this analysis.

Furthermore, Earthjustice et al., noted that the Guidelines conclude that “a larger number of sources causing impacts in a Class I area may warrant a lower contribution threshold.” *Id.* As Texas’s list of 126 BART eligible sources indicates, a large number of sources impact the Class I areas in Texas and in neighboring states. Indeed, the subset of sources that screened out of BART based on individual modeling have a combined, baseline impact of nearly 10 deciviews.[67] Thus, the situation in Texas is exactly what EPA had in mind when it noted that a contribution threshold lower than 0.5 deciviews may be appropriate. Had Texas followed the BART Guidelines, it may well have selected a threshold lower than 0.5 deciviews.

Earthjustice et al., stated that using a lower contribution threshold would change Texas’s conclusion as to which sources are subject to BART because there are sources with a baseline impact just below 0.5 deciviews. For example, the Ash Grove Cement plant’s 3-year average of the 98th percentile visibility impact ranges from .0325 to 0.431 at Wichita Mountains, based on the modeling approach used. SIP Appendix 9.8, BART Exemption Modeling Report, Ash Grove Cement Company, Midlothian, Texas at 13-14. ExxonMobil’s Beaumont refinery has a 3-year average, 98th percentile impact of .422 deciviews at Caney Creek. SIP Appendix 9.8, BART Modeling Analysis ExxonMobil Beaumont Refinery at 16. The International Paper, Texarkana Mill has a 3-year average, 98th percentile impact of .296 deciviews at Caney Creek. SIP Appendix 9.8, International Paper Demonstration of Exemption from BART Requirements at 28.

Earthjustice et al., stated that the EPA has a statutory responsibility to ensure that a SIP meets all applicable Clean Air Act requirements and is supported by the record. *See* 42 U.S.C. § 7410(k)(3), (l); *North Dakota v. EPA*, 730 F.3d at 761 (EPA must examine the substance of a state’s BART determinations in order to determine whether the state’s decision and plan is based upon “reasonable analysis” and is “reasonably moored” to the Clean Air Act’s requirements); *Oklahoma v. EPA*, 723 F.3d at 1208-10 (EPA reasonably disapproved BART determinations that did not comply with EPA regulations and guidance). Here, Texas’s use of a 0.5 deciview threshold has two fatal flaws: it is not based on the analysis prescribed by the BART Guidelines, and it is not supported by any analysis whatsoever in the record. Therefore, EPA must disapprove Texas’s conclusions that sources are not subject to BART, where Texas screened out sources because of a visibility impact below 0.5 deciviews. EPA must then develop an appropriate contribution threshold and determine which sources have impacts above the contribution threshold EPA develops and are therefore subject to BART.

In addition to using an unsupported 0.5 deciview threshold, Earthjustice et al., stated that Texas used unlawful assumptions to conclude that ExxonMobil’s Beaumont facility is not subject to BART. Modeling showed that using the Beaumont facility’s actual emissions between 2002 and 2004, the subject had a maximum impact greater than 0.5 deciviews at 7 Class I areas. SIP Appendix 9.8, BART Modeling Analysis ExxonMobil Beaumont Refinery at 14. Instead of then examining the 98th percentile impacts at these Class I areas, Texas relied on additional modeling based on projected emissions reductions based on anticipated controls; the additional modeling showed impacts lower than 0.5 deciviews, which led the State to conclude that the facility is not subject to BART. *Id. at* 16.

Earthjustice et al., stated that the BART Guidelines instruct states that the "baseline emissions rate should represent a realistic depiction of anticipated annual emissions for the source." 40 C.F.R. pt 51 App. Y § IV(D)(4)(d). "In general," baseline emissions should be "based upon actual emissions from a baseline period." *Id.* While baseline emissions can be based on future changes at the source, the overriding mandate is that baseline emissions be a "realistic depiction of anticipated annual emissions." *Id.*

Here, it is unclear whether the pollution controls that were expected to reduce emissions at the Beaumont facility have actually been used consistently since they were installed. In 2008, EPA fined ExxonMobil for widespread violations of emissions limits and monitoring requirements at its refineries, including the Beaumont facility. EPA's finding in 2008 that ExxonMobil had violated the consent decree governing operation of pollution controls at its refineries followed a 2005 consent decree resolving EPA's allegations that the refineries were in violation of multiple Clean Air Act requirements. EPA, ExxonMobil Refinery Settlement, *available at* http://www2.epa.gov/enforcement/exxonmobil-refinery-settlement#violations.

Earthjustice et al., stated that there is no evidence in the record that the baseline emissions Texas used for the Beaumont refinery represent a "realistic depiction of anticipated annual emissions," as required by the BART Guidelines. 40 C.F.R. pt 51 App. Y § IV(D)(4)(d). At a minimum, EPA should examine and document in the record whether the Beaumont refinery has actually achieved the emissions rates that Texas used in its future emissions scenario. If the Beaumont refinery's emissions have exceeded the emissions rates that Texas modeled, EPA should disapprove Texas's conclusion that ExxonMobil Beaumont is not subject to BART, conduct its own analysis of whether the facility is subject to BART, and conduct a five-factor analysis if the facility is subject to BART.

Footnotes:

[66] It is unclear whether Texas found that certain EGUs are subject to BART, but that CAIR could substitute for SO_2 and NOx BART controls, or whether Texas found that it need not even determine whether EGUs subject to CAIR are subject to BART. Regardless, Texas did not conduct SO_2 and NOx BART analyses for any EGU.

[67] *See* EPA, BART TSD-Texas (Nov. 2014) at 74-75 (29 sources that screened out based on CALPUFF modeling had a baseline impact of approximately 8.1 deciviews); *Id. at* 77 (6 sources that screened out based on CAMx modeling had a baseline impact of 1.3 deciviews). For the CALPUFF modeling, we avoided double-counting the 2 results reported for Ash Grove. We acknowledge the differences in the CALPUFF and CAMx models, and further acknowledge that the CALFPUFF modeling was conducted differently for different sources, based on either the CENRAP or refined modeling approaches. Thus, aggregating the impacts reported from the different modeling should be viewed as an approximation; the results would likely be slightly different if all sources had used the same modeling approach.

Response: We disagree with the comment. We address the screening model impacts for individual BART source using CAMx elsewhere in this document. We note that this modeling based on short-term permitted emission levels were 0.42 dv or less and would have been even lower if based on actual emission levels. For other sources that relied on CAMx modeling for BART screening, maximum modeled impacts for groups of sources were compared to the 0.5 dv threshold, and therefore any individual source's impact would be only a portion of the group's impacts that fell below 0.5 dv. Those sources that screened out based on CALPUFF modeling relied on a 0.5 dv threshold to demonstrate that they did not cause or contribute to visibility impairment at any Class I area. Overall EPA did not find any issues/concerns with the CALPUFF and CAMx modeling evaluations because they followed modeling protocols established in consultation with EPA and FLM representatives, including the choice of threshold.

EPA's BART Guidelines allow states conducting source-by-source BART determinations to exempt sources with visibility impacts as high as 0.5 dv.[331] While we agree that a state may choose to use a lower threshold, this should be based on consideration of not only the number of sources, but the proximity to the Class I area and the potential combined visibility impacts from a group of sources. Therefore, if a group of sources are located such that visibility impairing pollution from that group of sources are anticipated to be transported together and simultaneously impact visibility at a Class I area, a lower threshold may be appropriate to address the impacts from the sources within that group. The cumulative visibility impacts cited to by the commenter (e.g., 29 sources that screened out based on CALPUFF modeling had a baseline impact of approximately 8.1 deciviews) combines the maximum visibility impacts from each facility without any consideration of the location of the source or even the Class I area that is being impacted. The commenter's approach overstates the combined impact at a given Class I area and does not contemplate if sources are located near each other and would likely impact a Class I area at the same time.

With regards to comments concerning ExxonMobil Beaumont, as the commenter states, the facility was subject to a consent decree in 2005, prior to Texas submitting its SIP. Therefore at the time of the SIP submittal, future emission levels tied to enforceable emission reductions were identified for the source and considered as a realistic depiction of anticipated future emissions in the BART screening.[332] Violations of the consent decree and permitted emission limits are an enforcement matter and outside of the scope of this action.

Finally, we note that all Texas point sources, including those BART sources that screened out, were included in our Q/d analysis for RP and subsequent modeling to identify those sources with the largest impacts on visibility conditions on the 20% worst days.

With regard to BART-eligible EGUs, as we discuss in our proposal,[333] we have already issued a limited disapproval of the Texas regional haze SIP for its reliance on CAIR. However, we determined that CSAPR provides for greater reasonable progress towards the national goal than would BART and Texas is included in CSAPR for NOX and SO_2. Therefore, our proposed FIP to replace reliance on CAIR with reliance on the trading programs of CSAPR as an alternative to BART included a FIP to replace Texas' reliance on CAIR in 30 TAC 116.1510(d) with reliance on CSAPR. We proposed to approve the remainder of the provisions in the Texas BART rules and Texas' application of the BART rules regarding the identification of all BART eligible sources within the state and the screening of BART sources from full BART analysis.

On July 28, 2015, the D.C. Circuit Court's issued its decision in EME Homer City Generation v.

[331] 40 CFR part 51 Appendix Y Section III.A.1

[332] We note that emissions inventory data for 2009-2011 show annual emissions from the facility range from about 500 to 750 tpy of SO_2.

[333] 79 FR 74854.

EPA, 795 F.3d 118 (D.C. Cir 2015), upholding CSAPR but remanding without vacating a number of the Rule's state emissions budgets. Specifically, the court invalidated a number of the Phase 2 ozone season NOX budgets and found that the SO_2 budgets as to four states resulted in over control for purposes of section 110(a)(2)(D)(i) of the CAA. Texas' ozone season NOx budget and its SO_2 budget are both implicated in this remand. We are in the process of acting on the Court's remand. As a result, at this time we cannot ensure that CSAPR will continue to be an appropriate alternative to BART for Texas EGUs. Given the uncertainty arising from the remand of some of the state CSAPR budgets, we have decided not to finalize that portion of our FIP relying on CSAPR as an alternative to ¶ and NOx BART for EGUs in Texas.

As the question of how best to address the BART requirements for these significant sources of emissions of visibility impairing pollutants remains undecided, we have also concluded that our proposed portion of the FIP to address the requirements of section 110(a)(2)(D)(i)(II) with respect to visibility should also be addressed in a future rulemaking. We will address the question of appropriate SO_2 and NOX BART limits for EGUs in Texas and the remaining issues in a future rulemaking once EPA has determined how best to respond to the remand of some of the CSAPR state budgets. We note that a few of the sources for which we are finalizing SO_2 controls as part of the Texas long-term strategy are also BART-eligible. Should we determine in the future that it is necessary to perform source-specific BART determinations for these sources instead of relying on CSAPR, we anticipate that the SO_2 controls we are finalizing today, which are currently the most stringent available, will also be sufficient to satisfy the BART requirement.

Comment: TCEQ properly relied on aggregate visibility benefits analysis to determine that available controls were not reasonable. [NRG (0078) p. 5]

NRG stated that the EPA has proposed to disregard Texas' determination that available controls to reduce regional haze were not reasonable because Texas considered aggregate costs and visibility benefits. "We propose to find that the TCEQ's analysis is insufficient to determine the visibility benefit . . . . TCEQ's reliance on an aggregate analysis materially affected its conclusion that existing and scheduled controls would achieve reasonable progress. " 79 Fed. Reg. at 74,841.

NRG stated that the Texas approach is consistent with "option 3" identified in EPA's regulations for demonstrating that no sources in a state should be subject to BART, which states:

> You may also submit to EPA a demonstration based on an analysis of overall visibility impacts that emissions from BART-eligible sources in your State, considered together, are not reasonably anticipated to cause or contribute to any visibility impairment in a Class I area, and thus no source should be subject to BART. 40 C.F.R. Pt. 51, Appx. Y, § III.A.3, Option 3.

NRG stated that the EPA's underlying analysis makes clear that BART was the agency's template for doing its analysis. Among the numerous comparisons and references to BART rules, one of EPA's technical support documents states:

> Our Reasonable Progress Guidance notes the similarity between some of the reasonable progress factors and the BART factors contained in section 51.308(e)(l)(ii)(A), and suggests that the BART Guidelines be consulted regarding cost, energy and non-air quality environmental impacts, and remaining useful life. We are therefore relying on our BART Guidelines for assistance in interpreting those reasonable progress factors as applicable.
>
> . . . . Also, similar to a BART analysis, we are considering the projected visibility benefit in our analysis.[20]

NRG stated that not only was the Texas approach consistent with other EPA regional haze regulations, it also resulted in the objectively reasonable conclusion that substantial new controls with imperceptible visibility impacts are unreasonable. Texas determined what visibility benefits might accrue from new SO_2 control strategies, and that the maximum projected visibility benefit was only 0.36 deciview, which could not be perceived by the human eye.[21]

Thus, NRG disagreed with EPA's proposed rejection of Texas' reliance on an aggregate cost and visibility benefit analysis.

Footnotes:
[20] EPA, *Technical Support Document for the Oklahoma and Texas Regional Haze Federal Implementation Plans (FJP TSD)* (Nov. 2014), at 6.
[21] EPA, *Technical Support Document for the Texas Regional Haze State Implementation Plans (TX TSD)* (Nov. 2014), at 15.

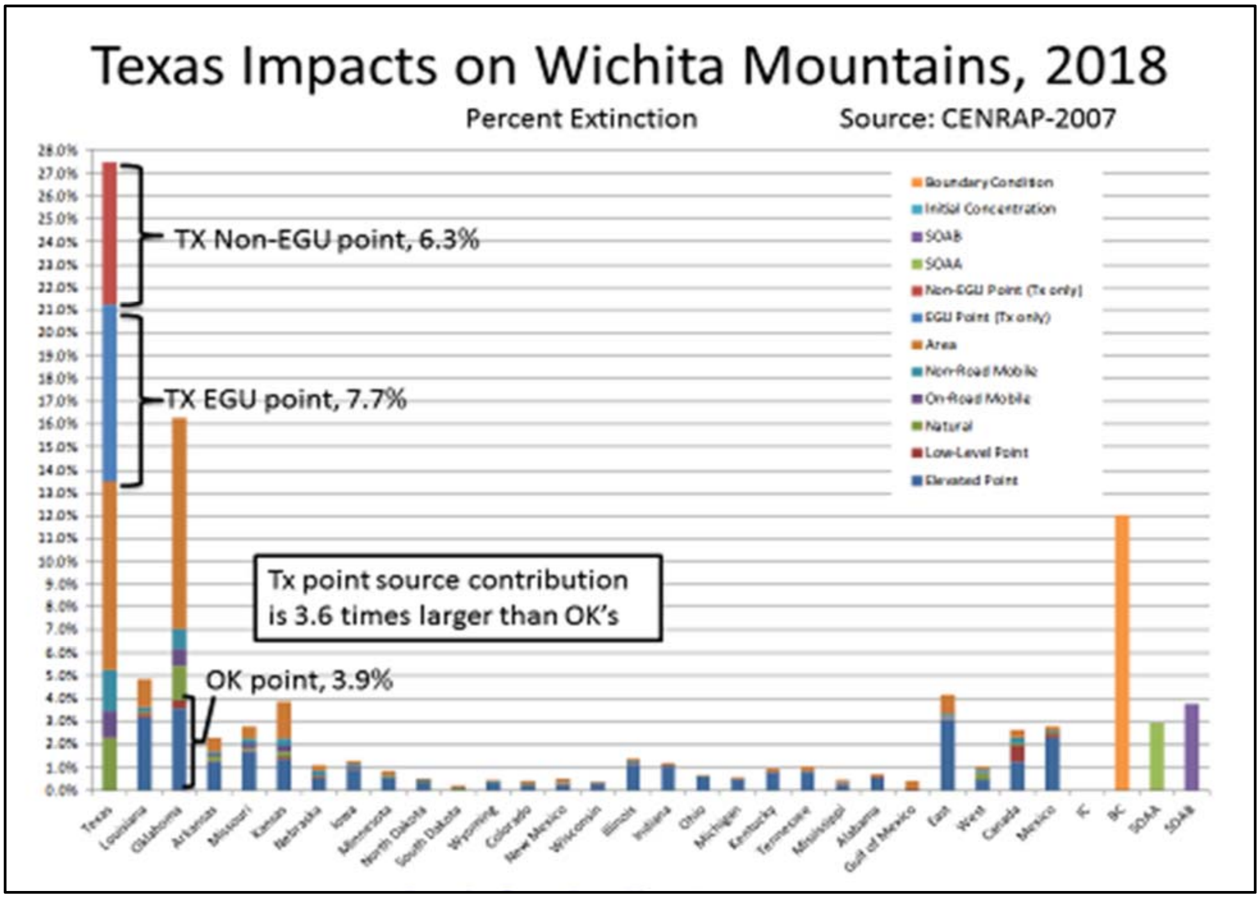
Response: It appears that NRG assumes that our reasonable progress and long-term strategy was completely borrowed from the BART Guidelines, which is incorrect. As we state in our FIP TSD and as NRG reproduces, "We are therefore relying on our BART Guidelines for assistance in interpreting those reasonable progress factors *as applicable* [emphasis added]." Certainly, there are many aspects of the BART analysis that are not applicable, such as the limitations of which sources are BART-eligible (some of the sources we proposed to control are not BART-eligible sources), the basic methodology of whether a source is subject to BART, etc.

NRG reproduces a part of our BART Guidelines and proposes that Texas's approach falls under the BART option in which the state's overall visibility impact can be analyzed in order to demonstrate that it is so small that individual source impacts are inconsequential. The full portion of the quote that NRG references and asserts to be applicable is:

> You may also submit to EPA a demonstration based on an analysis of overall visibility impacts that emissions from BART-eligible sources in your State, considered together, are not reasonably anticipated to cause or contribute to any visibility impairment in a Class I area, and thus no source should be subject to BART. You may do this on a pollutant by pollutant basis or for all visibility-impairing pollutants to determine if emissions from these sources contribute to visibility impairment.
>
> For example, emissions of SO_2 from your BART-eligible sources may clearly

cause or contribute to visibility impairment while direct emissions of PM2.5 from these sources may not contribute to impairment. If you can make such a demonstration, then you may reasonably conclude that none of your BART-eligible sources are subject to BART for a particular pollutant or pollutants. As noted above, your demonstration should take into account the interactions among pollutants and their resulting impacts on visibility before making any pollutant-specific determinations.

In fact, SO_2 emissions from Texas do clearly impact the visibility impairment at a number of Class I areas both inside and outside of Texas. For example, the following chart was compiled from information present in the TX regional haze SIP:[334]



Clearly, Texas's contribution to the visibility at the Wichita Mountains alone is much greater than that due to Oklahoma itself, in which the Wichita Mountains Class I Area is located. As Oklahoma noted in its SIP, "Texas contributes more to visibility impairment at the Wichita Mountains than Oklahoma or any other state does."[335] Consequently, even if Texas had desired to model its reasonable progress and long-term strategy after the above cited provision of the

[334] Appendix 8-1, "Technical Support Document for CENRAP Emissions and Air Quality Modeling to Support Regional Haze SIP."

[335] Regional Haze Implementation Plan Revision, State of Oklahoma, Department of Environmental Quality, February 2, 2010. Page 107.

BART Guidelines, it would not have been able to make this type of demonstration. Furthermore, NRG confuses the estimated visibility *improvement* from controls estimated by TCEQ and the visibility *impacts* anticipated from Texas emissions. We consequently disagree with NRG's assertion that Texas' approach was reasonable and we disagree specifically that Texas's approach of aggregating the visibility impacts and costs was appropriate.

13. Natural Conditions

Comment: Earthjustice et al., provided background on baseline and natural conditions. [Earthjustice (0067) p.7]

Earthjustice et al., stated that for each Class I area within its borders, the state must calculate baseline and natural visibility conditions. 40 C.F.R. § 51.308(d)(2). Both baseline and natural visibility conditions must be calculated for the twenty percent most impaired days and the twenty percent least impaired days. *Id.* § 51.308(e)(3). Given the statutory goal of eliminating all haze in Class I areas caused by "manmade" air pollution, 42 U.S.C. § 7491(a)(1), the calculation of natural visibility conditions establishes the ultimate goal for each Class I area. Each haze plan must then make reasonable progress toward achieving natural visibility conditions. *Id.* § 7491(b)(2). Thus, it is critical for a state to properly determine natural visibility conditions.

Response: The EPA acknowledges the background information provided by the commenter. We take no position with respect to the commenter's synopsis.

Comment: Luminant provided background information on Texas's determination of the uniform rate of progress for Big Bend and Guadalupe Mountains. [Luminant (0061) p. 18]

Luminant noted that, to set the URPs, Texas first calculated baseline, natural, and current visibility conditions at Big Bend and the Guadalupe Mountains. Using the Visibility Information Exchange Webs System ("VIEWS") and the IMPROVE algorithm, Texas calculated baseline conditions using data from 2001 to 2004.[137] At Big Bend, baseline visibility was calculated at 5.78 deciviews for the best 20 percent days and 17.30 deciviews for the worst 20 percent days.[138] At the Guadalupe Mountains, baseline visibility was calculated at 5.95 deciviews for the best 20 percent days and 17.19 deciviews for the worst 20 percent days.[139] For natural conditions, Texas estimated all fine soil and coarse mass to be naturally occurring.[140] Based on the assumption of coarse mass and fine soil as 100 percent natural, Texas calculated natural visibility at Big Bend at 10.09 deciviews for the worst 20 percent days and at 2.19 deciviews for the best 20 percent days.[141] Texas calculated natural visibility at the Guadalupe Mountains at 12.26 deciviews for the worst 20 percent days and at 2.10 deciviews for the best 20 percent days.[142] Texas also provided a comparison with 80 percent fine soil and coarse mass as natural.[143] When assuming 80 percent fine soil and course mass as natural, the estimated natural visibility would be 9.2 deciviews at Big Bend for the worst 20 percent days and would be 11.0 deciviews at the Guadalupe Mountains for the worst 20 percent days.[144]

Luminant noted that Texas calculated the uniform rate of progress to achieve natural conditions by 2064 by using the calculated baseline conditions and natural visibility conditions that rely on 100 percent coarse mass and soil as natural.[145] As shown in Table 1 provided by Luminant, under the uniform rate of progress, visibility conditions in 2018 would be 16.0 deciviews at Guadalupe Mountains and 15.6 deciviews at Big Bend.[146]

Table 1 from Luminant Comment (0061): Texas's 2018 URPs for Big Bend and Guadalupe Mountains

Class I Area	State Established URP (2018) (20% worst days)
Big Bend	15.6 dv[147]
Guadalupe Mountains	16.0 dv[148]

Response: The EPA acknowledges the background information provided by the commenter. We take no position with respect to the commenter's synopsis.

Comment: Luminant provided a summary of EPA's review of Texas's URPs for Big Bend and Guadalupe Mountains. [Luminant (0061) p. 48]

Luminant noted that the EPA proposes to approve Texas's determination of baseline visibility conditions for Big Bend and Guadalupe Mountains.[346] EPA proposes to disapprove Texas's determination of natural visibility conditions. In calculating natural visibility conditions, Texas used EPA's default values for all components of visibility impairment, except fine soil and coarse mass, which it treated as 100% attributable to natural conditions.[347] As discussed in correspondence, several of the Federal Land Managers recognized that EPA's regulations at "40 CFR 51.308 gives the State [the] right" "to recalculate natural conditions for Big Bend NP and Guadalupe Mountains NP" and concurred "that the basic approach used [by Texas] to adjust natural conditions is reasonable, provided that the Proposed SIP address the uncertainty of the assumption that all of the coarse mass and fine soil fraction on the worst 20 percent days is natural."[348]

Luminant stated that the EPA disagrees with both Texas and the Federal Land Managers and would instead use a default value that does not capture actual natural conditions at these areas. EPA bases its proposed disapproval, not on any actual data that refutes TCEQ's determination, but on the assertion that "TCEQ has not adequately demonstrated that all coarse mass and fine soil measured in the baseline period can be attributed to 100% natural sources."[349] EPA, however, does not address or refute the substantial body of technical data and research upon which TCEQ based its determination, nor does EPA point out any particular flaws in TCEQ's analysis.[350]

In lieu of Texas's natural visibility calculations, EPA proposes instead a FIP that would use EPA's "default" value for these components of the calculations, yet EPA "agree[s] that dust storms and other blown dust from deserts are a significant contributor to visibility impairment at the Texas Class I areas ***that may not be captured accurately by our default method***."[351] Nor does EPA's proposal take into account natural forest fires, but instead relies on an outdated default based on a time period of intense fire suppression.

Based on its proposal to disapprove Texas's calculation of natural visibility conditions, EPA also proposes to disapprove Texas's URPs for these two areas.[352] While EPA finds that "TCEQ . . . correctly followed the procedures for analyzing and determining the rate of progress needed to attain natural visibility conditions by the year 2064," because the natural visibility conditions is an element of the calculation of the URP, EPA also proposes to disapprove Texas's URPs.[353] EPA's proposed FIP would "reset the amount of natural visibility impairment for these Class I areas" and establish different URPs.[354] Yet, EPA concedes that it does "not have the information necessary to determine how much [coarse mass and soil] should be attributable to natural sources" at Guadalupe Mountains and Big Bend and "solicit[s] comment on the acceptability of alternative estimates in the range between our default estimates and the Texas estimates."[355]

[Luminant (0061) p. 72] Luminant asserted that EPA provides no reasoned basis for disapproving Texas's calculation of natural visibility conditions and the resulting uniform rate of progress for Big Bend and Guadalupe Mountains. Under the regional haze regulations, "natural conditions" "includes naturally occurring phenomena that reduce visibility," such as windblown dust and fire.[509] As part of their reasonable progress analysis, states must calculate natural visibility conditions "by estimating the degree of visibility impairment existing under natural conditions for the most impaired and least impaired days, based on available monitoring information and appropriate data analysis techniques . . . ."[510]

According to Luminant, in accordance with the regulations, Texas calculated natural visibility conditions at Big Bend and Guadalupe Mountains at 10.09 deciviews and 12.26 deciviews, respectively, for the 20% worst days.[511] Texas made its determination based on a substantial body of data and technical analysis that clearly demonstrate that haze conditions at these two areas are heavily influenced by natural dust storms and other natural events.[512] Specifically, Texas found that haze conditions at these two areas "are heavily impacted by large long range dust storms, that originate from dry desert and dry lake bed areas with little or no human activity, almost all of which are situated in the Chihuahuan Desert."[513] Texas shared its approach with several of the Federal Land Managers, who concurred that Texas's approach was "reasonable."[514]

Luminant stated that EPA disagrees with both Texas and the Federal Land Managers and would instead use a default value for natural conditions, which even EPA concedes does not "accurately" reflect natural conditions for these two Texas areas.[515] Yet, EPA provides no support for its disagreement or its proposed default value. In dismissing Texas's analysis, EPA finds no error in Texas's analytical approach or the technical support that Texas relied on. Indeed, EPA provides no data that would dispute Texas's approach and provides no additional analysis or rationale whatsoever.

Luminant stated that EPA's use of the default value does not support either its disapproval of Texas's calculation or its proposed replacement FIP. EPA's "default" value was never intended to be the required "norm" for all states to follow in the development of their regional haze SIP. In its regional haze guidance, EPA explains that states need not adopt EPA's default value and cautions that use of the default value does not "guarantee[]" that a state's analysis will be approved.[516] Rather, states "are welcome to adopt the default values for natural visibility conditions or, with sufficient technical justification, to propose alternatives to the basic approach or to generate refined estimates."[517]

[TCEQ/PUCT (0056) p. 7-8] The TCEQ contended that the natural conditions estimates that the EPA proposes are not technically supportable and should be withdrawn. The EPA failed to meaningfully address Texas' justification for its RPG and natural visibility condition analysis. The TCEQ urges the EPA to approve Texas' estimation that 100% of the coarse mass and fine soil observed at Big Bend and Guadalupe Mountains is the best estimation available.

The TCEQ stated that the EPA's proposal to use the Natural Conditions II (NCII) Committee estimations of natural conditions for coarse mass, i.e., dust, and fine soil, ignores the site-specific evidence and analysis presented on page 5-4 of the 2009 RH SIP. Further information and evidence is presented clearly in the appendices and in peer-reviewed scientific publications that are cited.7

The TCEQ stated that the technical evidence submitted in the 2009 RH SIP demonstrates that, on the most impaired 20% of days, the suspended soil (coarse mass and fine soil) at Guadalupe Mountains and Big Bend is best estimated by calculating that 100% of the soil is natural. The TCEQ asks the EPA to take note of the following conclusion in Chapter 5, page 5-4, the second paragraph of the 2009 RHSIP:

> The times when human-caused dust is likely to be more important at these sites are on days with less visibility than on the worst dust impaired days, since the most dust impaired days are dominated by dust storms and other blowing dust from the surrounding desert landscapes.

According to the TCEQ, in the proposal, the EPA correctly states:

> We note that with any of the methodologies for calculating natural conditions discussed above, Texas' Class I areas are not projected to meet the URP in 2018 according to the CENRAP modeling and are not projected to meet the goal of natural visibility conditions by 2064 (79 FR 74832).

Importantly however, the TCEQ stated that the EPA failed to note that, since over 50% of the visibility impairment at Big Bend on the most impaired 20% days comes from outside the U.S. and since there is no basis for projecting a reduction in that impact, the goal of reaching natural conditions at Big Bend is unrealistic, as is the implied goal of attaining the URP at any time. A more appropriate goal would be to achieve an appropriate reduction of the visibility impairment caused by anthropogenic emissions in Texas and the rest of the U.S.

The TCEQ asserted that they correctly calculated natural visibility conditions at Big Bend and Guadalupe Mountains in accordance with §51.308(d)(2)(iii) and EPA guidance. The use of a refined estimate is allowed under the rule and guidance. The EPA's determination that this refined approach to estimating natural visibility conditions is "not adequately demonstrated" is improper. Such a basis for review is not found in rule, statute or guidance. The EPA cites "uncertainty" in the TCEQ's assumptions yet the EPA's proposed disapproval and use of the default NCII values is contrary to the evidence presented in the 2009 RH SIP and is unjustified. The EPA admits that dust storms and blown dust from deserts, in a very arid region, are significant contributors to impairment in Big Bend and Guadalupe Mountains. The EPA's preference for the default estimates is equally unjustified. It is reasonable to assume coarse mass and dust as 100% naturally sourced for the natural visibility estimate for these areas that are located in a desert environment and close to sources of wind-blown dust. The EPA has not demonstrated that the TCEQ's estimate violates the rule or runs afoul of guidance, or is more uncertain than using the default values. Just because everyone else used the default is not a valid basis for disapproval given that the EPA's rules allow such a refined approach.

[TCEQ/PUCT (0056) p. 8-9] The TCEQ urged the EPA to accept the use of 100% natural dust as the most reasonable estimate for calculating natural conditions. The EPA's proposal presents no evidence that human activity contributes to the coarse mass or fine soil (dust) at Guadalupe Mountains or Big Bend.

The TCEQ asserted that the EPA did not do what the rule requires to calculate natural conditions "by estimating the degree of visibility impairment existing under natural conditions for the most impaired and least impaired days, based on available monitoring information and appropriate data analysis techniques." [See 40 CFR 51.308(d)(2)(iii)] Since the Texas 2009 RH SIP did present substantial evidence that natural blowing dust is the cause of the coarse mass and fine soil at both parks on the 20% of days with the most visibility impairment, the TCEQ strongly urges the EPA to accept the use of the 100% approximation.

[CCP (0075) p. 2] CCP stated that the EPA's proposed use of default values that do not reflect the substantial contribution of coarse matter, soils, and organic mass on natural conditions in the affected Class I areas is arbitrary. The TCEQ regional haze SIP and the rulemaking record support adjustments that further indicate that the rate of progress towards realistic natural conditions is sufficient for the 2018 planning period.

[Xcel Energy (0064) p. 6] Xcel Energy asserted that the EPA's rejection of Texas' attempt to account for the significant visibility impacts resulting from natural, wind-borne particulate matter is arbitrary and capricious. EPA's insistence on relying on its "default" methodology for natural conditions, which EPA acknowledges is inapplicable and inaccurate in an arid, semi-desert region such as West Texas, is manifestly improper and illegal.

[Xcel Energy (0064) p. 21-22] Xcel Energy stated that in developing its SIP, Texas undertook extensive, "refined" analysis of the role played by large particle particulate matter ("PM") on visibility conditions. Texas SIP, at ES-1. Both Big Bend and Guadalupe Mountains are in desert or semi-desert areas and are susceptible to high levels of wind-blown dust. To account for this in its analysis and modeling, Texas assumed that all of the large particle PM was naturally occurring dust. Texas SIP, at 11-1.

Xcel Energy stated that the EPA proposes to disapprove Texas' calculation of natural visibility conditions, stating that "[a]nthropogenic sources of coarse mass and fine soil in the baseline period could have included emissions associated with paved and unpaved roads, agricultural activity, and construction activities." 79 Fed. Reg. at 74,831. That is to say, some portion of the dust could come from human activity, although not from stationary sources. However, EPA did not undertake any analysis to determine whether, or to what extent, its assertion was correct. The mere possibility that other anthropogenic emissions "could have contributed" to the dust in these Class I areas is not a reasoned basis for rejecting TCEQ's technical assumptions. Further, because of the extremely sparse populations near these Class I areas, the likelihood is that virtually none, or very little, of the dust is human generated.

Rather than deferring to Texas' extensive analysis and conclusions about natural versus manmade dust in these remote locations, Xcel Energy stated that the EPA inexplicably resorts to a default value for the Proposal, despite acknowledging that its default methodology is manifestly not suited to the West Texas desert. "[D]ust storms and other blown dust from deserts are a significant contributor to visibility impairment at the Texas Class I areas that may not be captured accurately by our default method." *Id.* In addition, EPA noted that the impact of dust is less certain in Big Bend than at Guadalupe Mountains and noted that a different assumption "may be appropriate in estimating natural conditions there." EPA, Technical Support Document for the Texas Regional Haze State Implementation Plans, at 41 (2014) ("Texas TSD") (EPA Docket ID EPA-R06-0AR-2014-0754-0005). Nonetheless, EPA applied its default value to Guadalupe Mountains anyway. 7

Xcel Energy stated that the EPA should defer to Texas' analysis of naturally occurring dust in the two Class I areas as it clearly is more representative and more accurate than EPA's default value, which was developed for non-arid and non-desert areas. While using any of the methodologies will not allow Texas to meet the URP in 2018 or the natural visibility goal in 2064 due to the overwhelming impact of Mexico's sources, assuming that all dust in the two Class I areas is naturally occurring would at least allow for realistic RPGs and a more appropriate natural visibility target.

[NRG (0078) p. 11] NRG stated that the EPA has proposed to disapprove Texas' findings on the natural visibility conditions for Big Bend and Guadalupe Mountains on the basis of "significant uncertainty in the assumptions used in the Texas methodology and the demonstrated sensitivity to the assumption of 100% natural versus 80% soil and coarse mass from natural sources." 79 Fed. Reg. at 74,831-32. Because the natural visibility conditions are a factor in the natural visibility impairment and uniform rate of progress determinations, EPA has also proposed to disapprove Texas' findings on those two metrics.[34]

Instead, NRG stated that the EPA proposes to recalculate the natural visibility conditions using a default value. This results in a lower estimate of visibility impairment under natural visibility conditions, which in turn tends to require faster improvements in visibility through 2064. A comparison of the effect of EPA's proposal can be seen in Figures 2 and 3 in the attached report by Alpine Geophysics, LLC. Alpine Report at 8-9.

NRG disagrees with EPA's proposal to override Texas' findings on natural visibility conditions and the associated metrics for Big Bend and the Guadalupe Mountains, for the reasons stated below.

NRG stated that the EPA's only stated basis for disapproving the Texas findings on natural visibility conditions and related metrics is "uncertainty" relating to what amount of "soil and coarse mass" detected at air monitoring sites is attributable to natural sources. 79 Fed. Reg. at 74,831. At the same time, EPA notes in one of its supporting technical analysis that:

> The TCEQ has provided data that supports the conclusion that a large portion of dust impacting visibility at its Class I areas is likely due to natural sources. We agree that dust storms and other blown dust from deserts are a significant contributor to visibility impairment at the Texas Class I areas that may not be captured accurately by our default method. However, we do not believe, as the TCEQ asserts, that all coarse mass and soil can be attributable to 100% natural sources. FIP TSD at 32.

NRG stated that the EPA's alternative is a default metric that assumes that none of the soil and coarse mass is attributable to natural sources. However, this default approach is unreasonable because it conflicts with EPA's acknowledgment, quoted above, that natural sources contribute substantially to the observed visibility impairment at Big Bend and the Guadalupe Mountains.

Further, NRG stated that the EPA has recognized that Texas already addressed the concern that its approach might overestimate visibility impacts from natural sources, because "to the extent its assumption that 100% of coarse mass and fine soil is natural is an overestimate, it [TCEQ] expects that its low organic carbon estimate will more than compensate for any errors In this assumption at this time." 79 Fed. Reg. at 74,831. EPA's method by contrast would not appropriately compensate for natural contributions to visibility impairment.

In summary, NRG stated that the EPA has rejected a reasoned and logical approach to calculating natural visibility conditions by Texas, substituting for it a default value that EPA admits will have the effect of requiring Texas to improve visibility beyond natural conditions.

GCLC stated that Texas calculated natural visibility conditions for Big Bend at 10.09 dv and the Guadalupe Mountains at 12.26 dv, for the 20% worst days. [36] Texas' determination was based on a review of data and technical analyses for these two specific Class I areas. Rather than finding any fault with Texas' area-specific analysis, EPA has proposed to use a default value for natural conditions, even though EPA itself believes that this does not accurately reflect natural conditions for these two areas. [37] Without a sound basis for this disapproval, EPA's action to disapprove Texas' submission regarding natural visibility, and the resulting uniform rate of progress, is an arbitrary and capricious act.

AECT stated that EPA has proposed to disapprove the natural visibility conditions in Texas' SIP and to set more stringent natural visibility conditions, which would make Texas' Uniform Rate of Progress glide path more stringent (i.e., require faster improvement in visibility). EPA's stated basis for these proposed actions is its belief that Texas' approach for establishing the natural visibility conditions has "significant uncertainty".[28] that is an insufficient basis for EPA to use to support those proposed actions, especially since EPA has not shown that its own approach for establishing the natural visibility conditions has greater certainty.

In addition, AECT asserted that EPA has not adequately supported its proposed position that it is inappropriate for Texas to establish natural visibility conditions by assuming that most or all of the soil and coarse mass identified in the monitoring data can be attributed to natural sources, such as wildfires and dust storms, or EPA's proposed default method that does not account for natural sources. Moreover, EPA's proposed position to not allow Texas to consider the emissions from natural sources, such as wildfires and dust storms, in establishing natural visibility conditions is inconsistent with its approval of the New Mexico Regional Haze SIP. EPA concurred with New Mexico that it was appropriate to consider emissions from natural sources, such as wildfires and dust storms, because New Mexico "has limited ability to control" such sources of visibility impairment and they will continue to "limit the visibility improvement [that is] achievable".[29]

For the foregoing reasons, AECT believes that Texas has fully supported its determination of natural visibility conditions in its Regional Haze SIP, and AECT requests that EPA approve those natural visibility conditions.

Footnotes:
[28] 79 Fed. Reg. at 74831
[29] 77 Fed. Reg. 70693 (Nov. 27, 2012)
[36] Revisions to the State Implementation Plan (SIP) Concerning Regional Haze, TCEQ, 5-3 (Feb. 25, 2009) ("2009 Texas SIP Narrative").
[37] FIP TSD at 32.
[34] *See* 79 Fed. Reg. at 74,832-33 ("We have reviewed the TCEQ's estimates of the natural visibility impairment at Big Bend and the Guadalupe Mountains and we propose to disapprove these estimates because this calculation depends on the TCEQ's calculations for natural visibility conditions. … [W]e propose to find the TCEQ has calculate this [uniform] rate of progress on the basis of, and compared baseline visibility conditions to, a flawed estimation of natural visibility conditions for the Big Bend and Guadalupe Mountains, as we describe above. Therefore, we propose to disapprove the TCEQ's calculation of the URP needed to attain natural visibility conditions by 2064.").

Commenter's References:
[7] In response to Federal Land Manager comments, Texas also had calculated natural visibility conditions assuming that 80% of coarse mass and soil should be attributed to natural sources. 79 Fed. Reg. at 74,831. EPA also fails to address why the 80% estimate is inappropriate.

Commenter's Reference:
[7] See Appendix 5-1: Discussion of the Original and Revised Interagency Monitoring of Protected Visual Environments (IMPROVE) Algorithms; Appendix 5-2: Estimate of Natural Visibility Conditions; Appendix 5-2a: Natural Events: Dust Storms in West Texas; Appendix 5-2b: Estimating Natural Conditions Based on Revised IMPROVE Algorithm; Appendix 5-2c: Texas Natural Conditions SAS Program File and Data; see under References - Gillet. al. 2005; Kavouras et. al. 2006, 2007.

Footnotes:
[509] 40 C.F.R. § 51.301.
[510] Id. § 51.308(d)(2)(iii).
[511] 2009 Texas SIP Narrative at 5-3.
[512] See id. at app. 5-2.

[513] Id. app. 5-2 at 5.2.
[514] See U.S. Fish & Wildlife Serv. & Nat'l Park Serv., Comments on Texas Proposed Regional Haze Rule State Implementation Plan 2, 3 (Jan. 11, 2008).
[515] FIP TSD at 32.
[516] EPA, Guidance for Estimating Natural Visibility Conditions Under the Regional Haze Program 1.2 to 1.3 (Sept. 2003).
[517] Id. at 1.2 n.2.

Footnotes:
[346] 79 Fed. Reg. at 74,832.
[347] Id. at 74,831.
[348] See U.S. Fish & Wildlife Serv. & Nat'l Park Serv., Comments on Texas Proposed Regional Haze Rule State Implementation Plan 2, 3 (Jan. 11, 2008), available at http://tinyurl.com/FLMLetter.
[349] 79 Fed. Reg. at 74,831.
[350] See generally 2009 Texas SIP Narrative app. 5.2.
[351] 79 Fed. Reg. at 74,831 (emphasis added).
[352] Id. at 74,833.
[353] Id.
[354] Id. at 74,885.
[355] Id.

Response: We agree with commenters that the Regional Haze Rule and our guidance[336] do allow states to develop an alternate approach to estimate natural visibility conditions. The fact that the states have the option of calculating their own natural visibility conditions is not at issue. However, that approach must be fully supported and documented. As we state in our guidance, states are "free to develop alternative approaches that will provide natural visibility conditions estimates that are technically and scientifically supportable. Any refined approach should be based on accurate, complete, and unbiased information and should be developed using a high degree of scientific rigor."[337] Consistent with what was stated in our proposal, we find the TCEQ did not provide a technically and scientifically supportable approach, specifically by not adequately supporting the assumptions used in calculating "refined" estimates of natural visibility conditions. We disagree with Luminant's statement (and other similar statements made by commenters), that "[EPA] does not address or refute the substantial body of technical data and research upon which TCEQ based its determination, nor does EPA point out any particular flaws in TCEQ's analysis." The TCEQ's analysis and our own observations in our proposal do support a conclusion that much of the contribution of coarse mass and fine soil to the visibility impairment at the Guadalupe Mountains and Big Bend is due to natural sources. They do not demonstrate that 100% of this contribution is due to natural sources.

First, we disagree that Texas's natural visibility calculations can be viewed as a "substantial body of technical data and research." As we discuss below, the Texas natural visibility calculations depend on a key assumption that Texas itself concludes that it cannot verify: that 100% of the coarse mass and fine soil contribution to the natural visibility impairment at Big Bend and the Guadalupe Mountains is due to natural sources. The TCEQ points to "the site-specific evidence and analysis presented on page 5-4 of the 2009 RH SIP … [and] information and evidence is presented clearly in the appendices and in peer-reviewed scientific publications

[336] Guidance for Estimating Natural Visibility Conditions Under the Regional Haze Rule, EPA, September 2003.
[337] Id at p 1-11.

that are cited." However, these references do not scientifically validate the absolute assumption of 100% adopted by the TCEQ.

We also disagree with Luminant that we did not refute Texas' natural visibility calculation. In our proposed disapproval, we noted significant uncertainty in the estimates developed by Texas and the demonstrated sensitivity of the estimates to this assumption. We also noted that a different assumption for Big Bend was appropriate because the observed impacts from dust are different from Guadalupe Mountains.[338] In our proposal, we specifically solicited comments on the acceptability of alternate estimates in the range between the EPA default estimates and Texas' estimates.

AECT is incorrect that we did not allow Texas to consider the emissions from natural sources, such as wildfires and dust storms, in establishing natural visibility conditions. As we discuss below, both the Texas natural visibility calculation and the new IMPROVE calculation we employed contain parameters that address these types of natural sources. Our disagreement with the position relied upon in the Texas SIP is mainly with the undocumented assertion that all coarse mass and fine soil is natural.

Luminant states that the FLMs concurred "that the basic approach used [by Texas] to adjust natural conditions is reasonable, provided that the Proposed SIP address the uncertainty of the assumption that all of the coarse mass and fine soil fraction on the worst 20 percent days is natural." However, this quote is not fully reproduced, leading to an inaccurate characterization of the comment from the FLMs. The full quote is:

> We have reviewed Appendix 5.2 and find that the basic approach used to adjust natural conditions is reasonable, provided that the Proposed SIP address the uncertainty of the assumption that all of the coarse mass and fine soil fraction on the worst 20 percent days is natural. **Since there is human activity in the region, the State should provide a rationale for what fraction of soil and coarse mass is natural, and present an alternative where that fraction of the coarse mass and fine soil concentrations are assumed to be natural within the SIP narrative. In addition, we request that the SIP narrative include the default EPA predictions of natural conditions so that the reader can better understand the scope of changes Texas has chosen to make and can judge the effect of the State's choice on efforts to assess reasonable progress later in the SIP. Default values of natural conditions should be included in Table 5-2.** It would also help the reader to summarize how the refinement affects the revised natural condition if the State included a chart showing the breakdown of each basic pollutant component. This would give a non-technical reader a simple reference about which components in the haze calculation were changed and by how much[339] [emphasis added].

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[338] The "refined" approach that the TCEQ took for Big Bend is also questionable because the state's claimed reliance on "site-specific analysis and evidence" principally connects to Guadalupe Mountains conditions but it was uncritically adopted for Big Bend, as well.

[339] U.S. Fish & Wildlife Serv. & Nat'l Park Serv., Comments on Texas Proposed Regional Haze Rule State

In response to this comment from the FLMs, the TCEQ held additional discussions with the FLMs concerning the assumptions in their natural conditions estimate. Like us, the FLMs did not agree with the assumption that 100% of the coarse mass and soil was natural, and stated that there is human activity in the region. The FLMs "suggested that the commission could judiciously use 80 percent as the natural source of coarse and fine dust and 20 percent of coarse and fine dust due to human activity."[340] Thus, Luminant's statement that, "the EPA disagrees with both Texas and the Federal Land Managers" mischaracterizes the situation: Both we and the FLMs concluded that Texas did not substantiate its assumption that 100% of the coarse mass and soil contribution to the natural visibility conditions at the Texas Class I areas is natural. In fact, even the TCEQ acknowledged that the information they cite to in their SIP does not quantify the percentage of anthropogenic or natural contributions to total coarse mass and fine dust, and that some portion must be from human activity, as demonstrated by the following quote from the Texas Regional Haze SIP:[341]

> Unfortunately, while the Gill et al., and Kavouras et al., works suggest that the relative contribution of agricultural and/or other anthropogenic activities to suspended dust are only a very small portion of the source points/regions, they are not able to quantify the actual percentage of source load, let alone receptor concentrations. However, while some dust (CM and Soil) at both of Texas' Class I areas must be from some human activity, the times when human caused dust is likely to be more important at these sites are on days with less visibility impairment than on the worst dust impaired days, since the most dust impaired days are dominated by dust storms and other blowing dust from the surrounding desert landscape. So the TCEQ has chosen, for the sake of the most and least impaired natural visibility estimates, to treat 100 percent of the CM and Soil concentrations measured at each of its Class I areas as natural.
>
> However, to the extent to which the 100 percent natural CM and Soil estimate is an over estimate, the TCEQ expects this low OC estimate to more than compensate, at this time.

We therefore disagree with Luminant and others and reaffirm our proposed position that Texas has not demonstrated that 100% of the coarse mass and fine soil contributions to the natural conditions for Big Bend and the Guadalupe Mountains are due to natural conditions.

We agree with Luminant that in lieu of Texas's natural visibility calculations, we proposed a FIP that relied on a modified version of our "default" natural visibility conditions calculations.[342] These calculations are derived from the guidance we provided to the states,[343] which included

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Implementation Plan 2, 3 (Jan. 11, 2008), emphasis from NPS stating: "The comments which are highlighted in bold face discuss what we consider major shortcomings of the proposed SIP that we believe warrant additional consultation prior to final adoption of the Texas Regional Haze Plan. "

340 Appendix 2-2 of the Texas Regional Haze SIP.

341 Appendix 5-2 of the Texas Regional Haze SIP.

342 See the discussion on this in our proposal, beginning on 79 FR 74830.

343 Guidance for Estimating Natural Visibility Conditions Under the Regional Haze Rule, EPA–454/B–03–005, September 2003.

natural visibility conditions based on the IMPROVE equation. This guidance allows states to use a ‘‘refined’’ approach or alternative approaches to the guidance defaults to estimate the values that characterize the natural visibility conditions of their Class I areas. Another option that we noted in our proposal that was open to the states, and the one we used in proposing the natural conditions for the Texas Class I areas in our FIP, was the “new IMPROVE equation” that was adopted for use by the IMPROVE Steering Committee in December 2005. This refined version of the IMPROVE equation provided more accurate estimates of some of the factors that affect the calculation of light extinction. NRG incorrectly characterizes this equation as “assum[ing] that none of the soil and coarse mass is attributable to natural sources.” The new IMPROVE equation which we used in our FIP most certainly does contain parameters for coarse mass and fine soil, as indicated by Appendix 5-1 of the Texas SIP.

The TCEQ used this refined version of the IMPROVE equation, but altered the parameters concerning the concentrations of coarse mass and fine soil, without adequate documentation. We found that the TCEQ’s documentation was flawed, but we are under no obligation to follow in the TCEQ’s footsteps and make whole its methodology, when we had already provided guidance with default natural visibility conditions, which were further refined by the 2005 IMPROVE Steering Committee. We disagree with Xcel that we owe the TCEQ any deference other than to have provided it with an opportunity to adequately document its own natural visibility calculations. Instead, the burden was on the TCEQ to demonstrate its natural visibility conditions were more appropriate, which it failed to do. As we note in our proposal, the TCEQ stated within its SIP that it will continue to evaluate data, modeling, and any other sources of information in order to further improve its estimates. Furthermore, the TCEQ plans to work with us and the federal land managers to improve natural conditions estimates for future regional haze SIP revisions. We encourage these efforts, but for present purposes, we are unable to approve the calculation of natural visibility conditions based on the technically indefensible assumption that there is 0% dust (CM and soil) from human activity when the state rightly concedes that some impairment “must be from some human activity.”

Even as we are disapproving Texas’ natural conditions estimates, we conclude that our determinations for emissions limitations for EGUs in the FIP for the first planning period would be justified on the basis of natural conditions estimates at either levels in the SIP or the levels in the FIP, given the level of visibility impairment at each Class I area above the different estimates for natural conditions and the availability of cost-effective controls at those sources with the largest visibility impacts that result in meaningful progress towards the natural visibility goal. Furthermore, as we noted in our proposal, based on both our recalculated natural conditions and the Texas natural condition estimates that we are disapproving, Texas’ Class I areas are not projected to meet the uniform rate of progress in 2018 according to the CENRAP modeling and are not projected to meet the goal of natural visibility conditions by 2064.[344]

We address the impacts of international emissions in our responses to more detailed comments on that issue.

[344] 79 FR 74832

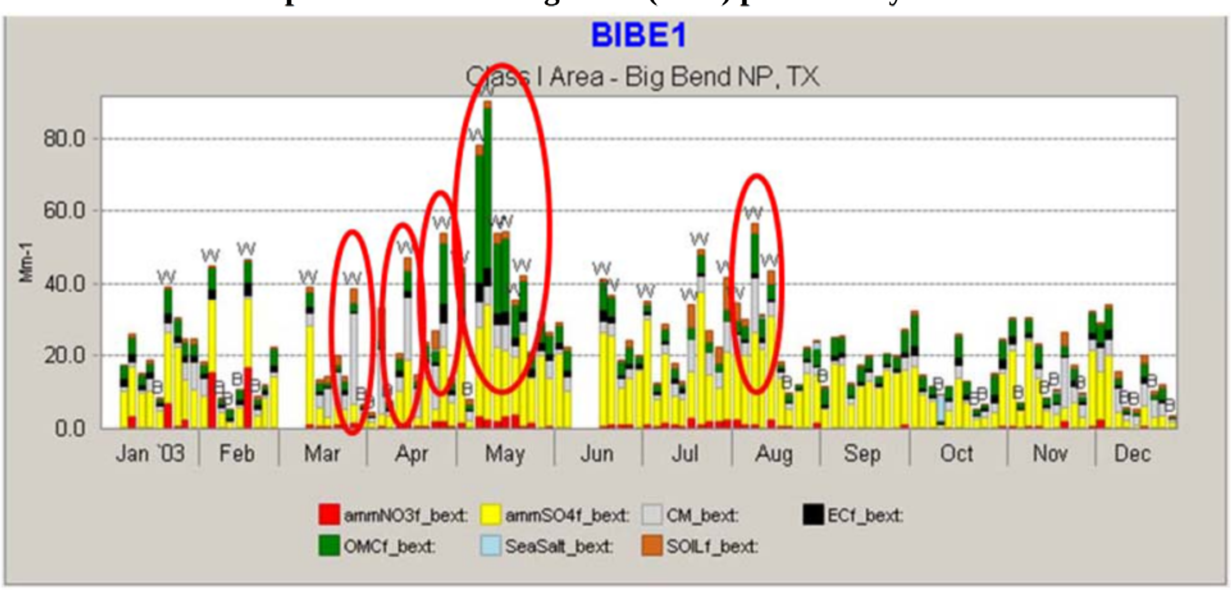
Comment: Adjustments to Default Natural Haze Conditions [Luminant (0061) p. 73, AECOM (0061/0075) p. 3-1], [AECOM (0061/0075) p. 1-5]

AECOM stated that the EPA's use of default values for coarse matter, soils, and organic mass as its basis for disapproving Texas' calculation of natural conditions is not justified. Adjustments to these values and to the natural conditions end point in the establishment of URPs are justified, as EPA recognizes in the proposal. While Texas' approach has merit, in response to EPA's request, we have calculated an alternative adjustment to reflect natural conditions at GUMO and BIBE. These adjustments further indicate that the rate of progress toward realistic natural conditions is sufficient for the 2018 URP interim goals at GUMO and BIBE, without the additional SO_2 controls that EPA is proposing.

AECOM noted that in order to calculate a URP, it is necessary to determine natural visibility conditions (i.e., visibility as it would be without any anthropogenic impacts). To do so, EPA has defined natural haze conditions for annual average, 20% best, and 20% worst days.[55] These estimates have been updated[56] with the use of a revised IMPROVE equation,[57] which Texas adopted for its regional haze SIP.

Luminant and AECOM noted that in developing its SIP, Texas found that some of the haziest days at its two Class I areas (BIBE and GUMO) are the result of uncontrollable natural conditions such as windblown dust and wildfire emissions. These events clearly show themselves in haze composition plots, which show the constituents of visibility impairment.[58]. For example, Exhibit 1 provided by AECOM (Figure 3-1 in 0061/0075) and Luminant (Figure 1 in 0061) is a haze composition plot for 2003 at Big Bend. Some of the 20% worst haze days are labeled with "W" and circled in red. These days show predominant percentages of haze due to four types of naturally-occurring haze-forming particles: organic mass (carbon) ("OMC"), coarse matter (large dust particles) ("CM"), "soils" (fine dust), and elemental carbon (e.g., soot from wildfires).

Exhibit 1. Haze Composition Plot for Big Bend (2003) provided by AECOM and Luminant



Luminant asserted that Texas's approach correctly accounts for these natural conditions. EPA, on the other hand, presents no data or analysis to dispute Texas's findings, nor does it find any error in Texas's approach. Texas did exactly what it was required to do under the regulations—it "estimate[ed] the degree of visibility impairment existing under natural conditions for the most impaired and least impaired days, based on available monitoring information and appropriate data analysis techniques."[519] Nothing in the regulations requires Texas to adopt, or even consider, EPA's "default" value. Indeed, the default value that EPA applies is out-of-date and underestimates natural haze levels because it is based on a period of intense natural fire suppression (pre-1988) that does not occur today.[520] Thus, EPA's proposed disapproval—the only basis for which is EPA's bare reference to an out-of-date "default" value—is both contrary to the regulations and arbitrary and capricious.

Luminant stated that one thing is crystal clear—the default values that EPA applies in its proposed FIP are unreasonable and unsupportable. In issuing its FIP, "EPA steps into the State's shoes, and must meet the same requirements" as the state.[521] Here, EPA has not followed the regulations in estimating natural conditions but has simply applied the "default" with no justification or support for doing so. And the record is undisputed that natural conditions at Big Bend and Guadalupe Mountains are not accurately reflected in the "default" value. Not only does EPA's default value understate natural fire levels as discussed above, EPA "agree[s]" with Texas that "dust storms and other blown dust from deserts are a significant contributor to visibility impairment at the Texas Class I areas," and EPA concedes those natural conditions "may not be captured accurately by our default method."[522]

Recognizing that its default value is not adequate, Luminant noted that the EPA "solicit[s] comment on the acceptability of alternate estimates in the range between the EPA default estimates and Texas' estimates."[523] We believe that Texas's estimates are fully supported based on the record before EPA and must be approved. We also asked AECOM to review EPA's proposal and the available data and to determine if it was possible to develop an alternative natural conditions value for each of Texas's two Class I areas that, consistent with EPA's regulations, reflects adjustments to days that are dominated by natural events. AECOM's methodology and rationale are discussed in its full report, which is attached to and incorporated in full into these comments. AECOM's approach adopts what Luminant asserts to be EPA's recent "conclusion" that "removing (or possibly adjusting) days that are dominated by natural events is consistent with the existing Regional Haze Rule (RHR)."[524]

According to Luminant, the results of AECOM's analysis are alternative values for natural conditions at Big Bend and Guadalupe Mountains that, unlike the default value EPA has proposed, take into account natural events and are an additional estimate of natural conditions. The resulting values—9.25 dv for Big Bend and 12.12 dv for Guadalupe Mountains—fall in between Texas's approach and EPA's default value. Applying these refined values for natural conditions results in a 2018 URP for Big Bend of 15.42 and a 2018 URP for Guadalupe Mountains of 16.01, which more accurately reflect natural conditions than EPA's default value. Based on the most recent five-year observed conditions, both areas will meet their refined URP in 2018, without any further controls.

Luminant stated that AECOM's analysis thus further confirms Texas's determination that its SIP revision results in reasonable progress by 2018 at these two Class I areas. AECOM's analysis also confirms EPA's conclusion that the default value do not "accurately" capture the natural conditions of these two areas.[525] Luminant concluded that the EPA's reliance on the default value is thus arbitrary and capricious and cannot form the basis for any action by EPA on Texas's submission.

[AECOM 0061/0075 p. 3-2] AECOM stated that for several of the 20% worst days, it is clear from looking over several years of composition plots for BIBE and GUMO that there are days that are dominated by the effects of naturally-caused haze, which is underrepresented in EPA's default estimates of natural conditions. The naturally-caused haze can be caused by wildfire emissions as well as natural windblown dust that may be characterized as exceptional events.

AECOM stated that this condition is well-known and documented for these areas. To paraphrase from the Forest History Society, throughout history except for recent decades, fire has been used to clear land, vary plant and tree species, and maintain habitat, among other purposes.[59] Native Americans used fire as a method to maintain land or to improve habitats. Although early settlers often used fire in the same way as the Native Americans, major wildfires on public lands were largely ignored and were frequently seen as an opportunity to open forestland for grazing.[60]

AECOM stated that many large fires erupted in North America in the 1800's to early 1900's and the life-threatening impact of these fires was slowly becoming apparent to the public. In response, the federal government began attempting to control forest fires in the 1890's by employing General Land Office rangers during the fire season. In 1905, the forest reserves (presently, the national forests) were transferred to the Forest Service. This agency became an authority for forming professional standards for firefighting, including hiring more rangers and locals to help with their efforts.[61] Since the beginning of the 20th century, fire suppression has resulted in a buildup of vegetative "fuels" and catastrophic wildfires. Recent estimates of background visual range, such as Trijonis[62] (1990) have underestimated the role of managed fire on regional haze. Since about 1990, various government agencies have increased prescribed burning to reduce the threat of dangerous wildfires, and the increased haze due to these fires is sometimes more of an impairment to visibility than industrial sources.

AECOM noted that the National Park Service has explained that, "[f]or most of the 20th Century, wildfires were extinguished immediately with the assumption that doing so would protect lives, property, and natural areas. However, following the unusually intense fire season of 1988, agencies including the National Park Service began to rethink their policies."[63] The data examined by Trijonis and adopted by EPA in their natural conditions default values precedes this change in thinking and underestimates natural haze due to wildfires, which causes elevated emissions of organic matter, dust, and soot. The frequency of wildfires in the western U.S. is shown in Figure 3-2 in AECOM comment 0061/0075.[64] Wildfire frequency was generally quite low prior to 1988 while frequency substantially increased following 1988.

AECOM noted that the default natural background assumed by EPA in their 2003 guidance document[65] and the corresponding updated default natural background using the revised IMPROVE algorithm are not realistic, and are unattainable due to these natural events. One important aspect of the uncontrollable haze, wildfires, is affected by the biased quantification of its contribution to natural haze due to suppression of wildfires during the 20th century. In addition, localized sources of naturally-caused windblown dust are another area underestimated by EPA for these Class I areas.

According to AECOM, the definition of natural conditions that can be reasonably attained for a reasonable application of EPA's regional haze rule should be revised for Texas and other states affected by naturally-caused haze. In fact, EPA's 2003 "Guidance for Estimating Natural Visibility Conditions Under the Regional Haze Program" acknowledges that wildfires are a contributor to natural visibility conditions, but the data used in estimates of natural conditions were taken during a period of artificial fire suppression so that the true impact of natural wildfires is understated. The report notes that "data should be available for EPA and States to develop improved estimates of the contribution of fire emissions to natural visibility conditions in mandatory Federal Class I areas over time."

Moreover, AECOM stated that achieving true natural conditions will require the elimination of all anthropogenic sources of emissions, including those from other countries, such as Mexico, where the U.S. has no jurisdiction. Estimating the number of years needed to attain natural conditions requires accurate predictions about future energy sources, technology improvements for emission sources, and every aspect of human behavior that causes visibility impairing emissions in the U.S. and other countries.[66]

AECOM stated that since Texas cannot control emissions from Mexico, these sources of haze must be factored into the end point goal for these two Class I areas. Doing so demonstrates further that additional reductions from Texas sources leading up the 2018 interim goal would have no measureable effect on visibility conditions, and EPA's proposal focuses upon a very minor component of haze while other much more important sources of haze are not addressed by EPA.

AECOM stated that the Federal Land Managers (FLM) support the development of refined estimates of natural conditions for the Texas Class I areas. Comments provided by the National Park Service on the Texas 2014 Five-Year Regional Haze SIP Revision stated, "Hopefully EPA will be working with states and FLM on improving estimates of natural conditions for the 2018 SIPs." [67] Nevertheless, EPA proposes to reject the efforts of Texas to provide more realistic estimates of natural conditions by providing an adjustment that accounts for naturally-caused haze because of a concern they have that the state did not provide sufficient technical support for the revised methodology used in the development of the SIP. Even so, EPA recognizes that it has no basis for imposing default values, as it proposes to do. EPA "agree[s] [with Texas] that dust storms and other blown dust from deserts are a significant contributor to visibility impairment at the Texas Class I areas that may not be captured accurately by our default method."[68] EPA has thus solicited comment on this issue, and we provide here a more reasonable alternative method to EPA's default value for quantifying the effects of natural haze due to wildfires and windblown dust that accounts for days of predominant influences of naturally-caused dust. The alternative refined approach (TX ALT NC) described below is conservative (that is, it likely understates the adjustment needed) in that it does not account for adjustments due to international emissions of sulfates and nitrates, nor days with somewhat modest components of naturally-caused haze. The adjusted particulate species for this alternative approach are limited to OMC, CM, and soils.

The method applied by AECOM here was to review the visibility extinction composition of each of the 20% worst days during the period of 2004-2013 (10 years) with IMPROVE data at the Texas Class I areas. Aerosol extinction composition over the 10-year period for BIBE and GUMO are shown in Figures 3-3 and 3-4 in AECOM comment 0061/0075. During 2011-2013, there is a greater fractional quantity of CM, OMC, and soil extinction. Drought conditions in Texas and other surrounding states likely caused greater impacts from windblown dust and wildfires during this period. Also, over time, the sulfate contribution to total extinction at BIBE and GUMO has steadily decreased, as expected from the emission trends noted above.

To develop more realistic estimates of natural conditions than assumed by EPA, a daily threshold percentage of total aerosol extinction caused by CM, OMC, and soil species was determined by AECOM for each Texas Class I area. This threshold was developed by examining histograms of the 20% worst days for a noticeable step-up in frequency of higher contributions of CM, OMC, and soil (i.e., from right to left). As shown in Figure 3-5, the resulting frequency thresholds of the total aerosol extinction caused by CM, OMC, and soil species for days of exceptional natural cases can be assigned as 40% for both BIBE and GUMO.

AECOM noted that in developing its SIP, TCEQ found that "while some dust (CM and Soil) at both Texas' Class I areas must be from some human activity, the times when human caused dust is likely to be more important at these sites are on days with less visibility impairment than on the worst dust impaired days, since the most dust impaired days are dominated by dust storms and other blowing dust from the surrounding desert landscape."[69] The frequency threshold percentages developed above can be used to identify those days where haze was caused by CM, OMC, and soil species from natural causes, and thus those conditions can be properly attributed to natural conditions.

Further, these frequency thresholds can be used to develop alternative approaches for establishing natural haze conditions at these two areas. The fraction of the OMC, CM, and soils aerosol extinction for the specific days above the frequency threshold, relative to that for all of the 20% worst days, was computed as a reasonable estimate of the uncontrollable fraction for these particulate species, due to natural causes. These uncontrollable fraction estimates are presented in Table 3-1 provided by AECOM (0061/0075).

Table 3-1: Uncontrollable Fraction of Baseline Extinction for CM, OMC, and Soil

Uncontrollable Fractions of Baseline Extinction for Three Species				
Site	Frequency Threshold	CM	OMC	Soil
BIBE	40%	0.635	0.484	0.658
GUMO	40%	0.860	0.624	0.878

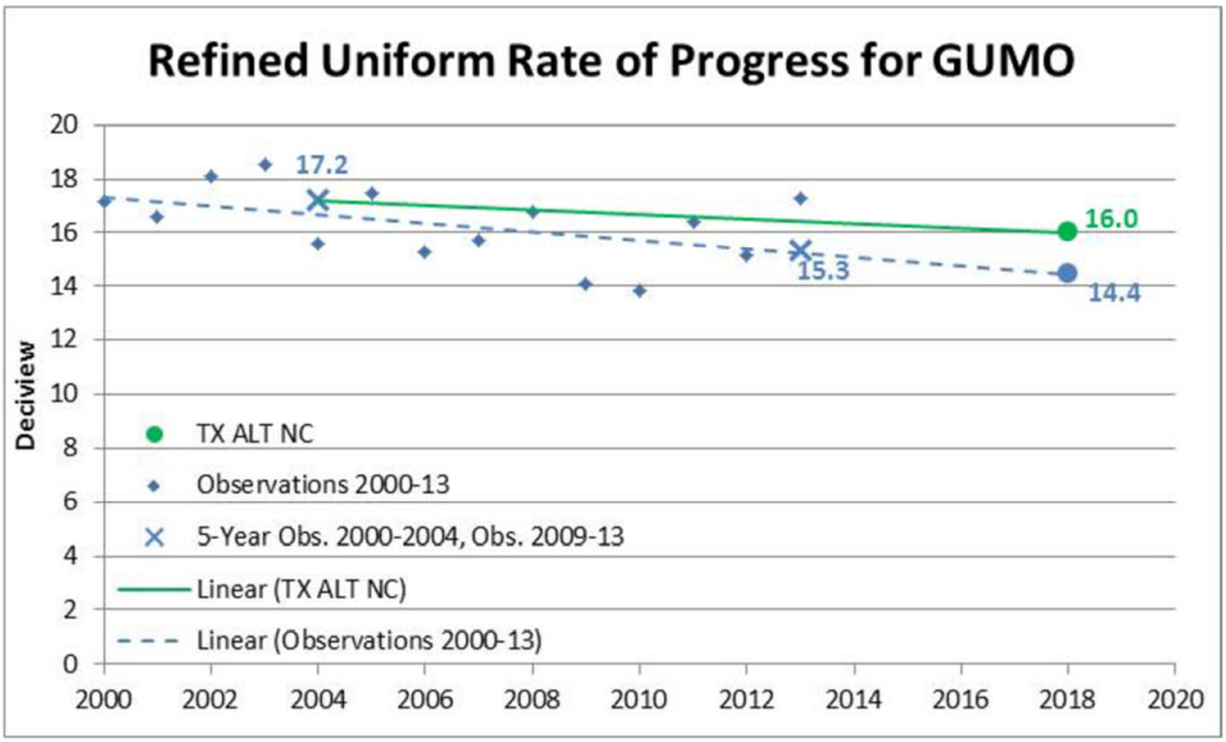
These estimates of the uncontrollable extinction were then applied (added) to EPA's default 20% worst days natural conditions extinction estimate to result in a more realistic end point for natural conditions for BIBE and GUMO than assumed by EPA (i.e., the NCII default). The species' extinctions were then summed for estimating the 5-year total extinction and converted to deciviews. Table 3-2 provided by AECOM (0061/0075) compares our refined estimate of natural conditions, as compared to the default value proposed by EPA and Texas' assumption of 100% (TX NC). The alternative method developed here (TX ALT NC), similar to TX NC, assumed 100% of CM, OMC, and soil species were natural on specific days. However, this assumption was applied only for those days where these species' combined extinction was equal to or greater than the frequency threshold percentages indicated above for the Texas Class I areas of the aerosol extinction to develop the uncontrollable fraction. Given the overwhelming amount of data and information indicating substantial impact from natural causes on the worst days, this is a more reasonable approach to estimating natural conditions than using the default values as EPA proposes. Our estimates are also likely conservative because they do not make any adjustments for days that are not dominated by naturally-caused haze.

Table 3-2: Default and Refined Natural Conditions at the Texas Class I Areas

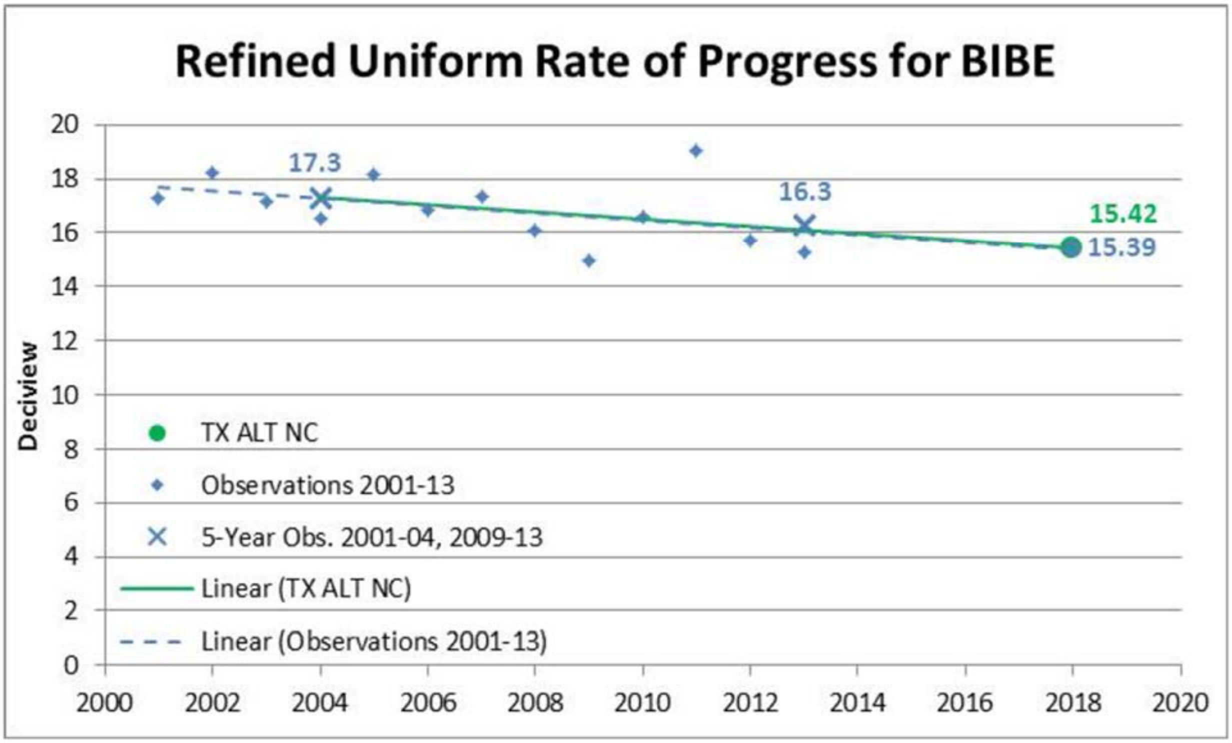
Natural Conditions (dv)			
Class I Area	NCII[70]	TX NC[71]	TX ALT NC
BIBE	7.16	10.09	9.25
GUMO	6.65	12.26	12.12

The TX ALT NC natural conditions haze levels for both areas are lower than Texas' 100% assumption. BIBE's TX ALT NC natural conditions is only about 2 dv higher than the NCII method while GUMO's is about 5.5 dv higher than NCII. (Figures 2 and 3 from Luminant 0061 and Figures 3-6 and 3-7 from AECOM 0061/0075) show the resulting uniform glide paths for the two Class I areas using the TX ALT NC results for natural conditions. (Figure 4 from Luminant 0061 and Figures 3-8 from AECOM 0061/0075) is an alternate figure shown for BIBE without the anomalous 2011 information included in the regression line. With the TX ALT NC values, the new URPs for 2018 become 16.01 dv for GUMO and 15.42 dv for BIBE. Using these adjusted natural condition end points and the associated glide paths, it is apparent that the 2018 URP goals will be met for GUMO based on the current IMPROVE measurements' linear regression. BIBE will also meet the revised glide path, and this does not factor in uncontrollable international emissions from Mexico (more discussion on this issue is provided below). Thus, the weight of evidence indicates that with appropriate adjustments and based on the current visibility data, the 2018 URPs will be met for all three Class I areas under consideration in EPA's proposed rule.

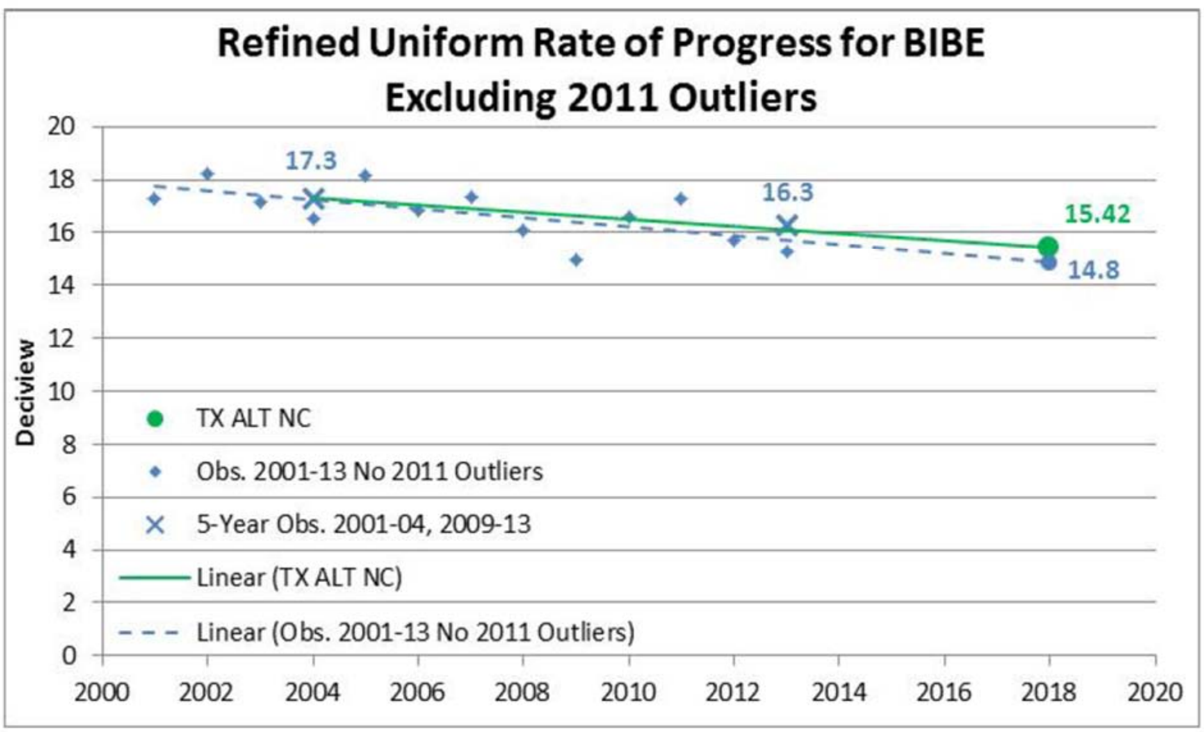
GUMO Glide Path with Alternative Natural Conditions
(Luminant (0061) Figure 2 and AECOM (0061/0075) Figure 3-6)



BIBE Glide Path with Alternative Natural Conditions
(Luminant (0061) Figure 3 and AECOM (0061/0075) Figure 3-7)



BIBE Glide Path with Alternative Natural Conditions (TX ALT NC) Excluding 2011 Outliers
(Luminant (0061) Figure 4 and AECOM (0061/0075) Figure 3-8)



<u>Luminant Footnotes:</u>

[519] 40 C.F.R. § 51.308(d)(2)(ii).
[520] AECOM Report at 3-3 to 3-4.
[521] 77 Fed. Reg. at 40,164.
[522] FIP TSD at 32.
[523] TX SIP TSD at 42.
[524] EPA, Pre-Meeting Materials for the EPA-FLM-RPO-States-Tribes Meeting on the Future of the Regional Haze Program, Topic III: The URP and RPG Framework 2 (Feb. 3, 2015).
[525] FIP TSD at 32.

AECOM Footnotes:
[55] http://www.epa.gov/ttn/oarpg/t1/memoranda/rh_envcurhr_gd.pdf.
[56] http://www.nature.nps.gov/air/Pubs/pdf/flag/FLAG_2010.pdf.
[57]http://vista.cira.colostate.edu/improve/Publications/GrayLit/016_IMPROVEeqReview/IMPROVEeqReview.htm. This equation relates measured concentrations of various particulate species to visibility extinction, which is a measure of the particle loading per unit length of viewing that causes visibility impairment, or haze.
[58] http://views.cira.colostate.edu/web/Composition/.
[59] http://www.foresthistory.org/ASPNET/Publications/first_century/sec3.htm.
[60] http://www.foresthistory.org/ASPNET/Publications/first_century/sec3.htm.
[61] http://www.foresthistory.org/ASPNET/Publications/first_century/sec3.htm.
[62] Trijonis, J. C, 1990. Characterization of Natural Background Aerosol Concentrations. Appendix A in Acidic Deposition: State of Science and Technology. Report 24. Visibility: Existing and Historical Conditions - Causes and Effects. J. C. Trijonis, lead author. National Acid Precipitation Assessment Program: Washington, DC.
[63] http://www.nps.gov/thro/parkmgmt/firemanagement.htm.
[64] Westerling, A. L., H. G. Hidalgo, D. R. Cayan, and T. W. Swetnam, 2006. Warming and Earlier Spring Increase
Western U.S. Forest Wildfire Activity. Science, 313, 940-943.
[65] http://www.epa.gov/ttn/oarpg/t1/memoranda/rh_envcurhr_gd.pdf
[66] https://www.ndhealth.gov/AQ/RegionalHaze/Regional%20Haze%20Link%20Documents/Main%20SIP%20Sections%201-12.pdf at 196-197.
[67] http://www.tceq.texas.gov/assets/public/implementation/air/sip/haze/14aAppB_rtc.pdf at 1.
[68] 79 Fed. Reg. 74,831 (emphasis added).
[69] http://www.tceq.texas.gov/assets/public/implementation/air/sip/haze/App5_2.pdf at 4.
[70] 79 Fed. Reg. 74,831.
[71] 79 Fed. Reg. 74,831.

Response: We disagree with Luminant that we did not find any error in Texas' approach to its calculation of the natural visibility calculations for its Class I areas, as is detailed in our proposal[345] and in our response to other comments. We agree with Luminant that Texas was not required to adopt our default values for natural visibility. However, as we address in our responses to other comments, Texas did have an obligation to properly document the assumptions it made in calculating its own natural visibility conditions, and it did not do so. We found that a key aspect of Texas' calculation—that it assumed 100% of the coarse mass and fine soil visibility impairment at its Class I areas was due to natural sources—was not supported. We further found evidence (that Luminant's own analyst has confirmed in this comment) that there are legitimate reasons to conclude that different assumptions regarding the coarse mass and fine soil contributions to visibility impairment are appropriate for Big Bend and the Guadalupe Mountains. Further, after having found that the TCEQ's documentation was flawed, we were under no obligation to follow in the TCEQ's footsteps and make whole its methodology, when we had already provided guidance with default natural visibility conditions, which were further

[345] See discussion beginning on 79 FR 74830.

refined by the 2005 IMPROVE Steering Committee. On the contrary, the burden to substantiate and support the assumption was on the TCEQ.

Luminant also incorrectly ties our solicitation of comments on alternative estimates of natural visibility calculations to a recognition that our default values were inadequate. Our natural visibility calculations were based on estimates of natural levels of visibility-impairing pollutants and the IMPROVE equation present in our Natural Visibility Guidance,[346] as modified by the "new IMPROVE equation" that was adopted for use by the IMPROVE Steering Committee in December 2005. This refined version of the IMPROVE equation provided more accurate estimates of some of the factors that affect the calculation of light extinction. These estimates, while they may stand further refinement, were fully vetted and adopted by all of the states except for Texas. Thus, we have confidence that it represents good science and is adequate for the purposes for which it was intended. As we indicate in our Reasonable Progress Guidance, Texas was free to base its natural visibility calculations on an alternative methodology, but in doing so it carried with it the burden of supporting and substantiating its assumptions, which was not met.

We agree with Luminant that we stated that, "dust storms and other blown dust from deserts are a significant contributor to visibility impairment at the Texas Class I areas," which "may not be captured accurately by our default method." However, Luminant fails to note in its comment that we followed that statement with the following:

However, we do not believe, as the TCEQ asserts, that all coarse mass and soil can be attributable to 100% natural sources. Although we believe that some coarse mass and soil should be attributable to natural sources, we do not have the information necessary to determine how much should be attributable to natural sources. We therefore acknowledge that like the TCEQ, we cannot accurately reset the natural conditions for the Guadalupe Mountains and Big Bend by using the TCEQ's methodology, which depends on this information. In lieu of this, we proposed to rely on the adjusted default estimates for the new IMPROVE equation from the Natural Conditions II committee,[347] which was the starting point for the Texas natural visibility calculations, but solicited comments on the acceptability of alternate estimates in the range between our default estimates and the Texas estimates. Again, we are under no obligation to accept the TCEQ's methodology and "fill in the blanks" in its flawed calculation of natural visibility conditions.

Luminant's contractor, AECOM, analyzed monitoring data from 2001 to 2013 for Big Bend and Guadalupe Mountains in an attempt to establish alternative natural conditions for Big Bend (BIBE) and the Guadalupe Mountains (GUMO). Luminant states that AECOM's approach adopts our recent conclusion that "removing (or possibly adjusting) days that are dominated by natural events is consistent with the existing Regional Haze Rule (RHR)." Here, Luminant

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346 Guidance for Estimating Natural Visibility Conditions Under the Regional Haze Rule, EPA–454/B–03–005, September 2003.

347 Regional Haze Rule Natural Level Estimates Using the Revised IMPROVE Aerosol Reconstructed Light Extinction Algorithm, Copeland, S. A., et al, Final Paper # 48, available in our docket.; NC II, or new IMPROVE natural visibility conditions are available at: *http://vista.cira.colostate.edu/Docs/ IMPROVE/Aerosol/NaturalConditions/ NaturalConditionsII_Format2_v2.xls*, for which we have filtered the data for Texas Class I areas and which is also available in our docket.

references a document[348] we distributed to the states, tribes, FLMs, and RPOs that served to establish a framework of issues that we were considering for inclusion within an update to Regional Haze Rule Guidance. Luminant is correct that we have been considering methods for improving the calculation of the natural visibility conditions. These include "removing (or possibly adjusting) days that are dominated by natural events is consistent with the existing Regional Haze Rule (RHR)." However, the mere fact that we solicited input on these issues does not mean that the method the TCEQ and Luminant (AECOM) chose to address them is correct or acceptable. In fact, we believe AECOM's effort is flawed in a number of key areas which we outline below.

Assumptions Underpinning AECOM's Methodology

We agree with AECOM that fire has a natural role in the ecosystem and that historical fire suppression has resulted in a buildup of vegetative fuels that has likely contributed to catastrophic forest fires. AECOM states that this rethinking of the role of natural fire influenced the FLMs and after 1988, wildfire frequency increased. AECOM then asserts that the Trijonis estimates that form the basis of our original natural conditions estimates predate this change in fire management strategy and therefore the contribution of fire is biased low in our default natural visibility calculations. However, AECOM does not present any documentation for this assertion. While AECOM presents information on increased frequency of wildfires, they do not discuss the intensity of the fires, the area burned, fuel loading or estimated emissions and impacts from these fires. In addition, there is considerable uncertainty in what prescribed fires are considered natural. Furthermore, while fire management strategies may have changed in the United States, AECOM does not address the impact from international wildfires. In addition, as we state above, our natural visibility calculations used the revised IMPROVE equation from the Natural Conditions II committee, which, was developed in 2005. Natural conditions calculated by the NC II committee using the revised IMPROVE equation was fitted to aerosol data from 2000-2004. Thus, we disagree that AECOM has adequately linked these facts to an underrepresentation of fire in our default natural conditions calculation. Similarly, AECOM merely presents the statement, "In addition, localized sources of naturally-caused windblown dust are another area underestimated by EPA for these Class I areas," but provides no documentation to support it. Further, we agree with AECOM that Texas should not have to compensate for the impact of international emissions from Mexico, and we do not ask Texas to do so. Luminant appears to summarize AECOM's report by concluding that windblown dust, fire, and emissions from Mexico constitute for so much of the visibility impact at its Class I areas, that Texas should be relieved of its responsibility to control its own sources of visibility impairing pollution. As we have detailed in other response to comments, our FIP is limited to controlling emission sources in Texas that impact visibility at Texas' two Class I areas and the Wichita Mountains.

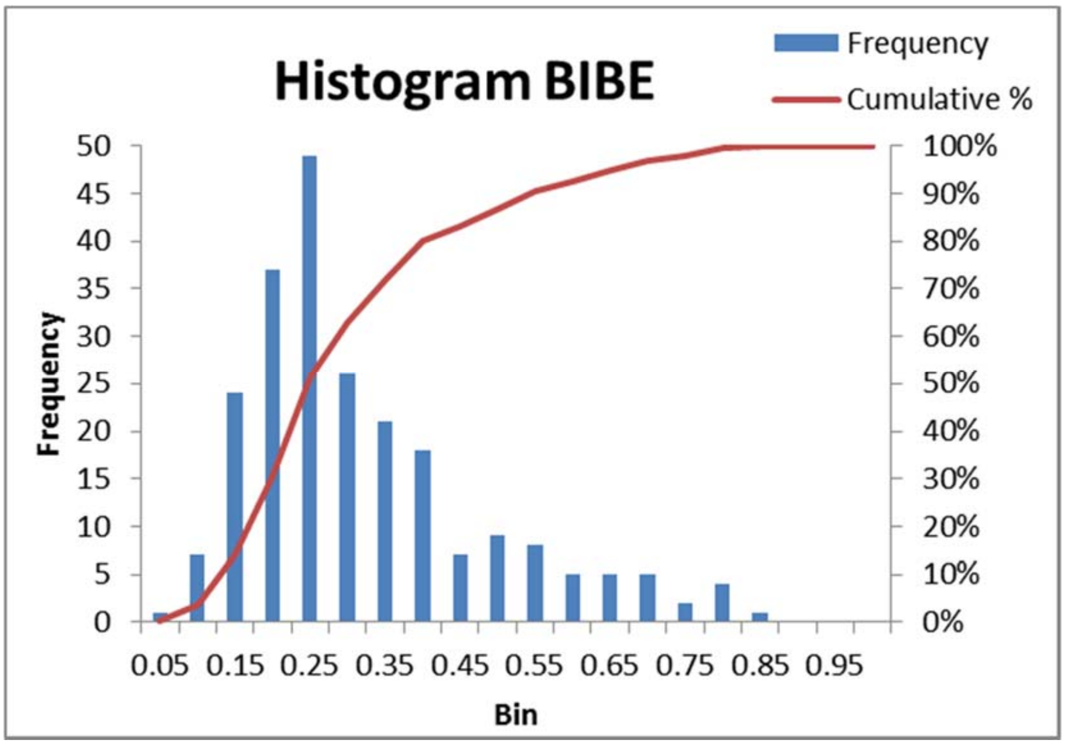
Although AECOM restricts its assumption to specific days, it nevertheless assumes that all Coarse Mass (CM), Organic Mass Carbon (OMC), and soil visibility impacts at BIBE and GUMO are 100% due to natural causes. AECOM provides no documentation to support this

[348] Guidance Topics Topic III: The URP and RPG Framework. DRAFT February 3, 2015, Pre-Meeting Materials for the EPA-FLM-RPO-States-Tribes Meeting , on the Future of the Regional Haze Program. This document has been added to our docket.

conclusion. Although we agree that much of those species contributions are due to natural sources, we do not believe that all of these contributions are due to natural sources. Fires, windblown CM and soil do have both anthropogenic and natural origins.

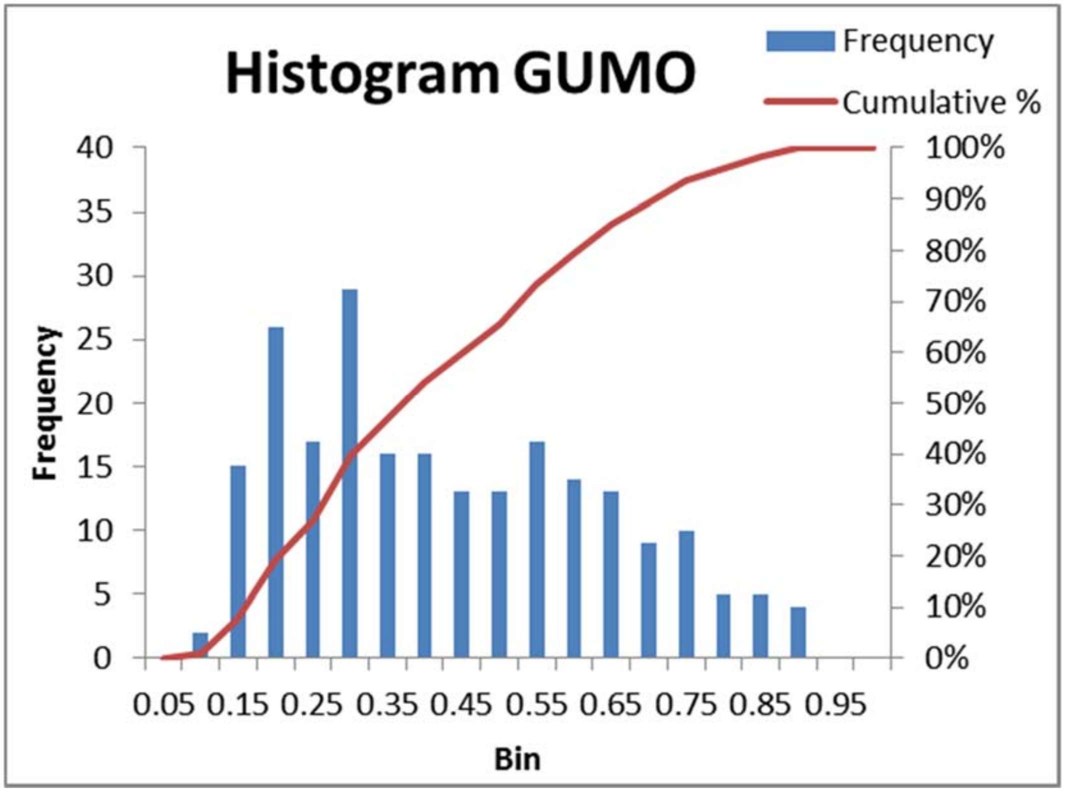
AECOM's Methodology

AECOM downloaded visibility monitoring data for BIBE and GUMO from 2001 to 2013 from the Federal Land Managers Database.[349] AECOM then extracted the data corresponding to the 20% worst days and then calculated a parameter "bCOS/abext," defined as the extinction due to the CM, OMC, and the soil divided by the total aerosol extinction. AECOM then constructed histograms that display the frequency in which its calculated parameter, bCOS/abext, occurred within particular ranges, from 2004 to 2013.[350] We reproduce those histograms below:



[349] http://views.cira.colostate.edu/fed/

[350] Throughout this discussion, we reference AECOM's spreadsheet in which it performed the natural visibility calculations, "Copy_of_AECOM_improve_2000-13.xlsx."



In the above histograms, AECOM defined ranges in which it counted the occurrences of its parameter, bCOS/abext, which appear in the horizontal axis as "Bin." For instance with regard to BIBE, AECOM noted that one occurrence of bCOS/abext occurred within the range of 0 to 0.05, and 7 occurrences of bCOS/abext occurred within the range of 0.05 to 0.10. Through visual inspection of these histograms, AECOM then looked for a "noticeable step-up in frequency of higher contributions of CM, OMC, and soil (i.e., from right to left)."[351] AECOM noted the "resulting frequency thresholds of the total aerosol extinction caused by CM, OMC, and soil species for days of exceptional natural cases can be assigned as 40% for both BIBE and GUMO."[352] We believe that AECOM concluded that a break in the frequency of the bCOS/abext ratio occurred in the bCOS/abext range of 0.35 to 0.40 (note the cumulative percentage plotted on the right vertical axis is not used in AECOM's analysis). AECOM asserted this break for both BIBE and GUMO. AECOM then further concluded that any days in which the bCOS/abext parameter exceeded 0.40 represented days in which the "haze was caused by CM, OMC, and soil species from natural causes, and thus those conditions can be properly attributed to natural conditions." Having identified those days, AECOM then assumed all CM, OMC, and soil extinctions for those days were due to natural causes. AECOM then summed the individual CM, OMC, and soil extinctions for those days that occurred from 2004 to 2013 and

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[351] AECOM's discussion of its methodology is taken from its report to Luminant entitled, "Analysis of the U.S. EPA's Proposed Rule on the Texas and Oklahoma Regional Haze State Implementation Plans," which is attached as Appendix B to Luminant's comments, contained in the file, "Comments_of_Luminant_Generation_Company_LLC_-_Docket_EPA-RO6-OAR-2014-07_4.pdf."

[352] As we discuss below, we have reservations as to whether any such "frequency threshold" can be defined for GUMO, and we question the legitimacy of AECOM's method for choosing a 40% value for either BIBE or GUMO.

divided them by the total CM, OMC, and soil extinctions for all monitored days from 2004 to 2013. AECOM then presented the resulting summary of that information:

Uncontrollable Fractions of Baseline Extinction for Three Species				
Site	Frequency Threshold	CM	OMC	Soil
BIBE	40%	0.635	0.484	0.658
GUMO	40%	0.860	0.624	0.878

AECOM then calculated the visibility impairment of these CM, OMC, and soil extinctions and added that impairment to our default natural visibility conditions. For instance with regard to CM, AECOM subtracted the natural conditions average CM value for the 20% worst days from the baseline average CM value for the 20% worst days, then multiplied the result by the CM cCOS/abext parameter it calculated above. This resulting value, which AECOM views as its adjustment for CM extinction over and above our default extinction contribution, was then added to the same. The calculation is presented below:

CM adjustment = CM ng90 + (CM C90-CM ng90) X CM uf

where:

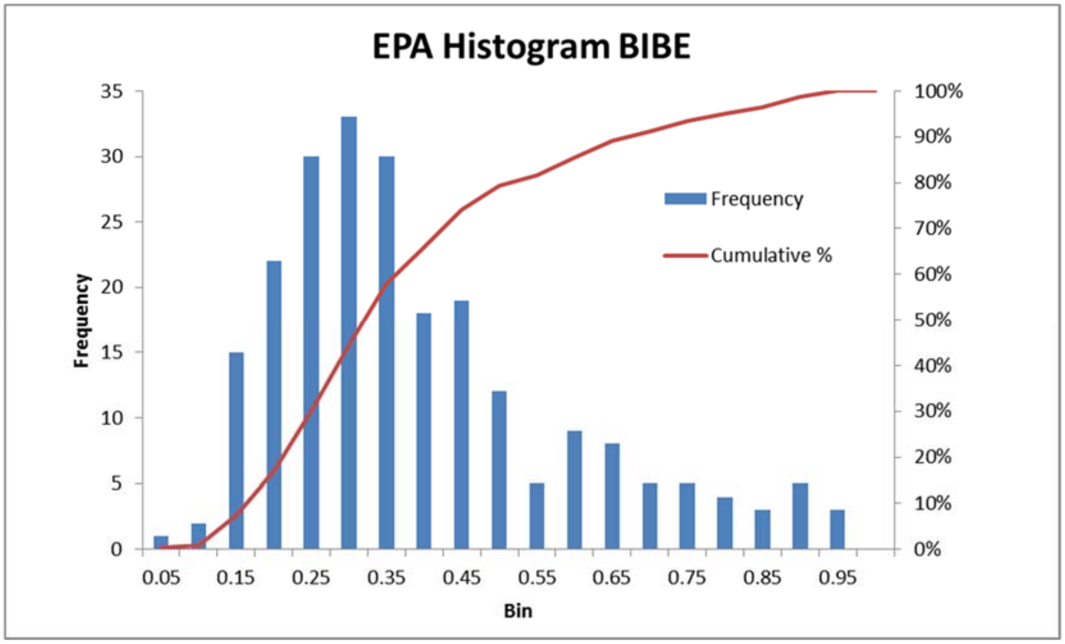
CM ng90 = Natural Conditions II average of 20% worst days for CM
CM C90 = Baseline average of 20% worst days for CM
CM uf = AECOM's uncontrollable fraction of baseline extinction for CM, or 0.635

AECOM makes similar adjustments for OMC and soil and sums up the resulting adjusted and unadjusted extinctions into a new total aerosol extinction. It then uses those values to calculate a revised natural visibility condition value using the standard haze equation. We present that information below:

Natural Conditions (dv)			
Class I Area	NCII[69]	TX NC[70]	TX ALT NC
BIBE	7.16	10.09	9.25
GUMO	6.65	12.26	12.12

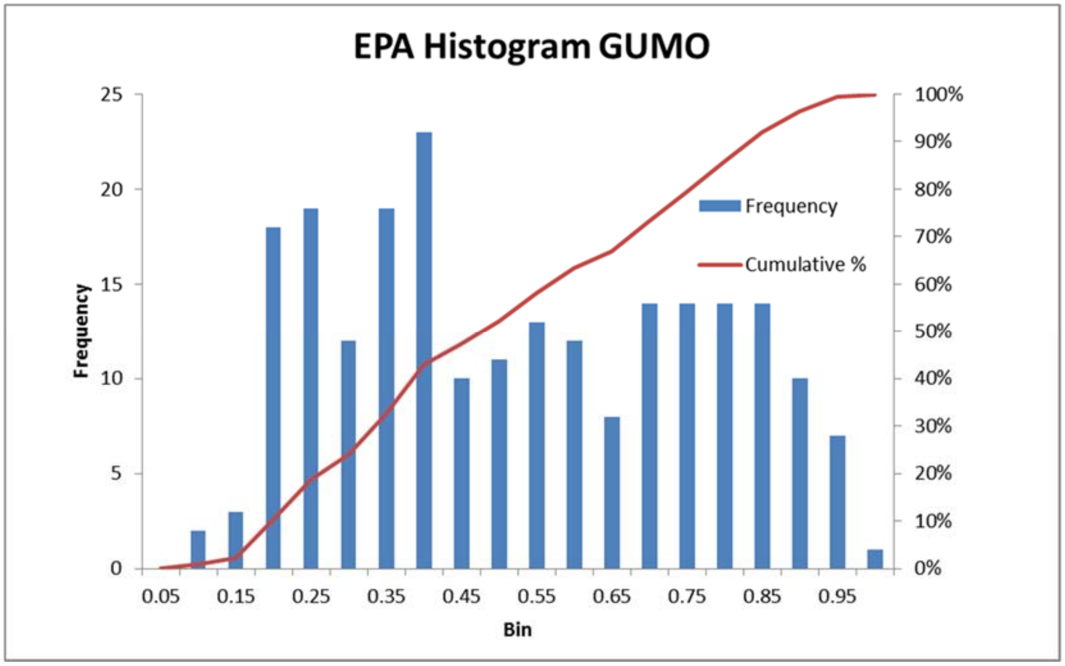
Flaws in AECOM's methodology

As an initial matter, we believe that AECOM erred in assembling its histograms. This can be readily detected by ordering the bCOS/abext values in AECOM's spreadsheet,[353] and counting the number of occurrences within the ranges AECOM defined. For instance, there is one value (0.044) in the 0 to 0.05 range, two values (0.084 and 0.086) in the 0.05 to 0.10 range, and 15 values (0.103, 0.106, 0.113, 0.116, 0.117, 0.120, 0.121, 0.128, 0.129, 0.130, 0.135, 0.138, 0.144, 0.145, and 0.148) in the 0.10 to 0.15 range. We have constructed corrected histograms and reproduce them below:[354]



[353] Column AD in tab "NCThreshd" for BIBE.

[354] Our corrected histograms appear in tab "EPA Histograms" in our reworked version of AECOM's spreadsheet, entitled, "Copy_of_AECOM_improve_2000-13_EPA.xlsx," which is in our final docket.



It is readily apparent that our histograms differ significantly from AECOM's histograms. In general, we believe that the "noticeable step-up in frequency of higher contributions of CM, OMC, and soil (i.e., from right to left)" that AECOM points to in its report is now more muted for both Class I Areas when the histograms are assembled correctly, to the point it is essentially absent for the Guadalupe Mountains. Although we believe AECOM's assertion that the identification of such a step-up in frequency was questionable for GUMO, it does not appear to exist in the case of our corrected histogram for GUMO. Thus, we must reject AECOM's methodology for GUMO just on this basis. In the case of BIBE, we believe that AECOM's choice of a 40% value, based on visual inspection of its histograms, was somewhat arbitrary. It is now difficult to see where such a break would occur. Nevertheless, setting aside this reservation and other observations we discuss below concerning AECOM's methodology, we believe it is instructive to test the sensitivity of AECOM's methodology to the choice of a "frequency threshold." Choosing a value of 50% for BIBE, which we believe is minimally appropriate, revises AECOM's natural visibility calculation for the 20% worst days for BIBE from 9.25 to 8.79.[355] Thus, AECOM's methodology is not robust and is sensitive to the threshold chosen, which itself is subjective.

AECOM and Luminant construct revised URPs for BIBE and GUMO based on AECOM's revised natural conditions calculations. AECOM concludes that because recent monitoring data indicates that the Wichita Mountains (WIMO) and GUMO are projected to meet our FIP URP, and with AECOM's revised URP BIBE will do the same, no further controls are necessary. As we note above, we must reject AECOM's natural visibility calculations due to flaws in its methodology. Because these calculations were subsequently used in AECOM's URP revisions they are similarly flawed. Moreover, under the Regional Haze Rule, even if it were concluded that the uniform rate of progress will be met for Big Bend and the Guadalupe Mountains, this

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[355] This was accomplished by changing the formulae in Column T from =IF(S3>=0.4,1,0) to =IF(S3>=0.5,1,0), in tab "20wBB," of AECOM's afore mentioned spreadsheet.

does not change the requirement that the reasonable progress goals be selected based on proper evaluation of the four factors. As discussed in the proposal and this document, the uniform rate of progress is not a "safe harbor" under the Regional Haze Rule. We address AECOM and Luminant's assertion that because WIMO and GUMO are meeting our FIP URPs no further controls are needed in our response to other comments, particularly our section responding to assertions that RPGs are already being met.

Comment: [TCEQ/PUCT (0056) p. 8, 9] The TCEQ stated that if the EPA does not approve the TCEQ natural conditions estimation that 100% of the soil dust at Big Bend and Guadalupe Mountains on the 20% most impaired days is natural, it should choose an estimate between the 80% natural estimate and 100% approximation. The TCEQ urged the EPA to choose an estimate that the dust is between 80% and 100% natural if the EPA chooses not to accept that estimate or to withdraw its proposed partial SIP disapproval and FIP.

The TCEQ noted that the FLMs commented that 80% would be more reasonable, but they did not present evidence to support this suggestion. However, the TCEQ considers that 100% is well supported in the 2009 RH SIP. The TCEQ contended that the 2009 RH SIP submittal presented strong, peer-reviewed publication evidence that, on the most impaired 20% of days, essentially all the coarse mass and fine soil at Guadalupe Mountains National Park is natural. It also presented evidence assembled by six scientists, including the chairman of the IMPROVE steering committee, that the dust impacts at Big Bend are largely from locally windblown dust. Because of the strong National Park Service restrictions on human activity in Big Bend and the fact that the IMPROVE monitor in Big Bend is surrounded in all directions by 10 or more miles of the park, the conclusion is that naturally eroded soil contributes all or nearly all the coarse mass and fine soil at Big Bend on the 20% of days with the most impaired visibility.

Response: We disagree with the TCEQ that we should "choose" an estimate between the 80% and 100% coarse mass and fine soil estimates. As we discuss above, we find that the TCEQ's 100% estimate was not supported. The documentation to which the TCEQ here cites, "dust impacts at Big Bend are *largely* from locally windblown dust" and "naturally eroded soil contributes all *or nearly all* the coarse mass and fine soil at Big Bend"[emphasis added] supports this conclusion. We have seen no documentation to support the FLM's 80% estimate that the TCEQ ultimately rejected. Consequently, we have no basis to conclude the 80 to 100% range itself even bounds the problem, let alone any insight as to which endpoint may be closer to the truth.

Comment: [TCEQ/PUCT (0056) p. 8] The TCEQ agreed with the proposed EPA finding that the TCEQ's estimate of baseline visibility conditions at Big Bend and Guadalupe Mountains have satisfied the requirements of §51.308(d)(2)(i).

Response: We agree with the TCEQ's comment.

Comment: TCEQ/PUCT (0056) p. 8] The TCEQ stated that, in Section V. B. 3 of the preamble, the EPA has mischaracterized the requirement for states to calculate natural visibility impairment beyond natural conditions. Table 3: *Natural Visibility Impairment* on page 74832 of the proposal is an incorrect and misleading characterization of Chapter 5, Table 5-2: *Visibility Metrics for the Class I Areas in Texas,* page 5-4 of the 2009 SIP. The TCEQ disagreed with the EPA's assessment of compliance with this requirement and urges the EPA to approve TCEQ's appropriate and technically defensible estimates of natural conditions, such as those used in the 2009 RH SIP. Section 51.308(d)(2)(iv)(A) of the RHR says:

> For the first implementation plan addressing the requirements of paragraphs (d) and (e) of this section, the number of deciviews by which baseline conditions exceed natural visibility conditions for the most impaired and least impaired days ... [underline added]

The TCEQ stated that, although the EPA appropriately proposes to find that the 2009 RH SIP correctly stated the baseline conditions at Big Bend and Guadalupe Mountains, the subsection just cited requires that the natural visibility conditions for the most and least impaired days at each Class I area be subtracted from the baseline conditions for the most and least impaired days to determine the number of deciviews by which baseline conditions exceed natural conditions on the respective sets of days.

Response: The table in our proposal that the TCEQ cites is merely a reformatted version of the same table the TCEQ itself presents on page 5-4 of its SIP. In this section of our proposal, we were summarizing the TCEQ's own information. Thus, the TCEQ's assertions that we somehow erred in following our own regulations is misplaced. We rechecked the information in our table and conclude that it correctly reproduced the TCEQ's information. As we discuss in our proposal, we are disapproving the determination of the number of deciviews by which baseline conditions exceed natural conditions because this calculation depends on the TCEQ's calculations for natural visibility conditions, which we are also disapproving. We disagree with the TCEQ's assertion that we "mischaracterized the requirement for states to calculate natural visibility impairment beyond natural conditions," or that this table constitutes "an incorrect and misleading characterization of [the TCEQ's] Chapter 5, Table 5-2."

Comment: [TCEQ/PUCT (0056) p. 9] The TCEQ disagreed with the EPA's proposed URP and natural conditions for both the Texas Class I areas. Once a final, technically supportable estimate of natural conditions has been selected, the URP can be calculated by straight-line interpolation from the baseline visibility conditions (2000 - 2004) to the estimated natural conditions in 2064 for each of the Texas Class I areas.

The TCEQ stated that the EPA failed to note that, since over 50% of the visibility impairment at Big Bend on the most impaired 20% days comes from outside the U.S. and since there is no basis for projecting a reduction in that impact, the goal of reaching natural conditions at Big Bend is unrealistic, as is the implied goal of attaining the URP at any time.[9] A more appropriate goal would be to achieve an appropriate reduction of the visibility impairment caused by anthropogenic emissions from Texas and the rest of the U.S. Later in the first full paragraph on page 79 FR 74843, the EPA correctly concluded that "it is not reasonable to meet the URP for the Texas Class I areas for this planning period." The EPA also recognized that "emissions and transport from Mexico and other international sources will limit the rate of progress achievable on the 20% worst days ..."

Commenter's Reference:
[9] See the EPA's approval of Arizona's natural conditions goal of767 years out for Saguaro East in 79 FR 52469.

Response: We address our calculation of natural visibility conditions in our responses to other comments. Also, in other comments, the TCEQ states that it agrees with our calculation of its baseline conditions. Because as the TCEQ notes, the URP is merely a straight line connecting the baseline and natural conditions, we cannot offer any further information concerning these issues. We address the impact of international emissions in our responses to more detailed comments on that subject.

Comment: [TCEQ/PUCT (0056) p. 17] As part of their comments on the EPA's proposed FIP, the TCEQ disagreed with the EPA proposal to calculate visibility impairment, (i.e., baseline visibility conditions minus natural visibility conditions) using the EPA's proposed substitute natural visibility conditions for Big Bend and Guadalupe Mountains instead of the natural visibility conditions calculated by Texas for its two Class I areas.

The TCEQ stated that the EPA should accept Texas' calculation of natural visibility conditions at Big Bend and Guadalupe Mountains. These calculations followed the requirements of 40 CFR 51.308(d)(2)(iii) using data and analyses specific to each of the Class I areas. The EPA's proposed substitute estimates of natural conditions were developed by a committee working on national estimates rather than using site specific scientific studies. The EPA did use the correct Baseline Visibility Conditions, 2000-2004, in Table 40.

Response: These issues have been addressed in our responses to other comments.

Comment: [TCEQ/PUCT (0056) p. 17-18] As part of their comments on the EPA's proposed FIP, the TCEQ supported the EPA's proposal to find that it is not reasonable to provide for rates of progress at Wichita Mountains, Big Bend, or Guadalupe Mountains that would attain natural visibility conditions by 2064 and to use the baseline conditions calculated by Texas in establishing the URP at Big Bend and Guadalupe Mountains.

The TCEQ noted that once technically supportable natural conditions estimates are selected for these two Class I areas, the URP can be established for them. However, the TCEQ disagreed with the EPA's proposal regarding the natural conditions estimates.

Response: These issues have been addressed in our responses to other comments.

Comment: [UARG (0065) p. 20-21] As part of their argument that EPA does not provide any lawful basis for disapproving the RPGs for Big Bend and Guadalupe or the Texas LTS, UARG noted that EPA states that it proposes to disapprove Texas's URP analysis because "we do not *believe* that the rate of improvement the TECQ [sic] has selected is reasonable, because we *disagree* with its four factor analysis and the analysis of emission measures needed to meet the URP." 79 Fed. Reg. at 74,843. This is not a lawful basis for a SIP disapproval. Texas has complied with the regional haze rule's requirements with respect to a URP analysis, and, for the reasons stated above, EPA has not provided a valid justification for disapproving Texas's reasonable progress analysis.

UARG stated that the EPA proposes to disapprove Texas's calculation of the URP as a result of its proposal to disapprove the state's calculation of natural visibility conditions at Big Bend and Guadalupe. *Id. at* 74,822. The primary reason for this proposed disapproval is Texas's assumption that fine soil and coarse mass concentrations, and their resulting light extinction effects, is entirely attributable to natural sources. *Id. at* 74,831. Texas provided a reasoned justification for its decision in this regard, explaining that "to the extent its assumption that 100% of coarse mass and fine soil is natural is an overestimate, it expects that its low organic carbon estimate will more than compensate for any errors in this assumption at this time." *Id*. Despite the reasonableness of this finding, Texas, at the FLMs' request, performed a supplemental analysis assuming that only 80 percent of this particulate matter was from natural sources. *Id*. In the final analysis, the FLMs recognized that EPA's regulations at "40 CFR 51.308 give[] the State [the] right" "to recalculate natural conditions for Big Bend [National Park] and Guadalupe Mountains [National Park]" and agreed that "the basic approach used [by Texas] to adjust natural conditions is reasonable, provided that the Proposed SIP address the uncertainty of the assumption that all of the coarse mass and fine soil fraction on the worst 20 percent days is natural."5 Texas's final SIP submission provides the basis for the assumption, as the FLMs requested.6 In contrast, EPA, without any meaningful analysis, would impose use of default values for this particulate matter provided for in the IMPROVE equation and proposes disapproval of the Texas SIP on that basis. *Id. at* 74,832. EPA provides no basis for rejecting Texas's reasoned explanation. Particularly in light of the FLM comments and Texas's rationale\ for using 100 percent, EPA has a duty to fully explain and to provide an adequate rationale for selecting the default values over Texas's determination. EPA failed to discharge that duty, and its proposed action is improper for that reason as well.

<u>Commenter's References:</u>
[5] U.S. Fish & Wildlife Serv. & Nat'l Park Serv., Comments on Texas Proposed Regional Haze Rule State Implementation Plan at 2, 3 (Jan. 11, 2008), Doc. ID No. EPA-R06-OAR-2014-0754- 0002, TX166-002-03.
[6] *See generally* TCEQ, Revisions To The State Implementation Plan (SIP) Concerning Regional Haze at Appendix. 5.2 (adopted Feb. 25, 2009), Doc. ID No. EPA-R06-OAR-2014-0754-0002, TX166-002-05 ("2009 Texas SIP").

Response: These issues have been addressed in our responses to other comments.

Comment: EPA unjustifiably proposes disapproval of TCEQ's URPs for Big Bend and Guadalupe Mountains in favor of URPs that reflect default values with no site-specific adjustment for natural haze conditions [CCP (0075) p. 4]

CCP stated that the URP is the rate of visibility improvement (expressed in deciviews) needed to attain natural visibility conditions in a Class I area by 2064. 40 C.F.R. § 51.308(d)(1). For purposes of the first regional haze planning period, the relevant URP is the amount of improvement needed by 2018 to be on track to attain natural visibility conditions in 2064. In order to calculate a URP for a Class I area, it is first necessary to determine natural visibility conditions in that area. EPA regulations provide that the ultimate responsibility for calculating natural conditions lies with the state. 40 C.F.R. §51.308(d)(2)(iii). Even though the EPA "Guidance for Estimating Natural Visibility Conditions Under the Regional Haze Program" provides "default" estimates of natural visibility, it, too, emphasizes the state's right to derive "refined" estimates.

Consistent with EPA guidance, CCP noted that TCEQ found that natural visibility conditions at Big Bend and Guadalupe Mountains were significantly influenced by particulate matter from natural conditions such as dust storms and fires as would be expected in this region. Therefore, TCEQ adjusted its natural visibility conditions in these areas to reflect only the visibility impairment caused by man-made emissions sources that are the potential targets for control under the CAA. If anthropogenic sources are not the cause of haze in these Class I areas, the CAA does not require those sources to be controlled since those controls would not result in improvements in visibility. See 40 C.F.R. § 51.308(d)(3)(iv) (requiring states to identify "all anthropogenic sources of visibility impairment").

CCP stated that, in the Proposed Rule, EPA agrees that "dust storms and other blown dust from deserts are a significant contributor to visibility impairment at the Texas Class I areas that may not be captured accurately by our default method." 79 Fed. Reg. 74,831. The record and supporting materials clearly show the contributions of natural events on visibility conditions, including data on wildfires, exceptional dust storms, droughts, and composition plots showing the substantial percentage of naturally-occurring haze-forming particles on the worst visibility days. Indeed, modeling shows that during one of the worst droughts on record in 2011, some of the worst haze days in Big Bend corresponded to events flagged as "Fire - Mexico/Central America."

CCP stated that the EPA arbitrarily ignores the observed contribution of natural dust on visibility conditions and rejects TCEQ's adjustments in favor default values for these areas that. EPA acted arbitrarily in rejecting TCEQ's adjustments in favor of its own default values, speculating that "[a]nthropogenic sources of coarse mass and fine soil in the baseline period could have included emissions associated with paved and unpaved roads, agricultural activity, and construction activities." 79 Fed. Reg. 74,831. The mere possibility that other anthropogenic emissions "could have contributed" to coarse mass is not a sufficient rationale for using inappropriate default factors and rejecting "reasonable" site-specific adjustments.

Although EPA erred in not proposing adjustments supported by the available information in the record, CCP stated that the EPA did seek comment on its use of a default value and alternatives to TCEQ's and EPA's approaches. The attached comments offer an adjustment approach based on the available data that satisfies EPA guidance and should be used by EPA in the event that EPA fails to withdraw the Proposed Rule.

Response: These issues have been addressed in our responses to other comments.

Comment: EPA's Disapproval of Texas's Calculation of Natural Visibility Conditions and Associated Calculations of Natural Visibility Impairment and the Uniform Rate of Progress Is Justified. [Earthjustice (0067) p.20]

Earthjustice et al., stated that the EPA correctly proposes to disapprove Texas's determination of natural visibility conditions at its two Class I areas, Big Bend and Guadalupe Mountains. 79 Fed. Reg. at 74,830- 32. Every state except for Texas calculated natural visibility at their Class I areas in accordance with EPA's standard NCII methodology. *Id. at* 74,832. Texas, however, chose to calculate natural visibility at Big Bend and Guadalupe Mountains based on a different approach that departed from EPA's standard methodology. *Id. at* 74,831. The result is an artificially inflated calculation of "natural visibility" conditions. If Texas's calculation is used to define the goal to meet, true natural visibility at Big Bend and Guadalupe Mountains would never be restored.

For example, according to EPA's standard method, natural visibility at Big Bend on the 20% worst days is 7.16 dv. *Id.* But Texas calculated Big Bend's natural visibility to be 10.09 dv—which is 2.93 dv greater than natural visibility conditions under EPA's method. *Id.* The disparity between Texas's approach and EPA's standard method is even more pronounced at Guadalupe Mountains, where natural visibility is 6.65 dv on the 20% worst days according to EPA's method and 12.26 dv under Texas's approach. *Id.* As described below, the Texas approach significantly skews its analysis towards a result that does not require additional emissions reductions from Texas sources.

Earthjustice et al., stated that the primary cause of this wide disparity between the Texas approach and EPA's standard methodology is the state's decision to attribute 100% of coarse mass and fine soil concentrations to natural causes. *Id.* However, it is extremely unlikely that natural dust storms cause 100% of the coarse mass and fine soil concentrations at Texas Class I areas. As EPA explains, coarse mass and fine soil pollution is often caused by dust from paved and unpaved roads, agricultural activity, and construction activities—all of which occur in Texas. *Id.* Indeed, the ubiquity of emissions from construction underlies the requirement for all state long-term strategies to consider "measures to mitigate the impacts of construction activities." 40 C.F.R. § 51.308(d)(3)(v)(B).

Earthjustice et al., stated that Texas admits that there is significant uncertainty associated with its estimates. Calculations of natural conditions should be based on supportable science, including "available monitoring information and appropriate data analysis techniques." 40 C.F.R. § 51.308(d)(2)(iii). The state's natural visibility estimates were not. Its estimates of natural conditions were highly influenced by and very sensitive to its attribution of 100% of coarse mass and fine soil concentrations to natural causes—a decision that is both highly implausible and unsupported. Therefore, EPA's disapproval – and the continued use of EPA's default values – is appropriate. The approach Texas took significantly overestimates the level of natural visibility impairment at Big Bend and Guadalupe Mountains. As a result, the state's approach fundamentally undermines the haze program's core purpose, which is to restore natural visibility conditions at our nation's most treasured public lands. Because the regional haze program's goal is to attain natural visibility conditions at every Class I area, the natural visibility calculation sets the ultimate target for each Class I area. *See* 64 Fed. Reg. 35,714, 35,729 (July 1, 1999) (explaining that the "[e]stimates of natural visibility conditions are needed to aid all interested parties, including the general public, in understanding how 'close' or 'far' a particular Class I area is in relation to the ultimate goal of the program"). The use of a higher natural visibility impairment skews the slope of the uniform rate of progress and makes it appear that a much lower rate of progress is sufficient. This biases the evaluation of what progress is "reasonable" in favor of doing less to reduce anthropogenic impairment. Because both are based on the state's flawed estimate of natural visibility conditions, EPA's disapproval of the Texas estimate of natural visibility impairment and the uniform rate of progress was appropriate.

Earthjustice et al., stated that Texas's unorthodox calculation of natural visibility conditions also leads to inconsistent and anomalous results. Guadalupe Mountains is located just 40 miles from Carlsbad Caverns National Park in New Mexico, and both national parks share an IMPROVE monitor. *See id.* at 74,843. Texas calculated natural visibility conditions at Guadalupe Mountains to be 12.26 dv. *Id. at* 74,831. But New Mexico—which used EPA's standard method—calculated natural visibility conditions at Carlsbad Caverns to be 6.65 dv. New Mexico 309(g) SIP at 31 (Mar. 31, 2011); *see also* 77 Fed. Reg. 36,044, 36,068 (June 12, 2012) (proposed approval of New Mexico haze plan); 77 Fed. Reg. 70,693 (Nov. 27, 2012) (final rule approving New Mexico haze plan). Given the two national parks' proximity and the fact that they share an IMPROVE monitor, Texas's inflation of natural visibility impairment at Guadalupe Mountains is problematic when compared to Carlsbad Caverns, for which national conditions are based on EPA's standard methodology. Departing from this methodological norm is unjustified. Both national parks are entitled to the same protections under the regional haze program.

Earthjustice et al., stated that supported EPA's proposal to use the NCII default values for determining natural visibility conditions at the Texas Class I areas. The NCII default values were used for every other Class I area in the country, and EPA should not revise its proposal to set a less stringent natural visibility target. Because the Federal Land Managers commented during the development of the Texas regional haze SIP that it is more reasonable to assume that 80% of coarse mass at Texas Class I areas is natural (and not 100% as Texas assumed in its natural visibility calculations), EPA has asked for comments on the acceptability of natural conditions estimates between EPA's defaults and Texas's values. We support the use of EPA's default values for several reasons.

First, as EPA notes, there is significant uncertainty associated with the assumptions used by Texas. This uncertainty would persist in the use of any estimates between EPA's default and Texas's values. Second, as noted above, all other states have used EPA's default values. They should be used here in the interest of both national consistency and also local consistency between Guadalupe Mountains and Carlsbad Caverns National Parks. Third, EPA's default values are based on the most recent science. Any deviations or refinements should be based on supportable science, including "available monitoring information and appropriate data analysis techniques." 40 C.F.R. § 51.308(d)(2)(iii). Texas's natural visibility estimates were not. Therefore, EPA's use of its default values in its FIP is appropriate.

Response: We agree with Earthjustice that our disapproval of Texas's natural visibility calculations and replacement with our own calculations was appropriate.

Comment: EPA Must Disapprove Texas's RPGs For Big Bend and Guadalupe Mountains as Unlawful. [Earthjustice (0067) p.26]

Earthjustice et al., stated that the EPA rightly proposes to disapprove the progress goals that Texas established for Big Bend and Guadalupe Mountains because the RPGs do not provide for reasonable progress based on the four factors that a state is required to consider. Texas adopted the CENRAP modeled 2018 visibility conditions as the RPGs for Big Bend and Guadalupe Mountains. To set RPGs for 2018, Texas relied on improvements in visibility that are anticipated to result from federal, state, and local control programs and narrowed the scope of its control analysis to point sources of NO_x and SO_2. Under the reasonable progress goal proposed by Texas, natural visibility conditions as calculated by Texas would not be reached at Big Bend until 2155 and the Guadalupe Mountains until 2081. Using the NCII default values for natural visibility conditions and Texas's RPG, natural visibility conditions would not be attained at Big Bend until 2215 and Guadalupe Mountains until 2167. Texas's proposed rate of progress is significantly slower than the URP. Texas found that its reasonable progress goal was reasonable because contributions from Mexico and other international sources allegedly prevent Texas from achieving a faster rate of progress. However, as discussed below, the contribution from Mexico and other international sources is not a justification for such a slow rate of progress where cost-effective controls are available for Texas sources.

Response: We agree with Earthjustice that we are correct to disapprove Texas' RPGs.

Comment: Natural Background Calculation Methods [Alpine (0078) p. 5, 10] Alpine stated that the TCEQ's method for calculating natural background visibility is reasonable. Additionally, EPA has not adequately demonstrated that the 80% natural source composition default value is more appropriate than TCEQ's 100% value at these specific Class I areas.

Alpine noted that when including the alternate uniform rate of progress slope calculation made by TCEQ in its SIP submittal, a calculation that uses a refined methodology to estimate natural visibility conditions, we also find these observations are even more favorable at Big Bend and Guadalupe Mountains than when compared to EPA's calculated uniform rate of progress line. The TCEQ constructed their URP by plotting a straight graphical line from the baseline level of visibility impairment to the level of visibility conditions representing no anthropogenic impairment in 2064 for both Big Bend and the Guadalupe Mountains. No alternate calculation was made by Texas for the Wichita Mountains Wilderness Class I area. This revised calculation is represented by the green dotted line in Alpine Figures 2 and 3 and represents a natural background visibility estimate that assumes 100% of the amount of natural fine soil and coarse mass in 2064 is natural.

Alpine stated that Title 40 CFR §51.308(d)(2)(iii) states that the ultimate responsibility for calculating natural conditions lies with the state. Even though the EPA "Guidance for Estimating Natural Visibility Conditions under the Regional Haze Program" provides "default" estimates of natural visibility, it, too, emphasizes the state's right to derive "refined" estimates.

Alpine stated that if we were to define "natural conditions" as EPA does in its guidance, we would state that this level is the result of visibility conditions that would be experienced in the absence of human-caused impairment. Using this definition, it is reasonable to agree with TCEQ's 2064 natural background visibility estimate that 100% of the amount of natural fine soil and coarse mass are natural. EPA's argument includes the fact that their review of the baseline visibility estimate, an average of recent observational conditions, and a level that TCEQ has agreed is the same as EPA's calculation and that EPA approved in their review of the SIP, does not take into account that 100% of the coarse mass and fine soil measured are attributable to natural sources. In reality, it is not the current year average baseline value that EPA should be concerned. This baseline value is the starting point for the uniform rate of progress line that initiates with current condition calculations for the W20% days and ends at 2064 natural conditions; a level absent of manmade influence.

Alpine stated that in calculating the uniform rate of progress slope, TCEQ's assumption of 100% natural contribution to coarse mass and fine soil in 2064 meets the true definition of natural background visibility, the end point of URP slope. EPA notes that anthropogenic sources of coarse mass and fine soil in the recent baseline period could have included emissions associated with vehicle perturbed paved and unpaved road dust, agricultural activity, and construction activity. However, EPA does not make the same statement for the 2064 natural background calculation, a visibility calculation purposefully absent the influence of these manmade interactions with natural emissions, as TCEQ notes in its refined calculation.

Alpine noted that, in its disapproval of this area of the SIP, EPA states that because "we find that the TCEQ has not adequately demonstrated that all coarse mass and fine soil measured in the baseline period can be attributed to 100% natural sources", TCEQ does not meet the calculation of the natural visibility conditions for the Big Bend and Guadalupe Mountain Class I areas under §51.308(d)(2)(iii). However, EPA's judgment on this point only refers to the baseline, or current, levels of the URP, not the natural background endpoint, the value that TCEQ uses its right to calculate using an alternate method.

According to Alpine, since EPA's own definition of natural visibility conditions supports TCEQ's usage of 100% natural source composition of coarse mass and fine soil, it can be concluded that the TCEQ approach to estimating natural visibility conditions is reasonable. Additionally, EPA has not adequately demonstrated that the 80% natural source composition default value is more appropriate than TCEQ's 100% value at these specific Class I areas.

Response: We agree with the commenter that the Regional Haze Rule does allow states to develop an alternate approach to estimate natural visibility conditions. The fact that the states have the option of calculating their own natural visibility conditions is not at issue. The commenter is incorrect in their explanation of how TCEQ estimated natural visibility conditions for the 2064 goal at the two Texas Class I areas. Contrary to the commenter's assertion that Texas estimated that course mass and fine soil for the 2064 to be 100% from natural sources, Texas evaluated the *baseline* extinction from course mass and fine soil, assumed that the baseline extinction was due to 100% natural sources, and then carried this baseline concentration forward as an estimate of the 2064 natural conditions. As we state in the Texas TSD and discuss further in a separate response to comment, Texas did not adequately support the determination that the baseline extinction was 100% from natural sources. The commenter confuses the EPA default values with the FLM suggested assumption of 80% natural source composition that TCEQ used for some additional calculations.

14. Consistency with Our Other Regional Haze Actions

The following comments allege specific instances of inconsistency with our other SIP and FIP actions. In some instances these comments constitute the entirety of the comment, and in other instances they are only a portion of the comment. We have collected these comments in this separate document so that our responses to allegations of inconsistencies can be more easily reviewed.

We also received comments that many of these cited instances are contrary to our regional consistency regulations at 40 CFR § 56.5. We explain the applicability of our regional consistency rules in detail in the first response to comments within this section below. We recognize that we have a duty to ensure our regional haze actions are carried out fairly, are consistent with the CAA, and are "as consistent as is reasonably possible" with other regional haze actions. [356] Further, as evidenced by our response to allegations that we have been inconsistent, we disagree that we are acting inconsistent with reasonable progress requirements or prior SIP actions in taking this final action for Texas and Oklahoma. Rather, we believe we have been consistent in our review and analysis of the Texas SIP given the specific facts presented in Texas and Oklahoma.

The Regional Haze Program is one of our more complicated programs, by virtue of our desire to extend flexibility to our states. We funded Regional Planning Organizations so that states could have forums to discuss approaches to regional haze that were best suited to their individual states. The Regional Haze Rule was designed to offer states multiple pathways to achieving the national goal of a return to natural visibility. States have flexibility in meeting our regulations, but our role as reviewer remains. Nevertheless, when we determine that a state's SIP is not approvable and we must replace it with a federal plan, we too are afforded some flexibility, as long as our federal plan complies with the CAA and our regulations.

What some commenters allege is inconsistency, is in fact the exercise of our judgment, based on the specific facts at hand. Because this is a SIP review action, we believe that we are not only authorized, but required to exercise independent technical judgment in evaluating the adequacy of the State's regional haze SIP, just as we must exercise such judgment in evaluating other SIPs. In evaluating other SIPs, we are constantly exercising judgment about SIP adequacy, not just to meet and maintain the NAAQS, but also to meet other requirements that do not have a numeric value. In this case, Congress did not establish NAAQS by which to measure visibility improvement; instead, it established a reasonable progress standard and required that EPA assure that such progress be achieved. Here, we are exercising judgment within the parameters laid out in the CAA and our regulations.

[356] 40 CFR § 56.5(a)(2).

Comment: EPA's disapproval is contrary to the agency's regional consistency rules
[Luminant (0061) p. 68]

Luminant stated that, because EPA's proposal applies a wholly different standard to Texas' SIP, it is unlawful. Under EPA's Clean Air Act regulations, "[e]ach responsible official in a Regional Office, including the Regional Administrator, shall assure that actions taken under the [CAA]: (1) Are carried out fairly and in a manner that is consistent with the CAA and Agency policy as set forth in the Agency rules and program directives [and] (2) Are as consistent as reasonably possible with the activities of other Regional Offices . . . ."[484] These regulations "strongly articulate EPA's firm commitment to national uniformity" in its CAA actions, and EPA actions that violate these regulations are "contrary to law."[485] Here, by applying a new and singularly different standard to Texas, and prohibiting the state from using a source category approach, EPA is acting inconsistent with both its own reasonable progress policy guidance and prior actions of many other EPA regional offices. EPA's proposal violates the agency's own regional consistency regulations and is contrary to law.[486]

[UARG (0065) p. 28] UARG stated that, in previous regional haze rulemakings, EPA has touted national consistency in analytical approach and consistent results across states and regions as not only a goal but a requirement of the CAA and the regional haze rules. *See, e.g.*, 77 Fed. Reg. 72,512, 72,518 (Dec. 5, 2012) (rejecting reliance on site-specific BART compliance costs in order to promote what EPA characterized as consistent costing methodologies across all states). Even in this proposed rule, EPA notes that the regional haze rule imposes certain requirements "to ensure that states use a common analytical framework and to provide an informed and equitable decision making process." 79 Fed. Reg. at 74,834. EPA's proposed action here, however, is anything but consistent with its past actions. Not only is this differential treatment unjustified and inconsistent with the regional haze rule; it also violates EPA's regional consistency regulations. Those regulations require that EPA "shall assure that actions taken under the [CAA]: (1) Are carried out fairly and in a manner that is consistent with the CAA and Agency policy as set forth in the Agency rules and program directives [and] (2) Are as consistent as reasonably possible with the activities of other Regional Offices." 40 C.F.R. § 56.5(a). EPA's proposed rule does not pass these basic tests of rational and consistent Agency decision-making.

[Associations (0059) p. 15] The Associations stated that by applying a wholly different standard in its evaluation of Texas' reasonable progress goals, EPA is violating its strict uniformity rule. EPA regulations state that "[e]ach responsible official in a Regional Office, including the Regional Administrator, shall assure that actions taken under the act: (1) Are carried out fairly and in a manner that is consistent with the CAA and Agency policy as set forth in the Agency rules and program directives [and] (2) Are as consistent as reasonably possible with the activities of other Regional Offices …." 40 C.F.R. § 56.5(a). This regulation reflects an agency-wide commitment to uniformity in interpreting and applying the Clean Air Act, and agency actions that violate these regulations are "contrary to law." *See National Environmental Development Association's Clean Air Project v. EPA*, 752 F.3d 999 (D.C. Cir. 2014). In this proposal, EPA unlawfully applies a wholly different standard of review to Texas' reasonable progress goals than it has in prior reviews of reasonable progress goals submitted by other States that have likewise relied on source category-based analyses. To satisfy its own uniformity rule, EPA must treat Texas like any other State and approve its use of a source category-based analysis in setting reasonable progress goals.

GCLC stated that EPA's Proposed FIP imposes unprecedented limitations on Texas through a completely novel means. This includes conducting an "additional analysis," creating a new fifth visibility factor, and imposing source-specific SO_2 emissions limitations on 15 separate BART-compliant and BART-exempt Texas EGUs a type of analysis or limitation that EPA has not imposed on any other state through the regional haze SIP /FIP process. This is also a contradiction of EPA's own rulemaking that CSAPR (and previously CAIR) serves as better-than BART for BART sources, and this goes far beyond any other type of limitations considered for non-BART sources in the statute, regulations, guidance documents, and every other review of other states' SIP submission. Some of the specific examples where EPA has acted inconsistently with prior actions have already been referenced in our comments above (e.g., EPA's actions on the Idaho and Nebraska SIP submissions) but extend far beyond those. This includes EPA's recent approvals of reasonable progress evaluations, where states have taken the same approach and reached the same results as Texas, and EPA has approved them. [70]

GCLC noted, by EPA's own admission, its FIP required a "thorough technical and policy analysis" in order to "ensure compliance with the Regional Haze Rule," because EPA is proposing the rule "without the benefit of prior precedent to streamline the process." [71] This is despite Texas' FIP being proposed after years of EPA's regional haze SIP/FIP determinations for numerous states. By taking this inconsistent and much-more burdensome path for Texas and Texas EGUs, EPA's Proposed FIP is in clear contravention to the regional consistency regulations found at 40 CFR, Part 56 - Regional Consistency. It is also in clear contravention of the recent D.C. Circuit holding in *National Environmental Development Association's Clean Air Project v. EPA*, which held that directives contravening the regional consistency regulations are a violation of law.

Footnotes:

[70] See Approval and Promulgation of Implementation Plans; Region 4 States; Visibility Protection Infrastructure Requirements for the 1997 and 2006 Fine Particulate Matter National Ambient Air Quality Standards, Final Rule, 79 Fed. Reg. 26,143,26,145-46 (May 7, 2014), which included: "Regarding the reasonable progress evaluations, each state at issue focused its reasonable progress analysis on SO_2 emissions based on the conclusion that sulfate particles account for the greatest portion of the regional haze affecting Class I areas in these states. Each state then established areas of influence and contribution thresholds to determine which of its sources should be evaluated for reasonable progress control. EPA approved each state's methodology for identifying units for reasonable progress evaluation and each state's reasonable progress determinations in the respective regional haze SIP actions and provided a detailed discussion of the methodology and the rationale for approval in the Federal Register notices associated with those actions. Contrary to the Commenter's assertions, Alabama, Georgia, Kentucky, North Carolina, and South Carolina did not "exempt [CAIR] sources ... that would otherwise be subject to reasonable progress review." Each of these states considered the four statutory reasonable progress factors in evaluating whether CAIR would satisfy reasonable progress requirements for the state's EGU sector and determined that no additional controls beyond CAIR were reasonable for SO_2 during the first planning period. As discussed in EPA's Reasonable Progress Guidance, states may evaluate the need for reasonable progress controls on a source category basis, rather than through a unit-specific analysis, and have wide latitude to determine additional control requirements for ensuring reasonable progress. The guidance also notes that states may consider emissions reductions from cap-and-trade programs such as CAIR in addition to source-specific controls."

[71] Declaration of Sam Coleman, Nat 'l Parks Conservation Ass 'n v. McCarthy, No. 11-01548, at 5 (D.D.C. 2014). (emphasis added).

Footnotes:
[484] 40 C.F.R. § 56.5(a). These requirements also apply to EPA Headquarters officials "who are responsible for developing the policies governing the implementation and enforcement of the CAA." Nat'l Envt'l Dev. Ass'n's Clean Air Project v. EPA, 752 F.3d 999, 1009 (D.C. Cir. 2014).
[485] Nat'l Envt'l Dev. Ass'n's Clean Air Project, 752 F.3d at 1010–11.
[486] Id. (holding that EPA action contrary to its regional consistency regulations was contrary to law); see also 40 C.F.R. § 56.5(a)(2) (officials in EPA regional offices "shall assure that actions taken under the act . . . [a]re as consistent as reasonably possible with the activities of other Regional Offices" (emphasis added)).

Response: We recognize that we have a duty, under our regional consistency regulations, to ensure our regional haze actions are "consistent with the [Clean Air] Act and Agency policy" and are "as consistent as reasonably possible" with other regional haze actions under 40 CFR § 56.5(a)(1) and (2). As explained below and elsewhere throughout this response to comments, we believe we are meeting the goals of these regulations in light of the specific facts presented in this action. We disagree that we are acting inconsistent with reasonable progress requirements or prior SIP actions in taking this final action for Texas and Oklahoma. Moreover, while EPA's regional consistency regulations and policies require us to carry out our actions pursuant to the CAA in a consistent manner across Regions as reasonably as possible, they do not require uniformity between those actions in all circumstances and instead "allow for some variation" in actions taken in different regions. [357]As explained below, in this action EPA is acting consistent with the CAA and our regional haze policies in taking these specific actions for Texas, and our final action is "as consistent as reasonably possible" with other actions given the specific facts presented in Texas and Oklahoma.

We believe we have been consistent in our review and analysis of the Texas SIP. As explained in more detail elsewhere in this Response to Comments, we must first review the SIP under the requirements of the CAA and federal regulations. Congress crafted the CAA to provide for states to take the lead in developing implementation plans, but balanced that decision by requiring us to review the plans to determine whether a SIP meets the requirements of the CAA. We have the authority to disapprove a SIP if it does not meet minimum CAA and/or regulatory requirements. Our action today is consistent with the statute.

Further, each Regional Haze SIP requires that we review it on an individual, case by case basis, based on the specific facts presented. Regional haze problems can fundamentally differ from state to state and region to region and thus require a case by case review. The Regional Haze Program is one of our more complicated programs, by virtue of our desire to extend flexibility to our states. We funded Regional Planning Organizations so that states could have forums to discuss approaches to regional haze that were best suited to their individual states. The Regional Haze Rule was designed to offer states multiple pathways to achieving the national goal of a return to natural visibility. States have flexibility in meeting our regulations, but our role as reviewer remains – we must review state regional haze plans to determine whether they meet the requirements of the CAA. Regardless of the inherent flexibility in the regional haze program, if we determine that a state's SIP is not approvable, we must replace it with a federal plan. And in

[357] 80 FR 50258.

devising that federal plan, we too are afforded some flexibility, as long as our federal plan complies with the CAA and our regulations.

We disagree with Commenter's assertion that we are applying a new and singularly different standard to Texas, and we further disagree that we have prohibited Texas from using a source category approach. As we explain in other comments, Texas partially analyzed its sources on a source-by-source approach, but did so in an incomplete and flawed manner. Our proposed disapproval was not based on the fact that Texas also used a category approach, but rather that this analysis was also flawed and did not comply with our regulations. While we believe we are consistent in our review here, we address allegations that we have been inconsistent with our other actions in our responses to other more specific comments

With regard to the commenter's general assertion that our action here is "unlawful," we disagree. In support of their claims, the comment relies heavily on the case *National Environmental Development Association's Clean Air Project v. EPA* (*NEDA CAP*), No. 13-1035 (DC Cir., May 30, 2014). *NEDA CAP* involved a specific December 2012 memorandum from EPA headquarters to the EPA regions regarding the limited scope of a court decision issued by the Sixth Circuit Court of Appeals based upon the doctrine of intercircuit nonacquiescence (*see* "Memorandum from Stephen D. Page, Director of the EPA's Office of Air Quality Planning and Standards, to Regional Air Division Directors, titled *Applicability of the Summit Decision to the EPA Title V and NSR Source Determinations* (December 21, 2012")). [358] While that case discussed application of EPA's regional consistency regulations, the court was focusing on the issue of whether such a memo addressing intercircuit nonacquiescence was allowed under the regulations. However, we are not dealing with such a question in this rulemaking action. Instead, we are dealing with fact specific analyses regarding whether and how the CAA's regional haze requirements are met in Texas, and our actions in this case are consistent with the CAA and the regional haze requirements, as well as the regional consistency regulations. While comments allege that some principle of national uniformity requires different actions in this case, we are reasonably and consistently relying on our authority to exercise our judgment, based on the specific facts at hand, in reviewing SIP actions. Here, we are exercising judgment within the parameters laid out in the CAA and our regulations. Because this is a SIP review action, we believe that we are not only authorized, but required to exercise independent technical judgment in evaluating the adequacy of the State's regional haze SIP, just as we must exercise such judgment in evaluating other SIPs. In evaluating other SIPs, we are constantly exercising judgment about SIP adequacy, not just to meet and maintain the NAAQS, but also to meet other requirements that do not have a numeric value. In the case of regional haze, Congress did not establish NAAQS-like numeric standards by which to measure visibility improvement; instead, it established a reasonable progress standard and required that we assure that such progress be achieved. Here, we are exercising judgment within the parameters laid out in the CAA and our regulations.

The SIP process anticipates a degree of flexibility in application of controls and requirements to allow each State to choose its own methods by which to comply with the requirements of the CAA and regulations. Likewise, when we must disapprove a SIP and issue a FIP, that same

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[358] We have recently proposed revisions to the regional consistency rules at "Amendments to Regional Consistency Regulations" to address the situation over intercircuit nonacquiescence. (80 FR 50250, August 19, 2015).

flexibility applies to allow for a program tailored to the particular State. In this action, we proposed to approved sections of the SIP and, for necessary portions of the SIP that were disapproved or missing, we proposed FIP requirements necessary to bring Texas into compliance with the regional haze requirements. In doing so, we applied the same processes and general knowledge used in other FIPs and followed the regional haze regulations consistently in proceeding with our action. Commenter's concerns arise not from inconsistent application or interpretation of regulations, but rather, Commenter objects to our state-specific decisions that we consider necessary to ensure compliance with the regional haze program. The regional haze program is not a "one size fits all" program, and the actions taken here are "as consistent as reasonably possible" in terms of how we reviewed Texas' SIP and proposed our FIP while taking into account the needs for flexibility in building a program designed upon state-specific needs. However, contrary to the commenter's assertions, even if our fact-specific determinations regarding the Texas SIP and FIP in this matter were found to be inconsistent with other regional haze actions, this action would *not* be in violation of EPA's regional consistency regulations. Those regulations actually allow for some variation between different regional actions. Specifically, 40 CFR 56.5(b) provides that regional officials can seek concurrence from the EPA headquarters with respect to any interpretations of the CAA, rule, regulation, or guidance in an individual action that "may result in inconsistent application among the regional Offices." Officials and staff from Region 6 have worked closely with EPA headquarters throughout the proposed and final actions regarding the Texas and Oklahoma regional haze requirements, including in the analysis and conclusions contained in the SIP and FIP determinations included in this final rule. Moreover, headquarters' concurrence in the decisions contained in this action is inherent in that fact that this final action is being issued by headquarters and signed by the EPA Administrator.

We address comments alleging inconsistency with our Idaho and Nebraska actions elsewhere within this section. We disagree that our action is in contravention of *National Environmental Development Association's Clean Air Project v. EPA* as explained in our response above to the *NEDA CAP* case. The Sam Coleman Declaration is discussed in the consideration of visibility section of our responses.

Comment: Luminant stated that there is no requirement in the statute, regulations, or guidance that Texas consider the visibility benefit from the implementation of individual controls in the manner EPA would—or even to consider visibility at all in its four-factor analysis. Indeed, EPA has approved other states' four-factor analyses, noting specifically that they did not perform this type of visibility analysis.[443]

CCP stated that visibility is not a specific statutory factor to consider prior to the establishment of RPGs under CAA Section 169A. See 77 Fed. Reg. 20,894, 20,934 (Apr. 6, 2012) ("Nevada SIP Approval") ("As we have noted, our regulations require consideration of four factors in reasonable progress determinations; visibility improvement is not one of the specified factors."). EPA previously rejected similar cumulative visibility improvements of 0.254 dv and 0.273 dv in the New York SIP as too "small" to justify controls. 77 Fed. Reg. 24,818.

GCLC noted, even if EPA did have the ability to impose a fifth "visibility factor," Texas' choice of a 0.5 deciview ("dv") threshold as a benchmark for total visibility improvement was entirely reasonable. For example, in recently reviewing and approving Idaho's reasonable progress goals, EPA "independently evaluated whether there are reasonable control measures available for sources located within Idaho's regulatory jurisdiction" and concluded that facilities with visibility impacts of 0.5 dv or less at the nearest Class I area were "relatively small."[26] Therefore, EPA ultimately concluded in Idaho that additional controls for "reasonable progress purposes [were] not reasonable at [that] time, because even though there [were] cost effective controls identified, visibility improvement [was] anticipated to be relatively small."[27] Luminant submitted similar comments and added that, in finalizing its approval and responding to comments, EPA again confirmed that, even though "several of the Idaho stationary sources have visibility impacts between 0.3-1.3 deciviews (dv)," those impacts were not a "significant contribution to visibility impairment" that warranted reasonable progress controls.[705] EPA has used this same threshold in other states to conclude that "reasonable progress controls" are not warranted.[706]

CCP stated that visibility may be appropriately considered on a cumulative basis, as TCEQ did for all sources that are candidates for control. Using a cumulative approach, Texas appropriately concluded there were insignificant cumulative visibility benefits, measured in deciviews, from requiring additional controls. See 76 Fed. Reg. 74,387 Table 10 (identifying estimated deciview improvements ranging from 0.16 dv in Big Bend to 0.36 dv in Wichita Mountains).

Footnotes:
443 See, e.g., 78 Fed. Reg. 10,546, 10,553 (Feb. 14, 2013) (approving Alaska's reasonable progress goals and recognizing in response to comments that "the SIP submission does not specifically identify the contribution of coal-combustion sources to visibility impairment in Denali National Park . . . ."); 77 Fed. Reg. 70,693, 70,702 (Nov. 27, 2012) (approving New Mexico's reasonable progress analysis that did not evaluate the contribution from individual EGUs). See also WildEarth Guardians v. EPA, 770 F.3d at 944 (affirming EPA's approval of New Mexico's reasonable progress analysis and holding: "Neither the Clean Air Act nor the Regional Haze Rule requires source-specific analysis in the determination of reasonable progress.").
26 Idaho SIP Approval Proposal, 77 Fed. Reg. at 30256.
27 Id.
705 77 Fed. Reg. at 66,930–31.
706 See, e.g., 77 Fed. Reg. 30.454, 30,464 (May 23, 2012) (Oregon).

Response: As we discuss in our proposal,[359] Texas basically employed the following approach assessing reasonable progress controls:

- Texas narrowed the scope of the control analysis to point sources of NOx and SO_2, and developed a list of potential controls and costs associated with those controls to inform their four factor analysis.
- It used the control strategy analysis developed by CENRAP as the starting point for its analysis and further eliminated potential sources based on a series of screening thresholds (e.g., cost, distance from a Class I Area, Q/d, previous analysis, etc.).
- It calculated the total cost of the controls that could be applied to the remaining sources that were within specific areas of influence of individual Class I Areas.

359 79 FR 74835.

- It constructed a subset of SO_2 and NOx controls for particular facilities and calculated the total annualized cost of those controls.
- Texas next weighed the four statutory factors in determining the reasonableness of additional controls, using cost as a key factor.
- Texas then essentially compared the total annualized cost of the SO_2 and NOx controls, their total projected emission reductions and their total visibility impacts at a number of Class I areas and determined that no controls were reasonable.

Also as we discuss in our proposal, we noted a number of flaws in Texas' analysis. Perhaps the most critical flaw in Texas' analysis, was as we described in our proposal:[360]

> The TCEQ constructed a large potential control set consisting of a mix of large and small sources, located at various distances from Class I areas, with a large geographical distribution. Because of the variation in size, type, and location of these sources, the potential to impact visibility and potential benefit from controls at a given Class I area can vary greatly between the identified sources. This potential control set identified by the TCEQ included controls on some sources that would likely result in significant visibility benefits, but also included controls on many sources with much less anticipated visibility benefits. Because it only estimated the visibility benefit of all the controls together, the TCEQ was not able to assess the potential benefit of controlling individual sources with significant, and potentially cost-effective, visibility benefits. Also, we believe that individual benefits were masked by the inclusion of those controls with little visibility benefit that only served to increase the total cost figures.

We address the consideration of visibility in a state or federal reasonable progress analysis in another response to comment within this document.

When considering visibility, it is quite possible that a state with low overall impacts could assess the totality of the visibility impacts of all of the sources within its borders, in consultation with other states, and conclude that no controls are necessary for a specific planning period. It is also possible that a state could proceed in this assessment by analyzing the individual source contributions to visibility impairment from its sources on Class I areas. Other approaches are also possible, but regardless of the approach taken, the state must engage in some rational method for making this assessment that complies with the requirements in the regional haze rule. As we discuss above, Texas' approach was highly flawed. Texas' cumulative approach effectively masked the effect of controlling those sources or group of sources with the largest visibility impacts. As we demonstrated in our proposal, when Texas facilities were analyzed separately, cost effective controls were identified. This flaw, considered with the other flaws we identified in Texas' four-factor reasonable progress analysis, caused us to conclude that Texas' reasonable progress demonstration under Section 51.308(d)(1)(i)(A) was not approvable.

Luminant states that we have approved other states' four-factor analyses, noting specifically that they did not perform this type of visibility analysis [individual source assessment] and cites to

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[360] 79 FR 74838.

the Alaska and New Mexico SIPs. With regard to the Alaska SIP, Luminant references the quote, "the SIP submission does not specifically identify the contribution of coal-combustion sources to visibility impairment in Denali National Park . . . ." The full quote is reproduced below:

> So while the SIP submission does not specifically identify the contribution of coal combustion sources to visibility impairment in Denali National Park, **it does demonstrate that wildfires are the major source of PM2.5 in the State, that wildfires have the greatest potential to impact visibility in Denali, and that wildfires are the major source of OMC on the worst visibility days in Denali National Park** [emphasis added**].**

As the above quote indicates, the regional haze problem in Alaska is fundamentally different than in Texas. As we discuss in our proposal, the CENRAP modeling, monitoring data and other technical analyses demonstrated that NOx and SO_2 are the primary causes of haze at the Wichita Mountains with SO_2 from point sources being the predominant driver. It also showed that SO_2 point sources in Texas were a significant contributor to the haze at the Wichita Mountains.[361] Consequently, the Alaska approach, which was based on the recognition that wildfire was having the greatest potential to impact the Denali Class I area, would not be appropriate. In addition, the Alaska SIP does include the BART analysis and control of the Healey Unit 1.

CCP stated that visibility is not a specific statutory factor to consider prior to the establishment of RPGs under CAA Section 169A and cited to 77 Fed. Reg. 20,894, 20,934 (Apr. 6, 2012) which it refers to as the "Nevada SIP Approval," quoting, "As we have noted, our regulations require consideration of four factors in reasonable progress determinations; visibility improvement is not one of the specified factors." The quote that CCP reproduces comes from our final action on the North Dakota regional haze SIP and the full quote is as follows:[362]

> As we have noted, our regulations require consideration of four factors in reasonable progress determinations; visibility improvement is not one of the specified factors. **As we have indicated, when a state considers visibility improvement as an additional factor in evaluating single-source control options, that consideration must be reasonable in light of the explicit goals established by Congress in CAA section 169A [**emphasis added**].**

Thus, our statement in our North Dakota action actually supports the consideration of visibility.[363] Furthermore, we note that statement was made in the context of evaluating source-specific controls (precisely the methodology we have employed in evaluating the Texas regional haze SIP), as long as that evaluation is reasonable in light of the goals of the regional haze program. Texas itself considered visibility impact and visibility benefit in its reasonable

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[361] 79 FR 74871

[362] 77 FR 20934.

[363] We were subsequently upheld on this point by the Eighth Circuit Court in North Dakota v. EPA. 730 F.3d 750, 766 (8th Cir. 2013). The Eighth Circuit acknowledged in *North Dakota v. EPA*, States can take visibility improvement into account when evaluating reasonable progress controls so long as they do so in a reasonable way

progress and RPG four-factor analysis but as we note above, its approach was highly flawed and consequently not approvable.

Like Texas, we considered visibility in our reasonable progress analysis. We believe that states (or EPA when promulgating a FIP) can consider visibility when determining reasonable progress in at least two ways. States can consider the visibility impacts of sources when determining what sources to analyze under the four-factor framework. As such, states can develop screening metrics that target those sources with the greatest visibility impacts for further analysis. Our 2007 guidance advocated this approach, and nearly all states, including Texas, used metrics like Q/d to consider the potential visibility impacts of their sources and screen out those sources with low visibility impacts.[364] We followed this same approach in our FIP by using both Q/d and a second metric based on a source's modeled percent contribution to total visibility impairment at impacted Class I areas. If states or we could not consider visibility impacts as a way of identifying which sources should be considered for additional controls, then states would have no rational way to differentiate between hundreds of sources that vary in distance from Class I areas, emit different visibility impairing pollutants in varying amounts, and are subject to diverse meteorological conditions that affect the transport of visibility-impairing pollutants. The result would be a cumbersome analysis encompassing hundreds of sources (or in the case of Texas, well over a thousand), many of which may have little if any impact on visibility in Class I areas. Congress could not have intended such an incongruous result. Second, once a universe of sources has been identified for analysis, we believe that States have the option of considering the visibility improvement that will result from potential control options when weighing the four statutory factors. In summary, if States were not permitted to consider visibility improvement when conducting their control determinations, then States would have to require all cost-effective controls (assuming no limiting energy or non-air quality environmental impacts) regardless of whether some of those controls would be more beneficial than others.

GCLC stated that even if we did have the ability to impose a fifth "visibility factor," Texas' choice of a 0.5 deciview ("dv") threshold as a benchmark for total visibility improvement was entirely reasonable. As we discuss in our proposal:[365]

> In evaluating and dismissing the estimated visibility benefit from the control set identified by the TCEQ, the TCEQ states that the estimated benefit is not perceptible (less than 1 dv) and that it is less than 0.5 dv, the threshold used under BART requirements used to determine if a facility contributes to visibility impairment. The 0.5 dv BART threshold referred to applies to the maximum anticipated visibility impact on a single day due to the short-term maximum actual baseline emissions from a single facility, compared to clean background

[364] For example, in VISTAS states, to select the specific point sources that would be considered for each Class I area, VISTAS first identified the geographic area that was most likely to influence visibility in each Class I area and then identified the major SO_2 point sources in that geographic area. The distance-weighted point source SO_2 emissions (Q/d) were combined with the gridded extinction-weighted back-trajectory residence times. The distance-weighted (Q/d) gridded point source SO_2 emissions were then multiplied by the total extinction-weighted back-trajectory residence times on a cell-by-cell basis and then normalized. VISTAS Area of Influence Analyses, 2007, is available in the docket for this action.

[365] 79 FR 74840.

conditions. The reasonable progress analysis presented by the TCEQ contemplates the visibility benefit anticipated for an average tpy emission reduction (as opposed to the impact from the total short-term maximum emissions from the sources) averaged across the 20% worst days, which would be anticipated to be significantly lower. See our FIP TSD for a detailed discussion of the different metrics and modeling typically used for BART and reasonable progress analyses. Furthermore, in a situation where the installation of BART may not result in a perceptible improvement in visibility, the visibility benefit may still be significant, as explained by the Regional Haze Rule:[366]

> Even though the visibility improvement from an individual source may not be perceptible, it should still be considered in setting BART because the contribution to haze may be significant relative to other source contributions in the Class I area. Thus, we disagree that the degree of improvement should be contingent upon perceptibility.

As we stated in our Oklahoma final decision:[367]

> Given that sources are subject to BART based on a contribution threshold of no greater than 0.5 deciviews, it would be inconsistent to automatically rule out additional controls where the improvement in visibility may be less than 1.0 deciview or even 0.5 deciviews. A perceptible visibility improvement is not a requirement of the BART determination because visibility improvements that are not perceptible may still be determined to be significant.

We further discuss in depth why Texas' choice of a 0.5 dv visibility threshold, including the manner in which it was applied, was not appropriate in our response to comments on consideration of cost versus visibility.

In support of its assertion, GCLC cites to our proposal to approve portions of Idaho's regional haze SIP. GCLC states that therein, we stated that we "independently evaluated whether there are reasonable control measures available for sources located within Idaho's regulatory jurisdiction" and concluded that facilities with visibility impacts of 0.5 dv or less at the nearest Class I area were "relatively small." Therefore, concludes GLCC, we concluded in Idaho that additional controls for "reasonable progress purposes [were] not reasonable at [that] time, because even though there [were] cost effective controls identified, visibility improvement [was] anticipated to be relatively small." For Idaho, we conducted a Q/d analysis (as we did for Texas). However, in Idaho's case, we relied on CALPUFF modeling results to assess visibility impacts of the identified sources. In assessing visibility benefits from potential controls, Texas extrapolated results from CAMx modeling to estimate the visibility improvement due to all the

[366] 70 FR 39130.
[367] 76 FR 81739.

identified controls in their analysis.[368] As we have discussed in our FIP TSD and separate response to comments, the results of our CAMx modeling (or Texas' extrapolated results based on CAMx modeling) cannot be directly compared to the results of CALPUFF modeling, which was used in the vast majority of other BART determinations and some reasonable progress determinations, because of differences between the models, model inputs, and metrics used.[369] Many of these differences result in CAMx modeled visibility impacts and benefits that are much lower than the CALPUFF modeled visibility impacts and benefits relied on in other actions. Consequently, we do not believe our proposed action in Idaho conflicts with our proposed Texas/Oklahoma FIP. We address Luminant's footnote to our Oregon action in our response to another comment.

CCP alleges inconsistency with our New York action. This reference, as with other similar references made by commenters alleging actions in which we rejected visibility results as being too small to justify the expense of controls, used CALPUFF modeling. As we explain in our FIP TSD[370] and elsewhere in our response to comments, technical issues related to the applicability of CALPUFF barred us from using it in our proposed action. We also explained why the results from our proposed model CAMx, cannot be compared to CALPUFF results. As a consequence, we disagree with CCP.

In light of the above, we do not agree that Texas' choice of a 0.5 dv threshold as a benchmark for total visibility improvement was reasonable.

Comment: Luminant stated that EPA's second guessing of the consultation between Oklahoma and Texas is in stark contrast to how EPA has treated other states. For example, EPA's action on Mississippi's regional haze SIP illustrates the proper deference owed to an agreement between states as to the level of reductions necessary. Mississippi considered potential controls on Plant Watson due to possible impacts at the Breton Wilderness area in Louisiana.[534] Following the consultation process between Louisiana and Mississippi, Louisiana asked for no further reductions from Mississippi.[535] EPA found that because the two states came to the agreement that no further reductions were required, it was proper for Mississippi to not impose further controls on Plant Watson.[536] In the final rule, EPA stated: "MDEQ has met its obligations with regard to obtaining emissions reductions since no additional control measures specific to Mississippi were identified by the Louisiana reasonable progress analysis."[537] Further, "[s]ince Breton is in Louisiana, EPA believes that Mississippi appropriately relied on Louisiana's

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[368] See our extended discussion of the difference between CALPUFF and CAMx modeling in our FIP TSD, beginning on page A-35 and our response to comments on modeling.

[369] See the Modeling section of the this document and our FIP TSD, beginning on page A-35, in which we explain why key differences in CALPUFF for BART and CAMx modeling for RP preclude the comparison of their respective results. Some of the major differences are: (1) CALPUFF uses maximum 24-hour emission rates, while CAMx uses annual average emission rates; (2) CALPUFF focuses on the day with the 98th percentile highest visibility impact from the source being evaluated, whereas CAMx focuses on the average visibility impacts across the 20% worst days regardless of whether the impacts from a specific facility are large or small; and (3) CAMx models all sources of emissions in the modeling domain, which includes all of the continental U.S., whereas CALPUFF only models the impact of emissions from one facility without explicit chemical interaction with other sources' emissions.

[370] FIP TSD, Appendix A. See discussion beginning on page A-35.

determination of which sources to prioritize for reasonable progress control evaluation during this implementation period."[538]

Response: Each review of a regional haze SIP is fact specific, making it difficult to apply the type of broad generalizations made by Luminant in its comment. Luminant is correct that EPA accepted the assessments of Louisiana and Mississippi that no additional emissions reductions were necessary from sources in Mississippi to ensure reasonable progress at Breton Wilderness area in Louisiana. That EPA deferred to the States' judgment as to the necessary measures in the Mississippi SIP, however, does not mean that the Agency's disapproval of the consultation between Texas and Oklahoma is improper.

One aspect of the consultation between Mississippi and Louisiana worth noting is that the two states were members of two different RPOs. Mississippi participated in VISTAS and used for its reasonable progress analysis the VISTAS' area of influence (AOI) methodology to identify those sources with potentially significant visibility impacts on Class I areas in other states. Plant Watson was one of two facilities that met the AOI criteria for potential visibility impacts at Breton NWA in Louisiana. Mississippi evaluated Plant Watson for potential controls but found that Plant Watson was subject to CAIR and indicated in its SIP that controls for NOx and SO_2 were planned for the larger of its two units.[371] Mississippi evaluated these projected reductions and the analysis developed in promulgating CAIR when considering the four reasonable progress factors. Mississippi also considered and provided information on the four factors for the other identified facility, Dupont DeLisle. Mississippi notified Louisiana (via consultation) about its findings. Louisiana, a member of CENRAP, relied on a different modeling and methodology to identify possible impacts from other states on Breton. Specifically, Louisiana relied on the source apportionment results from the CENRAP modeling and the Alpine Geophysics report developed for CENRAP. CENRAP source apportionment modeling showed that emissions from Mississippi were projected to contribute 5.26% of the total visibility impairment at Breton in 2018 compared to 24.7% from Louisiana emissions. The CENRAP modeling used by Louisiana in establishing the RPGs for Breton assumed the anticipated SO_2 and NOx controls at Plant Watson and projected significant visibility improvement at Breton.

During consultation, Louisiana and Mississippi discussed reductions at BART facilities. Mississippi identified two subject to BART sources (Mississippi Phosphates and Chevron refinery – Pascagoula) within 50 km of Breton. Due to BART and consent decree requirements on these sources, significant reductions in visibility impairment due to these nearby facilities was anticipated at Breton. Louisiana informed Mississippi (again via the consultation process) that regional modeling and other findings based on existing and proposed controls arising from local, state, and federal requirements indicated that Breton Island is expected to meet the uniform rate of progress goal and that it did not need additional reductions from Mississippi beyond those reductions anticipated due to BART, CAIR and other on-the-book requirements in order to ensure reasonable progress at Breton for the first planning period. Mississippi agreed that no additional controls were identified or needed for making reasonable progress at Breton for this planning period.

[371] In contrast, as Texas itself has noted in its SIP, the IPM model analysis used by CENRAP predicts that by 2018 EGUs in Texas will purchase approximately 125,000 tpy of emissions allowances from out of state. See Texas Regional Haze SIP, page 10-9.

There are key differences in the factual background informing the consultations between Louisiana and Mississippi and those of Oklahoma and Texas. As explained more fully elsewhere in our final action and this document, information made available by CENRAP demonstrated the significant impact of Texas emissions, particularly Texas point sources, at the Wichita Mountains and the potential for cost-effective controls at some of these sources. Recognizing this, Texas used the CENRAP analysis as a starting point, and performed supplemental analyses for both its reasonable progress and long-term strategy demonstrations. Visibility impacts from Texas sources on Wichita Mountains in Oklahoma were projected by CENRAP to be a significant portion of the total visibility impairment (28%). And there was, at the very least, a partial remedy in the form of cost effective controls on those Texas sources with the largest impacts on visibility.

Although Oklahoma and Texas were aware that Texas sources significantly impact the visibility at the Wichita Mountains and that cost-effective controls resulting in large emission reductions were likely available on some of these sources, Texas determined that no additional controls were reasonable based upon its technical analysis and Oklahoma did not pursue this point in its consultations by either asking Texas to further investigate these sources or request additional reductions from Texas, despite noting that additional reductions in Texas would be needed to make progress towards the natural visibility goal. The analysis and information relied on by Texas and Oklahoma during consultations does not support the determination that no additional controls in Texas were reasonable or support Oklahoma's determination that the established reasonable progress goal is proper.

As discussed in our proposed action, because Oklahoma adopted a reasonable progress goal that provides for a slower rate of visibility improvement than the uniform rate of progress, 51.308(d)(1)(ii) requires a demonstration based on the four factors that the established goal is reasonable and that meeting the uniform rate of progress is not reasonable. Oklahoma must also consider the uniform rate of progress and the emission reductions measures necessary to achieve it for this planning period.[372] Given the significant impact from Texas sources, and EGUs in particular, Oklahoma could not reasonably consider all the emission reductions needed to meet or approach the URP without considering emission reduction measures available for those sources in Texas that contribute the most to visibility impairment at Wichita Mountains.

Recognizing that the information made available by CENRAP indicated the significant impact of Texas emissions and potential for cost-effective controls, Texas used the CENRAP analysis as a starting point, and performed supplemental analysis for both its reasonable progress and long-term strategy demonstrations. However, that additional technical analysis performed by Texas was flawed and therefore did not provide the type of information necessary to fully evaluate the reasonableness of controls at Texas sources with the largest potential to impact visibility at its own Class I areas and the Wichita Mountains. Allowing this lack of adequate information to continue was a critical misstep for ODEQ in setting its reasonable progress goals, and a critical misstep for Texas when determining its fair share of emissions reductions under the long-term strategy requirement. The plain language of the CAA requires that states consider the four factors used in determining reasonable progress in developing the technical basis for the

[372] 40 CFR 51.308(d)(1)(i)(B)

reasonable progress goals both in their own Class I areas and downwind Class I areas. Such documentation is necessary so that interstate consultations can proceed on an informed basis, and so that downwind states can properly assess whether any additional upwind emissions reductions are necessary to achieve reasonable progress at their Class I areas. Therefore, Texas had an obligation to provide appropriate information to Oklahoma so it could establish a proper progress goal for the Wichita Mountains. Further, Texas had an obligation to conduct an appropriate technical analysis, and demonstrate through that analysis (required under (d)(3)(ii)), that it provided its fair share of emissions reductions to Oklahoma. In the review of the Texas and Oklahoma SIPs, we were compelled to disapprove the Texas technical analysis because of its flaws and consequently perform our own technical analysis. In summary, Texas was required through the consultation process to provide Oklahoma the information it needed to establish its reasonable progress goals for the Wichita Mountains, and it failed to do so.

In contrast, Louisiana, concluded that Breton Island was projected to be making reasonable progress towards the goal of natural visibility conditions considering all on-the-book controls, BART controls at Mississippi sources near Breton Island were anticipated to provide additional reduction in visibility impairment, and the majority of the visibility impairment at Breton was due to impacts from Louisiana sources. In consideration of all this information, Louisiana's determination that no additional controls were necessary at this time to address the impact from Mississippi sources was not unreasonable. Similarly, Mississippi's agreement with this assessment was also not unreasonable.

Comment: CCP stated that the EPA is requiring more from Oklahoma and Texas regarding consultation than it has previously required via rule, guidance and other SIP approvals. For example, in Michigan, EPA approved interstate consultation efforts even when Michigan did not offer additional controls for a Class I area not meeting its glide path until 2209. See Michigan SIP Approval, 77 Fed. Reg. 46,917 (Aug. 6, 2012) ("By coordinating with the MRPO and other RPOs, Michigan has worked to ensure that it achieves its fair share of overall emission reductions"). In Kentucky, EPA concluded that Kentucky adequately addressed the consultation requirements by determining that sources were meeting more stringent requirements than regional MANE-VU recommendations. Kentucky SIP, 76 Fed. Reg. at 78,213. As previously mentioned, EPA found that a level of 0.2 dv improvement was too low to justify additional controls in Arkansas. See 77 Fed. Reg. 14,604, 14,625 (March 12, 2012). To the extent EPA is inconsistently requiring more stringent requirements in Texas and Oklahoma than allowed elsewhere, this is a violation of CAA regional consistency requirements. See 40 C.F.R. § 56.3(a) and (b); National Environmental Development Ass'n's Clean Air Project v. EPA, 752 F.3d 999 (D.C. Circ. 2013).

Response: We agree that EPA approved Michigan's interstate consultation efforts with Minnesota and other states even though natural conditions would not be achieved for some time at certain Class I areas in those states.[373] CCP's comment appears to specifically reference

[373] We determined in considering this comment that an error was made in the Federal Register notice addressing EPA's review of the Michigan regional haze SIP cited by the commenter. The Federal Register notice states that based on the rate of progress anticipated for Voyageurs National Park located in Minnesota, natural conditions on

Voyageurs National Park, a Class I area in Minnesota. With regards to Michigan's impact on visibility conditions at this Class I area, Minnesota determined (and Michigan agreed) that Michigan sources were not a significant source of visibility impairing emissions for this planning period. Emissions from Michigan accounted for less than 3% of the total visibility impairment at either of the Minnesota Class I areas, and both states agreed that no additional reductions at Michigan sources were necessary for reasonable progress at the Minnesota Class I areas.

During the regional haze planning process, Michigan also consulted with several northeastern states in the MANE-VU RPO but ultimately determined that emissions from Michigan sources contributed very little to the visibility impairment at Class I areas in Maine, New Hampshire, New Jersey, and Vermont. Photochemical modeling showed that Michigan contributed no more than 5% of the total visibility impairment at any other state's Class I area. The State also concluded that significant reductions were anticipated from BART, and therefore additional controls beyond anticipated reductions from CAIR, BART and other on-the-book measures were not needed to address Michigan's impacts on other states. We note that EPA disapproved Michigan's BART determinations at two facilities and promulgated a FIP requiring additional reductions in emissions from these sources. This is in direct contrast to Oklahoma and Texas, where the CENRAP analyses show significant impacts from Texas sources are impeding progress towards natural visibility conditions in Oklahoma and that visibility impacts from Texas sources on Wichita Mountains in Oklahoma were projected to be a very significant portion of the total visibility impairment (28%) at Wichita Mountains, even after anticipated reductions due to CAIR compliance and other "on the book" requirements.[374] Texas, acknowledging this information, performed its technical analysis to identify reasonable controls and in developing its long-term strategy.

With respect to Kentucky's SIP, our approval of the consultation elements was consistent with our other actions. The MANE-VU states of Maine, New Hampshire, New Jersey, and Vermont identified Kentucky as a contributor to visibility impairment in their states and requested that Kentucky reduce its SO_2 emissions. In particular, these states requested that Kentucky require 90% control on 14 of its EGU stacks. Kentucky, a member of the VISTAS RPO, evaluated its sources for impacts on other state's class I areas and determined that no emission units had an impact over the threshold selected by Kentucky and many of the VISTAS states to identify units for additional analyses. Although Kentucky did not agree that its sources had significant impacts on visibility in the northeast, in response to the MANE-VU states' request, Kentucky noted that all but one of the 14 identified EGU stacks either had existing SO_2 controls or would be controlled by 2015. Again, this is in contrast to the circumstances and decisions reached by Oklahoma and Texas.

Regarding the comment that EPA found that a level of 0.2 dv improvement was too low to justify additional controls in Arkansas, CCP misrepresents or fails to understand EPA's decision,

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the 20% worst days would occur by 2209. See 77 FR 46,912, 46,919. EPA intended to state, however, that Seney Wilderness Area, a Class I area in Michigan would attain natural conditions by 2209 if the improvement in visibility at this area over the period of the first Michigan regional haze SIP were projected forward. The error, however, is not significant in the context of the comment above as natural conditions on the 20% worst days at Voyageurs National Park is not projected to occur until 2177

[374] As discussed elsewhere, there are no additional reductions due to BART on non-EGU sources in Texas.

and its comment does not provide the proper context about the decision as it relates to appropriate interstate consultation. We note that the estimated visibility impairment contribution from ***all*** sources in Arkansas on Wichita Mountains was 2.3% of the total extinction. For proper context, compare this with the estimated 1.5% total contribution from just ***a single source*** (i.e. Big Brown) at Wichita Mountains. Modeling results showed that complete removal of Arkansas' contribution would result in the 0.2 dv improvement in 2018 at Wichita Mountains. Both Arkansas and Oklahoma agreed, through consultation, that additional reductions from sources in Arkansas for reasonable progress at Wichita Mountains was unnecessary, and EPA agreed that the consultation was satisfactory. The same conclusion could not be made regarding the consultation between Oklahoma and Texas as the magnitude of emission reductions and associated visibility benefits to Wichita Mountains due to controls on Texas' sources was much more significant relative to Arkansas' impact on Wichita Mountains.

We accordingly do not agree that EPA has been inconsistent in its review of the regional haze SIPs or that we have violated the federal regional consistency rule requirements. We discuss National Environmental Development Ass'n's Clean Air Project v. EPA above.

Comment: The TCEQ stated that the EPA has viewed similar consultations in other state SIPs, using the same CENRAP information, as meeting the RHR requirements for long-term strategy consultations. A case in point is Arkansas's regional haze plan. The CENRAP modeling that the EPA now finds lacking for Texas and Oklahoma's consultation was perfectly fine for Arkansas. It demonstrated that visibility impairment from Arkansas sources at Hercules Glades in Missouri was projected to increase during 2002-2018. In consultations with Missouri, Arkansas made no commitment for additional controls beyond those already factored into CENRAP's modeling for 2018. All states agreed with this determination, including Missouri. Yet, with no further explanation, the EPA approved Arkansas' consultation and its determination that no additional controls were necessary, as consistent with the RHR, even though the data that was clearly available to everyone showed impairment at Hercules Glades due to Arkansas' sources would increase (76 FR 64186, 64216).

Response: The comment by TCEQ does not accurately reflect our proposed action on the Arkansas regional haze and does not take into account the context of our action on the interstate consultation between Arkansas and Missouri. Primarily, we note that the analyses done by CENRAP showed that the visibility impairment at Hercules Glades in Missouri attributable to emissions from Arkansas' sources was projected to ***decrease*** during the 2002-2018 time period. (See Figures E-6c and E-6d in AR020.0121 CENRAP-Appdx-A-F-TSD-Draft3_e51.pdf available in docket EPA-R06-OAR-2015-0189). However, as shown in Table 12 of the proposed action that the commenter is referencing, Arkansas' percentage contribution to the total impairment at Hercules-Glades was projected to increase. This is because, in a relative sense, the visibility impairment contribution from other geographic areas is decreasing faster than that of Arkansas, and thus, in percentage terms, the contribution from Arkansas is increasing. Both Missouri and Arkansas appropriately factored the visibility improvement resulting from on-the-book requirements and anticipated BART reductions, as demonstrated in the CENRAP modeling analysis, into their consultation process resulting in their mutual agreement that Arkansas was achieving its share of reductions at Hercules-Glades and that no additional controls were needed on Arkansas' sources. Missouri and Arkansas determined that their Class I areas are making reasonable progress towards the goal of natural visibility during the first planning period and that it was reasonable to not request reductions from other states at this time.

Comment: Xcel Energy stated that the EPA is requiring significantly more from Oklahoma and Texas with respect to the consultation process than it has previously required via rule, guidance and other SIP approvals. In adopting its regional haze regulatory guidelines, EPA noted that, if States determine that no further controls are needed in a particular planning period, States must merely *document* "any consultations with other States in support of their conclusions." RHR, 64 Fed. Reg. at 35,721-22. Texas and Oklahoma did this. *See* Texas SIP, at App. 4-2.

Xcel Energy noted that the EPA also appears to be arbitrarily taking a harder line in reviewing Texas' and Oklahoma's consultation efforts than it has taken with other states. In other recent regional haze SIP actions, EPA concluded that interstate consultation requirements were met, even though there was substantially less consultation than the discussions between Oklahoma and Texas:

- In Michigan, EPA found adequate consultation even when Michigan did not offer additional controls for a Class I area not meeting its glide path until 2209. *See* Proposed Michigan SIP Approval, 77 Fed. Reg. at 46,917 ("By coordinating with the MRPO and other RPOs, Michigan has worked to ensure that it achieves its fair share of overall emission reductions").

- In Arkansas, EPA concluded that Arkansas met consultation requirements based on three calls with states and concurrence in the conclusion that controls in other states are not necessary. Proposed Arkansas SIP Approval/Disapproval, 76 Fed. Reg. 64,186, 64,196 (Oct. 17, 2011).

- In Kentucky, EPA found that Kentucky adequately addressed the consultation requirements by determining that sources were meeting more stringent requirements than regional MANE-VU recommendations. Kentucky SIP Approval, 76 Fed. Reg. at 78,213.

Xcel Energy argued that the EPA cannot make inconsistent conclusions on the adequacy of the consultation process between Oklahoma and Texas as compared to other States without any reference to its rules, guidance and prior SIP approvals.

Footnotes:

[9] Although EPA stated in 2006 that it planned to issue more specific protocols for state consultation, EPA never released such guidance. *See* EPA, Additional Regional Haze Questions, at 11 (2006).

Response: Xcel cites to two pages from the 1999 Regional Haze Rule that contain EPA's responses to comments related to EPA's proposal to require all States to submit regional haze SIPs, including those without Class I areas. After explaining the statutory and technical basis for its final decision that all States contain sources whose emissions are reasonably anticipated to contribute to visibility impairment and must therefore submit regional haze SIPs, we summarized the overall import of that decision:

> As noted in the proposal, EPA is not specifying in this final rule what specific control measures a State must implement in its initial SIP for regional haze. That determination can only be made by a State once it has conducted the necessary technical analyses of emissions, air quality, and the other factors that go into determining reasonable progress. The EPA also recommends the coordination of resulting strategies for regional haze with strategies needed to attain the PM2.5 NAAQS. The EPA anticipates that as a result of the more refined analyses required by this rule, some States may conclude that control strategies specifically for protection of visibility are not needed at this time because the analyses may show that existing measures are sufficient to meet reasonable progress goals. The EPA is requiring States to document their analyses, including any consultations with other States in support of their conclusions that further controls are not needed at this time. The EPA believes that there is more than sufficient evidence to support our conclusion that emissions from each of the 48 contiguous States may be reasonably anticipated to cause or contribute to visibility impairment in a Class I area.

64 FR at 35721. On the following page, in response to comments that we had sufficient information to exclude all or part of some States from the regional haze program, we stated:

> [T]he EPA believes that a State wishing to demonstrate that it does not contribute to visibility impairment in any Class I area will need to provide information showing that it has consulted with other potentially affected States to assist EPA in assuring that the State's demonstration is not contradicted by evidence presented by other States

64 FR at 35722. Read in context, there is nothing in the preamble language cited by Xcel to suggest that EPA viewed its regulations as requiring States to "merely *document*" the fact that consultation took place to satisfy the requirements that each state obtains it share of emission reductions needed for reasonable progress. As the first excerpted paragraph makes clear, states that conclude that existing control measures are sufficient to ensure reasonable progress in a downwind Class I area must document *their analyses supporting this conclusion*, in addition to documenting the consultation process. As to the second paragraph, the preamble language addresses the possibility that a State may have information demonstrating that it does not, in fact, contribute to visibility impairment in a neighboring State's Class I area. Again, nothing in this language suggests that all that is required is evidence that the State consulted with the neighboring state.

We have addressed Xcel's comments regarding Michigan and Kentucky above and largely addressed its comments regarding Arkansas. With respect to Xcel's comment implying that because other states did not have as many consultative discussions as did Oklahoma and Texas, there was "less" consultation among those other states, we disagree that the interstate consultation requirements are measured by or satisfied by the number of separate discussions or the time spent in discussions among states. To satisfy the interstate consultation requirements, two (or more states) must reach appropriate conclusions about what constitutes reasonable progress at a particular Class I area based on careful consideration of the facts. As the commenter indicates, we did indeed take a hard look at the consultation efforts between Texas and Oklahoma; however, we did so because both states -- while acknowledging the very significant visibility impact from Texas sources at Wichita Mountains, and the lack of progress towards natural visibility conditions, and the availability of cost-effective controls on some of these sources-- nevertheless determined that no additional controls were necessary. Their analysis did not yield enough information to support this conclusion. The number of discussions between Texas and Oklahoma was not relevant to our proposed decision.

Comment: Luminant stated that EPA's actions with respect to Nebraska and South Dakota unravel EPA's new theory of the need and justification for "simultaneous" action on Texas's and Oklahoma's regional haze plans, and its interpretation of 40 C.F.R. § 51.308(d)(3)(ii) that underlies the theory (discussed below). Commenters on EPA's action for Nebraska asserted that, where one state's RPG is determined to be "not sufficient" (i.e., not "approvable"), "each state participating in the regional planning process for the applicable Class I area [must] be required to re-evaluate their LTS and make appropriate revisions to ensure they met their apportionment of emission reduction obligations necessary for achieving reasonable progress."[565] EPA disagreed with this comment, and explained that the process works in a fundamentally different way. EPA explained that states look to "air quality modeling performed by the RPOs" "[t]o set RPGs."[566] EPA further explained that there is "an inherent amount of uncertainty in the assumed emissions from all sources" and that when a state's final action "deviate[s] from what was included in the modeling," the remedy is for affected states to "consider asking [the contributing state] for additional emission reductions" "during subsequent periodic progress reports and regional haze SIP revisions."[567]

Luminant noted that EPA's proposed action here cannot be squared with its actions in connection with the Nebraska and South Dakota SIPs. EPA claims here that "[t]o properly assess whether Oklahoma had satisfied the reasonable progress requirements," it "had to review and evaluate Texas' regional haze SIP before proposing action on Oklahoma's RPGs."[568] But this is fundamentally at odds with EPA's explanation in its Nebraska/South Dakota action that states fulfill their statutory obligations by consulting and making assumptions together to develop their regional haze SIPs, and then make adjustments in future planning periods as necessary. As discussed above, EPA's prior explanation of the correct process is consistent with its regional haze regulations, and its current and novel interpretation is not. Further, while EPA now claims that "[i]n order to address these intricately intertwined issues between Oklahoma and Texas, it is appropriate to review them simultaneously,"[569] Oklahoma and Texas are no more "intertwined" than any other two states that must consult over out-of-state impacts. Indeed, the long distances between Texas sources and Oklahoma's Class I area—and the negligible visibility impacts involved—make Texas and Oklahoma less "intertwined" than most other states. There is no justification for EPA's approach here. And if EPA wants to require states to follow its new approach to regional haze planning, it must amend its regulations to establish a new consultation process, but it cannot impose one by fiat and use it to retroactively judge the Texas and Oklahoma submissions.

Luminant stated that EPA's proposed disapproval of Texas's long-term strategy is fundamentally inconsistent with EPA's prior action on Nebraska's long-term strategy, underscoring the error in EPA's proposal. Nebraska, like Texas, is a CENRAP state and participated with neighboring states in the CENRAP regional planning process.[54]

GCLC noted that EPA's analysis directly conflicts with its recent decision on Nebraska's regional haze SIP, where it found that Nebraska's SIP complied with the LTS requirements. In the SIP development process, South Dakota (the state with Class I areas potentially impacted by Nebraska) had the opportunity to comment on Nebraska's SIP, but "did not ask for additional reductions from Nebraska."[55] Given South Dakota's action, EPA found that Nebraska had "demonstrate[d] that it has included all measures necessary to obtain its share of the emission reductions needed to meet the RPGs for Class I areas where it causes or contributes to impairment" and had met its LTS obligations to South Dakota.[56] According to GCLC, an important factual distinction exists between the Nebraska-South Dakota cooperation, compared to the Texas-Oklahoma cooperation, further underscoring that EPA's proposal here is unjustified. In the Nebraska SIP process, Nebraska represented to South Dakota that it would impose sulfur dioxide ("SO_2") emission limits on a specific BART emissions source that it ultimately did not adopt.[57] EPA, rather than disapproving of Nebraska's LTS for failing to include this measure that South Dakota relied on, recommended addressing this issue in the second planning period.[58] With regard to the Texas SIP, Texas' long-term strategy includes all of the actions it agreed with Oklahoma to take, and thus there is no basis for EPA's proposed additional controls. But even if there were, those issues should be addressed in the next planning period, consistent with EPA's action on the Nebraska SIP. This lack of basis for EPA's action, as well as the inequality between the different SIP review processes, simply does not make sense and is arbitrary and capricious.

Luminant stated, that even where it is later determined that the contributing state's long-term strategy is not, in fact, adequate to meet the established goal, that is "not grounds for disapproving either [states'] SIP" and issuing a FIP, as EPA itself found in approving Nebraska's SIP.[616] Rather, the proper course is for the states "to consider whether other reasonable control measures are appropriate to ensure reasonable progress ***during subsequent periodic progress reports and regional haze SIP revisions***. "[617] Thus, EPA's attempt here to "simultaneously conduct[] reasonable progress and long-term strategy analyses" is fundamentally at odds with the regulations and EPA's prior application of those regulations.[618]

Footnotes:
[547] Id. at 40,155.
[55] Nebraska SIP Final Rule, 77 Fed. Reg. at 40155.
[56-58] Id.
[614] 64 Fed. Reg. at 35,735 ("The EPA expects that much of the consultation, apportionment demonstrations, and technical documentation will be facilitated and developed by regional planning organizations. We expect, and encourage, these efforts to develop a common technical basis and apportionment for long-term strategies that could be approved by individual State participants, and translated into regional haze SIPs for submission to EPA.").
[615] 77 Fed. Reg. at 40,155.
[616] Id.
[617] Id. (emphasis added).
[618] FIP TSD at 5.

[619] See EPA, Pre-Meeting Materials for the EPA-FLM-RPO-States-Tribes Meeting on the Future of the Regional Haze Program (Feb. 3, 2015).
[565] 77 Fed. Reg. at 40,155.
[566] Id.
[567] Id. at 40,155–56 (emphasis added).
[568] 79 Fed. Reg. at 74,821.
[569] Id. at 74,822.

Response: Luminant and GCLC comment that EPA's actions on Nebraska's and South Dakota's regional haze SIPs are inconsistent with EPA's proposed action on Texas and Oklahoma. Nebraska, like Texas, was found to impact visibility in a Class I area outside its borders. In particular, although Nebraska does not have a Class I area within its borders, it consulted with South Dakota during the regional haze planning process because of its potential impacts on Class I areas within South Dakota. During the RPO process, Nebraska indicated that it would require one of its large BART sources – Gerald Gentleman Station (GGS) – to install scrubbers to reduce emissions of SO_2 to meet the BART requirements. The modeling used to set the RPGs for the two Class I areas in South Dakota assumed that GGS would reduce its SO_2 emissions, in line with Nebraska's assumed BART determination.[375] Thus, South Dakota implicitly relied on SO_2 emission reductions from GGS in setting its RPGs.

Nebraska ultimately decided to not require GGS to install SO_2 controls for BART, but EPA, in reviewing the Nebraska regional haze SIP, concluded that the State had made significant errors in its BART determination for GGS and disapproved the State's BART determination for GGS. EPA also disapproved Nebraska's long-term strategy to the extent that it relied on its deficient SO_2 BART for GGS to achieve its share of emission reductions needed to meet the reasonable progress goals of other states' Class I areas. In addressing the deficiencies in Nebraska's regional haze SIP, however, EPA did not require SO_2 controls at GGS but rather relied on Nebraska's participation in CSPAR to address these deficiencies.

EPA is currently reconsidering our action on Nebraska's long-term strategy. The Eighth Circuit granted our request for a voluntary remand of our action on the Nebraska long-term strategy on March 19, 2015.[376] In our motion for a voluntary remand, we explained that "EPA is concerned that its present explanation could potentially be construed in a manner that is inconsistent with EPA's interpretation of the relevant statutory and regulatory requirements. Remand is therefore appropriate so that EPA has the opportunity to amend or further explain its rationale for declining to require additional controls as part of the FIP's long-term strategy, to more fully respond to comments submitted by the public, and to take further action if necessary." Therefore, the statements relied upon by the commenter are no longer relevant. We are currently reconsidering the Nebraska long-term strategy as it relates to the South Dakota reasonable progress goals and will take appropriate action in the future.

Comment: Luminant stated that, given EPA's regional haze guidance, it is not surprising that EPA has—prior to this proposal—repeatedly approved reasonable progress SIPs from other

[375] 77 FR. 12,770, 12776 (Mar. 2, 2012).
[376] See Respondent's Motion for Partial Voluntary Remand, Nebraska. v. US EPA (No. 12-3084) and Petition for Review of an Order of the EPA, Nebraska v. US EPA (No. 12-3084).

states that apply the four statutory factors on a source category basis as Texas did. For example, EPA recently approved of Idaho's reasonable progress goals for the Class I areas based on the state's "general level of review for the major source categories." Based on that review, EPA agreed with Idaho that "it is not reasonable to achieve the UPR [sic] in 2018" and approved the state's RPGs.[478] There are many other examples as well where EPA approved reasonable progress goals on a source-category basis. Some of these include:

- Alaska: "For this first Regional Haze Plan, ADEC believes that given the level of improvement needed to reach natural conditions and the level of technical tools available to demonstrate source specific impacts, it is reasonable to conduct the four-factor analysis on the general source categories rather than on individual sources."[479]

- Oregon: "The Department looked at key pollutants and certain source categories and the magnitude of their emissions in applying the four factors."[480]

- Washington: "[The state] decided to focus its four-factor analyses on the resulting set of 10 specific industries and emission source categories."[481]

- Alabama: "The preceding section [of the SIP narrative] (Section 7.6) discusses a general four factor analysis for coal fired units."[482]

According to Luminant, indeed, of particular relevance here, EPA has previously approved of Nebraska's reliance on CENRAP's source category analysis—the same source category analysis that Texas relies on—in partially approving that state's long-term strategy and rejecting calls to require further reductions for the benefit of out-of-state Class I areas.[483]

Footnotes:
[478] 77 Fed. Reg. at 30,256; 77 Fed. Reg. at 66,929.
[479] Alaska 2011 SIP Narrative at 9-9 (emphasis added); 77 Fed. Reg. 11,022, 11035 (Feb. 24, 2012) (proposed approval); 78 Fed. Reg. 10,546, 10,553 (Feb. 14, 2013) (final approval).
[480] Oregon 2010 SIP Narrative at 163 (emphasis added); 77 Fed. Reg. 30,454, 30,461 (May 23, 2012) (proposed approval); 77 Fed. Reg. 50,611, 50,612 (Aug. 22, 2012) (final approval).
[481] Washington 2010 SIP Narrative at 9-5 to 9-7 (emphasis added); 77 Fed. Reg. 76,174, 76,203 (Dec. 26, 2012) (proposed approval); 79 Fed. Reg. 33,438, 33,438 (June 11, 2014) (final approval).
[482] Alabama 2008 SIP Narrative at 79 (emphasis added); 77 Fed. Reg. 11,937, 11,949 (Feb. 28, 2012) (proposed approval); 77 Fed. Reg. 38, 515, 38,519 (June 28, 2012) (final approval).
[483] 77 Fed. Reg. 40,150, 40,156 (July 6, 2012) ("The CENRAP modeling demonstration provided by the State [of Nebraska] considered emissions of all anthropogenic source categories including major and minor stationary sources, mobile sources, and area sources in developing its strategy. With the exception of the SO_2 component of the BART requirements as described elsewhere in this notice, the State has successfully demonstrated compliance with all other remaining elements of the long-term strategy requirements.").

The Associations state that EPA fails to provide a reasoned explanation for disapproving Texas' reasonable progress goals based on Texas' failure to conduct a source-by-source analysis of emission controls when EPA has never required an individual source-based approach in the past. In its prior reviews of State reasonable progress goals EPA has uniformly approved States' reliance on source category-based analyses, even in the face of public comments urging a source-based approach. For example, EPA approved Alaska's regional haze SIP in which the State asserted that "it is reasonable to conduct the four-factor analysis on the general source categories rather than on individual sources." Alaska, *SIP Narrative* 9-9 (2011); 78 Fed. Reg. 10,546 (Feb. 14, 2013) (approving Alaska SIP). Likewise, EPA approved Oregon's reasonable progress goals after the State explained that it "looked at key pollutants and certain source categories and the magnitude of their emission in applying the four factors." Oregon, *SIP Narrative* 163 (2011); 77 Fed. Reg. 50,611 (Aug. 22, 2012) (approving Oregon SIP). EPA also approved Washington's reasonable progress goals after the "state decided to focus its four-factor analyses on … 10 specific industries and emission source categories." Washington, *SIP Narrative* at 9-5 to 9-7 (2010); 79 Fed. Reg. 33.439 (June 11, 2014) (approving Washington SIP).

According to the Associations, it is a well-established tenet of administrative law that "[r]easoned decision making … necessarily requires the agency to acknowledge and provide an adequate explanation for its departure from established precedent." *Dillmon v. NTSB*, 588 F.3d 1085, 1089-90 (D.C. Cir. 2009) (citing *FCC v Fox Television Stations, Inc.*, 129 S. Ct. 1800, 1811 (2009)). Indeed, given that the submitting States relied upon EPA's established guidance and precedents in crafting their SIPs, EPA is required to provide a "more substantial justification" for its disapprovals. *Perez v. Mortgage Bankers Ass'n*, *supra*, *slip op.* at 13. In its proposal to disapprove Texas' reasonable progress goals, EPA fails to even acknowledge, let alone provide a reasoned explanation for, its departure from past precedent where it has approved multiple SIPs based on analyses that were, in all relevant respects, identical to that conducted by Texas.

EPA's adoption of an individual source-based approach is inconsistent with EPA's past practice and with EPA's strict uniformity rule for regional offices. EPA fails to provide a reasoned explanation for disapproving Texas' reasonable progress goals based on Texas' failure to conduct a source-by-source analysis of emission controls when EPA has never required an individual source-based approach in the past. In its prior reviews of State reasonable progress goals EPA has uniformly approved States' reliance on source category-based analyses, even in the face of public comments urging a source-based approach. For example, EPA approved Alaska's regional haze SIP in which the State asserted that "it is reasonable to conduct the four-factor analysis on the general source categories rather than on individual sources." Alaska, *SIP Narrative* 9-9 (2011); 78 Fed. Reg. 10,546 (Feb. 14, 2013) (approving Alaska SIP). Likewise, EPA approved Oregon's reasonable progress goals after the State explained that it "looked at key pollutants and certain source categories and the magnitude of their emission in applying the four factors." Oregon, *SIP Narrative* 163 (2011); 77 Fed. Reg. 50,611 (Aug. 22, 2012) (approving Oregon SIP). EPA also approved Washington's reasonable progress goals after the "state decided to focus its four-factor analyses on … 10 specific industries and emission source categories." Washington, *SIP Narrative* at 9-5 to 9-7 (2010); 79 Fed. Reg. 33.439 (June 11, 2014) (approving Washington SIP).

GCLC stated that EPA has also, on numerous recent occasions, approved of SIPs that did not require source-specific requirements, but rather, looked more broadly at source categories. For example, EPA recently approved the reasonable progress goals submitted by Idaho based on the state's "general level of review for the major source categories."[34]

According to the TCEQ, neither CAA §169A, the RHR, nor the guidance available in 2009 required a unit-by-unit four factor analysis even where the state's RPGs would improve visibility less than the URP. The EPA itself supported the non-source specific four factor analysis approach in reviewing New Mexico's regional haze plan. In a challenge to New Mexico's plan, the EPA "points out that [§51.308(d)(1)(i)(A)] does not require a source-specific analysis."[11]

NRG stated that source-specific analysis also has not been applied by EPA in practice in the reasonable progress context:

- EPA recently defended a state's reasonable progress goals that did not rely on a source-specific analysis, and prevailed before the court: "[W]e reject the environmental groups' argument that the EPA had to engage in a source-specific analysis for a reasonable-progress determination. Nothing in the Regional Haze Rule or the Clean Air CAA required New Mexico to conduct a four-factor analysis of the Escalante plant." *WildEarth Guardians v. EPA*, 770 F.3d 919, 944.

Footnotes:
[34] See Idaho SIP Approval Proposal, 77 Fed. Reg. at 30256; see also Approval and Promulgation of Implementation Plans; State of Idaho; Regional Haze State Implementation Plan, 77 Fed. Reg. at 66929, 66929 (Nov. 8, 2012).

Footnotes:
[TCEQ: 11] See Wildearth Guardians v. EPA, 770 F3d 919, 944
[NRG: 11] 77 Fed. Reg. 38,515 (June 28, 2012) (Alabama); 77 Fed. Reg. 38,501 (June 28, 2012) (Georgia); 77 Fed. Reg. 19,098 (March 30, 2012) (Kentucky); 77 Fed. Reg. 71,533 (Dec. 3, 2012) (Michigan); 77 Fed. Reg. 38,185 (June 27, 2012) (North Carolina); 77 Fed. Reg. 38,509 (June 28, 2012) (South Carolina); 77 Fed. Reg. 24,392 (April 24, 2012) (Tennessee); 77 Fed. Reg. 16,937 (March 23, 2012) West Virginia).
[12] 79 Fed. Reg. at 74,844.

Response: Please see our responses to other comments regarding our obligations under our regional consistency rules.

Developing solutions to the complex problem of regional haze requires effective consultation among states. During the first planning period, the States worked together through regional planning organizations (RPOs) to help develop their regional haze SIPs. To assist in this effort, we provided tens of millions of dollars to the RPOs following the issuance of the 1999 regional haze rule to fund the development of the technical tools and analyses necessary to address regional haze and to facilitate consultation among the States.

The States set up 5 RPOs to address visibility impairment from a regional perspective. The technical analyses done by the RPOs for the first round of regional haze SIPs greatly increased the understanding of the problem of visibility impairment at the federal Class I areas, including that of the specific contribution of different species of pollutants.

We disagree with the fundamental premise of these commenters that our proposal to disapprove portions of the Texas Regional Haze SIP was based on Texas' use of a source category-based analysis in lieu of a source-by-source approach. First, Texas' approach to the reasonable progress and long-term strategy provisions of the Regional Haze Rule cannot be described as a being based on a "source-category" strategy. For instance, Texas did not examine all of the coal-fired power plants (or refineries, cement plants, etc.) in the state and devise an approach that treated them all similarly. Instead, as we describe in our proposal,[377] Texas did, in fact, partially evaluate controls for certain individual sources. In evaluating these controls, Texas employed a large, superficially refined control set consisting of a mix of large and small sources from a number of different source categories located within varying distances of Class I areas.[378] Texas estimated the cost of controls on a variety of source types (albeit in a flawed manner as we describe elsewhere) but abandoned that approach in favor of simply comparing the combined cost of controls on all sources (regardless of their respective categories) against Texas flawed estimate of their combined visibility benefit. This strategy is neither based on a source category approach, nor is it based on a source-by-source approach. Therefore, comparisons of Texas' approach to reasonable progress and long-term strategy against those of states that may have used a category approach are not valid. We understand many of these comments arose because our proposal included a statement that "individual sources were not considered by the TCEQ." This statement was not offered to propose a basis for disapproval, but we understand it is susceptible to being taken out of context (particularly in consideration of the comments received). It is perhaps more plain to state that individual sources were not *effectively* considered by the TCEQ.

Second, whatever its label, we proposed to disapprove Texas' reasonable progress analysis because it was flawed in several specific ways. A primary flaw was that Texas' potential control set was over-inclusive. It included controls on sources that served to increase the total cost, but which conferred little visibility benefit. As was noted in our proposal,[379] Texas adopted this approach despite evidence in the record of identified source-specific, cost-effective controls that would have resulted in large emission reductions on certain EGUs, and despite source apportionment modeling that identified large impacts from EGU sources in northeast Texas. Our proposal explained that this approach obscured benefits that might be obtained from individual sources and only considered aggregated costs. As we also explained, the submitted analysis failed to study or consider scrubber upgrade candidates. It was accordingly under-inclusive of large, highly cost-effective emissions reductions that would lead to significant improvements in visibility. These points are validated by the technical record for this FIP.

Therefore, whether Texas' analysis is labelled a source category analysis, an analysis of multiple individual sources, or some hybrid, we conclude that it contained serious deficiencies that would materially affect the outcome of the state's SIP process. As a result, we conclude this component of the SIP requires disapproval.

Given the regional differences in the degree of visibility impairment, the pollutants of concerns, and the impacts of fire and international emissions, we did not prescribe a one size fits all approach to reasonable progress. The RPOs accordingly adopted somewhat different approaches to recommending potential measures to ensure reasonable progress. That said, the RPOs and the

[377] See discussion beginning on 79 FR 74838. See also the Texas SIP, Appendix 10-1: Analysis of Control Strategies and Determination of Reasonable Progress Goals: Texas identified individual sources as possible candidates for controls under reasonable progress, and did not limit the consideration of the statutory factors to source categories.

[378] For example, the control set evaluated by Texas included specific EGUs, carbon black plants, inorganic chemical plants, paper mills and other sources.

[379] 79 FR 74838 ("[W]e believe that individual benefits were masked by the inclusion of those controls with little visibility benefit that only served to increase the total cost figures.")

States all agreed that large stationary sources of SO_2 are the typically the primary cause or one of the primary causes of anthropogenic visibility impairment at this time. In addition, in some regions of the country, the RPOs and the States also recognized NOx as a similarly important cause of visibility impairment.

In our review of the regional haze SIPs, we have attempted to take into account the differences between states in assessing the reasonableness of each state's SIP submittal. For example, in reviewing Alaska's regional haze plan, we took into account the following facts. First, Alaska has relatively pristine air quality, and unlike Texas and Oklahoma, its four Class I areas suffer from only a few deciviews of impairment. In Alaska's Denali National Park, for example, the 20% worst days have only 2.6 dv of impairment and to achieve the uniform rate of progress for the first planning period, Alaska needed only 0.4 dv improvement.[380] In Oklahoma, in contrast, Wichita Mountains has impairment of over 16 dv and requires 3.8 dv of improvement to meet the uniform rate of progress for this first planning period.[381] We also note that, unlike Texas, Alaska was not identified as contributing to visibility impairment at Class I areas in "nearby" states. Beyond the differences in the respective scales of the overall problem, Alaska also demonstrated that according to its 2002 emission inventory,[382] fire accounts for more than half of the of NOx emissions, about 70% of the SO_2 emissions, and over 90% of the PM 2.5 emissions in the state—far greater percentages than in Texas. Thus, the basic facts preclude a direct comparison between what constitutes an acceptable reasonable progress strategy for Alaska versus Texas and/or Oklahoma.

Nevertheless, setting these basic differences aside, the commenters have quoted a sentence from the Alaska SIP narrative that does not provide the complete context of the analysis. Alaska did, in fact, include information from individual sources in its analysis. As discussed in the Alaska SIP narrative at 9-5, for example, the emissions from ***individual*** sources were applied to supplement the modeling analysis used, which was based on the weighted emissions potential (WEP) of source categories with potentially significant visibility impacts. The SIP states: "To provide this insight the percent distribution of emissions from ***individual*** sources was organized into common categories within the point and stationary area source categories (the two anthropogenic categories that may be significantly impacting the Class I sites). The percent distribution of their emissions within each source category, borough and year was applied to the corresponding WEP value for those boroughs shown as potentially having a significant impact at each site (emphasis added)." In addition, throughout the SIP, Alaska points out the significant emission reductions expected from individual sources and how those reductions will ensure reasonable progress.

Of the remaining anthropogenic emission sources in Alaska, a significant fraction comes from marine and aviation emissions, two categories that Alaska concluded it lacked authority to regulate under the CAA. As a result, anthropogenic point source emissions constitute a much smaller fraction of the problem for Alaska's Class I areas than for other states. Of those anthropogenic point sources, Alaska determined that one was subject to BART and undertook a source specific analysis that required the installation of controls. Alaska also noted that another

[380] 77 FR 11022, 11027-28.
[381] 76 FR at 16,176.
[382] 77 FR 11030.

large point source of emissions would be reducing its emissions pursuant to a consent order, and that another had stopped operating.[383] Given those circumstances, that fact that the Class I Areas are predicted to attain their respective URPs in 2018, and the very low overall degree of visibility impairment at Alaska's Class I areas, we conclude that it was reasonable for Alaska to assess the remaining industrial sources by category. The Texas SIP, in comparison, did not adequately ensure reasonable progress would be achieved at Wichita Mountains.

In considering comments on consistency, we also note that we disagree with assertions by Luminant and others that we are being inconsistent with respect to source category analysis in States in the Pacific Northwest. In Idaho, the State reached the conclusion that no additional controls beyond BART were needed to ensure reasonable progress, based on an evaluation of possible cost-effective controls for certain categories, but the commenters fails to note that we disagreed that the information relied on by Idaho in reaching that conclusion was sufficient. We explained that "the Idaho SIP submittal *did not contain sufficient analysis* to support [the conclusion that no additional control measures were needed].[384] We conducted our own independent screening analysis of individual sources in Idaho. In the end, our analysis supported Idaho's conclusions that additional measures were not necessary in this planning period, and because our ultimate conclusion was the same as Idaho's, we did not disapprove the SIP. The process we followed for Idaho was consistent with the process we followed for Texas, although the resulting conclusions were different.

For Oregon, as in Idaho, EPA took the same approach of supplementing the State's analysis in considering the reasonableness of the State's determination that no additional controls beyond BART were needed to ensure reasonable progress. Specifically, we did our own independent screening of individual sources, and in so doing, we reached the same conclusion as Oregon did that no additional controls were necessary for this planning period.[385] We did not endorse the methodology used by Oregon and therefore, we disagree with the commenter's assertion that we approved the reasonable progress elements of the SIP based solely on an analysis by the State on a source category basis.

Luminant cites to our Washington decision stating that Washington's demonstration was, like Texas' based on a source-category demonstration. As above, we disagree that Texas' approach can be strictly characterized as a source-category approach, and regardless, the type of approach Texas used was not fundamentally at issue. We further disagree that the situations are similar. First, as we note in our proposal,[386] in establishing its RPGs, Washington did not take credit for a number of reductions including almost 10,000 tons of SO_2 reductions that occurred in the 2003 to 2005 timeframe from implementation of various control technologies from the Tesoro, ConocoPhillips, and Shell refineries. Tesoro installed wet FGD on the CO Boiler (Fluidized Catalyst Cracker) in 2005 for a reduction of 4,740 tons/yr SO_2 and is considered BART in Washington's BART determination. Conoco-Phillips installed wet-FGD on its CO boiler for a reduction of 2,041 tons/yr SO_2 which was not included in the WRAP modeling for RPGs. Shell Puget Sound Refining installed wet-FGD on their CO boiler for a reduction of 3,045 t/y SO_2

383 77 FR at 11035.
384 77 FR at 66931.
385 77 FR at 30464.
386 77 FR 76204.

which was not included in the WRAP modeling. Thus, Washington's reductions in visibility impairing pollution were substantially underestimated in the modeling used to establish the RPGs. Second, we see no similarity between Washington's approach to satisfying the reasonable progress requirements and Texas' approach, other than in both instances the states' RPGs were above their respective URPs. Washington did not adopt Texas' approach to RP/LTS, in which individual benefits were masked by the inclusion of those controls with little visibility benefit that only served to increase the total cost figures.[387] For Washington, we stated that considering the additional anticipated visibility improvements due to BART and additional reductions on refineries, additional controls on point sources or other source categories at this time are not likely to result in substantial visibility improvement in the first planning period due to the significant contribution from emissions from natural fire, the Pacific offshore, Canada, and outside the modeling domain.[388] As we demonstrated in our FIP, however, substantial visibility benefits were available from Texas sources.

We also note the state of Washington took individual sources into account when evaluating the four statutory factors. For example, the state considered emission controls under its Reasonably Available Control Technology (RACT) permitting requirements in reaching its conclusions for reasonable progress: "The process in state law called Reasonably Available Control Technology (RACT) requires a detailed valuation of the characteristics of *each existing source* covered by the rule process along with an evaluation of the efficacy of installation of various control equipment. The result of the process is a rule requiring *all units of the defined source category* to achieve a set of defined emission limitations (emphasis added)."[389]

In general, many western states, including Washington, Oregon, Idaho, and Alaska, use and reference analyses provided by the Western Regional Air Partnership (WRAP), including the WRAP's consideration of significant source categories for emission inventory development, source apportionment modeling, modeling to determine the categories most likely to impair visibility in Class I areas, and costs of controls. EPA has not taken issue with those types of analyses and such analyses can be useful in identifying appropriate controls to ensure reasonable progress. However, in cases where those analyses may not satisfactorily provide sufficient information to identify whether or not there are additional reasonable controls available for individual sources under reasonable progress, EPA has acted consistently. Specifically, we have either conducted our own independent analysis or confirmed that the state adequately considered emissions and visibility impacts from individual sources in addition to using the information from the WRAP (or other regional planning body) analyses, based on the underlying evaluations of the sources of visibility impairment in that state. In those instances where we reached the same conclusion as the state, we approved the SIP.

Luminant also points to our action on the Alabama regional haze SIP as another example of EPA approving reasonable progress goals on a source category basis. We note that the language quoted by Luminant in its comment regarding Alabama appears to be drawn from the Alabama SIP narrative rather than from our EPA's assessment of the state's plan. With respect to

[387] 79 FR 74838.

[388] 77 FR 76204.

[389] This "RACT" requirement applies under the State's approved SIP distinct from RACT as may be required CAA Section 172(c)("Nonattainment plan provisions").

Alabama's reasonable progress analysis for its coal fired EGUs in the state, EPA explained how participation in CAIR was expected to result in a 70% reduction in SO_2 emissions from Alabama. 77 FR 38,515, 38519 (June 28, 2012). Given these substantial reductions in SO_2 emissions, we agreed with Alabama that CAIR ensured sufficient progress for coal-fired EGUs for the first planning period. If the commenter is referring to non-EGU coal fired units, there is extensive discussion in the notice regarding Alabama's approach to identifying sources for potential reasonable progress controls through an "area of influence" methodology and the state's approach to consideration of controls for specific sources.[390]

Luminant also points to Nebraska's reliance on CENRAP's source category analysis and our partial approval of Nebraska's long-term strategy. We note that in Nebraska's regional haze SIP, the State determined that EGUs account for almost all potentially controllable emissions of SO_2 and NOx in the State.[391] Three EGUs, in turn, account for over 80% of these emissions. [Id. at 27, Table 8.4] As each of these sources had units constructed between 1962 and 1977, Nebraska considered each in turn to determine whether the facility was subject to BART. It determined that the two largest had impacts that exceeded 0.5 dv and then undertook source specific BART analyses to determine whether controls should be required. Although we disagreed with Nebraska's analyses of these two sources, we do note that the State did not rely on CENRAP's source category analysis in considering controls on these two EGUs that together comprise a significant proportion of the State's controllable SO_2 and NOx emissions, but rather relied on their BART analysis to inform their decision on appropriate controls for these units.[392] To the extent that Nebraska relied on the CENRAP modeling to assess the remaining stationary sources of emissions that are not-BART eligible in the state for reasonable progress, we do not consider that analogous to the situation at issue in Texas, given the differences between the two states in the number and size of sources of visibility impairing pollutants.[393]

TCEQ's and NRG's comments regarding EPA's approval of New Mexico's reasonable progress assessment also do not undermine our action in Texas. As in other states, the question of an appropriate reasonable progress analysis depends on the specific facts. In a petition for review of EPA's approval of New Mexico's regional haze plan, environmental litigants argued that New Mexico had erred by failing to consider the need for reasonable progress controls at Escalante Generating Station. As EPA had noted in its review of New Mexico's SIP, "… NOx emissions from the only subject-to-BART source in New Mexico (evaluated for controls under the BART requirements) are greater than the next 20 largest NOx sources in the State combined…."[394] And as explained in its brief, EPA reasonably approved New Mexico's SO_2 program which covered Escalante. WildEarth Guardians v. EPA, No. 12-9596 (10th Cir.), EPA Respondent's Brief at 59-60. In other words, it is *not* EPA's position that a State must undertake a source specific

[390] See e.g., 77 FR 35820.

[391] Final Nebraska Regional Haze SIP at 20, Table 8.1.

[392] In addition to requiring BART controls at subject facilities, the state also evaluated whether other sources need to be addressed at this time to reach reasonable progress goals. Nebraska regional haze SIP at p5

[393] In addition, the Eighth Circuit granted our request for a voluntary remand of our action on the Nebraska long-term strategy on March 19, 2015. See Respondent's Motion for Partial Voluntary Remand, Nebraska. v. US EPA (No. 12-3084) and Petition for Review of an Order of the EPA, Nebraska v. US EPA (No. 12-3084). We are currently reconsidering the Nebraska long-term strategy as it relates to the South Dakota reasonable progress goals and will take appropriate action in the future.

[394] 77 FR 70702, footnote 7.

analysis of each and every coal-fired power plant within its borders to meet the reasonable progress requirements. What it must do, however, is to reasonably assess the sources of visibility impairing pollutants within the state and potential control strategies.

Most importantly, we note that the commenters have essentially set up a straw man to attack. We did not propose to disapprove the Texas regional haze SIP because the state failed to evaluate the four statutory factors on a source-by-source basis. In fact, as we pointed out in the proposal, Texas did partially evaluate the potential for additional controls for individual sources. However, the analysis was flawed because it did not go far enough to support the state's conclusion that there were no reasonable controls available for reasonable progress. This conclusion contrasted with the fact that Texas had identified very large individual emission sources with cost effective options available to control those emissions. Our decision to require additional controls was supported in part by analyzing the improvement in visibility that was expected to result from controlling specific emission units, which is an element that was lacking in the Texas submittal. As discussed above, there were other states that also reached a conclusion that there were no reasonable additional controls, and similarly to Texas, EPA could not confirm that decision with the available information. In those cases, we conducted our own independent analyses and because our conclusions matched those of the affected states, we approved their SIPs. In reviewing all of the regional haze SIPs, we consistently examined whether or not states rejected potential reasonable progress measures that would have had a meaningful impact on visibility in their Class I areas in ensuring that reasonable progress was achieved during the first planning period. Texas did reject such controls which led to our disapproval of the SIP. Our decisions were not contingent upon whether or not a state evaluated the statutory factors on a source by source basis, but rather, whether or not the conclusion reached by the state was appropriate and that the supporting information was adequate.

Comment: AECT stated that EPA's Proposal evaluates Texas EGUs and other emissions sources using different and more stringent standards than it has used for emissions sources in other states with respect to their Regional Haze SIPs. By way of example, contrary to how EPA's Proposal evaluates Texas EGUs and other emissions sources, for the Regional Haze SIPs for other states, EPA: (i) did not require that determinations of reasonable progress be made on a source-by-source basis; [10] (ii) used a different visibility model;[11] (iii) determined that CSAPR is sufficient to meet reasonable progress requirements, and, thus, did not require any source that complies with CSAPR to install additional emissions control to meet reasonable progress;[12] and (iv) determined that a predicted impact on a Class I area of 0.5 deciview ("dv") was "relatively small" and that a source with a predicted impact on a Class I area at or below 0.5 dv should not be required to install additional emission controls to meet reasonable progress[13].

AECT asserted that EPA's evaluation of Texas EGUs and other emissions sources using different and more stringent standards than it has used for emissions sources in other states with respect to their Regional Haze SIPs is contrary to EPA's regional consistency rules in 40 CFR 56.3(a) and (b). Those rules require EPA to uniformly apply the criteria, procedures, policies, and rules that it employs in implementing the CAA, and to identify and correct regional inconsistencies by standardizing such criteria, procedures, policies, and rules. In a recent decision, the D.C. Circuit

Court of Appeals based its ruling that EPA had acted contrary to law on the requirements of 40 CFR 56.3(a) and (b).[14]

Based on the foregoing, AECT requested that EPA re-evaluate Texas' Regional Haze SIP using the same standards than it has used for other states' Regional Haze SIPs.

GCLC states that EPA has acted inconsistently with prior actions have already been referenced in our comments above (e.g., EPA's actions on the Idaho and Nebraska SIP submissions) but extend far beyond those. This includes EPA's recent approvals of reasonable progress evaluations, where states have taken the same approach and reached the same results as Texas, and EPA has approved them. [70]

Footnotes:

[10] See, e.g., Alaska 2011SIP Narrative at 9-9 and 78 Fed. Reg. 10546, 10553 (Feb. 14, 2013) (final approval); Oregon 2011SIP Narrative at 163 and 77 Fed. Reg. 50611, 50612 (Aug. 22, 2012) (final approval); Washington 2010 SIP Narrative at 9-5 to 9-7 and 79 Fed. Reg. 33438 (June 11, 2014) (final approval); Alabama 2008 SIP Narrative at 79 and 77 Fed. Reg. 38515, 38519 (June 28, 2012) (final approval)

[11] Declaration of Sam Coleman, Nat'/ Parks Conservation Ass'n v. McCarthy, No. 11-01548, at 5 (D.D.C. 2014).

[12] See 77 Fed. Reg. 38515 (June 28, 2012) (Alabama); 77 Fed. Reg. 38501(June 28, 2012) (Georgia); 77 Fed. Reg. 34218 (June 11, 2012) (Indiana); 77 Fed. Reg. 38006 (June 26, 2012) (Iowa); 77 Fed. Reg. 19098 (March 30, 2012} (Kentucky); 77 Fed. Reg. 71533 (Dec. 3, 2012) (Michigan); 77 Fed. Reg. 38007 (June 26, 2012) (Missouri); 77 Fed. Reg. 38185 (June 27, 2012) (North Carolina); 77 Fed. Reg. 39177 (July 2, 2012) (Ohio); 79 Fed. Reg. 24340 (April 30, 2014) (Pennsylvania); 77 Fed. Reg. 38509 (June 28, 2012) (South Carolina); 77 Fed. Reg. 24392 (April 24, 2012) (Tennessee); 77 Fed. Reg. 35287 (June 13, 2012) (Virginia); 77 Fed. Reg. 16937 (March 23, 2012) (West Virginia)

[13] 77 Fed. Reg. 30248, 30256 (May 22, 2012) (Idaho); 77 Fed. Reg. 30454, 30461, 30464 (May 23, 2012) (Oregon)

[14] National Environmental Development Ass'n's Clean Air Project v. EPA, 752 F.3d 999 (D.C. Cir. 2013)

[70] See Approval and Promulgation of Implementation Plans; Region 4 States; Visibility Protection Infrastructure Requirements for the 1997 and 2006 Fine Particulate Matter National Ambient Air Quality Standards, Final Rule, 79 Fed. Reg. 26,143,26,145-46 (May 7, 2014), which included: "Regarding the reasonable progress evaluations, each state at issue focused its reasonable progress analysis on SO_2 emissions based on the conclusion that sulfate particles account for the greatest portion of the regional haze affecting Class I areas in these states. Each state then established areas of influence and contribution thresholds to determine which of its sources should be evaluated for reasonable progress control. EPA approved each state's methodology for identifying units for reasonable progress evaluation and each state's reasonable progress determinations in the respective regional haze SIP actions and provided a detailed discussion of the methodology and the rationale for approval in the Federal Register notices associated with those actions. Contrary to the Commenter's assertions, Alabama, Georgia, Kentucky, North Carolina, and South Carolina did not "exempt [CAIR] sources ... that would otherwise be subject to reasonable progress review." Each of these states considered the four statutory reasonable progress factors in evaluating whether CAIR would satisfy reasonable progress requirements for the state's EGU sector and determined that no additional controls beyond CAIR were reasonable for SO_2 during the first planning period. As discussed in EPA's Reasonable Progress Guidance, states may evaluate the need for reasonable progress controls on a source category basis, rather than through a unit-specific analysis, and have wide latitude to determine additional control requirements for ensuring reasonable progress. The guidance also notes that states may consider emissions reductions from cap-and-trade programs such as CAIR in addition to source-specific controls."

[71] Declaration of Sam Coleman, Nat 'I Parks Conservation Ass 'n v. McCarthy, No. 11-01548, at 5 (D.D.C. 2014). (emphasis added).

Response: We disagree with AECT that we evaluated Texas EGUs and other emissions sources using different and more stringent standards than we used for emissions sources in other states. See our responses to other comments in this section regarding allegations that we have been inconsistent with regard to Texas' supposed source-category approach to reasonable progress and long-term strategy.

We address comments regarding our selection of the photochemical grid model CAMx over CALPUFF to assess visibility impacts and benefits for Texas sources in a separate response to comment. We note that Texas utilized CAMx modeling for BART screening purposes and extrapolated CAMx model results to estimate visibility benefits of additional controls in the Texas regional haze SIP.

Also, as we discuss elsewhere, our Regional Haze Rule requires a state to consider the four statutory factors for reasonable progress even if the state has participated in CAIR or CSAPR. In some cases, a state may have demonstrated, through the appropriate four-factor analysis, that emission reductions and visibility improvement expected from CAIR or CSAPR and other required measures, such as reductions required under BART for non-EGU sources, were sufficient to achieve reasonable progress for the first planning period without imposing additional controls. For those states, EPA approved the SIPs. The four-factor analysis for Texas did not support the state's conclusion that it was achieving reasonable progress without requiring additional controls. That flaw along with others as detailed in our final action was the basis of our FIP, which was not related to a more stringent evaluation for Texas compared to other states.

The commenter also implies that our evaluation of the Texas SIP was different and more stringent compared to other states because, for other states, EPA determined that "a predicted impact on a Class I area of 0.5 deciview ("dv") was "relatively small" and that a source with a predicted impact on a Class I area at or below 0.5 dv should not be required to install additional emission controls to meet reasonable progress." The inference from the commenter that a modeled impact of 0.5 dv is a "bright line" for reasonable progress decision has been improperly taken out of context. The actual passage that the commenter cites is:

> Since all of these sources have Q/d values below 20, EPA believes that their impacts on nearby Class I areas are expected to be less than 0.5 dv. Thus, EPA agrees with Oregon's conclusion that additional controls of non-BART point sources for reasonable progress purposes are not reasonable in the first planning period, because even though there are cost effective controls identified, visibility improvement is anticipated to be relatively small.

The analysis that EPA used for Oregon and in other states cited by the commenter was conceptually different, including the use of a different visibility model and metrics, than that used for evaluating TX's sources. The visibility analysis approach that we used for Oregon is different than the approach in Texas, and thus, drawing conclusions for the Texas sources based on the metrics and technical analysis we used for Oregon is also not appropriate. We discuss the differences in visibility models, model inputs, and metrics used elsewhere in a separate response to comment. We further discuss in depth why Texas' choice of a 0.5 dv visibility threshold, including the manner in which it was applied, was not appropriate in our response to comments on consideration of cost versus visibility.

For all regional haze SIPs, EPA assessed 1) whether or not the state appropriately considered the four statutory factors and adequately demonstrated that it was achieving reasonable progress at its Class I areas, and 2) whether or not the state, after appropriately consulting with other downwind states for which it was contributing to visibility impairment, obtained its share of emission reductions to ensure that the Class I areas of the downwind states were also achieving reasonable progress. For some SIPs, the appropriate supporting technical tools, including the models used, could differ in scope and complexity for a variety of reasons. However, criteria #1 and #2 above were uniformly applied in all cases. Please see our more detailed responses to comments regarding uniformity, but in summary, we disagree with the commenter that we contradicted the requirements of 40 CFR 56.3(a) and (b).

We disagree with AECT that we have violated our regional consistency rules and discuss that allegation in detail in the beginning of this section of our response to comments.

We are unsure of GLCC's point regarding its general comment on Idaho and Nebraska. Specific comments regarding previous actions in Nebraska and Idaho are addressed elsewhere. However as discussed in our responses above, we believe comments regarding Nebraska are likely moot, as we have taken a voluntary remand of our action on the Nebraska long-term strategy.[395] To the extent GLCC is referring to the issues of controls beyond CAIR/CSAPR or source-by-source versus category approaches to reasonable progress, we have addressed those issues in our response to other comments.

Comment: Luminant states as long as the state performs the required analysis (as Texas did here), EPA must respect the state's choices and approve its reasonable progress goals—even where EPA would have come to a different conclusion than the state in considering the factors.[432] And even though EPA believes that more reductions from Texas sources are "feasible,"[433] such a standard was specifically rejected by Congress in enacting the regional haze program and is not a lawful basis for EPA's disapproval.[434] EPA's proposal thus applied the wrong legal standard by which to judge Texas's SIP revision.

Further, Luminant stated that there was no error in Texas's analysis. Texas's analysis followed the regulations and EPA's own guidance in considering potential additional controls and assessing the four statutory factors. And, as discussed elsewhere in our comments, Texas followed the same approach as other states, whose SIPs EPA approved without reservation.[435]

Footnotes:

[432] North Dakota, 730 F.3d at 768 ("[T]he CAA requires only that a state establish reasonable progress, not the most reasonable progress."); 79 Fed. Reg. at 5205 (approving Wyoming's decision not to impose additional controls on oil and gas source category because EPA concluded that the costs "were not so low that EPA could find it necessarily unreasonable for the State to not have adopted them").

[433] Technical Support Document for the Oklahoma Regional Haze State Implementation Plan and Federal Implementation Plan (OK TSD) 29 ("Oklahoma TSD") (Nov. 2014).

[434] In the conference committee that reconciled the House and Senate versions of the 1977 Clean Air Act amendments, the term "maximum feasible progress" was specifically changed to "reasonable progress" in the final

[395] See Respondent's Motion for Partial Voluntary Remand, Nebraska. v. US EPA (No. 12-3084) and Petition for Review of an Order of the EPA, Nebraska v. US EPA (No. 12-3084).

legislation. See 1 Legislative History of the Clean Air Act Amendments 1977 Pub. L. No. 95-95 155 (1977) ("The term 'maximum feasible progress' is changed to read 'reasonable progress' whenever it appears in the section.").
[435] For example, EPA approved, without question, Washington's decision that the URP was not reasonably achievable and that additional controls were not necessary during the first planning period, based on the same rationale Texas used in its SIP. 77 Fed. 76,174 (Dec. 26, 2012). As EPA explained: "Additional controls on point sources or other source categories at this time is not likely to result in substantial visibility improvement in the first planning period due to the significant contribution from emissions from natural fire, the Pacific offshore, Canada, and outside the modeling domain." Id. at 76,204.

Response: We disagree with the commenters. Although we agree that Texas conducted an evaluation of the four reasonable progress factors, we determined that the state's evaluation was flawed. As explained in our final action and elsewhere in our responses to comments, this compelled us to conduct our own analysis and ultimately promulgate a FIP as required under the CAA. In conducting our analysis, had we reached the same conclusion as Texas with respect to additional controls necessary to achieve reasonable progress (as we did when we evaluated the Idaho SIP), we would have approved the reasonable progress elements of the SIP.

As for the cited North Dakota court decision, we first note that the Court here reaffirmed the determination in Oklahoma v. EPA,[396] that we have more than a ministerial duty in reviewing regional haze SIPs:

> Although the CAA grants states the primary role of determining the appropriate pollution controls within their borders, EPA is left with more than the ministerial task of routinely approving SIP submissions. The Tenth Circuit recently concluded that EPA acted within its power under § 169A in rejecting a BART determination on the basis that the state "did not properly take into consideration the costs of compliance when it relied on cost estimates that greatly overestimated the costs of dry and wet scrubbing to conclude these controls were not cost effective." Oklahoma v. EPA, 723 F.3d at 1206, 1208-10 (internal quotation marks omitted). The court held that because the state's cost of compliance estimate was based upon fundamental methodological flaws, EPA had a reasonable basis for rejecting the state's BART determination for failure to comply with the requisite BART guidelines at 1211-12. Moreover, in Alaska Department of Environmental Conservation v. EPA, 540 U.S. 461, 124 S.Ct. 983, 157 L.Ed.2d 967 (2004), the Supreme Court rejected an argument similar to that raised here regarding EPA's oversight role in the BACT determination process under § 167 of the CAA. The Court held that EPA was not limited simply to verifying that a BACT determination was actually made, concluding instead that EPA could examine the substance of the BACT determination to ensure that it was one that was "reasonably moored to the Act's provisions" and was based on "reasoned analysis." See id. at 485, 490, 124 S.Ct. 983. Although the Court's analysis was one under § 167, we nonetheless find it persuasive in the context of § 169A.

Thus, Luminant's contention that "as long as the state performs the required analysis … EPA must respect the state's choices and approve its reasonable progress goals" misinterprets our role.

[396] Oklahoma v. EPA, 723 F.3d at 1206, 1208-10.

Although the analysis ruled on by the Court concerned BART, we believe it concerns the same basic point regarding our review of the Texas Regional Haze SIP: As we discuss in our proposal,[397] we disagree with Luminant's view that Texas "performed the required analysis." As explained more fully in the section of this document that responds to comments dealing with state and federal roles in the regional haze program, we determined that Texas' reasonable progress and long-term strategy analysis was flawed and we have authority to review it and if necessary disapprove it and replace it with a FIP.

With regard to the quote Luminant reproduced from the Eighth Circuit Court's decision in North Dakota v. EPA cited above, several environmental groups challenged a portion of our final action on North Dakota's regional haze SIP that ultimately approved North Dakota's reasonable progress determination for NOx controls for the Coyote Station.[398] The environmental groups objected to North Dakota's decision to reject a control it had evaluated, after having applied the four reasonable progress factors, and subsequently approving another NOx control as reasonable progress.

We interpret the Court's statement as meaning broadly that just because a more stringent level of control could be technically feasible in a particular instance, it does not mean it necessarily must be required under reasonable progress. We see no conflict with this determination and our proposed Texas FIP. Extending the Court's reasoning, we too could have proposed additional controls on other sources within Texas, or higher levels of control on the sources for which we proposed controls. We proposed, however that neither additional controls nor a higher level of control on the sources for which we proposed controls was appropriate, after applying the four reasonable progress factors. In other words, we did not propose the highest level of control (referred to by the Court as "most reasonable"). Further, in North Dakota's case, we noted technical flaws in North Dakota's analysis, and we noted that we could have reached a different conclusion had we conducted the analysis ourselves, but we ultimately determined these issues did not prevent us from accepting North Dakota's reasonable progress determination. The Court did not find that our conclusions on the issue were arbitrary, stating in part that, "[e]ven if [the control in question] were perhaps the most reasonable technology available, the CAA requires only that a state establish reasonable progress, not the most reasonable progress.[399] In contrast, and as explained in greater detail elsewhere, in reviewing Texas's reasonable progress analysis, we determined that the technical analysis the state undertook was flawed and thus its reasonable progress determination was not approvable. We determined that cost effective controls were in fact available that would have very significant visibility benefits. However, Texas' flawed analysis masked the benefits of these controls.

Luminant also cites to our Wyoming action in support of its contention that we must respect the state's choices and approve its reasonable progress goals—even where we would have come to a different conclusion than the state in considering the factors. Luminant points to the section of our Wyoming action where we approved Wyoming's decision not to impose additional controls on oil and gas sources, where we stated in response to a comment, "those costs were not so low

[397] See discussion beginning on 79 FR 74838.
[398] North Dakota v. EPA, 730 F.3d 750 (8th Cir. 2013); (See EPA's final rule at 77 Fed. Reg. 20,894-945 (April 6, 2012)).
[399] Id. at 768.

that EPA could find it necessarily unreasonable for the State to not have adopted them." Luminant seems to be suggesting that because we agreed with the state's decision with regard to Wyoming's oil and gas sources, we are bound to agree with all state decisions—a notion we reject—again, our role is more than ministerial. Notwithstanding our comments above, as we further explain in our response to that comment in our Wyoming final action, oil and gas sources in Wyoming were already being controlled to a large extent, including BACT controls for new sources compressor engines, and through Wyoming's oil and gas permitting guidance. For instance, we discuss in our proposal for that action,[400] that Wyoming conducted a thorough evaluation of potential controls on oil and gas sources. For each source category it estimated a range for the cost effectiveness, which in many cases varied greatly. We stated, "As shown by the four-factor analyses, the most reasonable controls are for compressor engines, *which the State already controls through its minor source BACT requirements* …." Thus, although not disclosed by Luminant in its comment, some of the most cost effective controls were for oil and gas sources that were already being controlled in Wyoming. Also not disclosed by Luminant is the fact that we disagreed with Wyoming's control decisions in other instances. For instance, our Wyoming FIP required controls on the Dave Johnston Unit 3; the Laramie River Units 1, 2, and 3; and the Wyodak Unit 1. Luminant's contention that we, "must respect the state's choices and approve its reasonable progress goals—even where [we] would have come to a different conclusion" is therefore inconsistent with the facts within the very action which it references.

We address Luminant's allegation that we are inconsistent in comparison to our action for Washington in the response to another comment.

Comment: GCLC states that we have found no instance where EPA has imposed a FIP for the first planning period requiring additional reasonable progress controls on EGUs that relied on implementation of CAIR or CSAPR to satisfy BART. [15]

Luminant states that in reviewing other states' reasonable progress goals for the first planning period, EPA has repeatedly and systematically excluded sources that otherwise comply with the BART requirements, including complying through a regional trading program that is better-than-BART, from further emission controls in the first planning period without even conducting an "additional analysis" like it performs here for certain Texas sources.[759]

Luminant states that EPA proposes, as it did for these other states, to issue a FIP that would "replace Texas' reliance on CAIR to satisfy the BART requirement for EGUs with reliance on CSAPR."[377] But EPA's proposal otherwise disregards CSAPR's more stringent SO_2 and NO_x emission budgets for Texas, as compared to CAIR, as well as the additional trading restrictions imposed by CSAPR. For all other states that have relied on either CAIR or CSAPR, EPA has repeatedly found such participation to also satisfy the states' reasonable progress obligation for the first planning period for those sources.[378] But not so for Texas. EPA chooses to completely disregard CSAPR as an ongoing compliance obligation for Texas sources, even though more stringent budgets are now in place and will be in place through the 2018 interim goal.[379]

[400] See discussion beginning on 78 FR 34763.

Luminant claims this is a critical error by EPA and an inexcusable inconsistency in the proposal. In determining that CSAPR (like CAIR before it) "is better than BART,"[380] EPA conducted modeling that demonstrated: (1) "that the trading programs of the Transport Rule do not cause degradation in any affected Class I area"; and (2) that "average visibility improvement of the 'Transport Rule + BART elsewhere' alternative was greater than 'Nationwide BART' on both the 20 percent best and 20 percent worst days."[381]

As part of its analysis, EPA modeled the visibility in all Class I areas to determine the visibility (in deciviews) at each area in 2014 with the implementation of CSAPR and BART in states not subject to CSAPR.[382] This included Big Bend, Guadalupe Mountains, and Wichita Mountains. EPA used the same model—CAMx—that it now uses to judge the Texas SIP. Table 9 provided by Luminant shows the visibility at the three Class I areas of interest here that EPA modeled for 2014, assuming CSAPR emission budgets in Texas and other CSAPR states and BART controls in non-CSAPR states.

Table 9 Provided by Luminant (0061): EPA Modeled Visibility and three Class I Areas with CSAPR in Place[383]

Class I Area	EPA Modeled Visibility Conditions (2014) (20% Worst Days)	EPA Proposed RPG (2018) (20% worst days)
Big Bend	15.2 dv	16.57 dv
Guadalupe Mountains	14.7 dv	16.26 dv
Wichita Mountains	20.2 dv	21.33 dv

As Table 9 (provided by Luminant) shows, EPA's own CAMx modeling shows that—with CSAPR in place as it is today—the visibility at these three Class I areas is already well below the 2018 goals that EPA is proposing for these areas—and without the additional SO_2 controls that EPA would impose by the proposed FIP. Yet, despite imposing CSAPR in its FIP for Texas, EPA dismisses CSAPR's SO_2 budgets as "not much different than the CAIR Cap for Texas" and refuses to include CSAPR in its modeling for this proposal, as it did in its prior modeling. EPA provides no explanation of its inconsistent modeling approaches. And, as discussed in the next section, EPA's prior modeling that includes CSAPR more accurately predicts current visibility conditions in these Class I areas than does the new Texas-only modeling EPA commissioned from ENVIRON that disregarded CSAPR.

Luminant stated that Texas electric generating unit ("EGUs") are subject to stringent SO_2 and NO_x emission limits under EPA's Cross-State Air Pollution Rule ("CSAPR"), and EPA has determined that CSAPR's limits are better at improving visibility in Class I areas than Best Available Retrofit Technology ("BART"). We have found no instance of EPA issuing a FIP for a CSAPR state that would require emission limits beyond what will be required to comply with CSAPR. EPA's proposed FIP thus treats Texas and Texas EGUs in an inconsistent manner than EPA's prior actions in other states and arbitrarily ignores EPA's own CSAPR-better-than-BART findings.

Xcel states that EPA's concern about Texas importing unlimited allowances so as to avoid reducing emissions is not valid here because CSAPR, which replaced CAIR, limits the use of out-of-state allowances that can be used for compliance, and EPA has expressly allowed other states to rely on CSAPR to meet RPGs. *See* Proposed Michigan SIP Approval, 77 Fed. Reg. 46,912, 46,919 (the regional planning organization's "analysis shows emission reductions equivalent to the scale of CAIR are needed to meet reasonable progress goals.").

Xcel Energy stated that despite EPA's action in Michigan, in this Proposal, EPA arbitrarily argues that CAIR could be used "in lieu of BART" but not used in the RPG context. While BART and RPGs are distinctive components of a regional haze strategy, EPA provides no reasoned basis for allowing consideration of CAIR in the BART context and rejecting it in the RPG context. 3 That EPA would allow CAIR or CSAPR to substitute for BART, which is a unit-specific standard with unit-specific performance criteria, but not for demonstrating reasonable progress, which is a state-wide, multi-source program aimed at reducing the pollutants of concern for regional haze, is illogical, as well as arbitrary and capricious. In fact, EPA has done the exact opposite in other RPG determinations and re-affirmed States' reliance on BART-equivalent analyses. For example, as stated in its proposed approval of the Georgia SIP, "EPA believes it is reasonable to conclude that any control requirements imposed in the BART determination also satisfy the RPG related requirements for source review in the first implementation period." *See* Proposed Georgia SIP Approval, 77 Fed. Reg. 11,452, 11,469 (Feb. 27, 2012); *see also* Final Georgia SIP Approval, 77 Fed. Reg. 38,501 (Jun. 28, 2012). In North Dakota, EPA specifically rejected modeling for RPGs that was not conducted in the same way as BART on the basis that the "ultimate goal is the same." Proposed North Dakota SIP Approval/Disapproval, 76 Fed. Reg. at 58,629 n. 85; *see also* Final North Dakota SIP Approval/Disapproval, 77 Fed. Reg. at 20,906-07.

[UARG (0065) p. 27] UARG stated that the EPA, without providing any explanation, proposes to treat BART sources in Texas differently from the way all other sources that are subject to BART in other states have been treated. EPA's Reasonable Progress Guidance states that BART is likely to satisfy all reasonable progress requirements for the first planning period and leaves states with wide latitude to make a determination that it does. *See* Reasonable Progress Guidance at 4-2 to 4-3. Texas submitted a SIP that adopted the position EPA articulates in its guidance by relying on compliance with CAIR to satisfy BART obligations for EGUs that are subject to CAIR in the state. EPA proposes a FIP that would substitute reliance on CAIR with reliance on CSAPR, CAIR's successor rule, to satisfy those BART obligations. In other states, sources that have relied on CAIR or CSAPR to satisfy BART have not been subjected to additional reasonable progress requirements during the first regional haze planning period. EPA's proposed decision to require more of Texas is inconsistent with the Agency's guidance and previous regional haze rulemakings.

Luminant stated that EPA steps well outside its authority in attempting to require the installation of new scrubbers at seven Texas EGUs in 2020. The time period at issue in Texas's submittal, and thus the scope of EPA's review and authority, is limited to the first regional haze planning period—2008 to 2018.[879] As EPA has explained: "The RHR [regional haze rule] requires control strategies to cover an initial implementation period extending to the year 2018, with a comprehensive reassessment and revision of those strategies, as appropriate, every 10 years thereafter."[880]

The Associations stated that EPA acknowledges that it "cannot assume that the SO_2 controls we are proposing will be installed and operational within this planning period, which ends in 2018." *Id.* In this respect EPA's proposal is inconsistent with past regional haze actions, where EPA has consistently limited the scope of FIPs to control measures that can be implemented during the interim planning period. *See, e.g.*, 77 Fed. Reg. 20,894, 20,944 (Apr. 6, 2012) (applying a July 31, 2018, compliance deadline in North Dakota FIP); 77 Fed. Reg. 57,864, 57,916 (Sept. 18, 2012) (applying a July 31, 2018, compliance deadline in Montana FIP); 79 Fed. Reg. 52,420, 52,426 (Sept. 3, 2014) (applying a December 31, 2018, compliance deadline in Arizona FIP).

Luminant stated that EPA itself recently explained why it rejected comments that argued for additional controls in its prior approvals of five other states' regional haze SIPs, all of which took the same approach and reached the same results as Texas's SIP:

> Contrary to the Commenter's assertions, Alabama, Georgia, Kentucky, North Carolina, and South Carolina did not "exempt [CAIR] sources . . . that would otherwise be subject to reasonable progress review." Each of these states considered the four statutory reasonable progress factors in evaluating whether CAIR would satisfy reasonable progress requirements for the state's EGU sector and determined that no additional controls beyond CAIR were reasonable for SO_2 during the first planning period. ***As discussed in EPA's Reasonable Progress Guidance, states may evaluate the need for reasonable progress controls on a source category basis, rather than through a unit-specific analysis, and have wide latitude to determine additional control requirements for ensuring reasonable progress***. The guidance also notes that states may consider emissions reductions from cap-and-trade programs such as CAIR in addition to source-specific controls.[795]

Luminant asserted that EPA's different treatment of Texas is not at all justified, nor is it lawful under EPA's regional consistency regulations. EPA "shall assure that actions taken under the [CAA]: (1) Are carried out fairly and in a manner that is consistent with the CAA and Agency policy as set forth in the Agency rules and program directives [and] (2) Are as consistent as reasonably possible with the activities of other Regional Offices . . . ."[796] EPA has failed at this obligation, and without any explanation or justification. EPA's proposal does not treat Texas or Texas operators fairly, nor is it consistent with EPA's many prior actions on other states' regional haze SIPs, as the example cited above and the many others in these comments illustrate. Accordingly, EPA's proposal violates EPA's regional consistency regulations, fundamental notions of fairness, and is contrary to law.[797]

NRG stated that EPA has repeatedly used interstate emission trading rules such as the Clean Air Interstate Rule ("CAIR") and the Cross-State Air Pollution Rule ("CSAPR") to satisfy reasonable progress goals.[11] As EPA is proposing to use CSAPR to satisfy Texas' BART obligations,[12] it would only be logical to also use CSAPR to satisfy Texas' reasonable progress obligations as well.

Footnotes:

[3] It does not make sense to disregard CAIR or CSAPR in the context of RPGs, because all electric generating units in the state are subject to their emission limitations, while only some electric generating units are subject to BART

[15] See 77 Fed. Reg. 38,515 (June 28, 2012) (Alabama); 77 Fed. Reg. 38,501 (June 28, 2012) (Georgia); 77 Fed. Reg. 34,218 (June 11, 2012) (Indiana); 77 Fed. Reg. 38,006 (June 26, 2012) (Iowa); 77 Fed. Reg. 19,098 (March 30, 2012) (Kentucky); 77 Fed. Reg. 71,533 (Dec. 3, 2012) (Michigan); 77 Fed. Reg. 38,007 (June 26, 2012) (Missouri); 77 Fed. Reg. 38,185 (June 27, 2012) (North Carolina); 77 Fed. Reg. 39,177 (July 2, 2012) (Ohio); 79 Fed. Reg. 24,340 (April 30, 2014) (Pennsylvania); 77 Fed. Reg. 38,509 (June 28, 2012) (South Carolina); 77 Fed. Reg. 24,392 (April 24, 2012) (Tennessee); 77 Fed. Reg. 35,287 (June 13, 2012) (Virginia); 77 Fed. Reg. 16,937 (March 23, 2012) (West Virginia).

[759] Never, in its review of regional haze SIPs for the first planning period, has EPA imposed a FIP requiring additional "reasonable progress" controls on EGUs that relied on the implementation of CAIR/CSAPR to satisfy BART. See 77 Fed. Reg. 38,515 (June 28, 2012) (Alabama); 77 Fed. Reg. 38,501 (June 28, 2012) (Georgia); 77 Fed. Reg. 34,218 (June 11, 2012) (Indiana); 77 Fed. Reg. 38,006 (June 26, 2012) (Iowa); 77 Fed. Reg. 19,098 (Mar. 30, 2012) (Kentucky); 77 Fed. Reg. 71,533 (Dec. 3, 2012) (Michigan); 77 Fed. Reg. 38,007 (June 26, 2012) (Missouri); 77 Fed. Reg. 38,185 (June 27, 2012) (North Carolina); 77 Fed. Reg. 39,177 (July 2, 2012) (Ohio); 79 Fed. Reg. 24,340 (Apr. 30, 2014) (Pennsylvania); 77 Fed. Reg. 38,509 (June 28, 2012) (South Carolina); 77 Fed. Reg. 24,392 (Apr. 24, 2012) (Tennessee); 77 Fed. Reg. 35,287 (June 13, 2012) (Virginia); 77 Fed. Reg. 16,937 (Mar. 23, 2012) (West Virginia).

[795] 79 Fed. Reg. 26,143, 26,145–46 (May 7, 2014) (emphasis added) (alteration in original) (internal citations omitted).

[796] 40 C.F.R. § 56.5(a). These requirements also apply to EPA Headquarters officials "who are responsible for developing the policies governing the implementation and enforcement of the CAA." Nat'l Envtl. Dev. Ass'n's Clean Air Project v. EPA, 752 F.3d
999, 1009 (D.C. Cir. 2014).

[797] Nat'l Envtl. Dev. Ass'n's Clean Air Project, 752 F.3d at 1009–10 (holding that EPA action contrary to its regional consistency regulations was contrary to law); see also 40 C.F.R. § 56.5(a)(2) (officials in EPA regional offices "shall assure that actions taken under the act . . . [a]re as consistent as reasonably possible with the activities of other Regional Offices" (emphasis added)).

[759] Never, in its review of regional haze SIPs for the first planning period, has EPA imposed a FIP requiring additional "reasonable progress" controls on EGUs that relied on the implementation of CAIR/CSAPR to satisfy BART. See 77 Fed. Reg. 38,515 (June 28, 2012) (Alabama); 77 Fed. Reg. 38,501 (June 28, 2012) (Georgia); 77 Fed. Reg. 34,218 (June 11, 2012) (Indiana); 77 Fed. Reg. 38,006 (June 26, 2012) (Iowa); 77 Fed. Reg. 19,098 (Mar. 30, 2012) (Kentucky); 77 Fed. Reg. 71,533 (Dec. 3, 2012) (Michigan); 77 Fed. Reg. 38,007 (June 26, 2012) (Missouri); 77 Fed. Reg. 38,185 (June 27, 2012) (North Carolina); 77 Fed. Reg. 39,177 (July 2, 2012) (Ohio); 79 Fed. Reg. 24,340 (Apr. 30, 2014) (Pennsylvania); 77 Fed. Reg. 38,509 (June 28, 2012) (South Carolina); 77 Fed. Reg. 24,392 (Apr. 24, 2012) (Tennessee); 77 Fed. Reg. 35,287 (June 13, 2012) (Virginia); 77 Fed. Reg. 16,937 (Mar. 23, 2012) (West Virginia).

[378] 77 Fed. Reg. 38,515 (June 28, 2012) (Alabama); 77 Fed. Reg. 38,501 (June 28, 2012) (Georgia); 77 Fed. Reg. 34,218 (June 11, 2012) (Indiana); 77 Fed. Reg. 38,006 (June 26, 2012) (Iowa); 77 Fed. Reg. 19,098 (Mar. 30, 2012) (Kentucky); 77 Fed. Reg. 71,533 (Dec. 3, 2012) (Michigan); 77 Fed. Reg. 38,007 (June 26, 2012) (Missouri); 77 Fed. Reg. 38,185 (June 27, 2012) (North Carolina); 77 Fed. Reg. 39,177 (July 2, 2012) (Ohio); 79 Fed. Reg. 24,340 (Apr. 30, 2014) (Pennsylvania); 77 Fed. Reg. 38,509 (June 28, 2012) (South Carolina); 77 Fed. Reg. 24,392 (Apr. 24, 2012) (Tennessee); 77 Fed. Reg. 35,287 (June 13, 2012) (Virginia); 77 Fed. Reg. 16,937 (Mar. 23, 2012) (West Virginia).

[15] See 77 Fed. Reg. 38,515 (June 28, 2012) (Alabama); 77 Fed. Reg. 38,501 (June 28, 2012) (Georgia); 77 Fed. Reg. 34,218 (June 11, 2012) (Indiana); 77 Fed. Reg. 38,006 (June 26, 2012) (Iowa); 77 Fed. Reg. 19,098 (March 30, 2012) (Kentucky); 77 Fed. Reg. 71,533 (Dec. 3, 2012) (Michigan); 77 Fed. Reg. 38,007 (June 26, 2012) (Missouri); 77 Fed. Reg. 38,185 (June 27, 2012) (North Carolina); 77 Fed. Reg. 39,177 (July 2, 2012) (Ohio); 79 Fed. Reg. 24,340 (April 30, 2014) (Pennsylvania); 77 Fed. Reg. 38,509 (June 28, 2012) (South Carolina); 77 Fed. Reg. 24,392 (April 24, 2012) (Tennessee); 77 Fed. Reg. 35,287 (June 13, 2012) (Virginia); 77 Fed. Reg. 16,937 (March 23, 2012) (West Virginia).

[880] 77 Fed. Reg. at 30,252 (EPA proposed approval of Idaho reasonable progress goals and long-term strategy) 77 Fed. Reg. 30,454, 30,458 (May 23, 2012) (EPA proposed approval of Oregon reasonable progress goals and long-term strategy).

Footnotes:
[367] 40 C.F.R. § 51.308(e)(2); see 70 Fed. Reg. 39,104, 39,138–43 (July 6, 2005); Util. Air Regulatory Grp. v. EPA, 471 F.3d 1333, 1339–41 (D.C. Cir. 2006) (upholding "EPA's substitution of CAIR for BART").
[368] See 70 Fed. Reg. 39,104, 39,138–43 (July 6, 2005); Util. Air Regulatory Grp., 471 F.3d at 1339–41 (upholding "EPA's substitution of CAIR for BART").
[369] 2009 Texas SIP Narrative at 9-1.
[370] North Carolina v. EPA, 550 F.3d 1176, 1178 (D.C. Cir. 2008).
[371] 76 Fed. Reg. 48,208 (Aug. 8, 2011).
[372] Order, EME Homer City Generation, L.P. v. EPA, No. 11-1302, at 2 (D.C. Cir. Dec. 30, 2011).
[373] 79 Fed. Reg. 71,663 (Dec. 3, 2014).
[374] 77 Fed. Reg. 33,642, 33,643, 33,643 (June 7, 2012). Luminant and some of its affiliated companies filed a petition for review of EPA's disapproval of this portion of the Texas regional haze SIP in the U.S. Court of Appeals for the Fifth Circuit. See Luminant Generation Co. LLC v. EPA, 12-60617 (5th Cir.). On motion of an intervenor in that case, the Fifth Circuit transferred the petition to the U.S. Court of Appeals for the D.C. Circuit (Case No. 13-1178), and it was consolidated with other petitions under the lead case Util. Air Regulatory Grp. v. EPA, No. 12-1342. Luminant further moved to intervene in support of Respondent EPA in Case No. 12-1343, which is a petition challenging EPA's determination that CSAPR is "better than BART." The D.C. Circuit granted that motion on September 25, 2012. All of these consolidated petitions for review remain pending and are held in abeyance pending the D.C. Circuit's disposition of EME Homer City Generation, L.P. v. EPA, No. 11-1302, et al. EPA's proposal here states that EPA is "not taking comment" on its earlier limited disapproval of Texas's SIP on this basis. 79 Fed. Reg. at 74,821.
[375] 77 Fed. Reg. at 33,642, 33,643.
[376] Id. at 33,654.
[377] 79 Fed. Reg. at 74,823.
[378] 77 Fed. Reg. 38,515 (June 28, 2012) (Alabama); 77 Fed. Reg. 38,501 (June 28, 2012) (Georgia); 77 Fed. Reg. 34,218 (June 11, 2012) (Indiana); 77 Fed. Reg. 38,006 (June 26, 2012) (Iowa); 77 Fed. Reg. 19,098 (Mar. 30, 2012) (Kentucky); 77 Fed. Reg. 71,533 (Dec. 3, 2012) (Michigan); 77 Fed. Reg. 38,007 (June 26, 2012) (Missouri); 77 Fed. Reg. 38,185 (June 27, 2012) (North Carolina); 77 Fed. Reg. 39,177 (July 2, 2012) (Ohio); 79 Fed. Reg. 24,340 (Apr. 30, 2014) (Pennsylvania); 77 Fed. Reg. 38,509 (June 28, 2012) (South Carolina); 77 Fed. Reg. 24,392 (Apr. 24, 2012) (Tennessee); 77 Fed. Reg. 35,287 (June 13, 2012) (Virginia); 77 Fed. Reg. 16,937 (Mar. 23, 2012) (West Virginia).
[379] FIP TSD at A-45.
[380] 77 Fed. Reg. 33,642, 33,648 (June 7, 2012).
[381] Id. at 33,652 (emphasis added).
[382] EPA, Technical Support Document for Demonstration of the Transport Rule as a BART Alternative, Dock. ID No. EPAHQ- OAR-2011-0729-0014 (Dec. 2011) ("BART Alternative TSD").
[383] Id. at tbl.3-3; 79 Fed. Reg. at 74,887, tbl.43.

Response: Although we proposed to rely on CSAPR to address the BART requirements for EGUs in Texas, we are not finalizing that proposed action. On July 28, 2015, the D.C. Circuit Court's issued its decision in *EME Homer City Generation v. EPA*, 795 F.3d 118 (D.C. Cir 2015), upholding CSAPR but remanding without vacating a number of the Rule's state emissions budgets. Specifically, the court invalidated a number of the Phase 2[401] ozone season NO_X budgets and found that the SO_2 budgets as to four states resulted in overcontrol for purposes of

[401] CSAPR's effective date was stayed by the D.C. Circuit during a portion of the litigation over the rule. Thus, the Rule's Phase 1 effective date of January 1, 2012 was delayed until January 1, 2015, and the Rule's Phase 2 effective date of January 1, 2014 was delayed until January 1, 2017.

section 110(a)(2)(D). Texas' ozone season NO_X budget and its SO_2 budget are both implicated in this remand. We are in the process of acting on the Court's remand. As a result, at this time we cannot ensure that CSAPR will continue to be an appropriate alternative to BART for Texas EGUs. As a result, the comments that we are treating Texas differently than other states where EPA relied on CSAPR to meet the BART requirements are no longer applicable. Similarly, to the extent that CAIR or CSPAR could have been relied on to ensure reasonable progress in the Texas regional haze SIP or FIP, at this point in time CAIR is no longer in place and the CSAPR budgets for Texas are unclear.

Even assuming, however, that *EME Homer City* had not invalidated the CSAPR NOx and SO_2 budgets for Texas and that we were taking final action to address the BART requirements through reliance on CSAPR, we do not agree that EPA has been inconsistent in its treatment of Texas as compared to other states. As explained in our proposed rulemaking, allowing Texas to rely on CSAPR to meet its reasonable progress obligations is not appropriate, and the fact that other states did not require additional reasonable progress controls beyond CAIR (or CSAPR) does not automatically mean all states should not require any additional controls. Such a simplistic comparison ignores the meaningful differences between Texas and the states cited. These include the significant impacts that sources in Texas are projected to have on the visibility at the Wichita Mountains in Oklahoma in 2018 (which includes projected reductions due to CAIR compliance), the quality of the Texas technical evaluation, and the quality of the consultations between Texas and Oklahoma.

As explained above, in our review of the regional haze SIPs, we have attempted to take into account the differences between states in assessing the reasonableness of each state's SIP submittal. For example, in many of the CSAPR states in the East, CAIR was anticipated to lead to substantial reductions in SO_2 emissions from EGUs.[402] In contrast, in Texas, the State estimated that SO_2 emissions from EGUs would fall by only 36% to 350,000 tpy (2018).[403] In addition, for many of the Class I areas at issue, CAIR and other measures were anticipated to bring about sufficient visibility improvement for the area to exceed the rate of visibility improvement of the URP glidepath toward natural visibility conditions in 2064. Other factors, such as the state's percentage impact on downwind Class I areas also differentiates Texas in some cases.[404]

Luminant also notes Texas' more stringent NOx and SO_2 budgets under CSAPR. To the extent that these budgets might have changed the anticipated SO_2 emissions from sources in Texas, this is no longer relevant given the remand of these budgets to EPA. Moreover, we note that we did not propose to require any additional NOx controls in Texas to meet the reasonable progress requirements. For SO_2, at the time of EPA's proposed FIP, it was unclear to what extent Texas would reduce emissions and to what extent it would rely on credits from reductions in other

[402] .[402] See, e.g. 77 Fed. Reg. 38515, 38519 (In Alabama CAIR is expected to reduce EGU SO_2 emissions by 70%); 77 Fed. Reg. 38501, 38505 (Under Georgia's CAIR rule, EGU SO_2 emissions are capped at 149,140 tons, a 70% reduction from 2002 levels); 76 FR 78194, 78,207 (SO_2 emission from EGUs in Kentucky estimated to decline 54% by 2018); 77 Fed. Reg. 38185 (North Carolina SIP requires 73% reduction in SO_2 emissions); see also 77 Fed. Reg. 11,894, 11902 (South Carolina SO_2 point source emissions projected to decline 44% to 146,851 tons).
[403] 77 FR at 74,858.
[404] See e.g. 77 FR 11974, 11979 (Feb. 28, 2012) (combined effect of Iowa's emissions on any Class I area less than 5%).

states. As explained in detail in the FIP TSD (see page A-45) and elsewhere in this document, due to the cost of SO_2 credits being lower than originally projected and comments from Texas on a more recent IPM projection indicating that significant SO_2 reductions were not anticipated at these sources due to MATS and CAIR/CSAPR, we do not have reason to believe significant additional reductions will result in the near future due to CSAPR requirements (even assuming Texas CSAPR budgets remained unchanged). Furthermore, TCEQ noted that no large SO_2 control projects were planned at most of the sources being evaluated. We also noted that TCEQ has utilized recent emission data for EGUs when developing projected emissions for 2018 (and other future years) when developing ozone attainment demonstrations. Overall this information supports our position that recent actual emissions for specific sources evaluated and CENRAP's 2018 projections including anticipated CAIR reductions are a reasonable representation of future emission levels in 2018.

Xcel raises similar concerns as Luminant that EPA has allowed other states to rely on CSAPR to meet RPGs, citing to EPA's action on Michigan. As discussed elsewhere, Michigan had less than a 5% impact on visibility in downwind states. With respect to its own Class I areas, Michigan assessed the contribution of three Midwestern states together and concluded that the 47% reduction in SO_2 emissions was sufficient for reasonable progress. Michigan also noted that a number of subject-to-BART non-EGUs also have significant impacts on visibility in Michigan's Class I areas and BART determinations (by the State and by EPA) require additional reductions from these sources that will result in significant visibility benefits. In addition, Michigan noted in its regional haze SIP that some of the largest EGUs, such as DTE's Monroe power plant and Consumer Energy's Campbell plant, have installed or are in the process of installing controls.[405] More generally, with respect to Xcel's comment that EPA provides no reasoned basis for rejecting consideration of CAIR in the reasonable progress context, we disagree that this is what we proposed to do in Texas. In our proposal we took into account the impact of CSPAR/CAIR on emissions in Texas, but determined that participation in this program would not ensure reasonable progress at Wichita Mountains and the Texas Class I areas. It is important to remember that the test for determining whether a BART alternative provides for greater reasonable progress than BART is based on improvements in visibility ***on average across all Class I areas***. Therefore, a BART alternative may result in very little visibility improvement at some Class I areas and large improvements at other Class I areas such that on average across all Class I areas visibility conditions are better under the alternative than under BART. We noted in 2005 that the determination that CAIR provided for greater reasonable progress than BART did not answer the question of whether more than CAIR would be required in a regional haze SIP:

> Our determination that CAIR makes greater reasonable progress than BART for EGUs is not a determination that CAIR satisfies all reasonable progress requirements in CAIR affected States. Each State, whether in the CAIR region or not, is required to set reasonable progress goals for each Class I area within the State as required in regional haze rule section 308(d)(1), and to develop long term strategies, considering all anthropogenic sources of visibility impairing pollutants, as required by section 308(d)(3). In setting the reasonable progress goals, the

[405] Michigan regional Haze SIP at 54

> State is to consider the amount of visibility improvement needed to achieve a uniform rate of progress towards natural background conditions in the year 2064. (This uniform rate of progress is sometimes referred to as the default glide-path). The State is also to consider the statutory reasonable progress factors contained in CAA section 169A(g)(1).[406] In doing so, we anticipate that States will take into account the degree to which CAIR emissions reductions are projected to bring visibility conditions at its Class I areas in line with the default glide path. In some States, the improvements expected from CAIR, combined with the application of the reasonable progress factors to other source sectors, may result in a determination that few additional emissions reductions are reasonable for the first long-term strategy period. Nonetheless, each State is required to set its reasonable progress goals as provided by the regional haze rule and cannot assume that CAIR will satisfy all of its visibility-related obligations.[407]

UARG commented that our Reasonable Progress Guidance states that BART is likely to satisfy all reasonable progress requirements for the first planning period. This is a misrepresentation of our Reasonable Progress Guidance. The actual text is:

> Note that for some sources determined to be subject to BART, the State will already have completed a BART analysis. Since the BART analysis is based, in part, on an assessment of many of the same factors that must be addressed in establishing the RPG, it is reasonable to conclude that any control requirements imposed in the BART determination also satisfy the RPG-related requirements for source review in the first RPG planning period. Hence, you may conclude that no additional emissions controls are necessary for these sources in the first planning period.

Note that our Reasonable Progress Guidance refers to instances in which "control requirements [have been] imposed" on a sources as a result of a BART analysis. It is conceivable that participation in CAIR would lead to actual control of a particular source. However, as Texas itself has noted in its SIP, the IPM model analysis used by CENRAP predicts that by 2018 EGUs in Texas will purchase approximately 125,000 tpy of emissions allowances from out of state.[408]

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406 CAA Section 169A(g)(1) goes on to state that, in determining "reasonable progress," states must consider 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." This consideration is commonly referred to as the "four-factor analysis." [406] Correspondingly, under Section 51.308(d)(1) of the Regional Haze Rule, promulgated in response to this mandate, states must "establish goals (expressed in deciviews) that provide for reasonable progress towards achieving natural visibility conditions" for each Class I area within a state. Reasonable progress goals are interim goals that represent measurable, incremental visibility improvement over time toward the goal of natural visibility conditions. Section 51.308(d)(1)(i)(A) requires states to consider the four statutory factors when establishing their reasonable progress goals.

407 70 FR 39104, 39143.

408 Texas Regional Haze SIP, page 10-9.

This, combined with the precipitous decline in the CAIR allowance market,[409] makes it questionable that any of the BART sources included in our FIP would have installed controls as a result of CAIR. In addition, as noted elsewhere in this document with regard to CAIR's successor, on July 28, 2015, the D.C. Circuit Court's issued its decision in *EME Homer City Generation v. EPA*, 795 F.3d 118 (D.C. Cir 2015), upholding CSAPR but remanding without vacating a number of the Rule's state emissions budgets. Thus, potential control under CAIR/CSAPR as a substitute for BART is moot. This is consistent with our statement regarding the Georgia SIP cited by the commenter, where we noted that any ***control requirements*** imposed as BART would also satisfy reasonable progress. EPA's determination that CSPAR would provide for greater reasonable progress than BART did not result in the imposition of any control requirements imposed as BART.

Please see our responses to other comments alleging that we erred in proposing controls that would not be operational until after 2018, and concerning monitored progress of Big Bend, the Guadalupe Mountains, and the Wichita Mountains.

Comment: Earthjustice stated that, both states and EPA have required controls that provide benefits of less than 0.5 dv. *See, e.g.*, FIP TSD at A-75 (mentioning controls required in Wyoming and Arizona that would provide a visibility benefit less than 0.5 deciviews).

Response: We agree with Earthjustice that both states and we have required controls on sources that provide less than a 0.5 dv visibility improvement. As we note in the above citation to our FIP TSD, in our FIP for Wyoming, we controlled some sources that had a benefit of 0.3 dv using CALPUFF[410]. We explained that given the modeled emissions differences between reasonable progress with CAMx and BART with CALPUFF and difference in metrics it can be argued that a 0.3 dv benefit with CALPUFF would be on the order of 0.1-0.15 deciview benefit with CAMx modeling. We noted that this is an estimate just based on emissions and metrics differences and ignoring the other differences we discussed in our FIP TSD. We also noted that we finalized a FIP in Arizona that included controls that resulted in a 0.18 -dv and 0.24 dv benefit based on CALPUFF modeling.[411] With regard to that action, we noted that given the modeled emissions differences between reasonable progress analysis with CAMx and BART analysis with CALPUFF and difference in metrics it can be argued that a 0.18-0.24 dv benefit with CALPUFF would be on the order of 0.1 dv or less benefit with CAMx modeling (again, this is an estimate just based on emissions and metrics differences and ignoring the other differences we discussed in our FIP TSD).

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[409] See for instance, Schmalensee, R. and Stavins, R., The SO_2 Allowance Trading System: The Ironic History of a Grande Policy Experiment, Journal of Economic Perspectives, 8/3/2012; Hitaj, C., and Stocking, A., Market Efficiency and the U.S. Market for Sulfur Dioxide, Working Paper Series Congressional Budget Office, Washington, D.C., Working Paper 2014-01

[410] Wyoming Final FIP FR Vol. 78, No. 111; pages 34785-,34789.

[411] Arizona Final FIP FR Vol. 79, No. 170; pages 52464-52477.

Comment: Luminant states that the limits EPA is proposing in its FIP are more stringent than even Best Available Retrofit Technology ("BART") limits for existing EGUs that EPA has recently approved.[826]

Footnotes:
[826] See, e.g., Alaska: 0.30 lb/MMBtu for Healy Unit #1 (78 Fed. Reg. 10,546, 10,549 (Feb. 14, 2013)); Arizona: 0.23 lb/MMBtu for the Sundt Generating Station (79 Fed. Reg. 9318, 9325 (Feb. 18, 2014)), 0.15 lb/MMBtu for Cholla and Apache, and 0.08 lb/MMBtu for Coronado (77 Fed. Reg. 72,512, 72,515 (Dec. 5, 2012)); Colorado: 0.11 lb/MMBtu for Tri-State Craig, 0.12 lb/MMBtu for Comanche Station, 0.13 lb/MMBtu for Hayden, and 0.13 lb/MMBtu and 0.26 lb/MMBtu for Martin Drake (77 Fed. Reg. 18,052, 18,073 (March 26, 2012)); Kansas: 0.10 lb/MMBtu for La Cygne, and 0.15 lb/MMBtu for Westar Jeffrey (75 Fed. Reg. 80,754, 80,758 (Dec. 27, 2011)); Montana: 0.08 lb/MMbtu for Colstrip Units 1 and 2, and 0.57 for JE Corette (77 Fed. Reg. 57,864, 57,915 (Sept. 18, 2012)); North Dakota: 0.15 lb/MMBtu for Leland Olds Station, Milton R. Young Station, and Coal Creek Station, 0.24 lb/MMBtu and 0.16 lb/MMBtu for Stanton Station (76 Fed. Reg. 58,570, 58,595 (Sept. 21, 2011)); Nevada: 0.15 lb/MMBtu for Reid Gardner (77 Fed. Reg. 17,334, 17,338 (March 26, 2012)); New York: 0.09 lb/MMBtu for Danskammer Generating Station (77 Fed. Reg. 51,915, 51,928 (Aug. 28, 2012)); Oregon: 0.40 lb/MMBtu for PGE Boardman (76 Fed. Reg. 38997, 39,002 (July 2, 2011)); South Dakota: 0.09 lb/MMBtu for Big Stone (77 Fed. Reg. 24,845, 24,848 (April 26, 2012)).
[827] 79 Fed. Reg. at 74,885.

Response: We proposed the following SO_2 emission limits, based on a 30 Boiler Operating Day (BOD) average.

	Unit	**Proposed SO_2 Emission Limit (lbs/MMBtu)**
Scrubber Upgrades	Sandow 4	0.20
	Martin Lake 1	0.12
	Martin Lake 2	0.12
	Martin Lake 3	0.11
	Monticello 3	0.06
	Limestone 2	0.08
	Limestone 1	0.08
	San Miguel*	0.60
Scrubber Retrofits	Big Brown 1	0.04
	Big Brown 2	0.04
	Monticello 1	0.04
	Monticello 2	0.04
	Coleto Creek 1	0.04
	Tolk 172B	0.06
	Tolk 171B	0.06

We note that some of these limits are above the limits Luminant cites, some are below, and some are within the range of the limits Luminant cites. For our wet FGD scrubber retrofits, we based our proposed limits on 98% control with a floor of 0.04 lbs/MMBtu. For our SDA scrubber retrofit (Tolk only), we based our proposed limits on 95% control with a floor of 0.06 lbs/MMBtu. With the exception of San Miguel[412], we based our proposed limits for our wet FGD scrubber upgrades on 95% control with a floor of 0.04 lbs/MMBtu. This accounts for the range in values in the above table. In other words, 95% control of a coal with a higher sulfur content (e.g., Sandow 4), will produce an emission limit that is necessarily higher than 95% control of a coal with a lower sulfur content (e.g., Limestone). As the percentage of sulfur in coal varies widely across the U.S., and among the facilities Luminant cites, we do not believe that the simplistic comparison Luminant proposes (which focuses only on the numerical value of the limit and ignores the coal sulfur content) is valid.

As we note in our proposal,[413] and elsewhere in our response to comments, we believe that percentage control we have proposed is significantly below the maximum level of control that can be expected. Furthermore, although we cannot provide citations here due to the confidentiality protections we are required to extend to those companies that responded to our information requests, we have seen several instances of engineering firms providing wet scrubber upgrade and retrofit guarantees of greater than 95% control, and performance testing following scrubber upgrades resulting in greater than 95% control. We believe that the control levels we proposed remain appropriate.

Comment: CCP and Xcel stated that the EPA arbitrarily and unreasonably failed to compare the incremental costs and environmental benefits associated with alternative controls. EPA has done this comparative cost-incremental analysis for source-specific RPG controls in other regional haze SIPs/FIPs. See 76 Fed. Reg. 58,631 (Sept. 21, 2011) (analyzing RPGs for a source in the North Dakota FIP using incremental cost effectiveness analyses for various controls of NO_x emissions).

Xcel stated that EPA has previously accepted a 20-year amortization period for the life of these types of controls. EPA, Air Pollution Cost Control Manual, at 3-33 (2002) (stating amortization over 20-30 years is appropriate); Wyoming Regional Haze FIP, 79 Fed. Reg. 5032, 5064-65 (Jan. 30, 2014) (using a 20-year amortization period for the Dave Johnson and Naughton plants); Arizona FIP, 79 Fed. Reg. 52,240, 52,459 (Sept. 3, 2014) (assuming a 20-year amortization period); Montana FIP, 77 Fed. Reg. 57,864, 57,882 (Sept. 18, 2012) (using a 20-year amortization period).

S&L stated that EPA has used a 20-year scrubber useful life in several Regional Haze BART determinations.[27] It is also important to note that the majority of these evaluations were

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412 In San Miguel's case, we concluded that the scrubber upgrades it had already performed were reasonably reflective of the limits of wet scrubber technology, and our proposed SO_2 limits merely served to lock-in what San Miguel was already achieving. We discuss San Miguel's emission limits more thoroughly in our response to its own comment elsewhere.

413 See our Cost TSD, beginning on page 38.

completed for retrofit FGD systems (i.e., new systems) and not upgrades to existing scrubbers and related equipment that has already been operating for more than 30 years.

Stamper (enviros) agreed that, if an EGU owner indicates that a shorter life of the SO_2 controls should be evaluated in EPA's cost effectiveness determination due to a planned shutdown of a unit, then that shorter lifetime needs to be made into an enforceable requirement. This is consistent with how EPA has considered shorter equipment lifetimes in cost analyses for BART determinations, and there is no justification for a different approach for cost effectiveness analyses done for reasonable progress requirements. For example, Stamper noted that the owners of Dave Johnston Unit 3 in Wyoming informed EPA that the unit would be shut down in 2027. 79 Fed.Reg. 5045 (January 30, 2014).

Luminant stated that, "[t]here is no particular threshold for determining significance of visibility benefit in the regional haze rule."[839] Further, "States have latitude to determine these thresholds," and "[a]s long as this evaluation is done adequately and the states provide a reasoned basis for their decisions, ***EPA will defer to the state***."[840] EPA has forgotten its own practices and standards here. Texas fully explained and supported its cost effectiveness analysis, pursuant to EPA's regulations and guidance, and EPA does not find otherwise. EPA must approve Texas's submission.

The Associations stated that not all emissions reductions will have the same impacts on visibility in Class I areas. Key factors such as the type of pollutant at issue, distance from Class I areas, and prevailing winds can all affect the degree to which certain emissions will contribute to visibility impairment and, as a result, the visibility benefits that will be produced by reducing those emissions. In other words, not every ton of emissions reductions is the same. Recognizing this fact, EPA explains in guidance that "in assessing emission reduction strategies for source categories or individual, large scale sources, simple cost effectiveness estimates based on a dollar-per-ton calculation may not be as meaningful as a dollar-per-deciview calculation, especially if the strategies reduce different groups of pollutants." EPA, Guidance for Setting Reasonable Progress Goals Under the Regional Haze Program 5-2 (June 1, 2007). EPA has reaffirmed that view in subsequent SIP reviews, stating its belief "that dollars per deciview is one of several metrics that can be used to analyze cost of visibility improvement." 77 Fed. Reg. 40,150, 40,156 (July 6, 2012). That is, because of distance, wind patterns and other relevant meteorological factors, even emissions that might be quite inexpensive to reduce may have no meaningful impact on downwind visibility.

The Associations stated that the human eye cannot detect changes in visibility of less than one deciview and, under EPA's own statistical standards, these 2018 "improvements" would be treated as nonexistent.[4] That is why, in another FIP proposal, EPA recently concluded that a similar incremental visibility improvement was minimal and could not justify the much smaller difference in cost between wet and dry SO_2 scrubbers. EPA, *Arkansas FIP Proposal, Prepublication Version* 160-61 (Mar. 6, 2015).

Footnotes:
27 See, e.g., Best Available Retrofit Technology (BART) Determination, American Electric Power, Northeastern Power Plant, May 30, 2008. BART Five Factor Analysis, Kansas City Power & Light, La Cygne Generation Station, August 2007.

[839] 77 Fed. Reg. 40,150, 40,156 (July 6, 2012) (approval of Nebraska SIP).
[840] Id. (emphasis added).
[4] U.S. EPA, Technical Support Document for Demonstration of the Transport Rule as a BART Alternative 24, n.24 (Dec. 2011), Docket ID No. EPA-HQ-OAR-2011-0729-0014 ("All differences that are < 0.05 [deciviews] were rounded down to 0.0 and are considered to be no degradation").

Response: CCP and Xcel stated that we arbitrarily and unreasonably failed to compare the incremental costs and environmental benefits associated with alternative controls. They note that we have done this comparative cost-incremental analysis for source-specific RPG controls in other regional haze SIPs/FIPs. We disagree that we have ignored environmental costs and benefits in the reasonable progress analysis in Texas. When performing our control cost analysis for those facilities that did not have any SO_2 control, we also analyzed the next less effective control option, which is DSI.[414] Where NOx controls are at issue, incremental analyses play a more important role, given the range of options for NOx controls. Thus, we disagree with CCP and Xcel to include consideration of incremental visibility benefits and control costs.

Xcel stated that we have previously accepted a 20-year amortization period for the life of these types of controls, citing to our Cost Control Manual, our Wyoming, Arizona, and Montana Regional Haze FIPs. We believe the citation Xcel makes to our Control Cost Manual refers to page 3-33 of Chapter 3, "Permanent Total Enclosures" in Section 2, "Generic Equipment and Devices." The full quote is:

> For a PTE, the economic life is the same as the life of the building which might be 20-30 years or of the particular equipment enclosed by the PTE which might be less. The interest rate value recommended by the Office of Management and Budget (OMB) is 7 percent. (This replaces the 10 percent rate previously recommended by OMB.) **An economic life of 30 years and an interest rate of 7 percent yields a CRF of 0.080586 [emphasis added].**

This is a calculation example for a permanent total enclosure. Our Control Cost Manual has many calculation examples using different values for the economic life. None of these examples are meant to specify the actual economic life that should be used for a scrubber. Nevertheless, as the remainder of the full quote reveals, an economic life of 30 years was in fact used in calculating the capital recovery factor for that example, which is exactly what we used in all of our cost analyses.

Regarding S&L's reference to our BART determination for the American Electric Power (AEP) Northeastern Units 3 and 4, S&L fails to disclose that in that case our Oklahoma FIP[415] included a BART determination for the AEP Northeastern facility that assumed a 30 year life. Subsequent to that, Oklahoma submitted a SIP that we approved[416] that included a revised BART determination for the AEP Northeastern facility that included requirements that one of the units shut down by April 16, 2016. The remaining unit is required to comply with a reduced emission limit of 0.40 lbs/MMBtu (based on DSI control) beginning on April 16, 2016, reducing its capacity utilization between 2021 and 2026, and ultimately shutting down December 31, 2026.

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[414] See our Cost TSD for more details.
[415] 76 FR 81728.
[416] 79 FR 12944 and 79 FR 12954.

Thus, the use of a reduced operating life was appropriate because of the enforceable commitments described above. Unlike the AEP Northeastern situation, none of the units affected by our FIP has volunteered to enter into enforceable commitments that would result in an operating life of less than 30 years.

Regarding S&L's reference to the Kansas City Power and Light La Cygne Units 1 and 2 BART determinations, these were not included in a FIP—we approved those determinations, submitted to us by the State of Kansas, except for certain startup and shutdown exemptions. Unit 1 had an existing SO_2 scrubber and was being equipped with an SCR at the time of the BART evaluation. The State of Kansas did use a 20 year life in assessing BART for these units. The final BART determination was based on these controls for Unit 1 and the evaluation of whether SCR and a scrubber was merited for Unit 2. Ultimately, an emission rate of 0.10 lbs/MMBtu corresponding to the installation of an additional scrubber on Unit 2 was deemed BART. Accordingly, Kansas' use of a 20 year life did not impact SO_2 BART. For NOx BART, Kansas determined that a weighted average emission rate of 0.13 lbs/MMBtu applied to Units 1 and 2 together was BART. This was based on a SCR on Unit 1 and combustion controls for Unit 2. The decision not to require SCR on Unit 2 was based on the determination that the additional visibility benefit of SCR over the combustion controls was too small.[417] Consequently, the use of a 20 year life was not the determining factor. In any event, it appears that a SCR was ultimately installed on Unit 2 anyway.[418]

Regarding Xcel's reference to our Wyoming FIP, we note that the units referenced, the Naughton and Dave Johnson facilities were SCR cost analyses, unlike the proposed scrubber in our Texas/Oklahoma FIPs. In addition, EPA Region 8, which processed the Wyoming FIP, accepted shorter remaining useful lives for these units based on information supplied by the company, PacificCorp.[419] We agree with Stamper that the owners of Dave Johnston Unit 3 in Wyoming informed EPA that the unit would be shut down in 2027, and an EGU can use a shorter life by entering into an enforceable commitment with us and its state.

Regarding Xcel's reference to our Arizona FIP, we used a 20 year life to assess the control costs for an SNCR installation on a kiln for the Phoenix Cement Company Clarkdale Plant, which is a much different type of source than the coal fired power plants we evaluated in our proposed Texas/Oklahoma FIPs. Also, SNCR, a NOx control is a much different type of control than the SO_2 controls we evaluated in our proposed Texas/Oklahoma FIPs. Similarly in our Montana FIP, we used a 20 year life to assess the SNCR control costs for the Holcim Cement kiln. Consequently, we do not see any conflict with our use of a 30 year life for assessing the cost effectiveness of the coal fired power plants we proposed to control in our Texas/Oklahoma FIPs.

We agree with Luminant that there is no particular threshold for determining the significance of visibility benefit in the regional haze rule. We note the full quote Luminant references is:[420]

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417 76 FR 52616. See also 76 FR 80758.
418 http://www.sargentlundy.com/projects/la-cygne-unit-2/.
419 79 FR 5165.
420 77 FR 40156.

> There is no particular threshold for determining significance of visibility benefit in the regional haze rule. Significance is a source- and Class I-specific evaluation, meaning that it depends on how much visibility improvement is needed at the Class I area(s), how much a specific source impacts the Class I area(s), and the cost effectiveness and potential visibility improvement of available control options. States have latitude to determine these thresholds,[421] providing support and a reasonable and adequate basis for why they selected the thresholds, and to determine BART and reasonable progress controls, in consultation with other impacted states. **As long as this evaluation is done adequately and the states provide a reasoned basis for their decisions**, EPA will defer to the state [emphasis added].

As we indicate in the above quote, we will defer to the state, "as long as this evaluation is done adequately and the states provide a reasoned basis for their decisions." As we discuss in our proposal, we disagree that Texas has in fact supplied a reasoned basis for many aspects of its decisions on whether to control visibility impacting facilities within its borders. Thus, we disagree with Luminant that we have "forgotten [our] own practices and standards" and we disagree that Texas fully explained and supported its cost effectiveness analysis, pursuant to our regulations and guidance.

The Associations point to our Reasonable Progress Guidance[422] and our Nebraska FIP[423] as support for the use of the dollars per deciview metric. We acknowledge that we have in these documents and elsewhere discussed the potential use of the dollars per deciview metric. However, as we note in our Oklahoma FIP:[424]

> [T]he BART Guidelines require that cost effectiveness be calculated in terms of annualized dollars per ton of pollutant removed, or $/ton.[425] OG&E provided a $/deciview analysis for its units and comparable BART determination performed by us. In our analysis for our BART FIP for OG&E and AEP/PSO, we did not evaluate $/deciview. We explain that the BART Guidelines list the $/deciview metric as an optional cost effectiveness measure that can be employed along with the required $/ton metric for use in a BART evaluation. The metric can be useful in comparing control strategies or as additional information in the BART determination process; however, due to the complexity of the technical issues surrounding regional haze, we have never recommended the use of this metric as a cutpoint in making BART determinations. We note that to use the $/deciview

[421] BART guidelines at 70 FR 39170: However, we believe the States have flexibility in setting absolute thresholds, target levels of improvement, or de minimis levels since the deciview improvement must be weighed among the five factors, and States are free to determine the weight and significance to be assigned to each factor. For example, a 0.3, 0.5, or even 1.0 deciview improvement may merit stronger weighting in one case versus another, so one ''bright line'' may not be appropriate.

[422] Guidance for Setting Reasonable Progress Goals Under the Regional Haze Program, June 1, 2007 rev., page 5-2.

[423] 77 FR 40156.

[424] Response to Technical Comments for Sections E. through H. of the Federal Register Notice for the Oklahoma Regional Haze and Visibility Transport Federal Implementation Plan, Docket No. EPA-R06-OAR-2010-0190, 12/13/2011, pdf 116.

[425] 70 FR 39167.

> metric as the main determining factor would most likely require the development of thresholds of acceptable costs per deciview of improvement for BART determinations for both single and multiple Class I analyses. We have not developed such thresholds for use in BART determination made by us. As OG&E acknowledges, EPA did not use this metric as part of its proposed BART determinations for either the Four Corners Power Plant FIP in AZ, or the San Juan Generating Station FIP in NM. Generally speaking, while the metric can be useful if thoughtfully applied, we view the use of the $/deciview metric as suggesting a level of precision in the calculation of visibility impacts that is not justified in many cases. While we did not use a $/deciview metric, we did, however, consider the visibility benefits and costs of control together, as noted above by weighing the costs in light of the predicted visibility improvement.

Our decision was reviewed and upheld in Oklahoma v. EPA, 723 F.3d 1201 by the Tenth Circuit which ruled:

> Oklahoma first suggests EPA should not have rejected the visibility analysis it conducted in the SIP, which used the dollar-per-deciview method. This argument is misguided. The EPA rejected the SIP because of the flawed cost estimates. When promulgating its own implementation plan, it did not need to use the same metric as Oklahoma. The guidelines merely permit the BART-determining authority to use dollar per deciview as an optional method of evaluating cost effectiveness. *See* 40 C.F.R. pt. 51 app. Y(IV)(E)(1).[426]
>
> And in the final rule, the EPA explained why it did not use the dollar-per-deciview metric used by Oklahoma. "Generally speaking, while the metric can be useful if thoughtfully applied, we view the use of the $/deciview metric as suggesting a level of precision in the calculation of visibility impacts that is not justified in many cases." 76 Fed.Reg. at 81,747. The EPA has never mandated the use of this metric, and has not developed "thresholds of acceptable costs per deciview improvement." *Id.* While the federal land managers have developed thresholds, these thresholds were apparently developed without input from the EPA and without notice-and-comment review. EPA Br. at 54 n. 13. In light of this, we do not find it arbitrary or capricious that the EPA chose not to use the dollar-per-deciview metric in evaluating BART options in creating the FIP. We therefore also conclude that any argument by the petitioners that the dollar-per-deciview measurement proves the scrubbers are not cost effective lacks merit. *See* Pet. Reply Br. at 16.

[426] We note, however, that in both its final rule and in its brief the EPA asserts that the guidelines require the use of the dollar-per-ton metric in evaluating cost effectiveness. The guidelines themselves are a bit unclear. In the section on cost effectiveness, the guidelines mention only the dollar-per-ton metric. 40 C.F.R. pt. 51 app. Y(IV)(D)(4)(c). However, the guidelines later state that in evaluating alternatives, "we recommend you develop a chart (or charts) displaying for each of the alternatives" that includes, among other factors, the cost of compliance defined as "compliance — total annualized costs ($), cost effectiveness ($/ton), and incremental cost effectiveness ($/ton), and/or any other cost-effectiveness measures (such as $/deciview)." Id. app. Y(IV)(E)(1) (emphasis added).

We see no reason, despite that fact that the facilities we evaluated in our proposed Texas/Oklahoma FIPs were done under the reasonable progress and long-term strategy sections of the Regional Haze Rule, to deviate from our view of the dollar per deciview metric here. We also note that the use of the dollar per deciview metric is further complicated in the present case due to our use of CAMx modeling. As we discuss in our proposal and elsewhere in our response to comments, there is no way to directly compare the CAMx modeled visibility impacts and benefits we used in our proposed Texas/Oklahoma FIPs with previous CALPUFF modeling results.[427] Consequently, even if we were to use the dollar per deciview metric in our Texas/Oklahoma FIPs, we would have no way to compare the results against other modeling and cost analyses, the vast majority of which employed CALPUFF.

The Associations stated that the human eye cannot detect changes in visibility of less than one deciview and allege that our "Technical Support Document for Demonstration of the Transport Rule as a BART Alternative," proves their point that the 2018 visibility improvements in our proposed Texas/Oklahoma FIP should be treated as nonexistent. They cite to our "Technical Support Document for Demonstration of the Transport Rule as a BART Alternative" that references visibility degradations of less than 0.05 deciviews. We address this comment in a separate response to comment where we discuss consideration of cost versus visibility.

The Associations also point to our proposed Arkansas FIP stating we concluded that a similar incremental visibility improvement was minimal and could not justify the much smaller difference in cost between wet and dry SO_2 scrubbers. As we have noted elsewhere in our response to comments, because the visibility modeling in our proposed Arkansas FIP used the CALPUFF model, while that in our proposed Texas/Oklahoma FIPs used the CAMx model, the results are not comparable.[428] We consequently do not agree with the Associations' contention that we should conclude that the visibility improvements we modeled in our Texas/Oklahoma FIPs were not meaningful.

Comment: Luminant stated that the projected deciview improvement from the additional individual unit controls that EPA proposes are ***well below*** the level of improvement that EPA has previously found ***do not*** warrant "reasonable progress" controls. For example, in a final rule partially approving Wyoming's regional haze SIP, EPA determined that additional EGU emission controls projected to achieve visibility improvements as high as 0.18 deciview per unit at the most impacted Class I area were not warranted due to their "relatively modest" visibility benefit.[711] Similarly, for Montana, EPA found that projected visibility benefits from additional EGU emission controls as high as 0.273 deciview per unit at the most impacted Class I area were "not sufficient for us to consider it reasonable to impose this option in this planning period."[712] Here, by contrast, EPA is claiming that controls on individual Luminant units that are modeled by ENVIRON (EPA's own contractor) to achieve as little as 0.0136 deciview at the most impacted Class I area in 2018 (Sandow Unit 4 at Wichita Mountains) would "result in significant visibility improvements," and it proposes to require the controls on that basis.[713] Indeed, for

[427] See our FIP TSD, beginning on page A-35.
[428] See our FIP TSD, beginning on page A-35, in which we explain why key differences in CALPUFF and CAMx preclude the comparison of their respective results and why CAMx results for RP are generally much less than CALPUFF results for BART for the same facility/emissions due to the model inputs and metrics used.

Luminant's units, all of the visibility improvements that ENVIRON modeled for EPA are well below the improvements that EPA found were insignificant in its Wyoming and Montana final actions.[714] EPA's inconsistent action here and its unique treatment of Texas sources are thus arbitrary and capricious, in violation of EPA's regional consistency regulations, and unlawful. EPA's attempts to avoid this inconsistency by "adjusting" the modeling that ENVIRON provided to EPA are likewise arbitrary and capricious and unconvincing. As explained elsewhere in these comments, these post hoc adjustments are unjustified, based on incorrect data, and not related to the legal issue at hand (reasonable progress in 2018 judged by conditions in 2018). But even accepting EPA's fictions and adjustments to the modeling that is commissioned, EPA's inflated estimated benefits at the majority of the Luminant units that EPA would regulate are still below the level EPA found in Montana to be "not sufficient" to warrant additional controls.[715] In other words, even at the highest level of benefits that EPA can put forward (which are miniscule), the benefits are less than EPA found to be not sufficiently large to require additional controls. And EPA cannot claim that lower costs justify the controls here—a cost-per-deciview analysis (which EPA fails to conduct) demonstrates conclusively that none of the controls that EPA is proposing for Texas sources is cost-effective as compared to the controls EPA rejected in Wyoming and Montana.[716]

Luminant stated, even using EPA's data, the cost-per-deciview of EPA's proposal is substantially higher than values that EPA has recently determined are unreasonable to impose in the reasonable progress context. For example, in its recent review and partial approval of Wyoming's regional haze SIP, EPA determined that new emission controls for Dave Johnston Units 1 & 2 with a cost-per-deciview ranging from \$10 to \$39 million per deciview, depending on the control and the unit,[846] were unreasonable and were not required under the reasonable progress requirements.[847] EPA specifically explained that the cost, "while reasonable if viewed in isolation, was not necessarily justified this planning period in light of the ***relatively modest*** visibility improvement predicted by the revised modeling (0.11 deciviews—0.12 deciviews at the most impacted Class I area). As a result, we are approving the state's reasonable progress determinations of no new controls for Dave Johnston Units 1 and 2[.]"[848] Similarly, in reviewing Montana's SIP, EPA found that controls with a cost-per-deciview ranging from \$13 to \$23 million, depending on the control and the unit, were not required under the reasonable progress requirements.[849]

According to Luminant, were EPA to apply these same standards to Texas sources, the result would be the same—the small improvement that EPA has estimated would be outweighed by the substantial cost. The costs-per-deciview of the controls that EPA is proposing for Texas sources are substantially higher than the costs-per-deciview that EPA found justified Wyoming's and Montana's decisions not to impose additional controls on their EGUs. Yet again, EPA is applying a different standard to Texas sources and thus acting in violation of its regional consistency regulations and in an arbitrary and capricious manner. As it did in Wyoming and Montana, EPA must "approv[e] the State's reasonable progress determinations of no new controls"[850] for Texas EGUs.

Luminant stated that the EPA judges Texas's SIP using different and more stringent standards than it has used in other states. For example, in two separate actions approving Idaho's and Oregon's reasonable progress goals, EPA found that a total deciview impact on a Class I area of

0.5 deciview was "relatively small" and that a facility with an impact at or below that level should not be required to install additional controls to further reduce its impact.[10] Here, in contrast, EPA has determined that the largest impact from any one of Luminant's plants at a Class 1 area is 0.15 deciviews—less than one-third of what EPA previously found to be "relatively small" and an "unreasonable" basis for regulation—yet it subjects Luminant's plants to drastic and costly emission reductions on this basis.[11] EPA's proposal thus violates EPA's regional consistency regulations and is arbitrary and capricious.

Comment: [Luminant (0061) p. 113] Luminant stated that when viewed in the proper context—the deciview—the visibility impacts that EPA estimates here are clearly below thresholds that EPA has previously and routinely determined do not warrant additional emission controls under the reasonable progress requirements. For example, in recently reviewing and approving Idaho's reasonable progress goals, EPA "independently evaluated whether there are reasonable control measures available for sources located within Idaho's regulatory jurisdiction" and concluded that facilities with visibility impacts of 0.5 deciviews or less at the nearest Class I area were "***relatively small***."[703] Thus, EPA agreed with the state that additional controls for reasonable progress "are not reasonable at this time, because ***even though there are cost effective controls identified, visibility improvement is anticipated to be relatively small***."[704] Further, in finalizing its approval and responding to comments, EPA again confirmed that, even though "several of the Idaho stationary sources have visibility impacts between 0.3-1.3 deciviews (dv)," those impacts were not a "significant contribution to visibility impairment" that warranted reasonable progress controls.[705] EPA has used this same threshold in other states to conclude that "reasonable progress controls" are not warranted.[706]

But here, Luminant noted that EPA Region 6 fails to follow the same standard that other EPA Regions have used. Here, all of the visibility impacts that ENVIRON modeled, at EPA's request, for Luminant's plants are ***well below 0.5 dv***.[707] Indeed, the ***largest*** impact that ENVIRON modeled of any Luminant plant at any Class I area is only 0.151947 deciview (Monticello's modeled impact at Wichita Mountains),[708] less than one-third of the threshold that EPA employed in its "independent[]" evaluation of Idaho sources to eliminate them from further regulation.[709] EPA fails to explain its departure from the 0.5 deciview threshold it previously embraced, and its inconsistent action here is arbitrary and capricious and violates EPA's regional consistency regulations. EPA's use of percentage extinction, as opposed to deciview impact, appears to be an attempt to mask the fact that the Texas units here have relatively small impacts on actual visibility at the Class I areas at issue. Under the standards that EPA itself has previously established, the Luminant units at issue here have minimal impact on visibility and should not be subject to further controls under the reasonable progress program—"***even though there are cost effective controls identified . . . .***"[710]

NERA stated that EPA's decision making and the burdens it would impose on states and individual sources should be commensurate, at least in some measure, across all U.S. states, and EPA's own regulations require that it act consistently across all regions. If a FIP were to produce radically different benefits on a dollar per deciview basis in one state, one would at least expect EPA to provide a defensible basis for the different treatment, which EPA has not done in its proposed regional haze FIP for Texas.

According to NERA, the proposed regional haze FIP for Texas fails to treat Texas in a similar fashion as other states and fails to provide a rational basis for doing so. For example:

- As EPA has explained in its proposal, the FGD upgrades at four plants are the only controls that could potentially be implemented and operational during the first planning period, which ends in 2018.[4] Thus, as explained in Luminant's comments, only the potential benefits of the FGD upgrades can be considered as a basis for EPA's proposed FIP, which, like Texas's SIP, is limited to the first planning period. The visibility benefits from the SO_2 scrubber retrofits would be considered only in the subsequent planning period. In this regard:
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    - improvement in visibility from the FGD upgrades would cost approximately $129 million per year per deciview to $651 million per year per deciview (depending on the unit) on the 20% worst visibility days at WIMO, the Class I area that EPA claims is the most affected.
    - These estimates of dollars per deciview of improvement are mostly more than ten times higher than costs that EPA has deemed unnecessary and unreasonable in other regional haze rules. For the Wyoming FIP, additional controls with a cost effectiveness of only $10 million per year per deciview were deemed not to be warranted even though they each would have produced about twice as much absolute visibility impact at the most affected Class I area as EPA's proposed Texas FGD upgrades. For the Montana FIP, additional controls with a cost effectiveness of $38 million per year per deciview were deemed not to be warranted, also having higher absolute visibility impact.

- Even if the proposed new scrubber retrofits on seven Texas units could be considered to meet the statutory factor that considers time necessary for compliance, those measures are even less cost effective: between about $400 million per deciview and $1.3 billion per deciview. These would be 40 to 130 times higher than the upper bound EPA required in Wyoming, yet provide substantially less deciview benefit to their respective maximally affected Class I areas.

NERA stated that these estimates of dollars per deciview of improvement are mostly more than ten times higher than costs that EPA has deemed unnecessary and unreasonable in other regional haze rules. For the Wyoming FIP, additional controls with a cost effectiveness of only $10 million per year per deciview were deemed not to be warranted even though they each would have produced about twice as much absolute visibility impact at the most affected Class I area as EPA's proposed Texas FGD upgrades. For the Montana FIP, additional controls with a cost effectiveness of $38 million per year per deciview were deemed not to be warranted, also having higher absolute visibility impact. Even if the proposed new scrubber retrofits on seven Texas units could be considered to meet the statutory factor that considers time necessary for compliance, those measures are even less cost effective: between about $400 million per deciview and $1.3 billion per deciview. These would be 40 to 130 times higher than the upper bound EPA required in Wyoming, yet provide substantially less deciview benefit to their respective maximally affected Class I areas.

According to NERA, although EPA has rejected using a bright-line dollars per deciview threshold to justify additional controls for a reasonable progress analysis, cost effectiveness is a tool that can assure consistency in regulatory decisions across multiple types of sources and jurisdictions. If regulatory decisions were to result in source-specific controls with high cost effectiveness in one situation while requiring controls on other sources in another situation with much lower cost effectiveness, the overall policy would be inefficient. That is, it would produce less societal benefit than could be achieved at the same societal cost but with a different mix of control requirements. Cost-effectiveness analysis was developed specifically to avoid this undesirable societal outcome.

NERA noted that EPA's proposed actions on Texas's and Oklahoma's regional haze SIPs are the last of EPA's actions on SIPs submitted by states for the first planning period under the Regional Haze program.[22] This makes it possible to determine whether the controls being proposed in this FIP are consistent with the cost effectiveness that EPA has required in other regional haze actions for other states. We find that the upgrades proposed in the Texas FIP have extremely high cost per deciview improvement (*i.e.,* low cost effectiveness) compared to reasonable progress controls that EPA has evaluated in other states. *Inconsistency* in cost effectiveness, however, occurs if a reasonable progress control that EPA has deemed is unwarranted in another State has an estimated cost per deciview that is substantially less than the cost per deciview associated with the reasonable progress controls EPA now proposes for Texas.

NERA states that the upgrades proposed in the Texas FIP have extremely high cost per deciview improvement (*i.e.,* low cost effectiveness) compared to reasonable progress controls that EPA has evaluated in other states. We find a clear case of such inconsistency in the decisions that were made by EPA with respect to the regional haze SIPs of the States of Wyoming and Montana when compared to what EPA now proposes for Texas.[23] NERA noted, in its review of Wyoming's regional haze SIP, EPA initially proposed that Dave Johnston units #1 and #2 should be required to apply additional NO_x controls for reasonable progress. Three levels of NO_x control were considered in EPA's analysis: low NO_x burners with overfire air (LNB with OFA), and LNBs with OFA *in combination* with either selective non-catalytic reduction (LNB with OFA and SNCR) or with selective catalytic reduction (LNB with OFA and SCR). EPA found that these measures each have increasing NO_x reduction, increasing cost, and increasing visibility improvement; they also have decreasing cost effectiveness. Calculations of the cost per deciview of these options, based on EPA's data and estimates, are in Table 5. As can be seen, the cost effectiveness of the reasonable progress options considered by EPA in its review of the Wyoming SIP ranged from \$10 million per deciview to \$39 million per deciview. It is notable that EPA could have proposed to require any one of the three levels of control, but decided that not even the lowest of the three levels of control was warranted. Thus, even a control offering improvement at the maximally-affected Class I area costing \$10 million per deciview was not seen to be cost effective enough for Wyoming.[24] Information was not provided in the Wyoming FIP that would enable a computation of the cost per deciview for the cumulative visibility impacts of these controls.

AECOM stated that the EPA Region 6 has previously indicated that a visibility improvement of 0.2 delta-deciviews is too low for applying emission reductions. This action was for the

Arkansas RHR SIP, for which EPA stated, "[w]ith regard to the comment that Arkansas sources contributed 2.0% to visibility impairment at Wichita Mountains during the baseline period and are projected to contribute 2.3% in 2018, EPA notes that removal of this 2.3% contribution to the total extinction results in a visibility improvement of only 0.2 dv from the 2018 projected visibility conditions. Consequently, while we are concerned that the RPG at Wichita Mountains is not on the glide path, we believe the technical assessment that Arkansas sources do not have a significant impact at Wichita Mountains is accurate and ADEQ and ODEQ followed consultation procedures." [106]

AECOM stated that the EPA separately determined for the State of Wyoming that a single source's modeled visibility improvement of 0.19 dv for a Class I area was insignificant to require additional controls. EPA stated that, "[a]lthough the cost-effectiveness for SNCR is reasonable, we find it reasonable for the State not to select this control technology based on the incremental visibility improvement for this control technology." [107] Similarly, EPA determined that a visibility improvement of 0.17 dv was too low for application of emission controls. [108] These cases indicate that modeled visibility improvements as high as about 0.2 dv[109] have been determined to be too low for requiring emission controls because such controls would result in minimal improvements.

Xcel Energy noted that the EPA has previously rejected additional controls to achieve reasonable progress even when visibility improvement was magnitudes greater than EPA expects from the installation of scrubbers at the Tolk units:

- In Arkansas, EPA concluded that "a visibility improvement of *only* 0.2 dv" was too low to apply further emission reductions even when Wichita Mountains was not on the URP glidepath. Arkansas SIP Approval, 77 Fed. Reg. 14,604, 14,625 (March 12, 2012) (emphasis added).

- In Arizona, EPA projected benefits of SCR at one project to be 0.41 dv at the most affected Class I area but still rejected SCR for purposes of reasonable progress. This level of improvement is more than nine times greater than the visibility improvement that SDA scrubbers on Tolk would accomplish, at best, at the Guadalupe Mountains. Arizona FIP, 79 Fed. Reg. 9,318, 9,360 (Feb. 18, 2014).

- In Montana, EPA found a 0.18 dv improvement to be a "low visibility improvement" that "did not justify proposing additional controls" for SO_2 on one source. This level of improvement is more than four times greater than the visibility improvement that SDA scrubbers on Tolk would accomplish, at best, at the Guadalupe Mountains. Montana FIP, 77 Fed. Reg. 23,988, 24,012 (Apr. 20, 2012).

- In Oregon, even with relatively low costs per ton (\$1,816/ton of NO_X), minor visibility improvements were rejected because "adding SNCR only provided an additional 0.18 dv of visibility improvement over NLNB/MOF A at the Mt. Hood Wilderness Area." This level of improvement is more than four times greater than the visibility of improvement that SDA scrubbers on Tolk would accomplish, at best, at the Guadalupe Mountains. Proposed Oregon SIP, 76 Fed. Reg. 12,651, 12,661 (March 8, 2011).

EPA previously rejected similar *cumulative* visibility improvements of 0.254 dv and 0.273 dv in the New York SIP as "small." New York SIP Approval, 77 Fed. Reg. at 24,818. Nevertheless, EPA concluded for Texas that individual sources with de minimis deciview contributions and similarly small deciview cumulative benefits warrant the substantial costs of additional controls based on EPA's estimate of "extinction benefits and percentage of total extinction." 79 Fed. Reg. at 74,882.

[CCP (0075) p. 11] CCP stated that the EPA has rejected controls in the RPG context even when visibility was improved significantly more than EPA projects from the installation of a WFGD scrubber at Coleto Creek Unit 1. For example, in Arizona, EPA projected benefits of selective catalytic reduction technology ("SCR") at one project to be 0.41 dv at the most affected Class I area but still rejected that control for purposes of reasonable progress. 79 Fed. Reg. 9,318, 9,360 (Feb. 18, 2014) ("Arizona FIP"). In Montana, EPA found a 0.18 dv improvement to be a "low visibility improvement" that "did not justify proposing additional controls" for SO_2 on one source. 77 Fed. Reg. 23,988, 24,012 (Apr. 20, 2012) ("Montana FIP"). EPA separately determined for the State of Wyoming that single source's modeled visibility improvement of 0.19 dv for a Class I area was insignificant to require additional controls.(78 FR 34751) And in Arkansas, EPA concluded that 0.2 dv improvement was too low to apply further emission reductions for Wichita Mountains. 77 Fed. Reg. 14,604, 14,625 (Mar. 12, 2012).

[NRG (0078) p. 2] NRG stated that the EPA has also acknowledged that the actual visibility impact of its proposal will be much smaller than the 0.284 deciview improvement. For the actual worst 20 percent of days--the same dataset tracked under the reasonable progress rule EPA is implementing-the visibility improvement from NRG's facilities would be only 0.057 deciview.[2]

NRG stated that, notably, EPA has previously found a larger, 0.5 deciview impact to be insufficient to justify further regulation.[3] Thus, it would be inconsistent for EPA to pursue smaller changes in visibility by regulating Limestone as proposed.

Footnotes:

[1] See 79 Fed. Reg. at 74,881, Tbls. 34-36 (Table 34 shows the greatest improvements at 0.135 and 0.149 deciview for Limestone Units 1 and 2, respectively, for the Wichita Mountains as against "average natural conditions").

[2] Id.

[3] 77 Fed. Reg. 30,248, 30,256 (May 22, 2012); 77 Fed. Reg. 30,454, 30,464 (May 23, 2012).

Footnotes:

[11] EPA_txbart3612k_Vis_2002_2018_PSAT_Projected_072913.xlsx.

[703] 77 Fed. Reg. at 30,255–56 (emphasis added).

[704] Id. at 30,256 (emphasis added).

[705] 77 Fed. Reg. at 66,930–31.

[706] See, e.g., 77 Fed. Reg. 30.454, 30,464 (May 23, 2012) (Oregon).

[707] See Background, Table 3.

[708] Id.

[709] 77 Fed. Reg. at 30,255.

[710] Id. at 30,256; see also 77 Fed. Reg. at 30,464 (same).

711 79 Fed. Reg. 5,032, 5,044 5,051 (Jan. 30, 2014). EPA relies on its proposed rule for Wyoming that would have required these controls (FIP TSD at A-75, n.52), but it ignores its final rule that does not.
712 77 Fed. Reg. 23,988, 24,064-67 (April 20, 2012) (proposed); 77 Fed. Reg. 57,864 (Sept. 18, 2012) (final).
713 79 Fed. Reg. at 74,883. Deciview improvement values modeled by ENVIRON are provided in Table 4.
714 See Table 4.
715 See Table 7.
716 See Section XI.B.
[846] Based on the costs and visibility improvement values cited by EPA in its Wyoming rule, 79 Fed. Reg 5,032, 5044 (Jan. 30, 2014), NERA calculated these cost-per-deciview values. See NERA Report at 15-16.
[847] 79 Fed. Reg. at 5,051.
[848] Id.
[849] NERA Report at 16–17.
[850] Id.
[23] 79 Fed. Reg. 5,032 (Jan. 30, 2014).
[24] We note that this $10 million/dv is for the 98th percentile deciview improvement, which will be larger than the average deciview improvement on the 20% worst-visibility days, as is calculated for the proposed Texas FIP controls. If the average change on the 20% worst days were 10% less than on the 98th percentile day, the cost effectiveness would be $11 million/dv.
[106] 77 Fed. Reg. 14,625.
[107] 78 Fed. Reg. 34,751.
[108] 78 Fed. Reg. 34,752.
[109] EPA's Regional Haze Rule notes that "no degradation" to visibility would be "defined as less than a 0.1 deciview increase." (64 Fed. Reg. 35,730)

Response: Luminant, NERA and others cite to our Wyoming, Idaho and Montana FIPs and allege that we are proposing controls in Texas based on visibility improvement values and cost-per deciview values below what we have previously found do not warrant controls. Luminant also alleged that we attempted to avoid this inconsistency by "adjusting" the modeling that ENVIRON provided to us, stating these adjustments (which Luminant explores in more detail in another comment) are still below the level we found in Montana to be "not sufficient" to warrant additional controls. We address Luminant's comments concerning "adjustments" to the model results elsewhere in this document we address comments concerning modeling.

As we have discussed in our proposal,[429] our proposed controls were based on our simultaneous reasonable progress and long-term strategy analyses. These analyses address both (1) the requirements to consider the four reasonable progress factors for the Texas Class I areas, and (2) the technical basis required to develop the long-term strategy for the Texas Class I areas and the Wichita Mountains in Oklahoma. We used the ''four factor analysis'' method outlined in 40 CFR 51.308(d)(1)(A) that states are directed to use in establishing a RPG. We consider 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. We also discussed that, similar to a BART analysis, we were also considering visibility. We noted that, with the exception of the Tolk facility, the issues relating to the evaluation of three of these factors: (1) Time necessary for compliance, (2) energy and non-air quality environmental impacts of compliance, and (3) remaining useful life, are common to all the units we are analyzing.

That aside, as we have noted elsewhere in our response to comments, because the visibility

[429] 79 FR 74873.

projections cited to by Luminant used the CALPUFF model, while those in our proposed Texas/Oklahoma FIPs used the CAMx model, the results are not comparable. As we discuss elsewhere in our response to comments, we also disagree with Luminant that we are required, or that we should have, conducted a cost-per-deciview (i.e., $/dv) analysis. As we discuss in our proposal and elsewhere in our response to comments, there is no way to directly compare the CAMx modeled visibility impacts and benefits we used in our proposed TX/OK FIPs with previous CALPUFF modeling results of visibility impacts and benefits used in other actions because of differences in the models, model inputs, and metrics used.[430] Many of these differences result in CAMx modeled visibility impacts and benefits to be much lower than CALPUFF modeled impacts and benefits relied on in other actions. For example, one difference between the two model analyses is that CALPUFF modeling is focused on the *maximum* impact from the modeled source, whereas the CAMx modeling is focused on the *average* impact over the 20% worst days as determined by the monitored data during the baseline. The commenter's estimates do not consider these differences and attempt to compare CAMx results from our analysis to CALPUFF modeling results preformed for sources in other states. We consequently do not agree with the Luminant's contention that we are being inconsistent with our previous actions.

We also discuss in a separate response to comment that we disagree with the commenters' assertions that we did not properly compare the cost effectiveness of our proposed controls to their modeled visibility benefits. We also reject the commenters' assertions that this type of comparison requires the $/dv metric. We take up the issue of Luminant's reference to adjustments it states we made to our modeling in responses to comments concerning modeling elsewhere in this document.

AECOM cited to our proposed Arkansas FIP and our final Wyoming FIP and Luminant cited to our Idaho and Oregon actions, and NRG cited to our Idaho action as containing instances where we concluded that visibility improvements greater than what we are proposing in our Texas/Oklahoma FIPs were deemed too little to warrant controls. As we have noted elsewhere in our response to comments, because the visibility projections cited to were obtained from the CALPUFF model, while those in our proposed Texas/Oklahoma FIPs used the CAMx model, the results are not comparable.

Xcel cites to our Arkansas, Arizona, Montana, Oregon, and New York actions and alleges that we previously rejected controls that would have resulted in greater visibility than we now require for Texas. Similarly, CCP cites to our Arizona, Montana, and Wyoming actions. The actions cited all used CALPUFF modeling. We explain in our FIP TSD[431] and elsewhere in our response to comments, our selection of the photochemical grid model CAMx over CALPUFF to assess visibility impacts and benefits for Texas sources. We also explained why the results from our CAMx modeling analysis cannot be compared to CALPUFF results. As a consequence, we disagree with Xcel and CCP.

We address the allegations that we should not have proposed controls that would be installed beyond 2018 in our responses to other comments on the issue.

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[430] FIP TSD at A-35.

[431] FIP TSD, Appendix A. See discussion beginning on page A-35.

Comment: [Texas Governor (0066) p. 2-3] The Texas Governor explained that the EPA's actions are irrationally and arbitrarily discriminatory against the State of Texas. *Cf. Nw. Austin Mun. Utit. Dist. No. One v. Holder*, 557 U.S. 193, 203 (2009) (emphasizing "our historic tradition that all the States enjoy equal sovereignty" (internal quotation marks omitted)). It appears that EPA has devised one set of rules for States it likes and another set for States it dislikes.

The Texas Governor states that EPA approved California's "regional haze" SIP. See. 76 Fed. Reg. 34,608 (2011). In doing so, EPA gave the State of California until the year 2307 to eliminate "regional haze" at Desolation Wilderness and Mokelumne Wilderness, until the year 2106 to eliminate "regional haze" at Joshua Tree National Park, and until the year 2096 to eliminate "regional haze" at Sequoia National Park. Apparently, for a State like California, EPA thinks that up to 300 years constitutes "reasonable progress." 42 U.S.C. section 7491. EPA faulted Texas's plan to eliminate regional haze even faster. In particular, Texas proposed to eliminate "regional haze" in the Guadalupe Mountains by 2081 and in Big Bend by 2155. While that rate of haze-elimination clearly would have been "reasonable" in California, EPA determined that it was "not reasonable" in Texas. 79 Fed. Reg. at 74,843. The Texas Governor explained that the EPA's capricious discrimination violates the "fundamental norm of administrative procedure that] requires an agency to treat like cases alike. If the agency makes an exception in one case, then it must either make an exception in a similar case or point to a relevant distinction between the two cases." *Westar Energy, Inc. v. FERC*, 473 F.3d 1239, l24I (D.C. Cir. 2007). EPA has done nothing to explain why one set of rules applies to California while another, stricter set applies to Texas. This is the definition of arbitrary. The Texas Governor stated that the only self-evident explanation for EPA's discrimination is that California has fewer coal-fired power plants than does Texas. According to the latest data he has seen, the Texas Governor stated that Texas has 40 coal-fired electric generating units ("EGUs") while California only has 10. But Part C of the Clean Air Act does not give EPA the power to conduct a witch hunt against coal; it only allows EPA to "protect visibility." And Texas's SIP would reduce the same amount of visible haze as EPA's FIP while costing $2 billion less, and it would reduce haze faster than California's plan would. EPA cannot premise its FIP authority on its dislike of coal and/or its desire to play favorites between States.

Response: We do not believe that the type of simplistic comparison between Texas and California that the comment from the Texas Governor has proposed is valid. There is no requirement in the Regional Haze Rule, for a “one size fits all” date certain for achieving natural conditions, as the Governor has apparently implied. Indeed, the Regional Haze Rule is written expressly anticipating “reasonable progress” and these dates will be different, based on the unique circumstances present in each state with regard to the number and type of pollution sources, how much each state’s pollution impacts Class I visibility (both in and out of the state), the types of controls already present on a state’s sources, and a number of other relevant factors. With respect to the comment that EPA is approving a much slower rate of progress for California Class I areas than Texas Class I areas, we note that the difference is that, as explained elsewhere, Texas’ analysis was not in conformance with the requirements of the statute, which further analysis revealed resulted in reasonable controls not being required. We note that one reason for this is that Texas failed to reasonably estimate natural visibility conditions at Big Bend and Guadalupe Mountains. Taking into account a more realistic value for natural visibility conditions significantly changes the number of years for eliminating anthropogenic visibility impairment. As shown in Table 44 of our proposal, we estimate that at the rate of visibility improvement consistent with the controls required in the FIP, the number of years for eliminating anthropogenic visibility impairment are 173 years for Big Bend and 141 years for the Guadalupe Mountains. In addition, the difference is that additional reasonable controls of Texas's sources were identified and that by not requiring those controls, the reasonable progress goals of the affected Class I areas were not being properly determined. This was not the case in California, and the California SIP provided sufficient explanation, in accordance with the regional haze rule requirements, for why the rate of progress to reach natural conditions was slower than the uniform rate of progress.

The comment also seems to be implying that we examined the number of coal fired power plants in Texas and California, noted that Texas had more, and incorporated that knowledge in our proposal. The difference in the number of coal fired power plants in Texas versus any other state did not enter into our proposed decision making. However, it is reasonable to assume that the greater number of uncontrolled or under controlled coal fired power plants a state has, the greater will be its emissions. That is the case with Texas. We demonstrated that the emissions from these sources impact the visibility at the Wichita Mountains in Oklahoma more than all of Oklahoma's own point source categories combined. That fact did weigh heavily in our proposed decision making. Thus, we disagree with the comment that we acted arbitrarily, or that we are playing favorites with states, as the basis and appropriateness of our analysis and determinations have been explained extensively throughout our responses and final action, and our proposal did not result in a more stringent standard for Texas.

We note that the full paragraph of *Cf. Nw. Austin Mun. Utit. Dist. No. One* that the Texas Governor cites to is as follows:

> The Act also differentiates between the States, despite our historic tradition that all the States enjoy "equal sovereignty." *United States* v. *Louisiana*, 363 U.S. 1, 16, 80 S. Ct. 961, 4 L. Ed. 2d 1025 (1960) (citing *Lessee of Pollard* v. *Hagan*, 44 U.S. 212, 3 How. 212, 223, 11 L. Ed. 565 (1845)); see also *Texas* v. *White*, 74 U.S. 700, 7 Wall. 700, 725-726, 19 L. Ed. 227 (1869). Distinctions can be justified in some cases. "The doctrine of the equality of States . . . does not bar . . . remedies for *local* evils which have subsequently appeared." *Katzenbach, supra*, at 328-329, 86 S. Ct. 803, 15 L. Ed. 2d 769 (emphasis added). But a departure from the fundamental principle of equal sovereignty requires a showing that a statute's disparate geographic coverage is sufficiently related to the problem that it targets.

557 U.S. at 203. We note that the federal law at issue in that case imposed requirements on only certain States, i.e., disparate treatment of States on the face of the statute. The full context of the citation reveals that the Court was explaining that, despite the principle of equal sovereignty, a federal law's treatment of States can be disparate if the disparate treatment is sufficiently related to the problem being addressed by the statute at issue. We disagree that this holding is at issue

here. First, the CAA Regional Haze Rule provisions do not only apply to certain states but rather apply to all States. Second, as we have discussed in detail elsewhere, our proposal is consistent with the statute, regulations, guidance, and previous actions in other States. As we explain elsewhere, any potential differences in our proposal's methodology from other State's is a result of reasonable, scientifically sound implementation of the statute's requirements in a state as geographically large and source numerous as Texas, and, most importantly, does not result in Texas being held to a more stringent standard than other states. Again, and as stated in greater detail elsewhere, what commenters allege should be national uniformity ignores our authority to exercise of our judgment, based on the specific facts at hand in reviewing SIP actions. Here, we are exercising judgment within the parameters laid out in the CAA and our regulations. Because this is a SIP review action, we believe that we are not only authorized but required to exercise independent technical judgment in evaluating the adequacy of the State's regional haze SIP, just as we must exercise such judgment in evaluating other SIPs.

Comment: Luminant stated that in reviewing New Mexico's regional haze SIP, EPA has already approved a higher (less stringent) reasonable progress goal for the Carlsbad Caverns National Park (16.92 dv) that uses the same IMPROVE air quality monitor as Guadalupe Mountains for establishing and determining reasonable progress.[505] EPA's proposal to disapprove Texas's more stringent goal (0.63 deciview lower than New Mexico's RPG)—for the same monitored location—is the definition of arbitrary and capricious agency action. EPA provides absolutely no explanation, much less support, for its decision that the more stringent RPG established by Texas for the exact same monitored location for the same interim deadline is unreasonable. Nor does EPA provide explanation or support for its completely new and different proposed RPG for this site. The only mention in EPA's proposal about the common monitor for the two areas relates to discussions among Texas, New Mexico, and Federal Land Managers about natural visibility conditions for the two areas.[507] There is absolutely no discussion of New Mexico's RPG for the shared monitor or EPA's prior approval of that RPG as "reasonable."

Indeed, states Luminant, EPA approved New Mexico's RPG for this site based on the same rationale Texas provided to support its more stringent RPG. As explained by EPA:

> [New Mexico] reasonably concluded that the cost of additional controls was not warranted and concluded that the RPGs are reasonable given projected emissions reductions from anthropogenic sources and the fact that natural and out-of-state sources contribute significantly to haze. Because the State has limited ability to control naturally occurring wildfires and windblown dust, these sources of visibility impairment will continue to impact visibility at New Mexico's Class I areas and limit the visibility improvement achievable during the planning period.[508]

Luminant states EPA's approval of New Mexico's RPG also illustrates the inconsistency and arbitrary nature of EPA's treatment of Texas's SIP revision. If EPA were correct that Texas emissions are impacting visibility at this monitor in a significant way, and that reasonable progress for this area required emission reductions from sources in East Texas, EPA's position here would require it to object to New Mexico's RPG for Carlsbad Caverns and "disapprove" the interstate consultation between New Mexico and Texas (and other "upwind" states). Tellingly, EPA did not do so. Nor did it do so for other states (as discussed in Section III.C and elsewhere in these comments) that consulted and agreed on apportionment of emission reductions for their shared impact on Class I areas. EPA's different treatment and proposed disapproval of Texas's SIP revision is unexplained, arbitrary, and unlawful.

NRG stated that the monitoring data used to determine baseline and natural visibility conditions for the Guadalupe Mountains are the same dataset that was used to determine baseline and natural visibility conditions for the nearby Carlsbad Caverns area in New Mexico. However, in approving New Mexico's regional haze plan, EPA required the State to plan for achieving a less stringent degree of visibility improvement by 2018. A comparison of the Texas and New Mexico reasonable progress targets and associated visibility improvement appears in the following table:

Texas and New Mexico Reasonable Progress Goals Based on Data from Guadalupe Mountains Monitoring Site

	Guadalupe Mountains (Texas, proposed for disapproval)[30]	Carlsbad Caverns (New Mexico, approved by EPA)[31]
Baseline visibility conditions, 20% worst days	17.19 deciviews (dv)	17.19 dv
State's reasonable progress target for 2018, 20% worst days	16.3 dv	16.92 dv
Visibility improvement required by 2018, 20% worst days	0.9 dv	0.27 dv
Baseline visibility conditions, 20% best days	5.9 dv	5.95 dv
State's reasonable progress target for 2018, 20% best days	5.7 dv	6.12 dv
Visibility improvement required by 2018, 20% best days	0.2 dv	-0.17 dv (visibility allowed to deteriorate on 20% best days)

NRG noted, as shown in the comparison above, that the 2018 Texas reasonable progress goals for the Guadalupe Mountains are more stringent than the New Mexico goals that EPA approved for the adjacent Carlsbad Caverns area. Thus, EPA is proposing to reject a visibility improvement target that exceeds the improvements that EPA required of New Mexico under the same baseline conditions at the same monitoring site. This result would be incoherent and Inconsistent with EPA regulations requiring the agency to assure consistency of decision making through the "fair and uniform application by all Regional Offices of the criteria, procedures, and policies employed in Implementing and enforcing the act." 40 C.F.R. § 56.3(a).

GCLC noted that EPA proposes to disapprove Texas' RPG of 16.3 dv for the Guadalupe Mountains. This is despite the fact that EPA has already approved a higher RPG of 16.92 dv set by New Mexico for the Carlsbad Caverns National Park. These are contiguous parks that share the exact same, single, air quality monitor as the Guadalupe Mountains. Texas relied on similar rationale as did New Mexico to establish its RPG for this area, and if any conclusion should have been reached by EPA, it was that Texas' RPG was too stringent and should be relaxed based on EPA's prior decision. EPA's proposal to disapprove Texas' RPG for this area is the definition of an arbitrary and capricious action.

Footnotes:
[505] 77 Fed. Reg. 36,044, 36,071 (June 15, 2012) (proposed); 77 Fed. Reg. 70,693 (Nov. 27, 2012) (final).
[506] IMPROVE 2000 Report at 1-10 to 1-12, tbl.1.2.
[507] 79 Fed. Reg. at 74,843. Further, while EPA claims that "we discuss the difference between the natural visibility value calculated by New Mexico for Carlsbad Caverns and that calculated by Texas for the Guadalupe Mountains elsewhere in our proposal," id. at 74,843 n.218, we have been unable to locate any such discussion in the proposal or the docket.
[508] 77 Fed. Reg. at 70,701.
[30] 79 Fed. Reg. at 74,833.
[31] *See* 77 Fed. Reg. 36,044, 36,071 (June 15, 2012) (finalized at 77 Fed. Reg. 70,693 (Nov. 27, 2012)).

Response: We disagree with Luminant and other commenters that because we approved the 16.92 dv reasonable progress goals for Carlsbad Caverns National Park in New Mexico we should approve Texas' 16.3 dv reasonable progress goal for Guadalupe Mountains in Texas. The commenters base this argument on the fact these two Class I areas share a visibility monitor. This, commenters reason, means that each Class I area should have the same reasonable progress goal.

The comments indicate a lack of understanding of how reasonable progress goals are established, as well as the imports of the goals as opposed to the measures adopted to ensure reasonable progress. First, as we state in the Regional Haze Rule, the reasonable progress goal(s) set by the state are not enforceable. The reasonable progress goals represent the State's best estimate of the degree of visibility improvement that will result in 2018 from changes in emissions inventories, changes driven by the particular set of control measures the state has adopted in its regional haze SIP to address visibility, as well as all other enforceable measures expected to reduce emissions over the period of the SIP from 2002 to 2018.[432] Given the forward looking nature of reasonable progress goals and the range of assumptions that must be made as to emissions a decade or more in the future, we expect there to be some uncertainty in the estimates of visibility in 2018.

There are many Class I areas located in neighboring states that are in relatively close proximity, as indicated by the following map:[433]

[432] 64 FR 35733.
[433] http://www.epa.gov/visibility/classimp.gif.

There are 156 Class I areas, but only 110 monitors, requiring that many of these Class I areas share monitors, as shown by the following table:

Monitor Code	State	Site Name	Class I Area(s)
ACAD	Maine	Acadia National Park	Acadia, ME
MOOS	Maine	Moosehorn NWR	Moosehorn,ME; Roosevelt Campobello, ME
LYBR	Vermont	Lye Brook Wilderness	Lye Brook, VT
GRGU	New Hampshire	Great Gulf Wilderness	Great Gulf, NH; Presidential Range-Dry River, NH
BRIG	New Jersey	Brigantine National Wildlife Refuge	Brigantine, NJ
SHEN	Virginia	Shenandoah National Park	Shenandoah, VA
JEFF	Virginia	Jefferson/James River Face Wilderness	James River Face, VA
DOSO	West Virginia	Dolly Sods /Otter Creek Wilderness	Dolly Sods, WV; Otter Creek, WV
MACA	Kentucky	Mammoth Cave National Park	Mammoth Cave, KY
GRSM	Tennessee	Great Smoky Mountains National Park	Great Smoky Mountains, TN; Joyce Kilmer-Slickrock NC

SHRO	North Carolina	Shining Rock Wilderness	Shining Rock, NC
COHU	Georgia	Cohutta	Cohutta, GA
LIGO	North Carolina	Linville Gorge	Linville Gorge, NC
SWAN	North Carolina	Swanquarter	Swanquarter, NC
ROMA	South Carolina	Cape Romain National Wildlife Ref	Cape Romain, SC
OKEF	Georgia	Okefenokee National Wildlife Refu	Okefenokee, GA; Wolf Island, GA
SAMA	Florida	St. Marks	St Marks. FL
CHAS	Florida	Chassahowitzka National Wildlife	Chassahowitzka, FL
EVER	Florida	Everglades National Park	Everglades, FL
BRET	Louisiana	Breton	Breton, LA
SIPS	Alabama	Sipsy Wilderness	Sipsey, AL
SENE	Michigan	Seney	Seney, MI
BOWA	Minnesota	Boundary Waters Canoe Area	Boundary Waters, MN
VOYA	Minnesota	Voyageurs National Park	Voyageurs, MN
ISRO	Minnesota	Isle Royale National Park	Isle Royale, MN
MING	Missouri	Mingo	Mingo, MO
UPBU	Arkansas	Upper Buffalo Wilderness	Upper Buffalo, AR
HEGL	Missouri	Hercules-Glades	Hercules-Glades, MO
CACR	Arkansas	Caney Creek	Caney Creek, AR
WIMO	Oklahoma	Wichita Mountains	Wichita Mountains, OK
BIBE	Texas	Big Bend National Park	Big Bend, TX
GUMO	Texas	Guadalupe Mountains National Park	Guadalupe Mountains, TX, Carlsbad Caverns, NM
BAND	New Mexico	Bandelier National Monument	Bandelier, NM
SAPE	New Mexico	San Pedro Parks	San Pedro Parks, NM
WHPE	New Mexico	Wheeler Peak	Wheeler Peak, NM
SACR	New Mexico	Salt Creek	Salt Creek, NM
WHIT	New Mexico	White Mountain	White Mountain, NM
BOAP	New Mexico	Bosque del Apache	Bosque del Apache, NM
CHIR	Arizona	Chiricahua National Monument	Chiricahua Natl. Monument, AZ; Chiricahua Wilderness, AZ; Galiuro, AZ
SAGU	Arizona	Saguaro National Monument	Saguaro, AZ
PEFO	Arizona	Petrified Forest National Park	Petrified Forest, AZ
GICL	New Mexico	Gila Wilderness	Gila, NM
BALD	Arizona	Mount Baldy	Mount Baldy, AZ

TONT	Arizona	Tonto National Monument	Tonto, AZ
SIAN	Arizona	Sierra Ancha	Sierra Ancha, AZ
IKBA	Arizona	Ike's Backbone	Ike's Backbone, AZ
SYCA	Arizona	Sycamore Canyon	Sycamore Canyon, AZ
HANC	Arizona	Hance Camp at Grand Canyon NP	Grand Canyon, AZ
BRCA	Utah	Bryce Canyon National Park	Bryce Canyon, UT
CANY	Utah	Canyonlands National Park	Canyonlands, UT; Arches, UT
ZION	Utah	Zion	Zion, UT
CAPI	Utah	Capitol Reef	Capitol Reef, UT
GRSA	Colorado	Great Sand Dunes National Monument	Great Sand Dunes, CO
MEVE	Colorado	Mesa Verde National Park	Mesa Verde, CO
WEMI	Colorado	Weminuche Wilderness	Weminuche, CO; La Garita, CO; Black Canyon of Gunnison, CO
WHRI	Colorado	White River National Forest	Maroon Bells, CO; West Elk, CO; Eagles Nest, CO; Flat Tops, CO
ROMO	Colorado	Rocky Mountain National Park	Rocky Mountain, CO
MOZI	Colorado	Mount Zirkel Wilderness	Mount Zirkel,CO; Rawah, CO
BADL	South Dakota	Badlands National Park	Badlands, SD
WICA	South Dakota	Wind Cave	Wind Cave, SD
THRO	North Dakota	Theodore Roosevelt	Theodore Roosevelt, ND
LOST	North Dakota	Lostwood	Lostwood, ND
MELA	Montana	Medicine Lake	Medicine Lake, MT
ULBE	Montana	UL Bend	UL Bend, MT
BRID	Wyoming	Bridger Wilderness	Bridger, WY; Fitzpatrick, WY;
YELL	Wyoming	Yellowstone National Park	Yellowstone, WY; Grand Teton, WY; Red Rock Lakes, WY;
NOAB	Wyoming	North Absoraka	North Absoraka, WY; Washakie, WY
JARB	Nevada	Jarbidge Wilderness	Jarbidge, NV
CRMO	Idaho	Craters of the Moon NM(US DOE)	Craters of the Moon, ID
SAWT	Idaho	Sawtooth National Forest	Sawtooth, ID
SULA	Montana	Sula (Selway Bitteroot Wilderness)	Anaconda-Pintler, MT; Selway-Bitterroot, MT
GLAC	Montana	Glacier National Park	Glacier, MT
MONT	Montana	Monture	Bob Marshall, MT; Mission Mountains, MT; Scapegoat, MT
GAMO	Montana	Gates of the Mountains	Gates of the Mountainsm, MT
CABI	Montana	Cabinet Mountains	Cabinet Mountains, MT
STAR	Oregon	Starkey	Eagle Cap, OR; Strawberry Mountain, OR
HECA	Idaho	Hells Canyon	Hells Canyon, ID

MORA	Washington	Mount Rainier National Park	Mount Rainier, WA
WHPA	Washington	White Pass	Goat Rock, WA; Mount Adams, WA
SNPA	Washington	Snoqualamie Pass, Snoqualamie N.F	Alpine Lakes, WA
NOCA	Washington	Morth Cascades	North Cascades, WA; Clacier Peak, WA
PASA	Washington	Pasayten	Pasayten, WA
OLYM	Washington	Olympic	Olympic, WA
THSI	Oregon	Three Sisters Wilderness	Three Sisters, OR; Mount Jefferson, OR; Mount Washington, OR
MOHO	Oregon	Mount Hood	Mount Hood, OR
CRLA	Oregon	Crater Lake National Park	Crater Lake, OR; Diamond Peak, OR; Mnt. Lakes, OR; Gearhart Mnt, OR
LABE	California	Lava Beds	Lava Beds, CA
REDW	California	Redwood National Park	Redwood, CA
KALM	Oregon	Kalmiopsis	Kalmiopsis, OR
LAVO	California	Lassen Volcanic National Park	Lassen Volcanic, CA
PORE	California	Point Reyes National Seashore	Point Reyes, CA
PINN	California	Pinnacles National Monument	Pinnacles, CA
SAGA	California	San Gabriel	San Gabriel, CA
RAFA	California	San Rafael	San Rafael, CA
BLIS	California	Bliss State Park(TRPA)	Bliss, CA
YOSE	California	Yosemite National Park	Yosemite, CA
HOOV	California	Hoover	Hoover, CA
SEQU	California	Sequoia National Park	Sequoia, CA
SAGO	California	San Gorgonio Wilderness	San Gorgonio, CA
AGTI	California	Agua Tibia	Agua Tibia, CA
JOTR	California	Joshua Tree National Monument	Joshua Tree, CA
DENA	Alaska	Denali National Park	Denali, AK
TUXE	Alaska	Tuxedni	Tuxedni, AK
TRIN	California	Trinity	Trinity, CA
SIME	Alaska	Simeonof	Simeonof, AK
VIIS	Virgin Islands	Virgin Islands National Park	Virgin Islands
HAVO	Hawaii	Hawaii Volcanoes National Park	Hawaii Volcanoes, HI
HALE	Hawaii	Haleakala National Park	Haleakala, HI
DOLA	California	Dome Lands Wilderness	Dome Land, CA
KAIS	California	Kaiser	Kaiser, CA; Ansel Adams, CA;

In two instances, Class I areas that share monitors are located in different states. One instance is Carlsbad Caverns and the Guadalupe Mountains, to which Luminant cites; but the other is the Great Smoky Mountains National Park monitor, which is also shared with the Joyce Kilmer-Slickrock Wilderness.

In those instances in which the Class I areas share a monitor (interstate or intrastate), baseline visibility conditions (which are based on monitoring data) would be the same. Indeed, for Carlsbad and Guadalupe, both New Mexico and Texas came out with the same estimates of visibility impairment. (17.19 dv of impairment on the 20% worst days and 5.9 dv of impairment on the 20% best days). 77 Fed. Reg., 36,068; 79 Fed. Reg. 74,832. Given that the same monitor is used for both of these Class I areas, the two will continue to share the data that is used to measure progress. However, the Regional Haze Rule does not require or assume that the reasonable progress goals for two Class I areas that share a monitor must be the same during each planning period. In the end, the improvement in monitoring visibility conditions at two Class I areas sharing a monitor must be the same, but there is nothing in the regional haze rule that requires States to reach the same conclusions as to what is a reasonable goal for improving visibility over the next ten years:[434]

> In developing its submittal, each State will need to conduct analyses to support its reasonable progress goals according to information available at the time the plan is submitted about benefits from the existing CAA programs. Each State should set its goal(s) taking into consideration input from its stakeholders and based on the statutory factors described above.

In other words, although New Mexico and Texas share a monitor for the Carlsbad Caverns and Guadalupe Mountains Class I areas, each state has different sizes and types of sources of visibility impairing pollution within their regulatory control, and these sources have differing levels of controls already in place. Thus, each state set its goal(s) "taking into consideration input from its stakeholders and based on [its evaluation of] the statutory factors…." In addition, it is not irrelevant in considering this comment to note that New Mexico and Texas are in two different RPOs. The estimates of visibility conditions, as noted above, depends on assumptions regarding not only in-state emissions inventories (as noted above) but also inventories in nearby states, as well international emissions. The Regional Haze Rule includes provisions for state-to-state consultations (as we describe in our proposal), in which states are expected to share information, including the control strategies that states intend to include in their regional haze SIPs. Thus, having consulted and mutually developed and coordinated control strategies, each states' modeling should have incorporated the other state's controls, which would largely align their respective reasonable progress goals. However, Texas and New Mexico are in two different regional planning organizations, and each had different schedules for SIP development, they ran different visibility modeling, and their regional haze SIPs were constructed on the basis of different provisions of the Regional haze Rule.[435] Also, despite the requirement in the Regional Haze Rule that all state SIPs be submitted by December 17, 2007, all the states submitted late SIPs, staggered over the next several years. In fact, much of New Mexico's SIP was constructed prior to 2003.[436] As a consequence of these factors, Texas and New Mexico's

[434] 64 FR 35733.
[435] New Mexico's SIP was submitted under Section 51.309, and Texas' SIP was submitted under Section 51.308.
[436] In December, 2003, New Mexico submitted its Regional Haze SIP pursuant to the requirements of sections 169A and 169B of the CAA and the regional haze rule. However, in American Corn Growers Ass'n v. EPA, 291 F.3d 1 (DC Cir. 2002), the U.S. Court of Appeals for the District of Columbia Circuit issued a ruling vacating and

opportunities for consultation were less than ideal, and we had no choice but to conduct a piecemeal, sequential review of their SIPs, which limited our opportunity to effectively address interstate issues. We address our obligation for uniformity in response to more detailed comments on that issue.

It is also worth noting that even though EPA approved New Mexico's reasonable progress goal, these goals did not accurately reflect the final NOx BART determinations for the two largest sources of NOx within the state – the San Juan Generating Station and the Four Corners Power Plant (located on tribal lands).[437] As is clear from our decision to approve New Mexico's goals, the issue in assessing the reasonable progress goals and long-term strategies is to ensure that the state has provided a reasonable estimate of the progress to be expected but more importantly has carefully considered available control strategies and made a reasoned decision as to which set of measures should be adopted. Unlike the NAAQS, New Mexico's failure to achieve the reasonable progress goals at Carlsbad does not result in negative repercussions for the state. The monitored progress in visibility at both Carlsbad and Guadalupe will simply be one more factor to take into account in the next round of regional haze SIPs.

Comment: CCP noted, based on a cost-effectiveness threshold approved by EPA under the Clean Air Interstate Rule ("CAIR"), Texas used a $2,700 per ton threshold for screening out unreasonably costly RPG technologies. See Texas SIP 10-7. The use of this cost threshold as a screen is consistent with EPA-approved regional haze RPG determinations in Kentucky, see 76 Fed. Reg. 78,194, 78,206 (Dec. 16, 2011); Georgia, 77 Fed. Reg. 38,501, 38,508 (June 28, 2012); North Carolina, 77 Fed. Reg. 11,858, 11,870 (Feb. 28, 2012); and North Dakota, 77 Fed. Reg. 34,801 (June 12, 2012), 76 Fed. Reg. 58,630.

CCP stated that we arbitrarily rejected Texas' $2,700 threshold and unreasonably determined that "a threshold in the range of $4,000/ton to $5,000/ton would be reasonable for purposes of identifying potential cost-effective controls for further analysis" in Texas' SIP. See 79 Fed. 74,818, 74,838 (Dec. 16, 2014). EPA's rationale for rejecting Texas' threshold was that "CAIR was not designed as a reasonable progress strategy." Id. CCP noted EPA previously concluded that CAIR could be used "in lieu of BART." Id. Thus, concludes CCP, it was arbitrary for EPA to suggest that the same cost threshold cannot be used in the RPG context.

Further, in promulgating its BART rule, CCP noted that the EPA suggested that $1,500 per ton was a reasonable cost-effective threshold for eliminating additional controls. 70 Fed. Reg. 39,135-36 ("Based on the data before us, the costs of such controls in most cases are less than $ 1,500 per ton."). Thus, a $2,700 cost per ton threshold was also reasonable. Various controls proposed by EPA would have been rejected using the cost-per-ton threshold once site-specific factors were properly accounted for.

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remanding the BART provisions of the regional haze rule. In 2006, EPA issued BART guidelines to address the court's ruling in that case. See 70 FR 39104 (July 6, 2005). On January 13, 2009, New Mexico resubmitted portions of its RH SIP, but not the requirements addressing reasonable progress pursuant to Section 51.309(g). New Mexico later submitted the remaining portion of its SIP covering Section 51.309(g) on July 5, 2011. Texas submitted its Regional Haze SIP on March 31, 2009.

[437] 77 FR at 36073.

Xcel Energy stated that Texas used a $2,700 per ton threshold for SO_2 reductions that is consistent with other SIPs where EPA has approved regional haze RPG determinations:

- Kentucky SIP Approval, 76 Fed. Reg. at 78,206 (allowing use of $2,000 per ton SO_2 as a screening threshold based on the Clean Air Interstate Rule ("CAIR") for cost effectiveness);

- North Carolina SIP, 77 Fed. Reg. 11,858, 11,870 (Feb. 28, 2012). EPA approved the State's decision not to implement reasonable progress controls even though cost effectiveness values were described as ranging, "from 912 to 1,922 dollars per ton of SO_2 removed (\$/ton SO_2), and the average costs per utility system ranged from \$1,231 to \$1,375/ton SO_2";

- Final North Dakota SIP Approval/Disapproval, 77 Fed. Reg. 20,894, 20,936 (Apr. 6, 2012) (accepting North Dakota's determination that a level of $2,593 per ton of SO_2 removed was not reasonable and too costly in the reasonable progress context even though it is within the range EPA "ha[s] considered reasonable in the BART context").

- Proposed North Dakota SIP Approval/Disapproval, 76 Fed. Reg. 58,570, 58,630 (Sept. 21, 2011) (finding that North Dakota reasonably rejected cost effectiveness values for SO_2 control options ranging from about $4,000 to $5,000 per ton).

Xcel Energy stated that despite these prior actions, in this Proposal, EPA unreasonably rejected Texas' $2,700 threshold and arbitrarily determined that "a threshold in the range of $4,000/ton to $5,000/ton would be reasonable for purposes of identifying potential cost effective controls for further analysis" in Texas' SIP. *See* 79 Fed. Reg. at 74,838. This directly contradicts the precedent established in North Dakota and approved by EPA. EPA has expressly allowed other states to rely on CSAPR to meet RPGs. *See* Proposed Michigan SIP Approval, 77 Fed. Reg. 46,912, 46,919 (Aug. 6, 2012) (the regional planning organization's "analysis shows emission reductions equivalent to the scale of CAIR are needed to meet reasonable progress goals. . . . EPA believes that with CSAPR providing the reductions that Michigan expects to obtain from CAIR, Michigan's long-term strategy can in fact be expected to achieve the state-adopted reasonable progress goals that Michigan established."). The fact that it is impossible to meet the RPGs in Texas does not make it less legitimate to rely on the cost thresholds used in CAIR for identifying reasonable controls.

Xcel Energy stated that despite EPA's action in Michigan, in this Proposal, EPA arbitrarily argues that CAIR could be used "in lieu of BART" but not used in the RPG context. While BART and RPGs are distinctive components of a regional haze strategy, EPA provides no reasoned basis for allowing consideration of CAIR in the BART context and rejecting it in the RPG context. 3 That EPA would allow CAIR or CSAPR to substitute for BART, which is a unit-specific standard with unit-specific performance criteria, but not for demonstrating reasonable progress, which is a state-wide, multi-source program aimed at reducing the pollutants of concern for regional haze, is illogical, as well as arbitrary and capricious. In fact, EPA has done the exact opposite in other RPG determinations and re-affirmed States' reliance on

BART-equivalent analyses. For example, as stated in its proposed approval of the Georgia SIP, "EPA believes it is reasonable to conclude that any control requirements imposed in the BART determination also satisfy the RPG related requirements for source review in the first implementation period." *See* Proposed Georgia SIP Approval, 77 Fed. Reg. 11,452, 11,469 (Feb. 27, 2012); *see also* Final Georgia SIP Approval, 77 Fed. Reg. 38,501 (Jun. 28, 2012). In North Dakota, EPA specifically rejected modeling for RPGs that was not conducted in the same way as BART on the basis that the "ultimate goal is the same." Proposed North Dakota SIP Approval/Disapproval, 76 Fed. Reg. at 58,629 n. 85; *see also* Final North Dakota SIP Approval/Disapproval, 77 Fed. Reg. at 20,906-07.

Xcel Energy noted that prior EPA reviews comparing cost thresholds used in the BART and RPG context affirm Texas' use of a cost-per-ton threshold that is actually higher than cost-per-ton thresholds used in the BART context. *See* Proposed North Dakota SIP Approval/Disapproval, 76 Fed. Reg. at 58,630 ("The cost effectiveness value for a new wet scrubber is $2,593 per ton. While this is within the range of cost effectiveness values that North Dakota, other states, and we have considered reasonable in the BART context, it is not so low that we are prepared to disapprove the State's conclusion in the reasonable progress context."); *North Dakota* v. *EPA,* 730 F. 3d 750, 765 (8th Cir. 2013) (noting that RPGs do not necessarily require BART). Indeed, in promulgating its BART rule, EPA suggested that $1,500 per ton was a reasonable cost effective threshold for eliminating additional controls. BART Rule, 70 Fed. Reg. at 39,135-36 ("Based on the data before us, the costs of such controls in most cases are less than$ 1,500 per ton."). Thus, a $2,700 cost per ton threshold in the RPG context also should be considered reasonable and should not have been rejected by EPA.

In contrast to prior SIP approvals and EPA statements, Xcel Energy argued that the EPA arbitrarily concluded that Texas' use of the $2,700 per ton threshold was unreasonable and that a $4,000 to $5,000 threshold (a range it had previously rejected as "relatively high") was appropriate. *See* Proposed North Dakota SIP Approval/Disapproval, 76 Fed. Reg. at 58,630 (rejecting use of wet scrubbers for SO_2 controls based on cost effectiveness values of$4,735 and $5,453 per ton SO_2). Even when other states have used a higher cost effective threshold, EPA has rejected expensive cost controls when visibility benefits are "small." *See* New York SIP Approval, 77 Fed. Reg. 24,794, 24,818 (Apr. 25, 2012) (approving State's rejection of selective catalytic reduction ("SCR") to reduce NO_x emissions at cost of $5,358 per ton due to visibility improvement of only 0.254 at one Class I area). EPA offers no explanation as to why such a relatively high cost threshold is appropriate for Texas sources, particularly since the projected visibility benefits at the Class I areas addressed in the Proposal are smaller than those addressed in the North Dakota SIP and many other states where the cost thresholds were lower. This renders EPA's screening threshold arbitrary and capricious.

[TCEQ/PUCT (0056) p. 11] The TCEQ disagreed with the EPA's conclusion that $2,700 per ton was too low of a threshold for cost-effective controls. The EPA stated that CAIR was considered acceptable in lieu of BART but not necessarily designed as a reasonable progress strategy. The TCEQ selected the $2,700 per ton threshold because it was used in the CAIR analyses to control NO_x and SO_2. CAIR was a contemporary program designed for controlling primary and precursor pollutants for health-based ozone and particulate matter NAAQS. The cost rate was not selected because CAIR was considered acceptable for BART, but because it met the high standards for a health-based emissions reduction program. And thus, it was considered more than adequate for the standards of a visibility-based program.

[UARG (0065) p. 19-20] UARG noted that the EPA takes issue with the cost threshold Texas used to exclude certain controls from consideration. Texas chose $2,700 per ton, while EPA prefers $4,000 per ton to $5,000 per ton. *Id. at* 74,838. This preference is not a reason for disapproving Texas's SIP. Indeed, the only purported justification that EPA can muster – that reliance on the $2,700-per-ton cost threshold EPA used in CAIR is inappropriate because "[a] state should look beyond BART for additional reductions when developing its long-term strategy to achieve reasonable progress at its Class I areas" – conflicts with EPA's own guidance indicating that BART may reasonably be concluded to satisfy reasonable progress requirements in the first planning period. *Id.*; Reasonable Progress Guidance at 4-2 to 4-3. EPA cites – and can cite – no basis in the CAA or in the regional haze rule for disapproving Texas's cost threshold.[4]

[Xcel Energy (0064) p. 6] Xcel Energy stated that the EPA's rejection of the cost threshold that Texas applied in deciding whether controls should be required, and EPA's use of significantly higher cost thresholds, has no legal basis, is inconsistent with EPA's own precedent, and is arbitrary and capricious.

Earthjustice et al., stated that EPA has additional grounds for disapproving the haze plan Texas submitted. To begin, Texas considered only reasonable progress controls that would cost $2,700/ton or less. Texas set this screen based on EPA's CAIR rule, but as EPA explains, CAIR was as an entirely different Clean Air Act program that was not designed to comply with the regional haze program's reasonable progress requirements. 79 Fed. Reg. at 74,838. Texas did not adequately explain why this CAIR threshold would be an appropriate or reasonable screening tool for a reasonable progress analysis under the haze program. As EPA found, Texas's $2,700/ton screen arbitrarily screened out promising and cost-effective controls. For example, updated controls at Tolk would result in 20,000 tons per year of sulfur dioxide reductions at a cost of just $3,100/ton. *Id.* The screening also was inappropriate because Texas implemented it prior to consideration of controls necessary to mitigate visibility impacts from the state's sources given the large geographic distribution and number of impairing sources. Texas's failure to analyze such controls based on its arbitrary $2,700/ton screen was unreasonable and undermined the purposes of the haze program.

In addition, Earthjustice et al., stated that Texas relied on CAIR reductions despite evidence that Texas EGUs would comply with CAIR by purchasing allowances rather than reducing emissions and that projected CAIR reductions have not been achieved. Texas relied on 2018 CAIR projections as the baseline for its cost evaluations. However, Texas projected that its EGUs would comply with CAIR by purchasing 125,000 tons per year of emissions allowances from out-of-state sources, rather than reducing their emissions to the CAIR allocation levels. *Id. at* 74,838, 74,840. Moreover, recent emissions data from Texas power plants shows that in many cases current emission levels are above those projected for 2018, with no plans for upcoming controls to reduce emissions. *See* 79 Fed. Reg. 74842-43. Thus, the use of projected CAIR emissions as a baseline underestimated the likely actual baseline. Using the likely actual baseline has the effect of lowering the cost effectiveness ($/ton) values relative to Texas's evaluation. Further, if Texas's visibility assessment also relies on the CAIR projections, then the state is also underestimating the visibility benefit provided because purchasing allowances will not result in visibility benefits in the locale where projected. Accordingly, it was arbitrary for Texas to base its reasonable progress analysis on pollution reductions at Texas EGUs that would likely never occur.

Finally, Earthjustice et al., stated that Texas failed to consider upgrades to existing pollution controls. Texas's analysis failed to consider upgrades to existing pollution controls as possible control measures to improve visibility. A state's reasonable progress analysis and BART analysis are based on similar statutory factors, and EPA's BART Guidelines explain that when assessing possible control measures states should consider both new controls and upgrades to a source's existing controls. 40 C.F.R. Pt. 51, App. Y § IV(D)(1)(6) ("[T]here will often be control measures or devices already in place. For such emission units, it is important to include control options that involve improvements to existing controls . . . ."). As EPA documented, many heavily-polluting Texas EGUs can cost-effectively upgrade their existing scrubbers to achieve large pollution reductions, and Texas should have considered these measures. For example, EPA found that scrubber upgrades at Martin Lake's three units could reduce the coal plant's sulfur dioxide pollution by 21,000 tpy. 79 Fed. Reg. at 74,841.

Commenter's Reference:
[4] Moreover, although the point is not directly relevant to this proceeding, EPA's statement in the preamble to the proposed rule that "the URP does not establish a 'safe harbor' for the state in setting its progress goals," 79 Fed. Reg. at 74,834, is wrong and should be corrected by EPA. The language in the preamble to the 1999 regional haze rule that EPA quotes confirms that there is, in fact, such a safe harbor. EPA there made clear that if a state determines that the progress the URP would require is reasonable, then "the State *should* identify this amount of progress as its reasonable progress goal for the first long-term strategy." 64 Fed. Reg. 35,714, 35,732 (July 1, 1999) (emphasis added). *Only if* the state instead "determines that additional progress is reasonable" should the state adopt a more accelerated or ambitious RPG than the URP. *Id*. As this preamble language makes clear, the state has no obligation to undertake additional analysis if it determines the URP is reasonable for its Class I area. The decision whether to undertake such additional analysis is a matter reserved for the state's exercise of discretion.

Response: UARG and others state that we rejected Texas' $2,700/ton threshold because we preferred a $4,000 to $5,000 threshold. The quote UARG references actually states: "Sensitivity analysis performed by CENRAP suggests to us that a threshold in the range of $4,000/ ton to $5,000/ton would be reasonable for purposes of identifying potential cost-effective controls for further analysis." Here, we were referring to work done by CENRAP: "Sensitivity analysis performed by CENRAP suggests to us that a threshold in the range of $4,000/ ton to $5,000/ton would be reasonable for purposes of identifying potential cost-effective controls for further analysis. We did not adopt this threshold range, as can be seen by examining the range of cost-effective ness we proposed, which is significantly below that range. In addition, were we to actually perform an apples-to-apples comparison of the TCEQ's cost-effectiveness threshold to the upper limit of the Cost-effectiveness we proposed to find reasonable, we would have to escalate the $2,700/ton figure forward to 2014 when we performed our cost analysis. Doing so would yield a cost threshold of $3,448/ton.[438] This figure exceeds the cost-effectiveness range

[438] The CAIR was proposed on 1/30/2004 (69 FR 4566). Conservatively assume the $2,700/ton figure was adopted in 2014. Cost-effectiveness was performed in 2014, but we conservatively assume 2013. The CEPCI indices for 2004 and 2013 are 444.2 and 567.3, respectively. Consequently, escalating the $2,700/ton figure to 2013 results in a value of $3,448/ton (567.3/444.2) X $2,700/ton.

we proposed to find reasonable as one of the factors we considered. Thus, the cost-effectiveness range for the controls we proposed is actually lower (adjusted to account for the increased costs of pollution control equipment) than the $2,700/ton threshold the TCEQ utilized. Furthermore, in our proposal, we objected to the manner in which the $2,700 threshold was determined and applied. As we stated in our proposal: "The TCEQ eliminated controls with an estimated cost-efficiency greater than $2,700/ton from any further analysis, regardless of their potential visibility benefits. Given the large number of sources and their large geographic distribution, some consideration of location and emissions data is needed before controls should have been eliminated from further analysis. The TCEQ supports its selection of this value with reference to ''EPA estimated cost of implementing CAIR was up to $2,700/ton." However, although we demonstrated that CAIR was acceptable in lieu of BART, CAIR was not designed as a reasonable progress strategy. A state should look beyond BART for additional reductions when developing its long-term strategy to achieve reasonable progress at its Class I areas. As a result of the application of this $2,700/ton threshold, potentially cost-effective controls were not evaluated at sources that may result in meaningful visibility benefits at Guadalupe Mountains or Big Bend."

Several commenters point to various previous decisions in which we have approved state decisions to reject controls at various $/ton figures. These commenters do not mention the other aspect of BART and reasonable progress determinations in these instances—consideration of visibility benefit. Ignoring extreme ranges of cost (very high or low $/ton), control decisions are typically made on the basis of comparing the cost effectiveness in $/ton of pollutant removed to the visibility improvement that would be obtained from the installation of the control. Texas, however, rejected all controls with a cost effectiveness greater than $2,700 without consideration to visibility benefit. Thus, Texas rejected a number of controls with significant visibility benefit because its estimated cost effectiveness for those controls was above $2,700/ton. Texas also rejected controls with costs below its $2,700 threshold as a result of its analysis technique: Texas constructed a large potential control set consisting of a mix of large and small sources, located at various distances from Class I areas, with a large geographical distribution. Because of the variation in size, type, and location of these sources, the potential to impact visibility and potential benefit from controls at a given Class I area varied greatly between the identified sources. This potential control set identified by the TCEQ included controls on some sources that would likely result in significant visibility benefits, but also included controls on many sources with much less anticipated visibility benefits. Because it only estimated the visibility benefit of all the controls together, the TCEQ was not able to assess the potential benefit of controlling individual sources with significant, and potentially cost-effective, visibility benefits. In fact, individual benefits were obscured by the inclusion of those controls with little visibility benefit that only served to increase the total cost figures. For example, the TCEQ identified SO_2 controls at Big Brown to be approximately $1,500/ton, significantly less than its $2,700/ton threshold. Commenters did not mention this aspect of Texas' control evaluation, focusing only on Texas' $2,700/ton threshold. This results in a false comparison. Nevertheless we evaluate each of the commenters' allegations below.

CCP stated that based on a cost-effectiveness threshold approved by us under CAIR, Texas used a $2,700 per ton threshold for screening out unreasonably costly RPG technologies. CCP stated that the use of this cost threshold is consistent with EPA-approved regional haze RPG determinations in Kentucky, see 76 Fed. Reg. 78,194, 78,206 (Dec. 16, 2011); Georgia, 77 Fed. Reg. 38,501, 38,508 (June 28, 2012); North Carolina, 77 Fed. Reg. 11,858, 11,870 (Feb. 28, 2012); and North Dakota, 77 Fed. Reg. 34,801 (June 12, 2012), 76 Fed. Reg. 58,630.

As explained elsewhere in our action and responses to comments, although a State may rely on CAIR (or CSAPR) to meet the BART requirements, the State is still required to evaluate whether additional controls are necessary for reasonable progress. CCP's statement that EPA approved other regional haze SIPs that adopted this cost threshold is accurate, but EPA in those cases also considered whether the use of such a threshold affected the reasonableness of the States' reasonable progress determinations. Regarding Texas' use of a $2,700/ton cost threshold, we stated: "The TCEQ supports its selection of this value with reference to ''EPA estimated cost of implementing CAIR was up to $2,700/ton.'' However, although we demonstrated that CAIR was acceptable in lieu of BART, CAIR was not designed as a reasonable progress strategy. A state should look beyond BART for additional reductions when developing its long-term strategy to achieve reasonable progress at its Class I areas.[439] As a result of the application of this $2,700/ton threshold, potentially cost-effective controls were not evaluated at sources that may result in meaningful visibility benefits at Guadalupe Mountains or Big Bend. For example, potential SO_2 controls for the Tolk Station were estimated in the Alpine Geophysics analysis to cost an average of approximately $3,100/ton and result in nearly 20,000 tpy reduced across the two units. Applying the $2,700/ton threshold, the TCEQ did not consider potential controls on any EGUs in West Texas to improve visibility at the two Class I areas located in West Texas despite the potential visibility benefits from controlling these large point sources. Sensitivity analysis performed by CENRAP suggests to us that a threshold in the range of $4,000/ ton to $5,000/ton would be reasonable for purposes of identifying potential cost-effective controls for further analysis.[440]

CCP's allegation that we are being arbitrary in suggesting the same $2,700/ton threshold should not automatically be used in the RPG context is misapplied (BART is not reasonable progress). CCP also states that we suggested that $1,500 per ton was a reasonable cost-effective threshold for eliminating additional controls and cites to our BART Rule (70 Fed. 39,135-36): "Based on the data before us, the costs of such controls in most cases are less than $ 1,500 per ton." CCP concludes that a $2,700 cost per ton threshold was also reasonable. The above quote that CCP reproduces has nothing to do with the selection of a BART cost threshold as can be seen from an examination of the text immediately before it:

> We are establishing presumptive NOx limits in the guidelines that we have determined are cost-effective for most units for the different categories of units below, based on our analysis of the expected costs and performance of controls on BART-eligible units greater than 200 MW. We assumed that coal-fired EGUs would have space available to install separated over-fire air. Based on the large number of units of various boiler designs that have installed separated over-fire

[439] Per Section 51.308(e)(5), ''After a State has met the requirements for BART or implemented emissions trading program or other alternative measure that achieves more reasonable progress than the installation and operation of BART, BART-eligible sources will be subject to the requirements of paragraph (d) of this section in the same manner as other sources.''

[440] See ''Sensitivity Run Specifications for CENRAP Consultation,'' available in the docket for this action.

> air, we believe this assumption to be reasonable. It is possible, however, that some EGUs may not have adequate space available. In such cases, other NO_X combustion control technologies could be considered such as Rotating Opposed Fire Air (''ROFA''). The limits provided were chosen at levels that approximately 75 percent of the units could achieve with current combustion control technology. The costs of such controls in most cases range from just over $100 to $1000 per ton. Based on our analysis, however, we concluded that approximately 25 percent of the units could not meet these limits with current combustion control technology. However, our analysis indicates that all but a very few of these units could meet the presumptive limits using advanced combustion controls such as rotating opposed fire air (''ROFA''), which has already been demonstrated on a variety of coal-fired units. *Based on the data before us, the costs of such controls in most cases are less than $1500 per ton*.

As can be seen from an examination of the quote in its proper context, the $1,500/ton reference was merely our estimate (in 2005) of the cost of a particular type of NOx control and has nothing to do with the selection of a cost threshold—especially one for the type of SO_2 controls we proposed.

As we note in our proposal, in establishing a reasonable progress goal for any mandatory Class I Federal area within the state, the state must consider 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, and include a demonstration showing how these factors were taken into consideration in selecting the goal, among other requirements in Section 51.308(d)(1). Thus, cost is only one factor that must be evaluated. Also as we discuss in our proposal, we considered the visibility that would result from the installation of the controls as well.[441] In most cases, cost and visibility benefit are the determinative factors and are weighed against one another in determining whether controls are warranted.

Regarding the Kentucky proposal cited by CCP, we did state that Kentucky used a $2,000/ton threshold. However, in our review, we considered other information. For instance, we stated regarding Kentucky's evaluation of the Century Aluminum facility:[442]

> The Century Aluminum facility in Hawesville, Kentucky, has four potlines with 2002 base year emissions of 4,985 tons per year of SO_2 which were identified as having a significant contribution at the Mammoth Cave Class I area. VISTAS evaluated control options and costs for sources within the AOI for the Class I areas of concern. VISTAS used EPA's AirControlNet software to evaluate control options and costs for controls. The cost effectiveness of SO_2 control suggested by the VISTAS control cost spreadsheet for potlines 1– 4 at Century Aluminum is $14,207 per ton of SO_2 removed. Since the cost of compliance for the control option is over seven times greater than the Commonwealth's cost-effectiveness threshold [$2,000] for reasonable progress, KYDAQ concludes that there are no cost-effective controls available for these Century Aluminum units at

[441] 79 FR 74874.
[442] 76 FR 78206.

this time within the cost threshold established for this reasonable progress assessment for the first implementation period.

> Although the use of a specific threshold for assessing costs means that a state may not fully consider available emissions reduction measures above its threshold that would result in meaningful visibility improvement, EPA believes that the Kentucky SIP still ensures reasonable progress. In proposing to approve Kentucky's reasonable progress analysis, EPA is placing great weight on the fact that there is no indication in the SIP submittal that Kentucky, as a result of using a specific cost effectiveness threshold, rejected potential reasonable progress measures that would have had a meaningful impact on visibility in its Class I area. EPA notes that given the emissions reductions resulting from CAIR, Kentucky's BART determinations, and the measures in nearby states, the visibility improvements projected for the affected Class I area are in excess of that needed to be on the uniform rate of progress glidepath.

Thus, we do not believe that unlike Texas, the use of a cost threshold in Kentucky's SIP resulted in the state overlooking potential controls.

Regarding CCP's reference to our final action on Georgia, there is no indication that Georgia used a cost threshold. Georgia undertook reasonable progress analyses for 15 units, and made decisions based on its source specific evaluations of costs, visibility benefits, and other factors. See 77 Fed. Reg. 11,464-11,469. It doing so, it found control costs of over $3,500 to be cost-effective, at least with respect to the visibility benefits from the controls at issue. Id. at 11,465.

Regarding CCP's reference to our North Carolina proposal, we stated[443]:

> NCDAQ believed that it was not equitable to require non- EGUs to bear a greater economic burden than EGUs for a given control strategy. The facility-by-facility costs for EGUs under CSA ranged from 912 to 1,922 dollars per ton of SO_2 removed ($/ton SO_2), and the average costs per utility system ranged from $1,231 to $1,375/ ton SO_2. These costs were estimated using the capital costs from the CSA 2006 compliance plans and the projected operating costs provided by Duke Energy and Progress Energy. These costs were used as a guide in determining cost effectiveness.

However, we also made this statement in our final decision:[444]

> Although the use of a specific threshold for assessing costs means that a state may not fully consider available emissions reduction measures above its threshold that would result in meaningful visibility improvement, EPA believes that the North Carolina SIP ensures reasonable progress. In approving North Carolina's reasonable progress analysis, EPA is placing great weight on the fact that there is no indication in the SIP revision that North Carolina, as a result of using a specific

443 77 FR 11870.
444 77 FR 38189.

> cost effectiveness threshold, rejected potential reasonable progress measures that would have had a meaningful impact on visibility in its Class I areas.

Thus, we do not believe that unlike Texas, the use of a cost threshold in North Carolina's SIP resulted in the state overlooking potential controls.

With regard to CCP's reference to our North Dakota federal register notice or notices, we believe that CCP may have made an error in citation. CCP cited to "North Dakota, 77 Fed. Reg. 34,801 (June 12, 2012), 76 Fed. Reg. 58,630." The citation to 77 FR 34801 is a federal register notice for a final action on the Minnesota regional haze SIP. We performed word searches for "$" and "threshold," but did not obtain any results. Unfortunately, we therefore do not have enough information to respond to this part of the comment. CCP's second cite to "76 Fed. Reg. 58,630" is our proposal regarding the North Dakota SIP/FIP. We see no reference to the use of a cost threshold on the cited page. We also examined a few pages before and after the citations and were not able to find anything having to do with a cost threshold, and we performed a word search on "threshold," without success. Unfortunately, we do not have enough information to address this comment.

Xcel alleges inconsistency with our proposed North Dakota action, stating we approved North Dakota's rejection of controls ranging from $4,000 to $5,000/ton. We note, however, that all of the controls we proposed are significantly below these figures. Xcel also points to our final action on North Dakota, alleging inconsistency in our acceptance that $2,593/ton was not reasonable. However, Xcel fails to disclose that the $2,593 value its cites was in fact not used as a cost threshold that would serve to disqualify a control, regardless of its visibility benefit, as Texas used its $2,700/ton threshold. In North Dakota's case the $2,593 figure was for the installation of a new scrubber on the Coyote Station when the unit already controlled its SO_2 approximately 66%. Consequently the facts are not similar.

Xcel alleges inconsistency with our New York action. This reference, as with other similar references made by commenters alleging actions in which we rejected visibility results as being too small to justify the expense of controls, compare CALPUFF modeling in other actions to CAMx modeling utilized in our analysis. As we explain in our FIP TSD[445] and elsewhere in our response to comments and final action, the results from our CAMx, analysis cannot be compared to CALPUFF results due to differences in models, model inputs and metrics. As a consequence, we disagree with Xcel.

We also disagree with UARG that we erred in stating that the URP does not establish a "safe harbor' for the state in establishing its progress goals. As we note in our proposal:

> If the State determines that the amount of progress identified through the [URP] analysis is reasonable based upon the statutory factors, the State should identify this amount of progress as its reasonable progress goal for the first long-term strategy, unless it determines that additional progress beyond this amount is also reasonable. If the State determines that additional progress is reasonable *based on*

[445] FIP TSD, Appendix A. See discussion beginning on page A-35.

> *the statutory factors,* the State should adopt that amount of progress as its goal for the first long-term strategy [emphasis added].[446]

UARG's contention that progress beyond the URP is optional ignores the fact, as is made clear by the above quote from our proposal, that this determination must be based on the statutory factors. As we discuss in our proposal,[447] Texas's reasonable progress four factor analysis was highly flawed, and thus could not serve as a legitimate basis for rejecting additional progress beyond the URP. The CAA directs us to act if a state fails to submit a SIP, submits an incomplete SIP, or submits a SIP that does not meet the statutory requirements. Thus, the CAA provides us with a critical oversight role in ensuring that SIPs meet the CAA's requirements. In this instance, portions of the states' SIPs were not approvable for reasons discussed elsewhere this responses to comments, the final action, and the proposed rulemaking. Concerning the comment that BART may be sufficient to satisfy reasonable progress for the first planning period, BART is a part of reasonable progress but a BART determination is not a shield from additional review under the reasonable progress and long-term strategy provisions of the Regional Haze Rule.[448] Additional responses to this comment can be found in our responses related to controls that extend beyond CAIR/CSAPR.

We agree with Earthjustice that Texas' use of a $2,700/ton threshold was not justified and screened out promising reasonable controls. We also agree that we were conservative in our use of the projected CAIR emissions and that Texas should have considered scrubber upgrades, as we did.

Comment: Luminant stated that in other recent regional progress SIP reviews, EPA has employed CALPUFF, not CAMx, to evaluate individual source impacts for reasonable progress purposes.[721] EPA departs from its prior and established practice here and attempts to justify the use of CAMx instead. But instead of justifying its use of CAMx as an appropriate model for the application here, which is its legal obligation, EPA simply offers a list of reasons that it believes CALPUFF is ***not*** appropriate. Whatever reasons there may have been not to use CALPUFF to undertake the analysis EPA conducted, those reasons do not justify the use of CAMx modeling. And, as explained below, EPA's own prior analysis demonstrates that CAMx suffers from the same flaws EPA now claims to find in CALPUFF. In other words, EPA ignores the most logical conclusion—that given the miniscule impacts at issue here and the significant distances involved, ***no model*** is competent to make accurate predictions.

Footnotes:
[721] See, e.g., 79 Fed. Reg. at 5,209 (explaining that EPA "did independently run CALPUFF to model the visibility improvement from potential controls at Dave Johnston Units 1 and 2 and it is part of the basis of our final decision" to approve Wyoming's decision not to impose additional controls on those units in its reasonable progress SIP).

Response: We address this comment in the modeling section of this document.

[446] 64 FR 35732 (July 1, 1999).
[447] See discussion beginning on 79 FR 74838.
[448] 70 FR 39143.

Comment: Luminant stated that EPA's attempt to use "natural conditions" here is in no way validated by its prior action on the North Dakota SIP, as EPA wrongly contends.[750] There, North Dakota chose to use a "hybrid cumulative modeling approach" different from the modeling developed by its regional planning organization ("RPO").[751] No other state in North Dakota's RPO "opted to develop its own reasonable progress modeling methodology," and EPA concluded that North Dakota's hybrid approach did not satisfy the regulatory "criteria for the use of alternative models . . . ."[752] The fact that EPA's disapproval of North Dakota's hybrid approach was affirmed by the Eighth Circuit[753] does not justify EPA's use of "clean background" conditions by which to judge Texas's SIP. Texas did not use a unique or hybrid approach to assessing reasonable progress. Texas used the standard approach used by all CENRAP states. In fact, it is EPA that is using an unorthodox and hybrid approach in this instance, mixing modeling parameters, without demonstrating that its approach meets the criteria for alternative models. EPA, like North Dakota, is "***not free***" "to employ its own visibility model and to consider visibility improvement in its reasonable progress determinations" "in a manner that [is] inconsistent with the CAA," as EPA has done here.[754] EPA must follow its own regulations and guidance, just as EPA expects state and regulated entities to do.

Footnotes:
750 FIP TSD at A-39.
751 76 Fed. Reg. at 58,624, 58,627.
752 Id. at 58,624.
753 North Dakota, 730 F.3d at 766.
754 Id. (emphasis added).

Response: We address this comment in the modeling section of this document.

Comment: Luminant stated that EPA has repeatedly approved state reasonable progress goals that take into account international emissions and do not require domestic sources to further reduce their emissions to compensate for emissions over which the state has no control—including New Mexico's reasonable progress analysis for the exact same monitor at Guadalupe Mountains. [657]

Footnotes:
[657] See, e.g., 77 Fed. Reg. at 70,701 (New Mexico); 77 Fed. Reg. at 30,256 (Idaho); 77 Fed. Reg. 3681, 3687 (Jan. 22, 2012) (Minnesota); 77 Fed. Reg. 76,174, 76,204 (Dec. 26, 2012) (Washington).

Response: We address the impact of international emissions in our responses to other comments and in our final action. We did not propose nor do we require that Texas over control its sources to compensate for emissions from Mexico. None of the actions cited in the footnotes to the comment demonstrate that we have reasoned otherwise. The fact that a particular state's RPGs include influences from international emissions has no bearing on its evaluation of its own sources for emission limits and other measures to make reasonable progress. Our technical record demonstrates the FIP controls would achieve substantial visibility improvement. International emissions are not a basis for failing to conduct an appropriate determination of reasonable progress according to the statutory factors. We reviewed each of the notices that the commenter cites in alleging an inconsistency, but none of them show any inconsistency with these points.

Comment: Luminant discussed the timing of EPA's proposed disapproval of Texas and Oklahoma SIPS and proposed FIPS. [Luminant (0061) p. 25]

According to Luminant, Texas submitted its regional haze SIP revision to EPA on March 31, 2009.[203] However, EPA delayed its review of Texas's submission—well past the 2-year statutory deadline for EPA to act and after EPA had taken action on every other state regional haze SIP.[204] Indeed, EPA's proposed disapproval of Texas's SIP revision was published over five years after Texas submitted its plan to EPA and after Texas had already submitted its five-year progress report to EPA demonstrating substantial progress at the Class I areas. Yet, EPA proceeds as if its review is timely and that its delay has no implications. To the contrary, EPA's tardiness changes the landscape considerably—it means that substantial real-world data is already available that shows more progress towards natural visibility at the Texas and Oklahoma Class I areas than even EPA asserts is reasonable and necessary for the first planning period; it means that EPA has taken action on every other states' regional haze SIP and thus there is a substantial body of EPA precedent applying the regional haze requirements that constrains EPA's field of play as to Texas; and it means that EPA's remedial FIP authority is further constrained by the fact that only a few years will remain in the first planning period by the time EPA takes final action.

Luminant stated that EPA's proposal would disapprove most of the Texas submittal, including Texas's RPGs for Big Bend and Guadalupe Mountains and Texas's long-term strategy. EPA would also "simultaneously" disapprove of Texas's and Oklahoma's consultation through CENRAP and disapprove Oklahoma's RPG for Wichita Mountains. Based on these disapprovals, EPA claims the authority to issue a FIP that would impose SO_2 emission limits, and the installation or upgrade of SO_2 emission controls, at a handful of Texas EGUs. EPA estimates the cost of its FIP at close to $2 billion, which would be imposed on four companies. More than half of this cost would be imposed on Luminant.

Footnotes:
[203] 79 Fed. Reg. at 74,818.
[204] Id. at 74,820.

Response: We have addressed the comments over consideration of recent monitoring data, controls past the first planning period, EPA's FIP authority, and consistency issues elsewhere**.**

Comment: Luminant discussed EPA's singular and unprecedented approach for this rulemaking. [Luminant (0061) p. 25]

Luminant stated, given that EPA delayed acting on Texas's regional haze SIP until it had taken final action on every other state regional haze SIP for the first planning period,[205] there is a substantial body of precedent from EPA's prior actions regarding what is and is not an approvable plan for the first planning period. Nevertheless, in EPA's own words, its approach to Texas is "without . . . prior precedent" and does not use the same methodology or metrics that EPA employed in reviewing every other regional haze SIP.[206] And in a sharp departure from prior practice, EPA chose to consider the remaining portions of the Texas SIP and Oklahoma's RPG for Wichita Mountains in a simultaneous action, in what is an obvious attempt to expand the agency's authority beyond the bounds of the statute and regulations as currently written.[207]

Luminant noted that the EPA concedes, as it must, that its proposed approach to the remaining portions of the Texas and Oklahoma regional haze SIPs is procedurally and substantively unprecedented in comparison to EPA's previous actions on other states' SIPs. In a court filing in 2014, EPA's Deputy Regional Administrator of Region 6 explained:

> Due to the large distances involved and the large number of sources being analyzed, EPA is utilizing a different model than the standard models used previously by EPA and States for Regional Haze SIPs. This model is complicated and the results it generates are not directly comparable to the modeling platform used in most other States' Regional Haze submittals.[208]

EPA explained that "[a]ppropriate review of this model therefore requires thorough technical and policy analysis and interpretation to ensure compliance with the Regional Haze Rule, ***without the benefit of prior precedent*** to streamline the process."[209] In its proposal, EPA further explains that, not only is its process and methodology for the Texas SIP unprecedented, but so are the metrics it employs to determine which individual sources it targets for emissions controls.[210] As discussed below, EPA's new methodology relies on many novel and unsupported assumptions, including that it linearly assigns visibility impairment to individual sources despite the non-linear nature of the chemical reactions that produce haze conditions.

Footnotes:
[205] Id.
[206] Declaration of Sam Coleman, Nat'l Parks Conservation Ass'n v. McCarthy, No. 11-01548, at 5 (D.D.C. 2014)
[207] See 79 Fed. Reg. at 74,821.
[208] Declaration of Sam Coleman, Nat'l Parks Conservation Ass'n v. McCarthy, No. 11-01548, at 5 (D.D.C. 2014) (emphasis added).
[209] Id. (emphasis added).
[210] FIP TSD at A-35 ("We have not established specific metrics for use in evaluating single facility impacts on visibility impairment (RP) as downwind Class I areas with a photochemical grid model such as CAMx….").

Response: We explain in our proposal and final rule our basis for determining that Texas and Oklahoma were "intricately linked" and why we addressed them together in one action. As previously discussed, EPA has the authority to issue a FIP either when EPA has made a finding that the State has failed to timely submit a SIP or where EPA has found a SIP deficient. Here, EPA has authority on the latter grounds, and we have approved as much of the Texas and Oklahoma SIPs as possible under the CAA and adopted a FIP only to fill the remaining gap. Our action today is consistent with the statute.

We disagree with Luminant's use of Sam Coleman's declaration. While EPA did say that there was no "prior precedent," this was in regards to the particular type of modeling undertaken; Luminant takes Coleman's statement out of context. Coleman's statement is related to the additional modeling we determined was appropriate due to the large distances involved and the large number of sources being analyzed, which was a unique set of facts not encountered by us in the Regional Haze context before. Luminant conflates this context and over broadens the scope of Coleman's statement beyond the modeling to our approach in the proposal overall. Coleman's statement was not stating there was no prior precedent for the basis of our proposal, nor that our approach was inconsistent with other regional haze SIP actions. We have addressed EPA's modeling methodology and metrics with specificity elsewhere.

Comment: Luminant (0053-2) stated that EPA's proposal treats Texas differently than other states and reflects a drastic shift in how EPA reviews state regional haze SIPS. The proposal creates new standards and requirements that EPA has not imposed on other states in review of their SIPs for the first planning period. Texas's analysis of the four reasonable progress statutory factors was consistent with the statute and EPA's regulations and their guidance. In guidance to states, EPA has consistently said until now that reasonable progress is not required to be demonstrated on a source-by-source basis. Yet EPA's proposal would require Texas to do just that.

Response: We address these general comments in our responses to more specific comments elsewhere.

Comment: The requirements in the proposed FIP are untimely for the first regional haze planning period due to the EPA's delay in acting on the 2009 RH SIP submittal. [TCEQ/PUCT (0056) p. 4]

The TCEQ stated that the EPA is evaluating the approvability of the Texas 2009 RH SIP, which covers the first planning period that runs only through 2018. The EPA has been so untimely in its review of the 2009 RH SIP that only the proposed scrubber upgrades in the proposed FIP could possibly be in place by the end of 2018. The projected benefit of the other proposed FIP controls, the scrubber retrofits, is irrelevant to the approvability of Texas' 2009 RH SIP because they would not be in place during this first planning period.

Response: We have addressed the installation of controls and their applicability towards reasonable progress goals and the approvability of Texas's RP elsewhere.

Comment: [Texas Governor (0066) p. 2] The Texas Governor stated that the EPA did not have the up-to-date facts when it decided that the State was not doing enough to regulate visibility because EPA took almost six years to act on Texas's proposed SIP. And if EPA had bothered to look, it would have discovered that the haziness conditions in Big Bend and the Guadalupe Mountains are much better today than Texas projected way back in 2009. And those conditions will continue to improve even without EPA's costly-but-ineffectual regulations.

Response: We have addressed comments relating to consideration of recent monitoring data elsewhere. We have addressed costs and visibility benefit elsewhere.

Comment: The proposed rule improperly treats Texas and Oklahoma differently from other states and therefore violates EPA's regulations. [UARG (0065) p. 24-25]

UARG stated that the EPA proposes to disapprove the Texas and Oklahoma SIPs, in part, because both states relied on CENRAP modeling that EPA believes was incomplete. EPA does not explain what legally required elements were missing from the CENRAP modeling, and the Agency assertion that it is appropriate to disapprove the Texas and Oklahoma SIPs on this basis is incorrect. To the best of UARG's knowledge, EPA has not rejected reliance on modeling conducted by any other RPO. Indeed, as far as UARG is aware, EPA has not rejected reliance on CENRAP modeling for other states that also participated in CENRAP during this regional haze planning period. This is for a good reason: EPA's regional haze rule expressly countenances reliance on RPO-developed information. EPA's proposal in this rulemaking to reject reliance on CENRAP modeling and analysis is therefore inconsistent with EPA's past actions and its regional haze rule.

Response: Our response to the comments on the CENRAP modeling are detailed elsewhere in this document, particularly in the consultation and modeling sections.

Comment: EPA cannot treat Texas disparately from other states in promulgating a regional haze FIP [Xcel Energy (0064) p. 24]

Xcel Energy stated that the disparate treatment of Texas under the Proposal runs afoul of EPA's mandate for fair and consistent treatment of states under the CAA. EPA has issued "Regional Consistency" regulations to "[a]ssure fair and uniform application by all Regional Offices of the criteria, procedures, and policies employed in implementing and enforcing the act." 40 C.F.R. § 56.3(a); *see National Environmental Development Association's Clean Air Project v. EPA,* 752 F.3d 999 (D.C. Cir. 2014) (finding that EPA violated its Regional Consistency rules by applying a different interpretation of a single stationary source in jurisdictions outside of the Sixth Circuit). EPA, specifically regional offices such as the Region 6 office that promulgated the Texas FIP, have an obligation to ensure that their actions "are consistent as reasonably possible with the activities of other Regional Offices." 40 C.F.R. § 56.5. EPA's Region 6 has contravened EPA's regional consistency rules by treating Texas differently than other states in implementing the RHR, and EPA more broadly has failed to correct any regional inconsistencies in regional haze FIPs. 40 C.F.R. § 56.3(b) (EPA must "[p]rovide mechanisms for identifying and correcting inconsistencies by standardizing criteria, procedures, and policies being employed by Regional Office employees in implementing and enforcing the act."). EPA is "not free to ignore or violate its regulations while they remain in effect." *National Environmental Development Association's Clean Air Project,* 752 F.3d, at 1011 (citing *US. Lines, Inc. v. Federal Maritime Commission,* 584 F.2d 519, 526 n.20 (D.C . Cir. 1978).

Xcel Energy stated that the EPA's singling out of Texas for different treatment under the RHR also is in conflict with the "fundamental principle of equal sovereignty" among the States. *See Shelby County, Ala. v. Holder,* 570 U.S. _, 133 S. Ct. 2612, 2616 (2013) (holding the Voting Rights Act preclearance requirement for particular jurisdictions unconstitutional). The U.S. Supreme Court has held that states must be treated equally under federal law unless there is "a showing that a statute's disparate geographic coverage is sufficiently related to the problem that it targets." *Id. at* 2616-17 (citing *Northwest Austin Municipal Util. Dist. No. One v. Holder,* 557 U.S. 193, 203 (2009)). EPA has not identified a provision in the Clean Air Act that specifies a particular regional haze issue in Texas justifying the disparate treatment of Texas in its FIP. Furthermore, given the "regional" nature of regional haze, it is arbitrary and capricious to single out a particular State for more stringent treatment.

Response: We address the applicability of the regional consistency rule and the NEDA CAP case elsewhere. Regarding Xcel Energy's use of the *Shelby County* case, the federal law at issue in that case imposed requirements on only certain States, i.e., disparate treatment of States on the face of the statute. The language Xcel Energy cites is the Court explaining that treatment can be disparate if the disparate treatment is sufficiently related to the problem being addressed by the statute at issue. We disagree that this holding is at issue here. First, the CAA Regional Haze rule provisions do not only apply to certain States, but rather to all States. Second, as we have discussed in detail elsewhere, our proposal is consistent with the statute, regulations, guidance, and previous actions in other States. As we explain elsewhere, any potential differences in our proposal's methodology from other State's is a result of reasonable, scientifically sound implementation of the statute's requirements in a state as geographically large and source numerous as Texas, and, most importantly, does not result in Texas being held to a more stringent standard than other states. Again, and as stated in greater detail elsewhere, what commenters allege should be national uniformity ignores our authority to exercise judgment, based on the specific facts at hand in reviewing SIP actions. Here, we are exercising judgment within the parameters laid out in the CAA and our regulations. Because this is a SIP review action, we believe that we are not only authorized but required to exercise independent technical judgment in evaluating the adequacy of the State's regional haze SIP, just as we must exercise such judgment in evaluating other SIPs.

Comment: [Earthjustice (0067) p.22] Earthjustice et al., noted that, in comments made at public hearings on the proposed rule, Texas and industry argued that Texas is being treated differently than other states because EPA is imposing a novel requirement to assess reasonable progress on a source-by-source basis. But EPA is using the same basic framework for reviewing Texas's SIP that is established by the Clean Air Act: whether the plan meets all applicable legal requirements. 42 U.S.C. § 7410(c), (k), (l). EPA's statutory responsibility is to review each haze plan to ensure that it is "reasonably moored" to the Clean Air Act and that the plan is based on a reasoned analysis. *See Oklahoma v. EPA*, 723 F.3d at 1206-12; *North Dakota v. EPA*, 730 F.3d at 761 (quoting from Alaska Dep't of Envtl. Conservation v. EPA, 540 U.S. 461, 485 (2004)). This is precisely the approach that EPA has taken in its review of the Texas plan.

Response: We thank Earthjustice for their comment and acknowledge their support regarding the legality and consistency of our review of Texas' Regional Haze Regional Haze SIP. We have further addressed our reasoning for disapproval of the Texas Regional Haze SIP elsewhere. We have addressed source category and source-by-source assessments elsewhere. We have addressed EPA's review authority and the Oklahoma and North Dakota cases elsewhere.

Comment: EPA Invents New Requirements for Texas Sources. [Luminant (0061) p. 2]

Luminant stated that the EPA has stated that its new "individual source" and "visibility benefit" approach for Texas is "without . . . prior precedent"[7] and treats Texas and Oklahoma different than all other states. EPA's proposal thus violates principles of administrative law and EPA's own regulations, which require EPA to treat states and regulated entities in a similar and fair fashion.[8]

Footnotes:
[7] Declaration of Sam Coleman, Nat'l Parks Conservation Ass'n v. McCarthy, No. 11-01548, at 5 (D.D.C. 2014).
[8] Nat'l Envtl. Dev. Ass'n's Clean Air Project v. EPA, 752 F.3d 999, 1010–11 (D.C. Cir. 2014) (holding that EPA action contrary to its regional consistency regulations was contrary to law); see also 40 C.F.R. § 56.5(a)(2) (requiring that officials in EPA regional offices "shall assure that actions taken under the act . . . [a]re as consistent as reasonably possible with the activities of other Regional Offices" (emphasis added)).

Response: We address the comments on individual source and visibility benefit, as well as our regional consistency rule and the NEDA CAP case elsewhere. We disagree with the characterization of Luminant's comment on the Declaration and that is explained in more detail elsewhere. Luminant takes Mr. Coleman's statement out of context. Mr. Coleman's statement is related to the additional modeling we determined was appropriate due to the large distances involved and the large number of sources being analyzed, which was a unique set of facts not encountered by us in the Regional Haze context before. Luminant conflates this context and misapplies the scope of Coleman's statement beyond the modeling to "individual source" and "visibility benefit."

Comment: EPA's proposal for Texas is fundamentally inconsistent with its actions on other states' regional haze sips for the first planning period [Luminant (0061) p. 129]

Luminant stated that EPA concedes that its review and action on Texas's regional haze SIP for the first planning period is "without . . . prior precedent"[794] But it is not simply that EPA's proposal here is the first of its kind—it also arbitrarily treats Texas's proposal in a fundamentally different and inconsistent way than EPA has treated other states in reviewing their SIPs for the first planning period.

In the previous comments, Luminant detailed how EPA created out of whole cloth a new and unprecedented "visibility analysis" targeting a small group of Texas sources and applied inconsistent and more stringent thresholds and metrics to these Texas sources than it has for other states. They also explained how EPA, for the first time, is proposing to unwind a regional agreement between two states about the apportionment of emission reductions to achieve reasonable progress goals. And we explain how EPA is offering first-time "interpretations" of its regulations in an attempt to justify these proposed actions. In Section XIV, they further explained how EPA is proposing for Texas an unlawful FIP that would reach outside the first planning period (2008-2018) to require installation of emission controls in 2020—the first time, according to their research, that EPA has ever attempted to assert such far-reaching authority under the reasonable progress provisions of the regional haze program.

Luminant asserted that EPA was not required, and indeed is not authorized, to make this a regional haze action of "firsts." Texas's regional haze SIP is not unique, nor was the approach that Texas used to determine its reasonable progress goals and long-term strategy, and thus there was no reason for EPA to reinvent its review.

Footnotes:
[794] Declaration of Sam Coleman, Nat'l Parks Conservation Ass'n v. McCarthy, No. 11-01548, at 5 (D.D.C. 2014).
[795] 79 Fed. Reg. 26,143, 26,145–46 (May 7, 2014) (emphasis added) (alteration in original) (internal citations omitted).
[796] 40 C.F.R. § 56.5(a). These requirements also apply to EPA Headquarters officials "who are responsible for developing the policies governing the implementation and enforcement of the CAA." Nat'l Envtl. Dev. Ass'n's Clean Air Project v. EPA, 752 F.3d
999, 1009 (D.C. Cir. 2014).
[797] Nat'l Envtl. Dev. Ass'n's Clean Air Project, 752 F.3d at 1009–10 (holding that EPA action contrary to its regional consistency regulations was contrary to law); see also 40 C.F.R. § 56.5(a)(2) (officials in EPA regional offices "shall assure that actions taken under the act . . . [a]re as consistent as reasonably possible with the activities of other Regional Offices" (emphasis added)).

Response: As stated in our responses elsewhere, we disagree with Luminant's interpretation of Sam Coleman's declaration. While EPA did say that there was no "prior precedent," this was in regards to the particular type of modeling undertaken. Thus, Luminant takes Mr. Coleman's statement out of context. Mr. Coleman's statement is related to the additional modeling we determined was appropriate due to the large distances involved and the large number of sources being analyzed, which was a unique set of facts not encountered by us in the Regional Haze context before. Luminant conflates this context and over broadens the scope of Coleman's statement beyond the modeling to our proposal overall. Coleman's statement was not stating there was no prior precedent for our proposal overall, nor was it stating there was no prior precedent for the list of specific components of the proposal that Luminant states are "firsts."

With regard to comments relating to consultation, controls beyond the first planning period, visibility/modeling and our clarified interpretation, those comments have all been addressed elsewhere. We also address our regional consistency rule and the NEDCAP case elsewhere.

Comment: According to the Associations, it is a well-established tenet of administrative law that "[r]easoned decision making … necessarily requires the agency to acknowledge and provide an adequate explanation for its departure from established precedent." *Dillmon v. NTSB*, 588 F.3d 1085, 1089-90 (D.C. Cir. 2009) (citing *FCC v Fox Television Stations, Inc.*, 129 S. Ct. 1800, 1811 (2009)). Indeed, given that the submitting States relied upon EPA's established guidance and precedents in crafting their SIPs, EPA is required to provide a "more substantial justification" for its disapprovals. *Perez v. Mortgage Bankers Ass'n*, *supra*, *slip op.* at 13.

Response: We acknowledge the citations provided by the comment, but the comment begins with the faulty premise that the disapproval is based on a departure from established precedent. This is not correct. As explained in the section of this document addressing comments on consistency, this is not a case where we are departing from established precedent. All EPA actions to review SIPs presuppose the ability of EPA to disapprove those SIPs that lack a reasoned basis and do not accord with the requirements of the Clean Air Act. We find that portions of the SIP must be disapproved for not meeting CAA requirements, and the bases for disapproval are explained at length in our responses and final action.

Comment: EPA improperly rejected Texas' decision not to impose further controls in this planning period due to low deciview visibility improvement when it has repeatedly not required further controls in other SIPs. [Xcel Energy (0064) p. 11-13]

Xcel Energy stated that the EPA guidance on implementing RPGs specifically allows states to consider relative impacts in visibility when setting RPGs to ensure that the measures aimed at achieving the uniform rate of progress "are reasonable." *See* RPG Guidance, at 2-3. EPA's RPG Guidance notes that states should look at "other available measures for the sources and source categories that contribute *significantly* to visibility impairment." *Id.* It was never Congress' intent under the CAA to regulate every possible source of visibility impairment in a Class I area. Rather, the intent is only to regulate sources and source categories that *significantly* impair visibility and achieve visibility improvement over a long time horizon.

Xcel Energy noted that the EPA concludes that the "visibility benefits of SDA scrubbers on the Tolk units are projected to occur mainly at the Guadalupe Mountains." 79 Fed. Reg. at 74,882. EPA estimated that the visibility improvement in 2018 background levels from installing scrubbers at Tolk 1 and 2 (Units 171 b and 172b) would be 0.022 and 0.024 deciviews (dv), respectively. 4 *ld,* at 74,882, Table 36. Even EPA acknowledges that this level of deciview improvement is "smaller than" deciview improvements from installing scrubbers at emissions units at the W.A. Parish or Welsh plants. *Id. at* 74,882; *see id.* At 74,881, Table 34 (identifying deciview improvements at the Wichita Mountains ranging between 0.020- 0.025 dv from the installation of wet scrubbers at Parish Units 5-7 and deciview improvement between 0.022-0 .023 dv from the installation of wet scrubbers at Welsh Units 1-3). Nonetheless, EPA inconsistently proposes to control Tolk and do nothing at these other units, stating that "the visibility benefits from installing scrubbers on the W. A. Parish 5, 6, and 7 units; and Welsh 1, 2, and 3 units would not yield large enough visibility benefits to be considered at this time." *Id. at* 74,882; *see also* New York SIP Approval, 77 Fed. Reg. at 24,818 (rejecting controls based on visibility improvement of 0.254 dv, an amount *10 times greater* than the visibility improvement that would result from EPA's proposed SO_2 controls at either Tolk unit).

Xcel Energy noted that the EPA has previously rejected additional controls to achieve reasonable progress even when visibility improvement was magnitudes greater than EPA expects from the installation of scrubbers at the Tolk units:

- In Arkansas, EPA concluded that "a visibility improvement of *only* 0.2 dv" was too low to apply further emission reductions even when Wichita Mountains was not on the URP glidepath. Arkansas SIP Approval, 77 Fed. Reg. 14,604, 14,625 (March 12, 2012) (emphasis added).

- In Arizona, EPA projected benefits of SCR at one project to be 0.41 dv at the most affected Class I area but still rejected SCR for purposes of reasonable progress. This level of improvement is more than nine times greater than the visibility improvement that

SDA scrubbers on Tolk would accomplish, at best, at the Guadalupe Mountains. Arizona FIP, 79 Fed. Reg. 9,318, 9,360 (Feb. 18, 2014).

- In Montana, EPA found a 0.18 dv improvement to be a "low visibility improvement" that "did not justify proposing additional controls" for SO_2 on one source. This level of improvement is more than four times greater than the visibility improvement that SDA scrubbers on Tolk would accomplish, at best, at the Guadalupe Mountains. Montana FIP, 77 Fed. Reg. 23,988, 24,012 (Apr. 20, 2012).

- In Oregon, even with relatively low costs per ton ($1 ,816/ton of NO_x), minor visibility improvements were rejected because "adding SNCR only provided an additional 0.18 dv of visibility improvement over NLNB/MOF A at the Mt. Hood Wilderness Area." This level of improvement is more than four times greater than the visibility of improvement that SDA scrubbers on Tolk would accomplish, at best, at the Guadalupe Mountains. Proposed Oregon SIP, 76 Fed. Reg. 12,651, 12,661 (March 8, 2011).

Xcel Energy stated that although Texas considered visibility improvements, it concluded there were insignificant *cumulative* visibility benefits, measured in deciviews, from requiring additional controls. *See* 79 Fed. Reg. at 74,837, Table 10 (identifying estimated deciview improvements ranging from 0.16 dv in Big Bend to 0.36 dv in Wichita Mountains). EPA previously rejected similar *cumulative* visibility improvements of 0.254 dv and 0.273 dv in the New York SIP as "small." New York SIP Approval, 77 Fed. Reg. at 24,818. Nevertheless, EPA concluded for Texas that individual sources with de minimis deciview contributions and similarly small deciview cumulative benefits warrant the substantial costs of additional controls based on EPA's estimate of "extinction benefits and percentage of total extinction." 79 Fed. Reg. at 74,882. Based on the foregoing, it was manifestly unreasonable and capricious for EPA to reject both Texas' calculations of low visibility benefit and *EPA's own calculations* of low deciview improvement and, as explained below, turn to a novel and unprecedented method for justifying scrubbers at Tolk.

Commenter's References:

[4] EPA's discussion of why CALPUFF modeling, especially at the large distances involved in Texas, would predict higher deciview impacts than CAMx is beside the point. The greater complexity and consideration of the interaction of all relevant sources offered by CAMx, according to EPA, makes it a better model for assessing regional haze for the long distances between the sources and the Class I areas addressed in the Proposal. At the same time, however, both models provide results in the same parameter: deciviews. And the CAMx model shows a minuscule deciview impact by Tolk on the Guadalupe Mountains National Park.

Response: While we disagree with Xcel's characterization of our guidance and attribution of Congressional intent from it, our proposed FIP followed the statute, Congressional intent, our regulations, and our guidance cited by Xcel—as we have explained in greater detail elsewhere—and identified those sources with the largest visibility impacts at Wichita Mountains and the Texas Class I areas based on consideration of a source's emissions, location, and modeled visibility impairment. As discussed in more detail in our proposal and in the modeling section of our responses Texas determined, and we agreed, that it was reasonable to focus the analysis on point sources of SO_2 and NO_X.[449] This was based on review of emissions and source

[449] 79 FR 74838

apportionment results indicating that these sources were most responsible for anthropogenic contributions to visibility impairment. We then used a Q/d analysis to identify those sources with the greatest potential to impact visibility based on emissions and distance. Additional analysis using photochemical grid modeling was then completed to estimate the visibility impact from those sources. Based on consideration of facility level and estimated contributions to visibility from units at the modeled facilities, we identified those sources that had the largest visibility impacts to analyze for additional controls. Once identified, we performed the four-factor reasonable progress analysis on these sources to determine if reasonable controls were available and cost-effective for the first implementation period, which included consideration of visibility benefit.

We address comments concerning the visibility benefits of controlling the Tolk units, our determination that those controls are reasonable, and comparing the visibility benefits of controls on Tolk units at Guadalupe Mountains to visibility benefit of controls on units at Parish and Welsh at Wichita Mountains in separate responses to comments in the modeling section of this document. We note that, as discussed in depth elsewhere in this document where we address comments concerning the visibility metrics we used, we considered visibility benefits in terms of extinction, percentage of total extinction, and deciview improvement (based on both "dirty" and "clean" background). The commenter only provides a comparison based on deciview improvements for controls on Tolk units based on a "dirty" background approach. We evaluated the visibility benefits of controlling the two units at Tolk for Guadalupe Mountains and determined that based on evaluation of extinction and percentage of extinction that these controls would provide for meaningful progress towards the goal of reaching natural visibility conditions for this progress period at Guadalupe Mountains. From our initial modeling based on the 2018 CENRAP emissions, we estimated that controls on the two units at Tolk would address approximately 8% of the total visibility impairment from all Texas point sources at Guadalupe Mountains.

We address comments concerning Texas' approach in considering visibility benefits of controls in a separate response to comment where we address comments concerning consideration of costs versus visibility.

We address Xcel's allegations that we have been inconsistent in comparison to our actions, in the consistency section of this document.

15. Modeling

15.a. Modeling Protocol

General summary: We received comments that EPA should have prepared a modeling protocol and made it available for public/stakeholder review and comment. The commenters state that a modeling protocol is required by EPA modeling guidance.

Comment: EPA should have prepared a modeling protocol and made it available for public review and comment. [NRG (0078) p. 5]

NRG stated that the EPA did not provide a modeling protocol for public notice and comment as part of its proposal. A modeling protocol is the means to detailing and formalizing the procedures for conducting a modeling study. In this context, a protocol would help to ensure that sources are identified consistently for potential regulation.

NRG stated that the EPA would certainly have required a state issuing such a plan to provide a modeling protocol. Notably, EPA's regional haze modeling guidance recommends that states prepare such a modeling protocol in submitting a regional haze plan to EPA. Alpine Report at 31-33. Thus, to comply with this guidance, EPA would need to make available its own modeling protocol for public review. Similarly, EPA's BART rules require the use of a modeling protocol: "There are several steps for making an individual source attribution using a dispersion model: 1. Develop a modeling protocol." [40 CFR 51, Appx. Y, § III.A.3, Option 1.] And, "[I]f you wish to use a grid model, you should consult with the appropriate EPA Regional Office to develop an appropriate modeling protocol." [40 CFR 51, Appx. Y, § III.A.3, Option 3.]

In this instance, NRG noted that development of a modeling protocol for this action would have facilitated stakeholder participation in the evaluation of potential sources of visibility impairment and reduced the risk of EPA relying on outdated emissions information.

NRG concluded that it is inappropriate for EPA to fail to provide a modeling protocol where EPA's own regulations and practice would require an Implementing state to use a modeling protocol. In this instance, EPA's method to identify sources to regulate appears to lack such a consistent basis.

Response: EPA is not required to develop a modeling protocol for its reasonable progress/long-term strategy technical analysis and take public comment on it. Our BART guidelines in the regional haze rule[450], our guidance [451] and 40 CFR Part 51 Appendix W do not require us to develop a modeling protocol for our own technical work conducted to support review of a SIP submittal or rulemaking e.g., promulgating a FIP. The recommendation to do modeling protocols is to help ensure that state analyses will be developed and completed in accordance with EPA guidance and policy to help states and other stakeholders develop adequate submittals. We reviewed the Texas SIP submittal that contained its technical analysis to determine whether it was technically adequate and after our review thereof, we made the determination it was technically flawed. This required us to perform our own technical analysis so we developed a workplan and consulted with national experts at EPA HQ (Office of Air Quality Planning and Standards – OAQPS) that are responsible for developing modeling in support of national rulemaking, setting policy and modeling/technical guidance for RH analyses. We consulted with these experts a number of times as we refined our technical approach and developed a workplan. The docket for the proposal included the modeling files, documentation of how the information was developed, and included the TSD documents, model output and analysis files, etc. We took comment on all aspects of the above analyses and techniques.

[450] See 77 FR 33642 (June 7, 2012).
[451] See EPA, 2007 Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, PM2.5, and Regional Haze. EPA-454/B-07-002; EPA-R06-OAR-2014-0754-0010; http://www.epa.gov/ttn/scram/guidance/guide/Draft_O3-PM-RH_Modeling_Guidance-2014.pdf).

Comment: EPA's Failure to Follow Its Own Modeling Guidance [Alpine (0078) p. 5, 31]

Alpine stated that it is clear that EPA's action to partially disapprove Texas' SIP is not supportable based on the data and methods used to back their decision.

Alpine stated that the EPA failed to follow its own regional haze modeling guidance because:

- EPA's approach to evaluating visibility impacts lacked an objective, documented significance test; and
- EPA failed to publish a supporting modeling protocol.

Alpine stated that the EPA's current draft modeling guidance document,[12] as well as previous final versions of this guidance and current BART modeling protocols are designed to inform air quality planning by providing documentation that adequately supports and describes the procedures used in an analysis. Additionally, it is recommended by the Agency that a modeling protocol be prepared (to facilitate Regional Office review and approval of a modeling analysis) before the modeling is conducted.

Alpine stated that these protocol documents are designed to detail and formalize the procedures for conducting any modeling study and effectively communicating to the Agency and impacted stakeholders, what the blueprint is for the study at hand. An appropriate protocol document would lead to extensive participation by stakeholders in developing the demonstration and reduce the possibility, in advance of any analysis, of the modeling entity to have used incorrect, invalid, or outdated information.

Alpine stated that the EPA did not publish a modeling protocol. The EPA guidance for BART modeling.[13] CENRAP's BART modeling guidance[14] and the EPA guidance for the use of photochemical grid model for regional haze[15] all require a modeling protocol be prepared and submitted for public comment. The modeling protocol specifies how the modeling will be conducted, how the modeling results will be analyzed and how the modeling results will be used to inform decisions before any modeling actually occurs.

Alpine noted that the EPA states in the 2007 "Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, $PM_{2.5}$ and Regional Haze":

Developing and implementing a modeling/analysis protocol is a very important part of an acceptable modeled attainment demonstration. The protocol should detail and formalize the procedures for conducting all phases of the modeling study, such as describing the background and objectives for the study, creating a schedule and organizational structure for the study, developing the input data, conducting model performance evaluations, interpreting modeling results, describing procedures for using the model to demonstrate whether proposed strategies are sufficient to attain the NAAQS and/or regional haze goals, and producing documentation to be submitted for EPA Regional Office review and approval.

Furthermore, Alpine noted that the EPA states in the December 2014 “Draft Modeling Guidance for Demonstrating Attainment of Air Quality Goals for Ozone, $PM_{2.5}$, and Regional Haze”[16]:

As with any technical support document designed to inform air quality planning, an attainment demonstration should be supported by documentation that sufficiently describes the procedures used in the analysis. In order to facilitate the process of EPA Regional Office review and approval, we recommend the preparation of two separate supporting documents: one before the modeling analyses are initiated (modeling protocol) and one after the analyses have been completed (attainment demonstration package).

Alpine noted that the EPA BART modeling guidance states:

For regional haze applications, regional scale modeling typically involves use of a photochemical grid model that is capable of simulating aerosol chemistry, transport, and deposition of airborne pollutants, including particulate matter and ozone Regional scale air quality models are generally applied for geographic scales ranging from a multistate to the continental scale. Because of the design and intended applications of grid models, they may not be appropriate for BART assessments, so States should consult with the appropriate EPA Regional Office prior to carrying out any such modeling.

According to Alpine, for this modeling the EPA chose to use regional scale photochemical modeling. Although there is no technical objection to the use of the regional scale photochemical modeling, the CENRAP BART modeling guidance states:

EPA’s BART guidance clearly indicates the need for a detailed modeling protocol to support any application of alternative models for BART analyses. An example of the content of such a one atmosphere modeling protocol would be the CMAQ/CAMx modeling protocols developed for CENRAP (Morris et al., 2004c) and VISTAS (Morris et al, 2004a). In addition, certain components of the screening and source-specific protocols developed with CALPUFF (Tables 6-1 and 7-2) would be appropriate. The alternative modeling protocol should be submitted to the state, regional EPA office and FLM for review and negotiation. Note that EPA’s role in the development of the protocol is only advisory as the “states better understand the BART-eligible” source configurations” and factors affecting their particular Class I areas (70 FR Part 128 pp 39126).

Alpine stated that while a modeling protocol was prepared in 2004 to support the development of the 2002 to 2018 modeling platform,[17] this project has made significant alterations to the emissions inventory used in the development of this modeling platform and the state of science in photochemical model has advanced in the decade since this modeling platform.[18] Furthermore, this existing protocol does not cover how the modeling results will be used to assess if additional controls are required on specific units.

Alpine stated that since this modeling was conducted by EPA, EPA’s modeling protocol should have been discussed with other outside groups, especially impacted stakeholders in the process before moving forward with the analysis. The most transparent way to accomplish this would have been to prepare and share a modeling protocol in order to advise the public and solicit input on the actions that were to be taken with the modeling and analysis. In this case, consistent with EPA's own guidance on the matter, an updated modeling protocol should have been prepared and presented for public and other government agency comment.

Footnotes:
[12] http://www.epa.gov/ttn/scram/guidance/guide/Draft_O3-PM-RH_Modeling_Guidance-2014.pdf
[13] 70 CFR Part 128 pp 39125
[14] Alpine Geophysics, 2005. CENRAP BART Modeling Guidelines. Prepared by Alpine Geophysics, LLC, Prepared for Central Region Air Planning Assoc. 15 December 2005.
[15] EPA, 2007. Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, PM2.5, and Regional Haze. EPA-454/B-07-002.
[16] http://www.epa.gov/ttn/scram/guidance/guide/Draft_O3-PM-RH_Modeling_Guidance-2014.pdf
[17] http://pah.cert.ucr.edu/aqm/cenrap/docs/CENRAP_Draft2.0_Modeling_Protocol_120804.pdf
[18] EPA-R06-OAR-2014-0754-0010

Response: As discussed in the previous response, we were not required to develop a modeling protocol and take public comment on it prior to publishing our proposed Federal Register action that was subject to public review and comment. BART guidelines, our modeling guidance documents, and 40 CFR Part 51 Appendix W do not require us to develop a modeling protocol for our technical work conducted to support our review of SIPs or in rulemaking actions. EPA's role in this action was to review the Texas and Oklahoma Regional Haze SIPs and either approve or disapprove and provide FIP measures as needed, and provide all supporting information for our decisions. EPA has provided the opportunity for comment on all aspects of the modeling that we conducted as required for notice and comment rulemaking. We also respond to all significant comments either raised at our public hearings or submitted as written comments. As to the comment that EPA's BART guidance clearly indicates the need for utilizing an alternative model for BART analysis, we concur in general that this is a requirement for states and other BART analysis developers. We agree that Texas did submit a detailed modeling protocol when it proposed to utilize the CAMx model with CENRAP databases for screening of many sources for BART applicability. EPA was not conducting a BART modeling exercise but a reasonable progress technical analysis, but we did use the CAMx model and CENRAP databases with the same technical options of Plume-in-Grid and Particulate Source Apportionment Tool (PSAT) as Texas had previously done for their BART screening. We maintain that EPA does not have to develop a modeling protocol for the reasonable progress technical analysis, and was not required to develop a modeling protocol prior to our proposal in this action. In sum, we disagree with commenters as none of the citations provided by the commenter required EPA to develop a modeling protocol prior to publishing our proposed action.

EPA disagrees that we did not document the significance test and metrics that we used and that we did not describe our objective approach to identifying the largest impacting sources and then determining if controls were feasible, cost effective and resulted in improvements to visibility impacts. All of this information was included in the record with our proposal materials and detailed in our TSDs that were available in the docket for public review at that time. These issues are responded to in more detail elsewhere in our responses that address the various aspects of our technical approach and decision making process. We did our own review and analysis and documented our methodology and decision making process in our proposed action and our TSD materials. We disagree that we made significant alterations to the emission inventory, and while we incorporated some advancements in the science, none of these would create any deviations from the Texas technical analysis that impacts the results. This issue is addressed in more detail in specific responses to the changes in model and emission inventory in later responses.

15.b Model Selection/Model Performance/Model Uncertainty/Model Inputs

General summary: We received comments that our selection of the CAMx model rather than CALPUFF is inappropriate and unjustified. The commenters state that EPA has not justified the use of CAMx to model visibility impacts from individual sources and at large distances, and EPA's use of CAMx here is outside of the model's capabilities. Furthermore, the commenters assert EPA's concerns of using CALPUFF are not clear and concerns of model overprediction are also present in CAMX and therefore do not justify the use of CAMx. The commenters also state that EPA failed to consider and discuss bias and uncertainty in model results and instead relied on the model predictions as definitive results.

We received comments that EPA failed to perform a full model performance evaluation and instead compared model results to the CENRAP modeling results despite deviations from CENRAP's modeling protocol. EPA also failed to update the modeled emission inventories or consider more recent emissions data, such as the 2011 NEI and EPA's recent 2018 emission inventory showing large reductions from MATs. Recent monitor data indicates that EPA's modeling is not representative of anticipated future conditions and was not considered during model performance evaluation.

Comment: [Luminant (0061) p. 115] Luminant stated that EPA's first error is its choice of CAMx as a modeling platform, despite the fact that there is no precedent for applying CAMx in this way.[719] As EPA itself has explained, "CALPUFF is the best modeling application available for predicting a single source's contribution to visibility impairment. It is the only EPA-approved model for use in estimating single source pollutant concentrations resulting from the long range transport of primary pollutants."[720] Moreover, in other recent regional progress SIP reviews, EPA has employed CALPUFF, not CAMx, to evaluate individual source impacts for reasonable progress purposes.[721] EPA departs from its prior and established practice here and attempts to justify the use of CAMx instead. But instead of justifying its use of CAMx as an appropriate model for the application here, which is its legal obligation, EPA simply offers a list of reasons that it believes CALPUFF is ***not*** appropriate. Whatever reasons there may have been not to use CALPUFF to undertake the analysis EPA conducted, those reasons do not justify the use of CAMx modeling. And, as explained below, EPA's own prior analysis demonstrates that CAMx suffers from the same flaws EPA now claims to find in CALPUFF. In other words, EPA ignores the most logical conclusion—that given the miniscule impacts at issue here and the significant distances involved, ***no model*** is competent to make accurate predictions.

Footnotes:

[719] 79 Fed. Reg. at 74,877–78 (explaining why EPA "chose to use the CAMx photochemical model instead of CALPUFF").
[720] See 70 Fed. Reg. at 39,122.
[721] See, e.g., 79 Fed. Reg. at 5,209 (explaining that EPA "did independently run CALPUFF to model the visibility improvement from potential controls at Dave Johnston Units 1 and 2 and it is part of the basis of our final decision" to approve Wyoming's decision not to impose additional controls on those units in its reasonable progress SIP).

Response: See our next response.

Comment: [Luminant (0061) p. 116] Luminant noted that EPA claims one reason it chose CAMx over CALPUFF was the "large distances between sources and Class I areas."[722] But EPA's modeling guidelines, which specify the use of CALPUFF for visibility modeling of "a small group of sources," as EPA has done here, does not recommend the use of CAMx for visibility modeling.[723] Nor does EPA provide any support for its apparent view that the distances involved here are within CAMx's reliable range. And EPA cites no instance in which it has successfully modeled visibility benefits from individual controls at the distances involved here with CAMx. Indeed, EPA's deviations from CENRAP standard protocols—such as adjusting the grid and limiting the facilities analyzed—suggest that EPA acknowledges that its approach here is unique and outside the model's designed capabilities.[724]

Footnotes:
[722] 79 Fed. Reg. at 74,878.
[723] 40 C.F.R. pt. 51, app. W, § 6.2.1.
[724] In fact, the CAMx User's Guide states: "OSAT/PSAT provides ozone/PM attribution to source regions and categories for a given emissions matrix, but does not provide quantitative information as to how ozone/PM contributions would change as emissions are altered because chemical interactions are non-linear." Environ, CAMx User's Guide Version 6.1 at 4 (Apr. 2014).

Response: We further address the comment in reference to App. W recommended models in response to comments on that specific issue below. While we agree that we did include in our proposal and Modeling TSD a number of reasons in support of our selection of the photochemical grid model CAMx over CALPUFF, we also included a number of materials in the docket to this action that are in general public circulation that document concerns with CALPUFF.[452] One of the primary reasons for our use of CAMx over CALPUFF here is that we evaluated the Texas SIP for reasonable progress and not BART, and the differences in the purposes of these analyses supports the use of different models when the resources are available to utilize a photochemical model. Reasonable progress requires the evaluation of changes in

[452] The promulgation of CALPUFF in 2003 included distance limits of a few hundred kilometers (2003 App. W, FR Vol. 68, No. 72, April 15, 2003) , BART guidance indicated 50 km to a few hundred km as reasonable distances for CALPUFF (2005 BART Guidelines at 70 FR 39104, .39122), EPA's 2003 App. W only gave full promulgation for inert species estimates and did not approve CALPUFF for full chemistry calculations, the BART Guidelines in 2005 allowed for CALPUFF modeling using chemistry to only be used to estimate as a screening tool and part of a 5-factor BART analysis, and IWAQM Phase 2 report also raised concerns with the effective distance limits of CALPUFF.

emissions from one or more facilities on visibility impairment at downwind Class I areas. In order to properly account for chemical transformations of those emissions, the model used must also include the other pollutants in the airshed, for which CALPUFF is not as well suited. Reasonable progress analyses look at the changes in visibility on the 20% worst days, and this evaluation was done by most states, including Texas and Oklahoma, by utilizing a photochemical grid model (PGM) such as CAMx or CMAQ and not CALPUFF. Texas and Oklahoma relied upon CENRAP's control scenario CAMx modeling that included controls on some sources in each state that were identified as potentially having cost effective controls available as possible RP sources. In particular, Texas used the CENRAP modeling as a starting point for its reasonable progress/long-term strategy technical analysis. As discussed in our TSD, when we evaluated the technical analysis that Texas submitted, and that was based on CENRAP's CAMx modeling results, we identified that TCEQ's analysis was flawed, and we then evaluated how to best perform an evaluation to determine if there were potential reasonable controls that TCEQ should have evaluated. It would have been inappropriate for us to use CALPUFF modeling techniques to compare with TCEQ's CAMx based technical analysis; therefore, we also used CAMx. CENRAP used both CMAQ and CAMx in its Regional Haze modeling and included emissions from all regional haze emission sources in the modeling domain to the best that they could be quantified.[453] As the BART guidelines indicated, PGMs (CAMx) is a more intensive tool that also requires additional time and resources to conduct a proper evaluation compared to CALPUFF, so in many cases CALPUFF may be the only tool available that EPA and/or states have used in some recent RP analyses. It is also case-by-case depending on the distance to Class I area and the amount of refinement needed in visibility modeling and not all situations are equivalent. Considering that Texas had used as its base in its analysis the CENRAP CAMx modeling and the distances were outside CALPUFF's normal range, we wanted to make sure that we used the best tools and similar tools to see whether we were going to reach a different conclusion than Texas, which we knew to be not acceptable because its technical analysis was highly flawed. As the commenter indicated here and other commenters have indicated, PGMs are best suited for RH SIPs and identifying the impacts of sources or groups of sources when the tools allow. After the BART guidelines were published in the Federal Register on July 6, 2005, ENVIRON, a national consulting firm with expertise in photochemical modeling, worked under contract with TCEQ to refine the ability of CAMx to model single facilities and single point sources using advanced techniques of PiG with PSAT and particulate chemistry in the plume as well as in the CAMx grids. EPA OAQPS and EPA Region 6 consulted with FLM representatives and approved Texas' BART screening modeling protocol using these new tools in CAMx.[454] One of the model apportionments that Texas utilized in their BART screening was a source group of one source (Luminant's Monticello facility). This is an

[453] 2005 BART Guidelines at 70 FR 39104; 39123- 39124 (July 6, 2005); "Theoretically, the CALPUFF chemistry simulations, in total, may lead to model predictions that are generally overestimated at distances downwind of 200 km. Again, States can make judgments concerning the conservativeness or overestimation, if any, of the results. The use of other models and techniques to estimate if a source causes or contributes to visibility impairment may be considered by the State, and the BART guidelines preserve a State's ability to use other models. Regional scale photochemical grid models may have merit, but such models have been designed to assess cumulative impacts, not impacts from individual sources. Such models are very resource intensive and time consuming relative to CALPUFF, but States may consider their use for SIP development in the future as they are adapted and demonstrated to be appropriate for single source applications."

[454] See Appendix 9-4: CAMx Modeling Protocol, Screening Analysis of Potentially BART-Eligible Sources in Texas of the Texas regional haze SIP

example, but there were several other source groups that had only a few sources and a number of facilities did their own CAMx modeling of only their facility to screen out of BART applicability (See our BART TSD). Therefore, we disagree with the commenter that using CAMx to assess single source impacts has never been completed previously for RH SIPs.

The commenter briefly mentioned model performance concerns with CAMx that we will address in more detail in responses to more specific model performance comments below. However, we do note that EPA's analysis (cited by commenters below and referred to by the commenter) indicated that CAMx was one of the best performing models (performed significantly better than CALPUFF in a number of metrics) and the PGM models (such as CAMx) are the only ones that we can evaluate using Relative Response Factors (RRFs) and baseline monitoring that allows the overall modeling results to be used in a relative sense to estimate changes to baseline monitored values based on the relative change in model results between a basecase and a different modeled scenario. The use of the RRFs and the CAMx modeling results in a relative and not absolute sense, which removes much of the concerns about potential model performance issues. CALPUFF has no way to compare in a relative sense and the results are used directly, which makes CALPUFF results more uncertain. In addition, despite the point there are refined techniques that may allow CALPUFF to be used at greater distances, this approach has not been through full model evaluations by EPA, and since CALPUFF was initially promulgated in 2003 for distance less than 300 km, this raises concerns as to this approach.

Another reason we were concerned with CALPUFF is that CALPUFF was never fully approved for chemistry modeling and was only approved to be used for BART assessments as one of the five factors in the overall RH BART analysis.[455] As discussed in our modeling TSD, CAMx and other PGMs have been approved by EPA in modeling protocols for regional haze analysis, including full chemistry calculations.

We disagree that there is no precedent for using CAMx in this way. TCEQ also used CAMx with PiG and PSAT to screen out groups of sources and individual sources for their impacts on Class I areas for BART screening. TCEQ contracted for the development of PiG with PSAT in order to do the BART screening with CAMx in 2006-2007. TCEQ screened out a number of Luminant's EGU sources (for PM impacts only) using the CAMx modeling of small groups of sources and individual sources. One of the reasons that TCEQ wanted to use CAMx instead of CALPUFF was due to the distances and potential uncertainties of CALPUFF model results at these distances. The only difference between our analysis with CAMx and CENRAP and TCEQ's analysis is we did source apportionment on more individual facilities and sources compared to the analysis that TCEQ and 6 other facilities conducted and TCEQ included in its RH SIP. We only refined the CAMx modeling that CENRAP and TCEQ had generated. As discussed in the TSD, these facilities are very large sources of emissions and each facility is large enough that looking at individual sources for potential impacts is not dissimilar to what the states or EPA would also do for a nonattainment SIP for ozone or PM NAAQS. Therefore, our use of CAMx

[455] Discussed in 2003 App. W promulgation of use of CALPUFF for LRT (2003 App. W, FR Vol. 68, No. 72, April 15, 2003), 2005 BART guidelines cited by commenter (2005 BART Guidelines, FR Vol. 70, No. 128 p.39122-39125) and also discussed in response to a comment in EPA's Final FIP in New Mexico FR Vol. 76, No. 162, August 22, 2011, p. 52431-52434

for evaluation of additional potential RP controls is consistent with the state's SIP submission. We address the comment that App. W does not approve CAMx for long range transport elsewhere, but we disagree with the commenter and note that the only models approved on a case-by-case basis that include a 'full PM2.5 chemistry mechanism' are PGMs such as CAMx. CALPUFF is not approved for full chemistry and therefore PGMs were used for the 'full chemistry' needs of a regional haze modeling exercise for LTS/RP.

The commenter indicated that EPA cites no instance in which it has successfully modeled visibility benefits from individual controls at the distances involved here with CAMx and EPA's deviations from CENRAP standard protocols—such as adjusting the grid and limiting the facilities analyzed—suggest that EPA acknowledges that its approach here is unique and outside the model's designed capability. We strongly disagree with the commenter. CAMx has been used in national EPA rule makings and regulatory impact assessments including the assessments of additional reductions needed to bring air pollution levels down in specific states and at specific monitors. There are numerous attainment demonstrations in Texas that have included modeling the benefits of controls on single facilities or small groups of facilities. Texas has previously modeled sensitivity of controlling NOx on some of the EGUs in East Texas to evaluate if the impacts would help reduce ozone levels in the DFW area (2007 DFW Ozone SIP). Minnesota previously conducted CAMx modeling for a single facility as part of its RH SIP revisions.

CAMx and CMAQ have been used in a number of regulatory actions and even in Texas's BART screening of sources, which is very similar to evaluating the benefit of controls on a specific source. The commenter seems to indicate that we inappropriately adjusted the grid and limited the facilities analyzed. We did contract for ENVIRON to do a smaller modeling grid (12 km) to try to better characterize chemistry and transport in the modeling domain of interest (Texas and Oklahoma and their Class I areas).[456] CENRAP, in 2006-2007 originally tried to evaluate and do a 12 km grid, instead of 36 km grid but it was a large resource burden on computer run time (9-10 years ago) and the performance improvements were not significant enough to justify the increased run-time and processing times.[457] With the advancements in computing power since then however, we were able to do a refined 12 km grid over the area of interest to result in a more accurate characterization of chemistry and transport.

In summary, there are many reasons that support our selection of CAMx over CALPUFF for the purposes of this action. Again, CAMx is better suited for evaluating the reasonable progress metric of improvement on the 20% worst days. It is also better suited for evaluating multiple sources individually in a complex airshed. In addition, many publically available references point to CALPUFF's potential overprediction and general performance concerns at the distances at issue here. Any bias issues in CAMx are ameliorated by tethering the model to real

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[456] TCEQ also included a 12 km nested grid over Texas and the Class I areas surrounding Texas. (TCEQ's Modeling Guidance- Guidance for the Application of the CAMx Hybrid Photochemical Model to Assess Visibility Impacts of Texas BART sources at Class I Areas" from this point the document will be referred to as "TX BART CAMx Guidance."

[457] Technical Support Document for CENRAP Emissions and Air Quality Modeling to Support Regional Haze State Implementation Plans, September 2007 at Section 1.3.4 available in the docket for this action

monitoring data, through the use of relative response factors generated by modeling of base and future cases to predict future monitored values.

Comment: [Luminant (0061) p. 116] Luminant asserted that EPA also claims that it was "concerned that CALPUFF could overestimate impacts," but that claim is contradicted by prior EPA findings.[725] In prior regional haze actions, EPA has defended its use of CALPUFF against criticisms that the model "overstates visibility impacts."[726] EPA has explained that "it is uncertain whether the simplified chemistry [in CALPUFF] will always overpredict visibility impacts."[727] And, contrary to its rationale here, EPA has found that "the CALPUFF model frequently predicted ***lower*** nitrate concentrations compared to the Comprehensive Air Quality Model (CAMx) photochemical grid model . . . ."[728] Moreover, EPA has previously explained, again contrary to its rationale here, that CALPUFF is used "to estimate the 98th percentile visibility impairment rather than the highest daily impact value" to compensate for the fact that CALPUFF "might in some cases predict a maximum 24-hour impact that is an 'outlier.'"[729] In other words, any "overprediction" in CALPUFF is compensated for by eliminating the highest outlier values. For this reason, there is no justification for EPA's attempt to lower the impact thresholds it has previously used in other regional haze actions (down from 0.5 deciview to "on the order of 0.1-0.15 deciview"[730]) because any overprediction by CALPUFF is already accounted for in how the results are reported.

Moreover, Luminant noted that even if EPA were correct that CALPUFF overpredicts visibility impacts, CAMx suffers from the same flaw, particularly at these long distances. Studies conducted for EPA by ENVIRON—***the same contractor that EPA hired to perform its Texas source modeling***—conclude that CAMx overpredicts visibility impacts ***by three times***, as EPA now claims CALPUFF does.[731] EPA provides no contrary analysis or empirical validation here to demonstrate otherwise. Thus, based on EPA's own prior studies, CAMx is not an accurate tool for the job that EPA seeks to undertake here. Nor is there any basis or need for adjusting visibility thresholds previously developed by EPA using CALPUFF modeling in order to make direct comparisons to EPA's CAMx modeling results here. Even if EPA's claim that CALPUFF overpredicts is correct, EPA's own prior analysis shows that CAMx does as well. Thus, if CAMx could be used at all here, to more accurately predict actual visibility conditions, EPA's modeling would need to be adjusted lower by a factor of one-third, thus providing even less justification for EPA's proposal.[732]

Footnotes:
[725] 79 Fed. Reg. at 74,878.
[726] 77 Fed. Reg. at 20,908.
[727] Id.
[728] Id.
[729] Id.
[730] FIP TSD at A-75.
[731] AECOM Report at 6-2 to 6-3.
[732] Id. at 6-10.

Response: We disagree with the commenter and their characterization of the situation. In the BART guidelines proposal, EPA originally proposed using the maximum value from CALPUFF modeling results but in the final EPA weighted the concerns with CALPUFF's simplified chemistry as the commenter noted and provided guidance that the 98th percentile visibility impairment should be used to compensate for NOx chemistry concerns, the simplified chemistry, and a concern of using the maximum distribution point for regulatory decisions (Final BART Guidelines (70 FR 39104, 39121).The comment that CALPUFF frequently predicts lower nitrate values than CAMx is not an accurate characterization. The reference is citing to a presentation at Community Modeling and Analysis System (CMAS) conference in 2010 by Bret Anderson and others including Erik Snyder of Region 6. The presentation indicated that for one modeling analysis CAMx results were slightly higher than CALPUFF results, but there were also more days where CALPUFF nitrates were larger than the CAMx results. The authors of the study indicated that it could be a number of issues that would need to be investigated further before drawing conclusions on the results and this was only one limited analysis and does demonstrate that modeling the same values will always give higher nitrate values from CAMx compared to CALPUFF results. A more accurate characterization is that initial modeling of a source did present nitrate values that were sometimes in the CAMx results but not in the CALPUFF results, but a general conclusion that CAMx will predict higher nitrate values than CALPUFF in all cases is unfounded and not supported by the limited data.[458]

The commenter did not seem to understand what was discussed in our TSD (page A-75) on the point of taking into account the differences in emission inputs and difference in metrics. We were not lowering the delta dv from 0.5 to 0.1-0.15 due to CALPUFF model performance concerns. CALPUFF modeling for BART purposes used by states often used the 98th percentile value (High-eighth-high) to compare to the 0.5 delta-dv threshold for BART applicability. RP modeling evaluates impacts on 20% worst days, which is an average value over a large number of days and is statistically much further down on the curve of ranked impacts than the 98th percentile and is therefore much smaller than 0.5 delta-dv just due to the difference in metrics utilized for visibility impairment versus BART screening. The other factor that makes CALPUFF results for BART different and larger than RP modeling with CAMx or CALPUFF is that BART modeling uses the highest 24-hour emission rate over a 3-5 year period that was often on the order of twice as much as the values typically used for RP analysis. Therefore, the difference in emission rate by itself would lead to CAMx RP model values to be on the order of 50% of the value of CALPUFF modeling results for BART screening. Just these two differences would lead to the CAMx results for RP being much lower than the same source modeled using the BART screening maximum emissions and 98th percentile value. Thus, the commenter is wrong and it is reasonable to require RP controls for impacts much lower than 0.5 delta-dv.

We respond to the comments about Environ's model performance analysis below, but we disagree with the conclusions. We do not conclude, nor does the cited AECOM report conclude that all CALPUFF and CAMx model results should be calibrated down to 1/3rd the model output

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[458] CMAS 2010 conference Powerpoint "Proof-of-Concept Evaluation of Use of Photochemical Grid Model Source Apportionment Techniques for Prevention of Significant Deterioration of Air Quality Analysis Requirements"; Bret Anderson, Kirk Baker, Ralph Morris, Chris Emery, Andy Hawkins, Erik Snyder; 'anderson-proof-of-concept_2010.pptx'

values based on the subset of statistics the commenter selected from the two field studies. EPA does not allow directly calibrating model results,[459] especially not based on limited field studies that are not even in the same climatological situation as our analysis. Furthermore, the alleged factor of 3 overprediction is based on the direct model results which is not the way we used our CAMx results. We note that our CAMx modeling results (as noted in our TSD and in other responses) are used in a relative sense and the absolute model values are not directly compared to any threshold value. In our CAMx analysis we used Relative Response Factors (as recommended by EPA's Regional Haze modeling guidance - 2007 Final guidance[460] and 2014 Draft guidance[461]) that uses the future predicted values at a monitor and divides these values by the baseline predicted values and then multiplies this ratio times the actual baseline monitored values to get an estimate of future year values. This minimizes bias issues with PGMs such as our CAMx modeling. Any bias issues in CAMx are ameliorated by tethering the model to real monitoring data, through the use of relative response factors generated by modeling of base and future cases to predict future monitored values.

In conclusion, we disagree with the commenter and will continue to follow EPA's guidance for using RRFs with our CAMx modeling results. As also discussed in other responses on the size of the impacts, we continue to maintain that CAMx modeling results in our analysis are naturally much lower due to the difference in metrics and emission rates that are modeled. If CALPUFF BART screening modeling would require a source to model maximum 24-hour emission rates of 2000 lb/day of SO_2 and the monthly actual emission rate (similar to our CAMx analysis) was only 1000 lb/day, it would not be reasonable to use a 0.5 delta-dv threshold in both cases. As discussed elsewhere, we do not support nor do we think any calibrating of our CAMx modeling results are reasonable, nor required. Further, any calibrating of model results is specifically restricted by App. W.

Comment: [Luminant (0061) p. 118] Having chosen to use CAMx modeling instead, EPA should judge the results of the modeling as they were calculated—not attempt to adjust them to create an artificial justification for its proposal. [739]

Footnotes:
[737] FIP TSD at A-37.
[738] 79 Fed. Reg. at 74,881.
[739] Further, in directing ENVIRON to use a newer version of CAMx than CENRAP used, EPA violated its own guidance that "the better course is to rely on modeling based on the same version of the model that the State employed to ensure we are using a consistent comparison." 77 Fed. Reg. at 20,908 (citing Mont. Sulphur & Chem. Co. v. EPA, 2012 U.S. App. LEXIS 1056 (9th Cir. Jan. 19, 2012)).

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[459] App. W, Section 7.2.9(a) "…Therefore, model calibration is unacceptable."
[460] EPA, 2007. Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, PM2.5, and Regional Haze. EPA-454/B-07-002.
[461] Draft Modeling Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, PM2.5, and Regional Haze http://www.epa.gov/ttn/scram/guidance/guide/Draft_O3-PM-RH_Modeling_Guidance-2014.pdf

Response: We address comments concerning "adjustments" to the CAMx model results elsewhere in this document. As discussed in another response, we reviewed CAMx modeling results for our 2002 basecase modeling using the updated CAMx version and other changes that we made and did not see any significant changes in model results. The situation that the commenter is referring to in Montana is distinguishable in that it dealt with a situation where the original Montana SIP work had been completed using one dispersion model (ISC) and the discussion was about to update witha recently promulgated model AERMOD that replaced ISC as the preferred model. In that situation, AERMOD handled meteorology and dispersion in a very different way than ISC and changes in modeling results would have most likely been seen, thus sending the state potentially back to the drawing board to develop a new SIP. EPA knew this and expected changes in model outputs between these two models and granted a general grace period of one year for most permitting and other actions that were already in the queue so that they could be processed with their existing ISC based analyses and future analyses submitted would use AERMOD. Our situation is distinguishable from the Montana situation in that we did not change model platforms that have fundamental differences in their formulation. We utilized modeling generated with an older version of CAMx that has been approved in a number of SIPs and utilized a new version for our analysis that had some science improvements that are comparable to scientific tweaks to the existing model formulation and not fundamental changes in model formulation.[462]

Comment: The margin of error in different CAMx modeling compilations was not considered. [Xcel Energy (0064) p. 29]

Xcel Energy stated that model performance varies as a function of many factors including, but not limited to, the following: pollutant, time of day, time of year, accuracy of input data (e.g., emissions inventories, meteorological data, etc.), selection of model options/parameterizations, resolution, and geographical location. Studies have shown that photochemical models tend to under-predict sulfate concentrations in general, while for nitrate concentrations they tend to over-predict in the winter and under-predict in the summer. *See* Appendix C to comment 0064, "Compilation and Interpretation of Photochemical Model Performance Statistics," Heather Simon, et. al., U.S. EPA, Atmospheric Environment (2012). Performance of photochemical models also appears to be significantly better in the Eastern U.S. than the Western U.S. (west of the Rocky Mountains). Something as seemingly insignificant as the choice of compiler can lead to slight differences in modeled results. When utilizing modeling for regulatory purposes, the bias and error should be reported and taken into consideration when proposing controls. From a review of the EPA provided documentation, these items were not considered and instead a definitive result was predicted.

Xcel Energy stated that the EPA also arbitrarily used CAMx modeling to model transport of haze from sources despite significant known limitations with CAMx involving over-prediction of emissions at longer distances, and even though EPA has consistently promoted the use of CALPUFF. *See,* Documentation of The Evaluation of Calpuff and Other Long Range Transport Models Using Tracer Field Experiment Data, Environ International Corporation, EPA Contract

[462] Environ February 2013 memorandum, "2002 Baseline CAMx Simulation, Texas Regional Haze Evaluation"; 'Memo_TXHAZE_2002CAMx_ENV_21Feb2013.docx'

No. EP-D-07-102, Work Assignment No. 4-06, Figure 6-13 (2012), *available at* http://www.epa.gov/ttn/scram/reports/EPA- 454_R-12-003.pdf.

Response: See our response to the next comment and our responses above to similar comments.

Comment: [Luminant (0061) p. 117] Luminant stated that EPA fails to perform a model performance evaluation of its additional modeling, as required by EPA's own modeling guidance.[734] Had any state presented a SIP revision without a performance evaluation, EPA would not have allowed the use of such modeling. Indeed, as a contractor for CENRAP, ENVIRON conducted an extensive model performance evaluation, which was incorporated into the Texas SIP.[735] EPA provides no explanation of why it is deviating from its own modeling guidelines in this proposal and certainly no justification for doing so. In fact, even ENVIRON finds that its own results reported to EPA are "suspect" and warns that "care should be taken in the interpretation of the visibility projections at these Class I areas."[736]

Footnotes:
[734] ENVIRON Feb. 2013 Memo at 8.
[735] 2009 Texas SIP Narrative app 8-1, ch. 3 ("Model Performance Evaluation").
[736] Id. at 12.

Response: We did not do a detailed model performance of the 2002 basecase because that had already been done by CENRAP. The only changes we made in the 2002 basecase was to use a newer version of the CAMx model, include a flexi-nested 12 km computational grid over the Oklahoma and Texas areas of interest, and incorporate an updated chemical mechanism which included re-categorizing emissions to the new mechanism to utilize improvements in the science for our analysis and decisions. As we discussed in our proposal materials, these changes were not large and did not warrant a full model performance evaluation. We did compare model results with previous results and determined that model results were very similar and extinctions at Class I areas were similar and deemed acceptable. We reiterate that all of this information was included in our record at the time of proposal and was subject to public review. It is not uncommon as a professional practice in the modeling community to do some small updates such as we did and not perform a full updated model performance analysis. We did evaluate model projections on the worst 20% days, best 20% days in comparison to monitored values and we also compared to previous similar comparisons performed with CENRAP's CMAQ modeling results.[463] Overall there was a significant underestimation of sulfate compounds compared to monitored values on the 20% worst days. Contrary to the assertions of several commenters that CAMx results are biased high, this was not true for the 20% worst days at Class I areas in Texas and near Texas. This is important because it indicates that the CAMx modeling was actually underestimating the SO_2 impacts on most of the 20% worst days, which is opposite of the comment that CAMx results overestimated by a factor of 3.While all models have some bias issues and never replicate the atmosphere exactly, the previous modeling results developed by ENVIRON for CENRAP did include an extensive model performance analysis and were considered acceptable by CENRAP and TCEQ, and we have previously approved the CENRAP

[463] Environ February 2013 memorandum, "2002 Baseline CAMx Simulation, Texas Regional Haze Evaluation"; 'Memo_TXHAZE_2002CAMx_ENV_21Feb2013.docx'

modeling database in other CENRAP states. Considering the limited scale of the changes, the analysis of our modeling data compared to 2002 monitoring data, and no distinguishing of any differences in model projections compared to CENRAP's 2002 modeling, a full performance analysis was not necessary. Overall, the changes we did in the basecase modeling (12 km grid, updated CAMx and chemical mechanism and chemical speciation with some sources evaluated with updated PiG and PSAT) would not be expected to result in much change in model performance and in fact, they did not.

We respond to the comments about ENVIRON's model performance analysis of CAMx below, but we disagree with the conclusions made by commenters. We do not conclude, nor does the report conclude that all CAMx model results should be calibrated down to 1/3rd the model output values based on the subset of statistics the commenter selected from the two field studies. EPA does not allow directly calibrating model results,[464] especially when not based on limited field studies that are not even in the same climatological situation as our analysis. Furthermore, the alleged factor of 3 overprediction is based on the direct model results which is not the way we used our CAMx results. ENVIRON'S thorough model performance evaluation for CENRAP did not indicate an overprediction bias by a factor of 3 (CENRAP TSD), therefore it does not seem appropriate to consider that CAMx is performing in the manner as badly as the commenter suggests. In our evaluation of the basecase monitored to model values for the 20% worst days, the model was actually underpredicting overall and for sulfate species.[465] In the ETEX and CAPTEX studies performed for EPA, CAMx had some of the best model performance of the models evaluated and CALPUFF had some of the worst model performance evaluations. We note that our CAMx modeling results (as noted in our TSD and in other responses) are used in a relative sense and the absolute model values are not directly compared to any threshold value. Here, in our CAMx analysis we used Relative Response Factors (as recommended by EPA's Regional Haze modeling guidance (2007 Final guidance and 2014 Draft guidance) that uses the future predicted values at a monitor and divides these values by the baseline predicted values and then multiplies this ratio times the actual baseline monitored values to get an estimate of future year values. This minimizes bias and error issues with PGMs such as our CAMx modeling. Any bias issues in CAMx are ameliorated by tethering the model to real monitoring data, through the use of relative response factors generated by modeling of base and future cases to predict future monitored values.

As discussed in other responses, the selection of CAMx for this analysis was not arbitrary and was in-line with both CENRAP and TCEQ selection to use CAMx modeling to assess impacts of potential RP sources. CAMx with the PiG and PSAT tools was also used by TCEQ for BART screening, so there were several precedents to point to that utilized CAMx for our work. Based on recent modeling and guidance development conducted by EPA's OAQPS office, CAMx also appears to be one of the better tools for this type of analysis.[466] As discussed in detail in other

[464] App. W, Section 7.2.9(a) "…Therefore, model calibration is unacceptable."

[465] Environ February 2013 memorandum, "2002 Baseline CAMx Simulation, Texas Regional Haze Evaluation"; 'Memo_TXHAZE_2002CAMx_ENV_21Feb2013.docx'

[466] Draft Guidance on the use of models for assessing the impacts of emissions from single sources on the secondarily formed pollutants ozone and $PM_{2.5}$ (EPA-454/P-15-001) and Interagency Workgroup on Air Quality Modeling Phase 3 Summary Report: Long Range Transport and Air Quality Related Values (EPA-454/P-15-003).

responses, CALPUFF has multiple limitations, especially in the context of evaluating impacts for RP and potential RP controls.

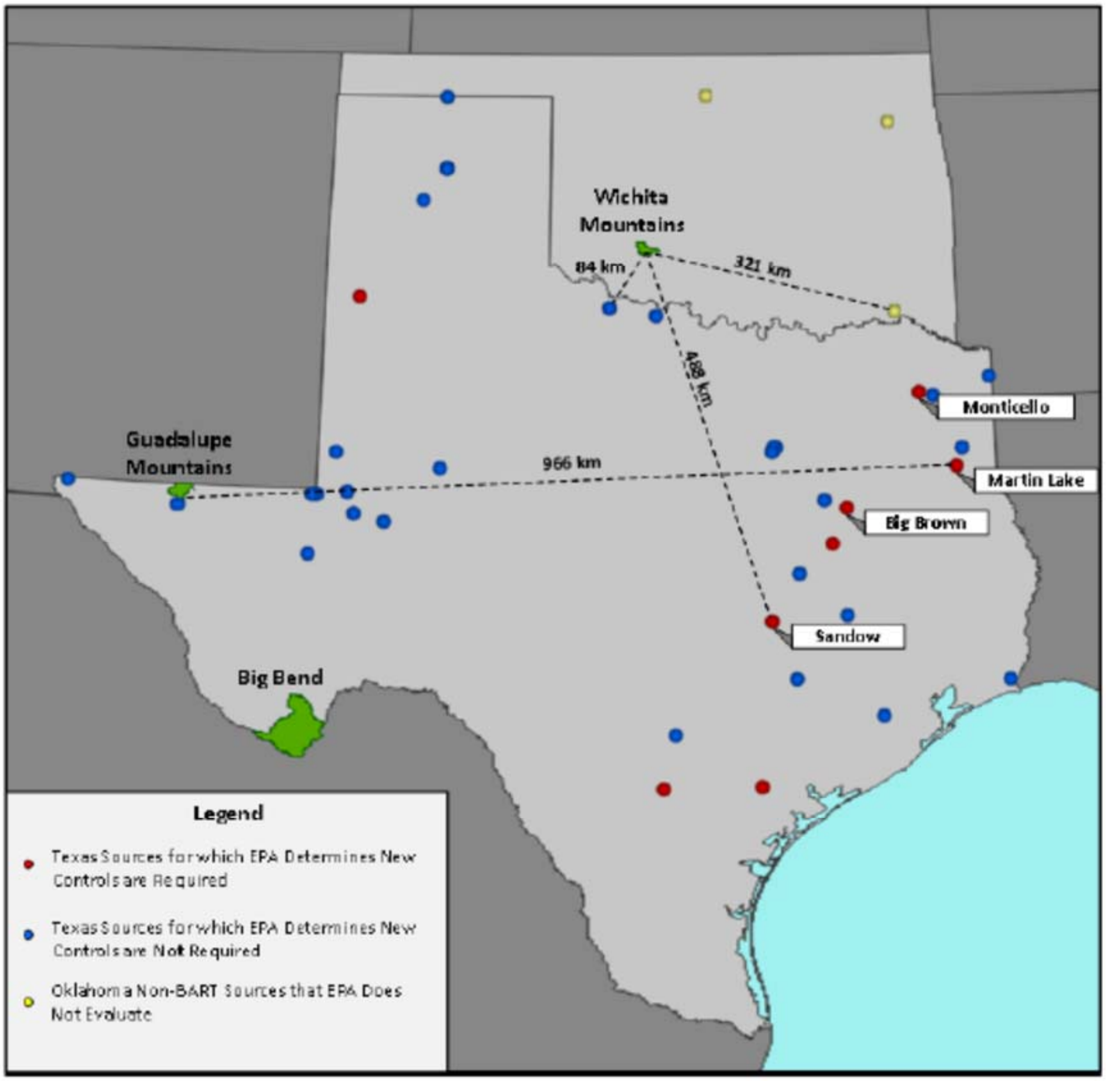
Comment: [AECOM (0061 and 0075) p. 6-2] AECOM stated that it is well-documented that CAMx has transport limitations and uncertainties. For example, to the best of our knowledge, there has not been a single rigorous and comprehensive evaluation on the ability of PGMs to accurately represent the transport of pollutants over specific distance ranges, especially for distances on the order of at least 500 km. In this regard, EPA's proposal does not address whether CAMx can accurately represent the impacts of pollutants at the very large distances from the sources that were simulated. EPA asserts that CALPUFF has some limitations at large distances, but it does not present data or analysis to show that CAMx does not.

Response: See previous responses for comments above. We address the comment about model performance evaluations on the order of at least 500 km elsewhere in responses to tracer study comments in this document. As discussed in responses below to evaluations with tracer studies, PGM such as CAMx are some of the best performing models in general and have been shown to perform significantly better than CALPUFF. See our responses to ETEX and CAPTEX tracer studies and other model performance comments.

Comment: [Luminant (0061), p. i] Luminant stated that the proposal burdens a handful of Texas generating units, located far away from these Class I areas, with massive costs that would threaten their continued operation and economic viability and the thousands of jobs they provide.

Luminant stated that, to arrive at this conclusion, EPA invents a methodology found nowhere in the statute or regulations and applies it in a seemingly random manner. The map below depicts EPA's skewed and unprecedented approach for Texas, with sources far away from these federal areas somehow being captured by EPA's novel methodology, while closer sources are excluded. There is no discernible rationale for this flawed approach.

Map of Sources and Federal Areas Provided by Luminant (0061)



Luminant asserted that never before has EPA singled out individual sources using the new approach that EPA employs here to derail the regional haze plans by Texas and Oklahoma. The record is irrefutable that EPA has routinely approved other states' regional haze plans that look just like the Texas plan and achieved the same level of progress.

Luminant stated that, with this unprecedented approach, EPA resorts to stretching the science and the law beyond all recognition to justify its preordained result. EPA fails to follow its own modeling protocols or to validate its modeling, and it uses results well outside the model's well-recognized limitations.

Response: These comments are addressed in other responses below where we discuss identification of sources for additional analysis. The comment that EPA failed to follow its own modeling protocols and model validation/model performance analysis are addressed in responses to similar comments above. In response to the comment of utilizing the model outside the model's limitations we do not agree. Models are tools to be used to assess specific situation as needed, and while the model and analyses we used in this case have not been used many times for RH purposes that does not prohibit us from doing so if the appropriate modeling tools are available. As discussed in responses elsewhere, TCEQ used CAMx modeling to assess small groups and individual point sources to identify their impacts on surrounding Class I areas. TCEQ sponsored additional scientific developments within CAMx to improve the science of assessing single source impacts on visibility impairment at downwind Class I areas in 2006/2007 in order to evaluate a large number of facilities with CAMx for BART screening. Texas's RH SIP included six CAMx modeling evaluations in 2007 for single facilities to screen out from BART. Therefore, using CAMx to assess visibility impairment impacts of a single facility or a large source is not a new or unprecedented approach. CENRAP utilized CAMX modeling to assess visibility impacts from source types and source regions, such as point sources within a particular state.

Beyond what has been applied in practice in various SIPs and FIPs, there is no visibility benefit deciview significance threshold that exists in the RH regulation or guidance. As a result, the EPA interprets the visibility improvement from the modeling results on a case-by-case basis. As discussed elsewhere, the EPA believes that it is appropriate to apply different interpretations of rounding conventions based on the circumstances of the emissions reductions scenario(s) and geographic scope of the analysis.

Comment: [UARG (0065) p. 26-27] UARG stated that the EPA – apparently for the first time in a regional haze rule – rejects reliance on the CALPUFF model and instead relies on CAMx. *Id*. at 74,877-78. EPA's BART Guidelines, as the proposed rule acknowledges, state that CALPUFF is "the best regulatory modeling application currently available for predicting a single source's contribution to visibility impairment." *See id*. at 74,847. CALPUFF is, moreover, "the only EPA-approved model for use in estimating single source pollutant concentrations resulting from the long range transport of primary pollutants." 70 Fed. Reg. 39,104, 39,122 (July 6, 2005). In previous regional haze rulemakings, EPA has refused to accept anything other than CALPUFF modeling performed using CALPUFF version 5.8, the version of the model approved in EPA regulations. EPA has even rejected visibility modeling that was conducted using more up-to-date versions of CALPUFF that are intended to correct errors in version 5.8. *See, e.g.*, 76 Fed. Reg. 52,388, 52,431 (Aug. 22, 2011) (rejecting modeling results from CALPUFF versions 6.112 and 6.4). The primary rationale that EPA provides to support its use of CAMx here is that "[t]he large distances between sources and Class I areas are outside the typical range of CALPUFF. Because of the range, we were concerned that CALPUFF could overestimate impacts." 79 Fed. Reg. at 74,878. But EPA provides no technical assessment supporting the reliability of CAMx to model visibility impacts of single sources over long ranges. That the single model on which EPA heretofore has insisted cannot reliably predict impacts over the distances at issue in this proposed rule should have signaled to EPA that its proposed rule is arbitrary and irrational and that those distances are simply too great to allow for imposition of reasonable progress regulations by EPA. In any event, EPA provides no valid basis for using CAMx uniquely here, instead of CALPUFF.

Response: As discussed in several other responses to comments concerning modeling in this section, we discuss a number of concerns with using CALPUFF at the distances present in our analysis. CENRAP and Texas used CAMx modeling for their RP analysis. We disagree with the points raised by the commenter in the above comment and our positions on these points were discussed in our TSDs. In addition, even Texas raised concerns with CALPUFF in their TX BART CAMx Guidance.[467] Texas argued that with the updates to CAMx that they helped develop with PiG and PSAT with full chemistry in the PiG, that CAMx was the best tool to use for modeling impacts of groups of sources and single sources in Texas on nearby Class I areas in Texas and outside of Texas (multiple locations in the TX BART CAMx Guidance including page 1-1 to 1-10). As the commenter noted, EPA has previously not approved CALPUFF modeling with more updated chemical mechanisms because the new versions have not gone through performance testing and approval by EPA and therefore are not acceptable regulatory versions of the CALPUFF modeling system (see 76 FR 52431, 52434 (August 22, 2011). EPA did provide all of its technical assessments in the record to this action, including documentation that CENRAP and TCEQ had used CAMx in similar analyses as part of their work products over 7 years prior to our proposal. As also discussed in similar responses, EPA, TCEQ and CENRAP all used CAMx modeling for evaluation of potential RP and BART sources, including single facility analyses. Therefore, including additional similar responses to CAMx vs. CALPUFF elsewhere, EPA's use of CAMx instead of CALPUFF was an appropriate response given the continued concerns with using CALPUFF in Texas for distances outside the normal operation of CALPUFF and was not arbitrary or capricious.

Comment: [Southwestern Public Service [SPS]/Xcel Energy (0053-24 and 0054-4)] SPS (Xcel Energy) stated that the EPA's proposal is based on out-of-date emissions and meteorological data. EPA acknowledges that the scrubber retrofits would not be in place by the end of the first planning period for the regional haze in 2018. As a result, consideration of these expensive controls should be evaluated fully in the next planning period as part of the Texas state plan due to EPA in 2018. This would allow consideration of the updated data, current conditions, and the effect of new programs, and avoid undue reliance on data and modeling that are now over 10 years old.

In addition, by that time SPS would have better sense of its compliance plans for the proposed Section 111(d) clean power plan. This would allow for more comprehensive planning to assure the best economic environmental benefit of our customers without impacting long-term progress towards the goal of attaining natural visibility in Texas and Oklahoma Class I areas.

Response: We address the comments about out-of-date emissions and meteorological data in this response here. Comments concerning controls beyond the first planning period are addressed elsewhere in this document.

As discussed elsewhere, EPA's responsibility in this process was to evaluate Texas' RH Plan and either approve or disapprove the submittal, and if we disapproved it, to promulgate a FIP to address the deficiencies. EPA evaluated the Texas RH modeling analysis for RP that was based on 2002 meteorology (as agreed in modeling protocols) and 2002 and 2018 emission inventory databases provided with the State's SIP submission. Even though we found Texas' technical analysis flawed, we did use the CENRAP databases in our technical analysis with CAMx, as Texas did.

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[467] TCEQ's Modeling Guidance- Guidance for the Application of the CAMx Hybrid Photochemical Model to Assess Visibility Impacts of Texas BART sources at Class I Areas (Decmber 13, 2007)

As discussed below, we did consider recent actual emissions in a number of ways to assess the visibility impacts and potential benefits from controls on specific sources. We also used the most recent CAMx model version and updated chemical mechanism that included improvements to the source apportionment of single point sources and plume in grid algorithms to use the most recent science for our RP evaluations. These were relatively small changes compared to doing a full update to all the emission inventories.

The commenter indicated that the meteorology data was outdated. What the commenter is suggesting is that EPA should have generated an entirely new reasonable progress modeling demonstration. The development of the RH modeling databases by CENRAP took about 5 years and much more money and resources than we had available and would have been well beyond the scope of work in finding Texas' technical analysis to be flawed and developing a methodology to address the flaws. Updating the meteorology data would have been a major update, not like the minor updates we did for the technical analysis. Therefore, we did not believe it was necessary to update the meteorology data.

With regard to comments that we used out-of-date emissions and we should have performed a more complete update of the inventory during our technical analysis, a full emission inventory update for all emission categories such as biogenic, mobile, non-road, area, and point sources for 2002 and 2018 was not necessary for our evaluation as to whether additional reasonable progress controls are appropriate for specific sources or groups of sources. We evaluated the existing CENRAP 2002 and 2018 emission inventories and whether to update parts of the 2018 emission inventories. We considered updating the EGU inventory with an emissions inventory estimate developed for modeling performed for the MATS rulemaking. However, there was considerable uncertainty in the emission reductions projected in that inventory due to MATS compliance. Comments from Texas and EGU owners[468] on a more recent emission inventory (that included many of the same assumptions on emission reductions due to MATS that were used to develop the MATS inventory) indicated that no significant emission reductions or major controls were planned to be installed on EGUs in Texas for SO_2 emissions in response to MATS.

As discussed elsewhere, we performed a Q/d analysis to identify those sources with the greatest potential to impact visibility based on 2009-2011 emissions. We then performed CAMx modeling using the same CENRAP 2018 projected emissions as Texas to estimate the individual visibility impacts due to the projected 2018 emissions of those 38 sources identified by the Q/d analysis. For this modeling, we did do minor updates to emissions on a few specific facilities to incorporate recent information that had changed for specific units/facilities to reflect installed controls or improvements in control efficiencies.[469] We thought it was appropriate to conduct our analysis of these select facilities using the most recent information, since this could impact potential RP control decisions for those facilities. These changes were not large in comparison to the overall modeled emission inventory. We also considered recent emissions data in

[468] Texas comments on Draft IPM modeling conducted by EPA for potential national rule making platform provided on June 26, 2014. In this docket materials as "TCEQ comment letter to EPA on draft modeling platform dated June 24, 2014. '2018 EMP signed.pdf'
[469] FIP TSD at A-16

estimating and evaluating facility-level and unit-level impacts in order to identify those sources with the largest visibility impacts for additional control analysis.

After our initial modeling analyses to identify those sources with the largest visibility impacts for additional control analysis, we developed estimated High and Low control-level emission estimates based on recent actuals emissions and anticipated control efficiencies of potential controls to assess the potential visibility benefit of controls. As we explain in detail elsewhere in the FIP TSD and in response to comments, we determined that recent actual emissions were more representative of anticipated future emissions than the 2018 CENRAP projected emissions for these EGU sources in Texas based on available information, including the comments from Texas and EGU owners on future anticipated reductions. In our analysis of potential controls for individual units, we estimated the potential visibility benefit of controls based on both additional reductions to the 2018 CENRAP projected emission levels and reductions to recent actual emission levels. We also utilized recent actual emissions in our cost estimates.

15.c Modeling Emission Inventory

Comment: [AECT (0074) p. 7-8] AECT stated that the EPA's Proposal lacks a reasonable basis because EPA's FIP visibility modeling predicts higher visibility impacts from Texas emissions sources in 2018 than will actually occur because those sources' SO_2 emissions that were used in such modeling are outdated and fail to reflect the substantial SO_2 emissions reductions those sources have achieved or will achieve by 2018.

AECT stated that EPA's FIP visibility modeling predicts higher visibility impacts from Texas emissions sources in 2018 than will actually occur because those sources' SO_2 emissions that EPA used in such modeling are outdated and fail to reflect the substantial SO_2 emissions reductions those sources have achieved or will achieve by 2018. Specifically, in conducting its FIP visibility modeling, EPA assumed that Texas emissions sources would emit 749,119 tpy of SO_2 in 2018 based on a projection from the 2002 CENRAP SO_2 emissions inventory.[23] However, more recent data show that SO_2 emissions from Texas emissions sources have decreased much faster than EPA projected. Indeed, EPA's most recent national SO_2 emissions inventory shows that, by 2011, actual Texas SO_2 emissions were only 558,502 tpy, or only about 75% of the 749,119 tpy of SO_2 emissions that EPA assumed in conducting its FIP visibility modeling. Moreover, when EPA's IPM projections are applied to the 558,502 tpy of SO_2, the 2018 Texas SO_2 emissions are projected to be only 259,743 tpy, or only about 35% of the 749,119 tpy of SO_2 emissions that EPA assumed in conducting its FIP visibility modeling.

AECT noted that a recent court decision requires that EPA consider the effect of the more recent and more accurate SO_2 emissions data in determining whether any additional SO_2 emissions controls are needed for the identified Texas EGUs to meet the reasonable progress requirements.[24] If EPA uses more recent and more accurate SO_2 emissions in its FIP visibility modeling, the predicted visibility impacts from Texas emissions sources in 2018 will be significantly lower than the visibility impacts predicted by the FIP visibility modeling that EPA used to support its Proposal. In fact, AECT is confident that the visibility impacts predicted by such modeling will be so low that EPA will be required to conclude that there is no support for the proposed requirement for additional SO_2 emissions controls on the Texas EGUs.

Footnotes:
23 79 Fed. Reg. at 74858, Table 20
24 Sierra Club v. EPA, 671F. 3d 955 (9th Cir. Jan. 20, 2012) (rejecting an EPA SIP approval that relied on an emissions projection that had been superseded in the time between the state's SIP submission and EPA's action on it)

Response: See our response to the next comment.

Comment: EPA's FIP modeling inventories are outdated, fail to integrate substantial recent reductions, and artificially inflate the modeled Impacts of Texas sources.
[Alpine (0078) p. 5, 26; NRG (0078), p. 2, 3]

NRG stated that the EPA used an outdated base year and future year emissions inventory in its modeling that had the effect of inflating the modeled impacts of Texas sources on visibility impairment.

As explained in the attached report by Alpine Geophysics (0078), NRG noted that the EPA assumed through the current proposal that Texas sources would emit 749,119 tons per year (tpy) of SO_2 in 2018 based on a projection from the 2002 CENRAP emissions inventory. This projection assumed a decrease of over 200,000 tons per year of SO_2 emissions from 2002 to 2018. More recent data show that SO_2 emissions have fallen much faster than were anticipated in 2002. EPA's most recent National Emissions Inventory shows that, by 2011, actual Texas SO_2 emissions were only 558,502 tpy, or 25% lower than the prior projection for 2018. Applying EPA's IPM projections indicates that 2018 emissions are now projected to be only 259,743 tpy 502, or 65% lower than the projection relied on by EPA's proposal.[4]

According to NRG, had EPA used its own more recent emissions data and projections, the modeled impact of Texas sources on visibility impairment would have been significantly reduced, making clear that further controls are not needed to assure visibility protection. As a recent 9th Circuit decision made clear, EPA must use the most up-to-date data available in acting on state plans.[5] Thus, EPA may not ignore the effect of this more recent data that implicates EPA's action on the Texas and Oklahoma regional haze plans.

NRG concluded that additional controls are not needed to achieve the regulatory targets EPA is proposing to set, as EPA continues to predict through the IPM model that visibility-impairing emissions will progressively decline through 2018. Alpine Report at 26-27.

Emission and Modeling Inventories Used to Support Disapproval of Texas's SIP Submittal.
Alpine stated that the modeling utilized by EPA to support the proposed rule was based on emission estimates that are out of date and demonstrated to be erroneously high.

Alpine noted that, to support EPA's disapproval of portions of Texas' SIP submittal, the Agency relied on 2002 base year modeling projected to 2018, originally conducted for CENRAP in 2007, augmented with limited source updates as documented in the SIP review process.[9] It is my opinion that EPA's modeling, using this dated modeling platform, generated regional haze results and modeled source impacts that were erroneously high.

Alpine stated that EPA's modeling inventories and projections are objectively inaccurate and artificially inflate the modeled impacts of Texas sources on regional haze levels.

Alpine stated that current EPA emission inventory data[10] shows reductions in emissions in most states beyond what was projected in the 2018 CENRAP modeling, including large reductions in emissions from Texas and the southern States. Emissions from both EGU and non-EGU Texas point sources are lower than have been projected in the CENRAP modeling and should be considered in concert with emission reductions recently reported by EPA from all other contributing sources in the modeling domain.

Comparing emissions in the Texas Regional Haze FIP TSD to EPA's most recently released modeling platform and emissions projections, Alpine noted that total SO_2 emissions, from all anthropogenic sources, are significantly higher in magnitude in both the FIP base year (2002) and projection year (2018), relative to base year (2011) and projections (2018) from the new platform. Alpine provided a figure showing an annual SO_2 emissions comparison for Texas, including the totals reported in the EPA FIP TSD and compared to the recent EPA modeling platform. (Figure 16 in Alpine comment 0078, not reproduced here)

Alpine stated that much of this difference is attributed to the 2007 vintage of the EPA's FIP modeling inventories and demonstrates the improved data, methods, and models used to prepare current, state-of-knowledge emission inventories in the past year. Simply stated, the overall influence of SO_2 emissions from current EPA emissions and projections is significantly lower in 2011 and 2018 than those emissions and projections EPA used to simulate visibility in the Texas FIP modeling.

As an example, Alpine noted that both EPA and Texas have cited the use of the Integrated Planning Model (IPM), a multiregional, dynamic, deterministic linear programming model of the U.S. electric power sector. Version 5.13 of this model reflects state rules, consent decrees, and announced shutdowns through August, 2013. IPM 5.13 was significantly updated from IPM 2.19 that EPA relied on in its review of TCEQ's SIP and represents electricity demand projections from the Annual Energy Outlook 2013.

Alpine pointed out that in Table 8 of EPA's FIP TSD, the Agency noted annual emission estimates of SO_2 from the EGU sector. We have added to this table EPA's most current estimate of Texas' SO_2 emissions from EGUs as projected to 2018 with IPM 5.13

Comparison of Texas 2002 Baseline SO_2 emissions, 2015 CAIR EGUs Budget and 2018 IPM Predicted SO_2 Emissions. (Table 6 of Alpine comment 0078)

SO_2 Emissions	Texas SO_2 Emissions (tpy)
CENRAP 2002 base case	550,000
EPA's CAIR budget for Texas EGUs for 2015	225,000
IPM 2.19 projection CENRAP modeled for 2018	350,000

IPM 5.13 projection EPA modeled for 2018	144,520

Reviewing these latest IPM projections of EGU point source SO_2 emissions, estimates that represent EPA's latest view of the implementation of the Clean Air Interstate Rule and the Mercury and Air Toxics Standards, and comparing them to EPA's FIP TSD emission estimates, Alpine noted that EPA is now projecting annual SO_2 emissions from EGUs to be significantly lower than they did before. In fact, SO_2 from the EGU sector is projected to be 205,000 tons lower, or an approximate 60% lower value than what EPA cites for these sources in the FIP TSD.

Alpine stated, since the EPA source apportionment modeling uses the dated, higher EGU emission estimates and projection year inventories, we have a high level of confidence that EPA is overestimating the SO_2 emissions predicted regionally and therefore underestimating the improvements in visibility at the identified Class I areas.

Alpine concluded, when the combination of current EPA predicted EGU and non-EGU point and other nonpoint emission reductions are taken into account, both within Texas and in the surrounding domain, it is reasonable to expect that modeled visibility improvement will be achieved, consistent with the observational record.

NRG Footnotes:
[4] Report of Gregory M. Stella, Alpine Geophysics LLC, *Professional Review* of *Texas Regional Haze FIP* {April 17, 2015) {"Alpine Report"), at 22-23, 26-27.
[5] See Sierra Club v. EPA, 671 F.3d 955 (9th Cir. 2012) (rejecting an EPA SIP approval that relied on an emissions projection that had been superseded in the time between the state's submission and EPA's action).

Response: As discussed in our FIP TSD (A-15 – A-16), we did start with the CENRAP 2018 Emission Inventory and made some adjustments based on review of information that had changed for specific units/facilities. These included:

- Updated emissions to 8 facilities and added one new facility:
- One new unit at Sommers/Deely/Spruce power plant site
- Two new units at Sandow 5 Generating Plant (new plant)
- Three new units at WA Parish Station carried over from the 2002 CENRAP inventory and emission changes to one existing unit
- Emission changes at North Texas Cement (Ash grove) to reflect shutting down two units and rebuilding the third unit
- Emission changes to reflect recently installed controls or improvements in control efficiencies on power plants at Sommers/Deely/Spruce, Big Brown, Gibbons Creek, Sandown Steam Electric Station, Monticello Steam Electric Station, and Fayette Power Project

As discussed in our FIP TSD (A-15-A-49), the CENRAP modeling was based on an IPM (Integrated Planning Model) that estimated EGU future emissions in 2018 including reductions for CAIR across the Eastern half of the United States. This analysis was conducted in 2006 and projected that Texas would actually be a purchaser of SO_2 credits, and not as much high level controls would be placed on Texas EGU sources. Given the length of time between 2006 when the IPM analysis was conducted, and 2013 when we were conducting this analysis, we had some concern that projections could be off for the EGUs in Texas. Information available also indicated that SO_2 credits were much cheaper than originally projected, therefore more credits may have been used in lieu of emission reductions. We also weighed the technique that Texas has used in estimating emissions from EGUs for future years (including 2018) in ozone attainment demonstration SIPs in DFW and HGB[470]. For these photochemical modeling analyses with CAMx they have relied upon the recent CEM data that is also included in CAMD's databases in conjunction with information on recently permitted EGUs for estimating the emissions to model for EGUs in Texas in 2018 as these emission levels are near CAIR Phase II control levels.

We did consider updating these emissions for the Cross State Air Pollution Rule (CSAPR) or the Mercury and Air Toxics Standards (MATS), but based on recent information and recent actual emissions from CEMS we were uncertain that any significant additional reductions would be expected from Texas EGU sources in the next couple of years. Also, based on recent comments from the TCEQ, it was also unclear if any further SO_2 or NOx reductions would occur due to these rules even if all litigation was resolved. The TCEQ had provided extensive comments on recent emission inventory indicating that further significant reductions from current emission levels for SO_2 were not expected due to CSAPR or MATS.[471] We thought it was reasonable to continue to rely upon the initial CENRAP 2018 modeling inventory initially and update the information that we were more certain about as discussed above. We utilized 2009-2013 CEM data for EGUs in evaluation and selection of updated High and Low controlled emission levels to model. Comparison of recent CEM data with CAIR projections indicated that the overall Texas emissions from EGUs were on track to meet the projected CAIR emissions level (which included Texas purchasing ~125,000 tons of emission credits from other states) without further substantial reductions. However, comparison of 2018 CENRAP projected emissions to recent actual emissions for specific facilities identified by us for additional analysis showed that a number of these facilities have recent actual emissions that are much higher than CENRAP 2018 modeled emissions.[472] For the ENVIRON modeling we did not increase emissions for existing sources based on recent actuals but we did lower emissions as described above to account for information on recently installed controls or improvements in control efficiencies.

[470] HGB 1997 8-Hour Ozone standard attainment demonstration approved by EPA in 2013, see TSD materials for 2010 "Appendix B Emission Modeling for the HGB Attainment Demonstrtion SIP Revision for the 1997 Eight-Hour Ozone Standard" on page B-78, "09017SIP_ado_Appendix_B.pdf".; DFW 1997 8-Hour Ozone standard attainment demonstration submitted to EPA, see TSD Appendix B: Emission Modeling for the DFW Attainment Demonstration SIP Revision for the 1997 Eight-Hour Ozone Standard, Page B-39, "AppB_EI_ado.pdf"; DFW 2008 8-Hour Ozone standard attainment demonstration proposed for adoption Dec. 10, 2014 and posted October 2014, see TSD materials "Appendix B Emissions Modeling for the Dallas-Fort Worth Attainment Demonstration State Implementation Plan Revision for the 2008 Eight-Hour Ozone Standard" Starting Page 40.,DFWAD_SIP_Appendix B.pdf

[471] TCEQ comment letter to EPA on draft modeling platform dated June 24, 2014. '2018 EMP signed.pdf'

[472] See Table A.4-2 of the FIP TSD for a comparison of recent actual emissions to CENRAP 2018 projected emission levels.

At the time we also noted that TCEQ in recent ozone attainment modeling had also used recent CEM data to represent expected emissions levels from Texas EGUs for future year of 2018 in recent Houston and DFW area modeling.

We note that Texas had recently submitted comments to us (few months before our proposal) on a more recent EPA IPM projection that was going to be part of a new modeling platform for national rule making and in these comments and comments from several EGU owners in Texas, the assertion was that no significant amount of additional SO_2 controls are expected due to compliance with MATS. [473]. The comments also pointed out that as some of our cursory research had also indicated that no large SO_2 control projects were planned at most of the sources we were evaluating. Therefore, based on Texas' recent comments and other information, we concluded considerable uncertainty exists as to whether any further reductions of SO_2 will occur beyond current emission levels as a result of compliance with MATS or CSAPR. Overall this information supported us looking at recent actual emissions to represent future emission levels in 2018 in our evaluations. We did fully contemplate trying to update EGU emissions in Texas, but based on a full analysis of all the data, we did not use recent national IPM runs discussed by the commenters because ,as Texas was indicating, EGU emissions in Texas are not anticipated to be consistent with those emission inventories and are not expected to be much reduced from current emission levels. In our visibility analysis, we estimated visibility impacts and benefits from those individual facilities shown to have the largest visibility impacts using both the 2018 CENRAP projected levels and recent actual emission levels that we have determined to be more representative of anticipated emissions in 2018 for these sources. As demonstrated in our FIP TSD and proposal, the identified facilities have significant impacts on visibility conditions. Our technical record makes it equally plain that the required controls reduce impacts from these sources and result in meaningful visibility benefits towards the goal of natural visibility conditions. We discuss comments concerning consideration of recent monitored visibility data elsewhere.

We state in our proposal that observed improvement from the baseline conditions is partially the result of reductions in the impacts from SO_2 emissions and that emissions from non-EGU Texas point sources are lower than have been projected in the modeling.[474] We note that additional reductions are still needed to meet or exceed the URP goals for 2018 as calculated by us. As discussed elsewhere, emission reductions at some of the sources that impact visibility the most are still above the emission level projected in the model and we have demonstrated that cost-effective controls are available at many of these sources that will result in meaningful visibility benefits towards the goal of natural visibility conditions. We also note that not many non-EGU emission reductions are due to enforceable emission limits or installation of controls and that economic/business fluctuations could result in increases that could negatively impact visibility. We discuss our consideration of recent visibility modeling elsewhere in this document.

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[473] Texas comments on Draft IPM modeling conducted by EPA for potential national rule making platformprovided on June 26, 2014. In this docket materials as "TCEQ comment letter to EPA on draft modeling platform dated June 24, 2014. '2018 EMP signed.pdf'

[474] 79 FR 74843. We discuss the impact of recent meteorological conditions on monitored visibility conditions elsewhere in this section of the document.

15.d Monitor Data and Model Performance

Comment: EPA's proposal fails to account for real-world data and fails to validate the modeling it relies on [Luminant (0061) p. 139]

Luminant stated that EPA's proposed disapproval and FIP are also arbitrary and capricious because they disregard real-world data and are based on modeling results that are not properly validated. Real-world data collected by EPA's IMPROVE monitors (discussed in Section V) show that the three Class I areas of interest have already achieved the visibility target EPA sets for them for 2018 without the additional controls that EPA is proposing. As these data show, actual conditions have already improved beyond the point that EPA considers reasonable for 2018, and they are projected to meet even the URP for 2018.[851] Thus, as explained in Section V, there is no basis or authority for requiring any additional controls based on estimated impacts to those areas.

Luminant stated that EPA acts contrary to law and in an arbitrary and capricious manner by ignoring these real-world data. Despite recognizing that "[m]odel performance at IMPROVE monitors is of highest importance, because these monitors are sited to be representative of the visibility conditions impacting each Class 1 Area,"[852] EPA refuses to incorporate that data into its analysis here or to use it to validate its modeling results. This makes no sense and points to the fundamental flaws throughout EPA's analysis.

Luminant noted that EPA has failed here in its obligation to consider and reconcile the stark inconsistencies between what its models predicted and reality.[853] Inexplicably, and in deviation from EPA guidance,[854] ENVIRON did not perform a model performance evaluation to validate any of the results it provided to EPA, even though ENVIRON noted significant deviations in its modeling as compared to real-world conditions.[855] Indeed, at Guadalupe Mountains, as to ***the most dominant*** constituents of visibility impairment (soil and coarse mass), ENVIRON found that the model performance was "suspect" and warned that "care should be taken in interpreting these modeling results."[856] These findings by ENVIRON call into question the foundational assumption in EPA's proposed FIP—that SO_2 impacts from a handful of Texas sources are the primary contributor to visibility impacts at the three Class I areas—and renders arbitrary and unsupported EPA's decision to "limit[] our analyses to the consideration of SO_2 controls for these EGU sources."[857]

According to Luminant, even in the face of these contrary data, EPA did not request ENVIRON to perform a full model performance evaluation, or do one itself. Instead, EPA simply "compared" the results of ENVIRON's new modeling to ENVIRON's prior modeling for CENRAP and concluded that because the results "overall were very similar" (in EPA's subjective view) the new model results were "validat[ed]."[858] But, as discussed in our Background discussion of EPA's Step 2, EPA's new modeling deviated significantly from CENRAP's modeling. For example, CENRAP's modeling did not involve Plume in Grid (PiG) modeling targeted at these selected Texas sources, as did EPA's new modeling that forms the core of its proposal. There are many other deviations.[859] EPA's "comparison" to CENRAP's modeling is thus of no value at all and is certainly not a proper or reliable form of validation. EPA's novel method of "validation" is not defensible, and EPA's failure to properly validate its results undercuts EPA's entire proposal. Moreover, EPA's ultimate decision about what units to regulate was not based on ENVIRON's modeling at all, but instead on EPA's alterations of it, which EPA does not claim were validated in any manner.

Luminant asserted, if EPA is going to impose emission-reduction obligations based on complex modeling and "but-for" projections, it must use available means to verify those projections. EPA may use "predictive models" only where it "provides a complete analytic defense" and "addresse[s] what appear to be stark disparities between its projections and real world observations."[860] Here, EPA arbitrarily disregards available air-quality data that shows visibility targets for 2018 have already been achieved or are on track to be achieved without additional controls and ignores anomalies brought to its attention by ENVIRON. Unexplained contradictions between EPA's predictions and real-world observations like these undermine the accuracy of EPA's air-quality projections and render the emission controls based on those projections arbitrary and unlawful.[861]

Luminant stated, in this very rulemaking, EPA recognizes the need to reconcile modeled results with real world data and further recognizes that Texas did this for the modeling it relied on.[862] And EPA recognizes that IMPROVE monitoring data is "[t]he starting point" for an assessment of visibility conditions.[863] Yet, despite recognizing this obligation, EPA failed to perform a model performance evaluation prior to using its new CAMx modeling to evaluate "the 38 facilities in Texas" (identified through EPA's Q/D analysis) for additional controls in the proposed FIP.[864] Under EPA guidance, "[t]he results of a model performance evaluation should be considered prior to using modeling to support an attainment demonstration or regional haze assessment."[865] EPA claims to have "validat[ed]" its new modeling with reference to CENRAP modeling,[866] but that is not an accepted validation technique per EPA guidance. In fact, it is bad science. Proper model validation should show, not just that the answer is similar to the answer from another model, but that the model predicted the right answer for the right reason.[867] Clearly, ENVIRON's CAMx modeling and EPA's alterations of it—which are the core of its proposed FIP—over-predicted the visibility impacts from these 38 facilities at the three Class I areas (as research by its own contractor clearly demonstrates), as shown by comparison to current real-world monitored data, and thus EPA's results cannot be used as a reliable basis for imposing additional controls. If EPA had performed a thorough review of its modeling analysis and input data, it would have found several errors in the assumed stack parameters for existing sources, including the assumption that units would have the exact same stack temperature and velocity before and after the upgrades and retrofits that EPA is proposing. These types of errors are yet further reasons EPA should have validated its modeling.

Luminant stated that there is no basis for EPA to ignore this real-world data, which is more reflective of actual conditions in 2018 than the model EPA has constructed. EPA concedes that reductions in SO_2 emissions are occurring in Texas and have improved visibility in the relevant Class I areas.[868] EPA also concedes that emissions will not worsen between now and 2018.[869] And EPA cannot contest that CSAPR's SO_2 budgets, which are now in effect and binding, are lower than CAIR's budgets and impose more stringent caps on out-of-state trading. EPA's decision to ignore CSAPR and other existing regulations for this rulemaking is not only inexplicable, it is one of the obvious flaws with EPA's predictions.

According to Luminant, indeed, proper validation of EPA's new modeling, against real-world data, was particularly appropriate here given EPA's own prior studies showing that CAMx overpredicts visibility impacts at the distances involved here and EPA's own prior regional haze modeling for these very Class I areas which, as discussed in Section VIII, shows that these areas meet EPA's own proposed RPGs. It is clear that EPA's new modeling for Texas—in which EPA refuses to account for CSAPR and other existing programs that will control SO_2 emissions through 2018—significantly overpredicts visibility impacts in 2018. EPA has failed to reconcile its current modeling with this prior modeling or explain the stark discrepancies. Indeed, EPA's air quality modeling predicts that air quality will worsen from present conditions after the implementation of nearly $2 billion of additional SO_2 controls. This simply cannot be correct. There are fundamental flaws in EPA's modeling that proper validation would surely reveal.

Footnotes:
[851] See AECOM Report at 2-5 to 2-10.
[852] CENRAP Modeling TSD at 34.
[853] Cf. NRDC v. Jackson, 650 F.3d 662, 665 (7th Cir. 2011) ("The way to test" predictive models is to "compare [the] projection against real outcomes." "An agency that clings to predictions rather than performing readily available tests may run into trouble." (citing Bechtel v. FCC, 10 F.3d 875 (D.C. Cir. 1993))).
[854] EPA, Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, PM2.5, and Regional Haze 190 (Apr. 2007), available at http://www.epa.gov/ttn/scram/guidance/guide/final-03-pm-rhguidance.pdf.
[855] ENVIRON Feb. 2013 Memo at 8 ("This project did not include a complete statistical performance evaluation."); id. at 12 (concluding that its "model results show variation of dominant light-extinction component"); id. at 19 ("Performance for Soil and especially CM is suspect and care should be taken in interpreting these modeling results.").
[856] Id. at 18–19.
[857] FIP TSD at 3.
[858] FIP TSD at A-15 to A-16.
[859] ENVIRON Memo at 6.
[860] Appalachian Power Co. v. EPA, 249 F.3d 1032, 1054 (D.C. Cir. 2001).
[861] See Motor Vehicle Mfrs. Ass'n of the U.S. v. State Farm Mut. Auto. Ins. Co., 463 U.S. 29, 43 (1983) (agency rule is "arbitrary and capricious" where the agency "failed to consider an important aspect of the problem" or "offered an explanation for its decision that runs counter to the evidence before the agency").
[862] TX SIP TSD 2014 at 55 ("Model performance evaluation is performed by comparing output from model simulations with ambient air quality data for the same time period to determine whether the model's performance is sufficiently accurate to justify using the model for simulating future conditions.").
[863] CENRAP Modeling TSD at 10. See also id. at 34 ("Model performance at IMPROVE monitors is of highest importance, because these monitors are sited to be representative of the visibility conditions impacting each Class I Area.").

[864] FIP TSD at A-15. Because EPA used the ENVIRON modeling at various steps in its FIP methodology (see, e.g., id. at A-50 ("we then scaled the ENVIRON modeling")), the error pervades the entire proposal.
[865] EPA, Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, PM2.5, and Regional Haze 190 (Apr. 2007), available at http://www.epa.gov/ttn/scram/guidance/guide/final-03-pm-rhguidance.pdf.
[866] FIP TSD at A-16.
[867] See Paul D. Sampson et al., Operational Evaluation of Air Quality Models 3 (1999), available at: http://www.nrcse.washington.edu/pdf/trs18_aqmodels.pdf ("The point of model evaluation is to establish the credibility of a model for use in decision-making. Most model applications require that the model extrapolate well beyond current precursor and primary emission conditions that could exist in any model evaluation data set. This is particularly true for issues that span the urban to global scales, such as oxidants, acidic deposition and visibility. Thus, a model evaluation needs to test the science in the models. Testing the science means looking for the "right" kind of answer (right answer for right reason and wrong answer for right reason), rather than simply looking for good comparisons of final outcome." (quoting Robin L. Dennis et al., Correcting RADM's Sulfate Underprediction: Discovery and Correction of Model Errors and Testing the Corrections Through Comparisons Against Field Data, 27 Atmos Environ 975, 997 (1993))).
[868] 79 Fed. Reg. at 74,843, 74,870.
[869] FIP TSD at A-45 ("Overall this information supports looking at recent actual emissions to represent future emission levels in 2018.").

Response: We did not disregard the recent IMPROVE monitoring data. In fact, the recent ambient monitoring data at the IMPROVE sites in the three Class I areas (2011-2013) are influenced by meteorology that has lower than normal transport of pollution from sources in Texas when compared to the base period on which projections are based (2000-2004) and to the 30-year meteorology analysis of transport to the three Class I areas (1984-2013). Thus, examining the 2011-2013 time period overstates the progress that can be expected over long term. In response to comments and information provided by commenters, we conducted further analysis to appropriately evaluate whether the base period was suited for projections to 2018 and also an analysis of how the meteorology accompanying the more recent monitoring data for 2011-2013 compared to normal meteorology conditions. We further note that 2014 also was not quite a normal year[475] and likely similarly biased low for visibility impacts at the Class I areas, but even so monitoring data in 2014 did increase compared to the 2011-13 data. Overall, we conclude that our evaluation of 2002 and 2018 levels and the controls needed for reasonable progress are based on representative periods and that recent monitoring trends are not as representative and not expected to continue if meteorology is more in line with 30-year climatological and transport norms. See our analysis in response to HYSPLIT analyses and other information provided about recent and baseline meteorology elsewhere in this section. We note that recent monitoring data is lower but as discussed in response to previous comments, there are not large reductions expected between now and 2018. There is always variability in meteorology that impacts the monitoring trends independent of emission trends. As we have explained in our

[475] Some preliminary analyses of meteorology and pollution levels in 2014 indicated a higher frequency of cold fronts during the summer of 2014 that led to cleaner air from the arctic mixing with the air in the region and resulted in lower pollution build-up and transport of pollution to Class I areas in Oklahoma and Texas.

final action and other responses to comment, being on or near the glide path does not provide safe harbor. As demonstrated in our FIP TSD and proposal, the identified facilities have significant impacts on visibility conditions. Our technical record makes it equally plain that the required controls reduce impacts from the sources that have the largest impact and result in meaningful visibility benefits towards the goal of natural visibility conditions.

We note that photochemical grid model results are evaluated with Relative Response Factors (RRFs) to help remove potential bias concerns. While no model is free from bias issues, previous evaluations of the CENRAP databases we used for our analyses have been evaluated by us and the CENRAP CAMx model performance was considered adequate because the modeled outputs compared well to past measured conditions.
Our FIP is based on impacts at all three Class I areas and the model does not perform perfectly for some species at Guadalupe Mountains, however these are not the pollutants that we are proposing to reduce to yield improvements in visibility impairment at GUMO, BIBE, and WIMO. Monitoring data at Guadalupe Mountains does indicate that sulfates also contribute to higher visibility impairment days, so SO_2 reductions would be expected to improve visibility at GUMO. As discussed in responses elsewhere in this section, there was an extensive model performance conducted on the CENRAP modeling and the changes we made were relatively minor and evaluations of speciated light extinction for the 20% best and worst days in comparison to the CENRAP model values did not show substantial differences for WIMO, GUMO, and BIBE. Many of the changes we made, such as using PiG and PSAT and a 12 km fine grid, were all things that TCEQ previously did to the CENRAP databases and protocol without additional model performance analysis. We approved the protocol that they did not need to conduct a model performance analysis. From discussions with TCEQ and others at the time, the changes were not expected to result in substantial differences. We went a step beyond what TCEQ had previously done by doing some evaluation of the model results to ensure that things had not substantially changed. Model performance was deemed adequate by CENRAP and TCEQ and other CENRAP members and as also discussed in other responses, the information available did not indicate a full performance analysis of 2002 monitor data to modeled data was necessary. We respond to the comments concerning "adjustments" to CAMx results in separate responses to comments where we discuss modeling. We do not agree that the inert tracer studies (CAPTEX and ETEX) indicate that CAMx is overestimating impacts from point sources in our analysis. We have detailed responses in other parts of this section that address these comments. The errors in the stack data the commenter raises would not be expected to substantially change the modeling results and we discuss the impact these stack prameters have on our estimated visibility benefits of controls elsewhere in this modeling section. See responses above in regard to recent actual SO_2 emissions and how they were factored into our 2018 emissions.

15.e Camx Not Approved Model for LRT

General Summary: We received several comments that CAMx is not the approved model in 40 CFR 51 Appendix W for modeling long-range transport (LRT) for visibility. We received comments that our selection of the CAMx model rather than CALPUFF is inappropriate and unjustified and that CALPUFF is the proper LRT model. The commenters state that EPA has not justified the use of CAMx to model visibility impacts from individual sources and at large distances, and EPA's use of CAMx here is outside of the model's capabilities. Furthermore, the commenters assert EPAs' concerns of using CALPUFF are not clear and concerns of model overprediction are also present in CAMX and therefore do not justify the use of CAMx.

Comment: EPA's use of CAMx modeling to review the Texas Regional Haze SIP [AECOM (0061 and 0075) p. 6-1]

AECOM stated that to evaluate the Texas SIP and develop its proposed FIP, EPA utilized the Comprehensive Air Quality Model with Extensions (CAMx) to model the visibility impacts to the three Class I areas from emissions from a small number of Texas point sources, and also to model the visibility benefits from the SO_2 emission controls it would impose on those sources. (EPA FIP Technical Support Document at A-15-A-16) EPA contracted with ENVIRON to perform this modeling based on direction from EPA.

AECOM stated that CAMx is a photochemical grid model (PGM), which is a computational model that is designed to represent the complex physical and chemical processes of multiple pollutants in the atmosphere. PGM models are capable of estimating the transport, chemistry, and removal, among other processes, for various gases and particulate matter (PM). Furthermore, they can provide an estimate of the concentrations of the chemical components that are part of PM.

For regional air quality modeling, AECOM stated that this capability is important in that these models can consider the impacts from all possible pollution sources (both natural and anthropogenic) as long as they are included in the emissions inventory. Once particulate matter concentrations are known, atmospheric light extinction (bext) can be calculated with the help of the IMPROVE equation and this can be expressed in deciviews (dv) with the following definition:

$$dv = 10 * \ln (bext/10)$$

AECOM stated that CAMx is capable of providing the contributions to total PM from individual or groups of sources through the Particulate Source Apportionment Technology (PSAT). PSAT 'tags' and tracks the species of interest from the emissions' location until it reaches a receptor of interest (in this case specific Class I areas). It is typical in this type of regional assessment to start with a one-year 'base case' simulation that both represents current conditions and helps to identify the biases and shortcomings of the model through a model performance evaluation. Once the model is deemed suitable for its intended use, one or multiple scenarios representing different future emission inventories (but the same meteorological conditions as the base case simulation) are simulated. Once model estimates are known, a subsequent analysis of results is performed. For regional haze assessment, an analysis including the identification of the 20% best and 20% worst visibility days in the target Class I areas is typically included.

Although there is significant precedent for the use of PGMs for development of SIPs (particularly with regard to ozone) and other types of analyses, AECOM stated that CAMx is not an EPA-approved model for long-range transport in the regional haze context.[95] The discussion below identifies the known uncertainties and limitations in the use of these models for a regional haze analysis.

Footnotes:
[95] 40 C.F.R. Part 51, Appendix W, § 6.2.3. ("If LRT [long-range transport] is determined to be important, then refined estimates utilizing the CALPUFF modeling system should be obtained.")

Summary: AECOM stated that CAMx is not an EPA-approved model for long-range transport in the regional haze context. (More specific comments on model limitations and uncertainties follow and are addressed in responses to other comments in the modeling responses).

Response: A number of commenters made this same comment that EPA erred in using CAMx, and that App. W, § 6.2.3 indicates we should have used the CALPUFF modeling system for our RP analysis. We note that this is a misinterpretation of App. W, § 6.2.3 and CALPUFF's preferred regulatory status. When EPA promulgated CALPUFF as a preferred model in 2003, we only approved it for LRT for direct emissions and we did not provide preferred status to CALPUFF for use of the chemistry module included in CALPUFF that can generate values for secondary formed pollutants including visibility impairment.[476]

The 2005 BART Guidelines recommended the use of CALPUFF for assessing visibility (secondary chemical impacts) but noted that CALPUFF's chemistry was fairly simple and the visibility results from CALPUFF could be used as one of the five factors in a BART evaluation and the impacts should be utilized somewhat in a relative sense because CALPUFF was not explicitly approved for full chemistry calculations.[477] The BART guidelines also provided the option to potentially use PGMs (such as CAMx) in the future if modeling tools available were appropriate and EPA approved of the technical approaches and how the model would be utilized.[478] The specific regulatory status of CALPUFF in regards to chemistry and secondary

[476] FR Vol. 68, No. 72, April 15, 2003, page 18447 and 18442 respectively; "Today's rule recommends a new modeling system for calculating PSD increment consumption—CALPUFF— that increases efficiency and accuracy." and "CALPUFF's treatment of chemical transformations, which affect AQRVs. Specific concern was expressed about the sulfate and aqueous phase chemistry algorithms. As chronicled on the FLAG Web site (above), these procedures and criteria have been published and received review and comment. However, today's rule addresses the suitability of CALPUFF for PSD increment consumption and for complex wind situations (with case-by- case approval), not AQRV analyses.

[477] 70 FR 39123, 39124. ''We understand the concerns of commenters that the chemistry modules of the CALPUFF model are less advanced than some of the more recent atmospheric chemistry simulations. To date, no other modeling applications with updated chemistry have been approved by EPA to estimate single source pollutant concentrations from long range transport.'' and in discussion of using other models with more advanced chemistry it continues, ''A discussion of the use of alternative models is given in the Guideline on Air Quality in appendix W, section 3.2.''

[478] 70 FR 39123, 39124. "The use of other models and techniques to estimate if a source causes or contributes to visibility impairment may be considered by the State, and the BART guidelines preserve a State's ability to use other models. Regional scale photochemical grid models may have merit, but such models have been designed to assess cumulative impacts, not impacts from individual sources. Such models are very resource intensive and time consuming relative to CALPUFF, but States may consider their use for SIP development in the future as they are adapted and demonstrated to be appropriate for single source applications."

formation was also covered in responses to comments previously in a final action on New Mexico's BART FIP.[479]

Therefore, there is no specific guideline model approved for full chemistry and the use of CALPUFF to calculate visibility impairment using CALPUFF's chemistry mechanism is not considered an application of a model in preferred mode but is allowed to be utilized in a relative quantitative sense in evaluating for applicability to BART and as part of a BART five-factor analysis. As we note elsewhere, PGMs such as CAMx have been used in a number of SIP actions and approved by EPA, and PGMs have advanced state-of-the-science chemistry that has undergone peer review. CAMx is one of the PGMs that has been approved for many SIP analyses and was one of the models approved to be used by CENRAP and its members (including Texas). Further, CAMx with the improvements in PiG with chemistry and PSAT that TCEQ and ENVIRON developed in 2005-2007 meets the requirements of App. W 3.2.2 and 3.3[480] in determining acceptability of a model as an alternative model for assessing visibility impacts. TCEQ previously requested to use CAMx for BART screening in 2005-2006 and cited concerns with CALPUFF's chemistry, model performance and the distances of many of the sources in Texas from Class I areas as being much further than the typical maximum range that CALPUFF was used (300 km). EPA worked with Texas and conferred with other EPA experts and FLM representatives about using CAMx instead of CALPUFF in this situation. Texas worked with the CAMx model developer ENVIRON to modify the model so the PiG tool could be used with full chemistry in the plume and also PSAT within the plume as well as in the modeling grid. With these refinements to assess single sources and small groups of sources, EPA approved the TCEQ's request to use CAMx for BART screening and Texas used it for a large number of sources, grouped in small groups and in some cases the sources were individually modeled with CAMx by TCEQ. Six sources in Texas also utilized TCEQ's CAMx BART screening modeling guidance and conducted single source visibility impact analysis.[481] Therefore there is specific precedent with the CENRAP databases and using CAMx with the appropriate tools to assess visibility impacts for individual sources and small groups of sources in Texas, and we note that for some of the BART screening modeling, it was only one or a few sources at a facility that were specifically modeled and many facilities' emissions were lower than the single units we evaluated. Arguably, if we applied the rationale that we erred, one could argue that if we erred in using CAMx in our analysis, then we also erred in approving the BART screening modeling evaluations with CAMx performed by Texas that allowed many sources to be determined to not be applicable to a full BART analysis. We do not agree with the comment that we erred in using CAMx for our analysis.

Neither the regional haze regulations nor Appendix W require the use of a specific preferred model for photochemical grid modeling for visibility (regional haze), but we have approved the use of regional scale photochemical grid models such as REMSAD and CMAQ.[482] CAMx is another regional scale photochemical grid model that was utilized by the RPOs and states and

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[479] EPA's Final FIP in New Mexico FR Vol. 76, No. 162, August 22, 2011, p. 52431-52434

[480] FR Vol. 70, No. 216 68232.

[481] TCEQ's Modeling Guidance- Guidance for the Application of the CAMx Hybrid Photochemical Model to Assess Visibility Impacts of Texas BART sources at Class I Areas"

[482] 40 CFR Part 51 Appendix W, Section 6.2.1 (e&f).

approved by EPA. CENRAP conducted its final CAMx source apportionment modeling for the regional haze analysis to be utilized in consultations of its nine state members in development of their SIPs. We approved most of these SIPs that included modeling analyses using CAMx and thus CAMx is clearly acceptable for evaluating long range transport for visibility.[483] As we have stated previously, Texas used CAMx in its reasonable progress analysis to extrapolate the visibility benefits from all potential controls it identified. Again, as as detailed elsewhere, although Texas used the CENRAP CAMx source apportionment modeling as the basis for its analysis, we found such analysis was flawed for RP/LTS.

As discussed above, Texas used CAMx to screen small groups of sources and individual sources as part of its BART screening and we approved that approach in 2006/7,[484] based on modeling enhancements that Texas contracted to be developed to assist in assessing single point source visibility impacts on visibility at Class I areas. The visibility impact analysis we performed with CAMx is commensurate with the work originally done by Texas in 2006/7 for its BART screening, and many of the sources that Texas modeled with CAMx had emissions of RH pollutants smaller than individual units that we evaluated in the unit specific analysis we conducted. Overall, Appendix W gives us discretionary authority in the selection of what models to use for visibility assessments with modeling systems, and models such as CALPUFF, CMAQ, REMSAD, and CAMx have all been used for that purpose. As we have stated above, CALPUFF is not a preferred model when it is uses its chemistry module for estimating visibility impairment. In this specific situation, we determined that CAMx had the best scientific modeling approaches and tools and was best suited for the complex analysis that we needed to perform.

15.f National Academy of Science

General Summary: Commenters state that the National Academy of Science advised EPA that there are considerable uncertainties in ascertaining a precise relationship between individual sources and regional haze and that such an undertaking would be time-consuming, expensive and "doomed to failure." Based on those advisements, the commenters draw the conclusion that EPA's analysis of individual sources is therefore unprecedented and "doomed to failure."

Comment: EPA's modeling choices are arbitrary and capricious and do not support its conclusions [Luminant (0061) p. 115]

Luminant stated that EPA's unprecedented analysis of individual Texas sources is arbitrary and capricious and was ill-conceived from its inception. EPA was advised by the National Academy of Sciences that a "program that focuses solely on determining the contribution of individual emission sources to visibility impairment is doomed to failure."[717] As the NAS explained, "it would be an extremely time-consuming and expensive undertaking to try to determine, one source at a time, the percent contribution of each source to haze. . . . [T]here are (and will probably continue to be) considerable uncertainties in ascertaining a precise relationship between

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[483] EPA – 454/B-07-002, April 2007; "Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, $PM_{2.5}$, and Regional Haze.

[484] EPA, TCEQ, and FLM representatives verbally approved the approach in 2006 and in email exchange with TCEQ representatives in February 2007 (see email from Erik Snyder (EPA) to Greg Nudd of TCEQ Feb. 13, 2007 and response email from Greg Nudd to Erik Snyder Feb. 15, 2007).

individual sources and the spatial pattern of regional haze."[718] Despite this warning, EPA embarked on its unprecedented effort for Texas. But the results of its efforts only prove the truth of the NAS's prior findings.

Footnotes:
[717] Nat'l Acad. of Scis., Protecting Visibility in National Parks and Wilderness Areas 7 (1993).
[718] Id.

Response: The citation to the NAS report is not a fair representation of the current modeling world. We disagree with the commenters for the following reasons:

- The NAS report was from 1993. There have been considerable advances in model development and computing power in the 20+ years since that report.
- Computers are also much cheaper and there is a larger population of modelers.
- Modeling is no longer as time consuming or expensive.
- Development of PSAT technology and Plume in Grid with chemistry allows for just this sort of analysis without requiring the "one at a time" approach envisioned by NAS.
- Model performance has greatly improved and computing power allows for higher grid resolution and more complicated chemistry and transport than in the past when NAS issued its report.

Comment: [Luminant (0061) p. 108] Luminant noted that the EPA itself has explained that its regional haze regulations do not contemplate an individual source / individual control approach to reasonable progress. EPA, in issuing the rules it claims to be applying here, "avoided inclusion of any approach in the regional haze rule that required the assessment of the visibility improvement attributed to an individual source . . . ."[680] EPA's decision in this regard was driven by an evaluation of The National Academy of Sciences ("NAS"), following the 1990 Clean Air Act amendments, which found that a "program that focuses solely on determining the contribution of individual emission sources to visibility impairment is doomed to failure."[681] As the NAS explained:

Because haze is caused by the combined effects of the emissions of many sources, it would be an extremely time-consuming and expensive undertaking to try to determine, one source at a time, the percent contribution of each source to haze. For instance, the efforts to trace the contribution of the Navajo Generating Station to haze in the Grand Canyon National Park took several years and cost millions of dollars without leading to quantitatively definitive answers. Moreover, there are (and will probably continue to be) considerable uncertainties in ascertaining a precise relationship between individual sources and the spatial pattern of regional haze.[682]

Even though EPA repudiated such an approach in issuing its regulations, EPA embarks on such a doomed-to-fail effort for Texas, pretending that it can quantify contribution from individual sources to areas hundreds of miles away, down to the hundredth of a deciview. EPA's approach for doing so has no support, and there is no precedent for such an undertaking—and certainly no example of it being done successfully. Indeed, EPA cites no examples of prior SIP reviews in which it has employed such an "individual control" analysis or any of the thresholds or metrics that EPA employs in evaluating Texas' SIP and developing its FIP. EPA may not lawfully engage in such an undertaking for Texas, regardless of the merits that EPA may now see in such an approach.

Footnotes:
[680] Am. Corn Growers Ass'n, 291 F.3d at 21 (Garland, J., dissenting) (emphasis added); see also Response to Petitions at 16 (emphasis added).
[681] Nat'l Acad. of Scis., Protecting Visibility in National Parks and Wilderness Areas 7 (1993).
[682] Id.

Response: Some of these comments are responded to elsewhere in this document. As noted earlier, the NAS report is merely a report based upon facts in existence before its release in 1993. Much of it now is out of date. There is no basis for relying upon it to preclude evaluation of single facilities with modeling for visibility impacts. The CAA supports the use of updated science and tools for conducting technical analysis for SIP or FIP development. It is expected that many of the components of the Regional Haze Rule would be addressed by or rely on current-day sound science and computing tools, and this will also be the case for furture implementation of the RHR, including determinations of RP.

EPA promulgated the Regional Haze Rules in 1999 and at that time there were very limited tools for treating individual sources. In addition, the refined PiG with chemistry, better plume dispersion, and source apportionment had not all been developed and included in PGMs. As discussed in other responses, it was the development of these tools in CAMx and the ability to use PiG with full chemistry and source apportionment that allowed some of the first CAMx based modeling to be included in a RH SIP. As discussed in more detail in another response, TCEQ worked with the CAMx model developer to advance the science in CAMx and integrate these tools. TCEQ then requested EPA to approve the use of CAMx with the tools to evaluate visibility impacts at distant Class I areas for BART eligible units at either a single facility or a small group of facilities to be evaluated and ultimately screen facility/ies out of full BART applicability. This CAMx modeling ultimately screened out a large number of the over 100 BART eligible facilities in Texas. The NAS report was pertinent at the time in 1993 and most of the 1990s and early 2000s, but in the mid-2000s the modeling tools took a large step forward in the ability to assess impacts from single facilities using PGMs. Therefore we disagree with the commenter that we are on a "doomed to failure" approach in using CAMx to evaluate single sources for RP. We note that recently Minnesota has also utilized PGMs to assess single facility impacts at Class I areas in recent SIP efforts.

15.g Appendix W requires Modeling a 3-yr Period

General Summary: We received comments that EPA failed to follow its modeling guidance in Appendix W that recommends modeling data for 5 years, and no less than 3 years of data for long-range transport applications.

Comment: [Luminant (0061) p. 117] Luminant noted, even if CAMx were proven to be a reliable model for the purposes EPA is using it for, EPA's application of CAMx deviates from standard modeling practice in several regards, making the results unreliable. For example, EPA's own visibility modeling guidelines call for the use of three years of data. EPA's Guideline on Air

Quality Models, found in Appendix W to EPA's regulations, allows the use of one year of data for a single year only for short-range applications. EPA's recommendation for long-range applications is the use of five years, and no less than three years, of modeling data.[733]

Footnotes:
[733] 40 C.F.R. pt. 51, app. W, § 8.3.1.2.

Comment: EPA's limited CAMx modeling (only one year) contradicts EPA's own guidance for conducting long-range transport modeling. [AECOM (0061 and 0075) p. 1-6, 6-2]

AECOM stated that the EPA's use of CAMx here deviates from standard modeling protocol that accounts for the meteorological variability that occurs for the time period being modeled. EPA's CAMx modeling for Texas used only one year of data (2002). (EPA FIP Technical Support Document at A-15.) The use of a one-year modeling simulation to represent "typical" meteorological conditions is problematic, especially for the impact assessment on receptors located at such large distances from the sources. AECOM asserted that EPA's Appendix W allows the use of one year of data for a single year only for short-range applications and EPA's recommendation for long-range applications is the use of at least three years of modeling. (40 C.F.R. Part 51, Appendix W, § 8.3.1.2) EPA asserts in its proposal that it is following the BART Guidelines in several respects. However, the BART Guidelines require "a period of three or five years of meteorological data" for modeling to assess visibility impacts.[98] EPA provides no explanation of why a photochemical model like CAMx should not be required to follow the same approach as modeling for a BART analyses.

Footnotes:
[98]70 Fed. Reg. 39,107

Response to Luminant and AECOM: Both Luminant and AECOM assert that 40 CFR Part 51, App. W § 8.3.1.2.including § 8.3.1.2.d apply and EPA should have modeled at least 3 years of meteorology data. The commenters assert that EPA was performing a long-range transport analysis and should have used 3 years of meteorology data instead of 1 year. App. W § 8.3 and § 8.3.2.1 more directly address the meteorological requirements for dispersion models for PSD purposes, including the LRT model CALPUFF. PGMs are very complicated modeling analyses and very resource intensive and EPA has issued specific modeling guidance documents for PGM analyses to clarify and provide additional guidance and clarifications on when and how to use the models. As discussed in response to another comment about the appropriateness of using CAMx, the BART guidelines allow a PGM to be used (with EPA approval), but the BART guidelines do not prescribe the meteorological period that is necessary if a PGM is used. EPA's modeling guidance for PGMs stresses the need to pick representative periods to model that may be only one year or less of meteorology, but are representative of the baseline period (in this case 2000-2004).[485] EPA's general modeling guidance is to utilize multiple years of data for dispersion models, but EPA's guidance for analyses with PGMs is more complicated and there has always been a balance between modeling a long period and the available resources and

[485] EPA-454/B-07-002, April 2007; 'Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, $PM_{2.5}$ and Regional Haze'

reasonableness in the amount of computation time and other resources needed for a PGM based analysis. Updated Draft modeling guidance released for comment in December 2014 continue to reflect that one full year should be modeled for Regional Haze.[486]

EPA, FLM representatives, CENRAP and TCEQ all agreed to conduct an analysis for LTS and RP at Class I areas using the CAMx and CMAQ photochemical grid models. In the protocols that were established and approved for CENRAP states and most other RPOs, EPA and the RPOs (and their members) agreed to model 2002 and this was deemed acceptable given the resource intensity nature of a one year annual simulation with photochemical grid modeling.[487] The agreement to model only one meteorological year for photochemical grid modeling was approved by EPA regional offices and EPA's Office of Air Quality Planning and Standards, which promulgated the RH rules, BART rules, App. W, and issued modeling guidance for photochemical modeling for RH SIPs. One thing that is important to note is while the meteorology is only done for one year (2002) and then also modeled with 2018 emissions, the model RRF values (2018 result/2002 results) are multiplied times the monitoring data representative of 2000-2004. The use of the 5 years of monitoring data and the RRF approach, which estimates future modeled values by multiplying the ratio of future model divided by base model to yield a 2018 value that should be representative of the 5-year average of meteorology in the future case.[488] This analysis technique is not perfect, but it is a way that EPA modeling guidance attempts to incorporate 5-years of monitored data to make the modeling more representative of a 5-year period instead of just using 2002 monitoring data that would only represent the influences of 1-year.

If we applied the commenters' logic and their interpretation of App. W § 8.3.2.1, and required three years of meteorology, at a minimum there are several other things that would have to be completed: 1. If 3 years of PGM modeling were conducted, that would require the generation of two additional years of meteorology data, meteorology performance evaluations and refinements until an acceptable met model performance was achieved; 2. two more years of year-specific emission inventories;3. and two more years of RH PGM modeling with model performance evaluations and adjustments until adequate model performance was achieved. Considering that national rulemaking that EPA conducts has typically only utilized one year of meteorology for the baseline period and attainment SIPs and RH SIPs require only one year of meteorology (or less for ozone), the conclusion that would be reached by following the comment would be totally unreasonable in comparison to all other PGM modeling conducted for regulatory purposes. Given that following the commenter's logic and interpretation would result in a workload 2 times larger than the original RH SIP development just to do RP or BART screening if following the BART guidelines as the commenter indicates is not a reasonable interpretation.

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486 DRAFT December 2014 'Modeling Guidance for Demonstrating Attainment of Air Quality Goals for Ozone, PM2.5 and Regional Haze', p.16.

487 Id. p. 149. ; "Thus, the preferred approach for regional haze-related model applications is to simulate an entire, representative year (i.e., one whose mean derived deciview values for "20% worst" and "20% best" days approximates mean values for deciviews averaged over 5 years for the best and worst days). States can then base the RRF values on the best and worst days in each Class I area for the modeled year (the ~24 best and worst days from the modeling year).

488 Id. several sections of the guidance document.

We note that if we applied the commenters' interpretation to the existing Texas RH SIP and BART screening modeling, we would have to disapprove all the BART screening modeling conducted with CAMx and also disapprove the RH SIP because they did not have 3 to 5 years of meteorology data.

The commenters failed to take into account a number of issues here. First, there is a general question of whether App. W § 8.3.1.2.d applies directly in this case as they assert. The analysis was for RP and to identify if some sources had large impacts on RP and if they did, whether there were reasonable available controls for these sources which might result in lowering visibility impairment for the 20% worst days (an improvement in RP). Second, CENRAP, using 2002 meteorology and CAMx, conducted an analysis on groups of sources, source types and split by regions and potential controls on sources. Third, Texas conducted an RP technical analysis starting with the results of the CENRAP analysis. Texas included its RP technical analysis in its SIP submittal. We conclude that in this case, EPA's modeling guidance and requirements are consistent with using the 1 year of meteorology. EPA will continue to revisit our PGM guidance periodically and update as needed to address any future concerns and further advancements and changes in modeling resources, etc.

The commenter also asserted that EPA indicated we were following the BART guidelines in several respects, but did not provide any context to evaluate how this was indicated in our record and related to their specific comment. We did rely upon the BART Guidelines for assistance in assessing the reasonable progress factors, as applicable. As discussed above, the part of the BART guidelines that discusses that a three to five year meteorological dataset should be used to assess visibility benefits for BART, is not applicable to our analysis for RP using CAMx.

15.h ETEX and CAPTEX Tracer Studies and CAMx Model Uncertainty

General summary: We received comments that EPA's CAMx modeling significantly overstates visibility impact and improvements on which EPA based its proposal. Commenters describe the ETEX and CAPTEX tracer studies and conclude that the results of these studies prove that CAMx overestimates visibility impacts by a factor of 3. The results also show an overestimate in CALPUFF results by a factor of 6 (ETEX) or a factor of 3 to 4 (CAPTEX). When this factor of 3 overprediction is taken into consideration, modeled visibility improvement from controls are small and should not be required.

Comment: [AECOM (0061/0075) p. 1-6] AECOM stated that the EPA's CAMx modeling significantly overstates the visibility improvements on which EPA is basing its proposal. Analysis performed for EPA by ENVIRON in 2012, which EPA fails to address in this proposal, shows that CAMx overstates visibility impacts by a factor of three at the distances EPA attempts to model here.

Response: See our response to the next comment.

Comment: [AECOM (0061 and 0075) p. 6-2, AECOM/CCP (0075) App A] Luminant and CCP attached an AECOM report titled, "*Analysis of the U.S. EPA's Proposed Rule on the Texas and Oklahoma Regional Haze State Implementation Plans*."(AECOM, 0061 and 0075). CCP attached a report by AECOM titled, "*Analysis of Visibility Impacts from Coleto Creek Unit 1 - Using CALPUFF*." (AECOM/CCP, 0075).

Both AECOM reports described the EPA/Environ 2012 European Tracer Experiment (ETEX) and Cross-Appalachian Tracer Experiment (CAPTEX) studies used to evaluate the CAMx and CALPUFF models. The AECOM (0061 and 0075) report discussed CAMx, while the AECOM/CPP (0075) report discussed the long-range transport over-prediction tendency of CALPUFF. Additional details and figures associated with the ETEX and CAPTEX studies can be found in the AECOM reports. A summary of AECOM's conclusions based on the ETEX and CAPTEX studies is provided below.

ETEX. The European Tracer Experiment (ETEX), is a study which consisted of a release of tracers (perfluorocarbons), sampled for three days after the beginning of the emission release that used a sampling network that was spread over a large part of Europe in the Fall of 1994. The release was planned to take place in western France, corresponding to a forecast of relatively steady winds that would transport the tracer over the network of ground-level monitors that were in place. The sampling network consisted of 168 ground-level sampling stations in Western and Eastern Europe. Various national meteorological services hosted the samplers at a number of weather stations through Europe. The study examined the similarities between observed ground-level tracer concentrations from the experiment with modeled predictions by CAMx and CALPUFF.

Based on these studies, the AECOM (0061 and 0075) asserted that the report concluded that CAMx actually over-predicts visibility impacts by a factor of 3, meaning that the visibility impacts and improvements that EPA cites as the basis for its proposal are vastly overstated. This tendency of CAMx to over-predict may be one likely reason that EPA's model results are vastly different than the real-world IMPROVE monitor data discussed above.

AECOM/CPP (0075) concluded that the ETEX results suggest that CALPUFF over-predicts observations by a factor of about 6.

Both AECOM reports stated that due to the approximately linear relationship of modeled concentrations to extinction (via the IMPROVE equation), this over-prediction tendency would apply to visibility impacts as well. AECOM (0061 and 0075) added that for an incremental change of extinction that is overestimated by a factor of 3 with CAMx, the corresponding incremental change of deciviews are approximately linear along the logarithmic curve of the extinction-deciview relationship that is of most concern to the EPA modeled deciviews.

According to both AECOM reports, the ETEX tracer study evaluation shows for CAMx and CALPUFF:

- the locations of the CAMx predictions are subject to larger uncertainty the farther the simulated transport distance, since an accumulation of errors in the wind speed and direction can result in large erroneous displacements of modeled emissions; and
- the magnitude of the predictions is likely to be overstated because of limitations in the application of vertical wind direction shear effects that tend to disperse pollutants more effectively than the models indicate.

CAPTEX. CAPTEX was a series of 3-hour perflourocarbon tracer releases from Dayton, Ohio, and Sudbury, Ontario, conducted during the fall of 1983. The releases were timed to take advantage of forecast, steady winds from the west and northwest, since the sampling sites were located to the east of the release points. The sampling sites were arrayed in arcs, at approximately 100-km intervals, at distances of between roughly 300 km to 1100 km from the release point. The 62 sampling sites in the United States and 24 sampling sites in Canada took either 3-hour or 6-hour samples, depending on the distance from the release point.

Based on the results of the CAMx evaluation as reported in Appendix C of the 2012 EPA/ENVIRON report, AECOM indicated that for the two CAPTEX experiments evaluated: The use of CAMx with plume-in-grid employed (which EPA employs for its review of the Texas SIP), the fractional bias results ranged from about 0.6 to 1.2, corresponding to over-predictions ranging from a factor of 2 to 4. The over-prediction tendency for the large distances associated with CAPTEX is consistent with the ETEX results for CAMx.

- CALPUFF has fractional bias evaluation results slightly higher than 1.0, corresponding to over-predictions between 3 and 4. The over-prediction tendency for the large distances associated with CAPTEX is consistent with the ETEX results.

According to AECOM, the implication for the tendency for CAMx and CALPUFF to more significantly over-predict impacts of emission sources hundreds of kilometers from a target is that the modeled impact of controls for these distant sources is overstated**.**

Response: We disagree with the commenters' conclusion about the ETEX and CAPTEX tracer studies and the relevance of these tracer study analyses. The analysis provided allegedly indicating that CAMx overestimates visibility impacts by a factor of 3 is an incorrect interpretation and has flaws in the evaluation and conclusions. Our regulations do not allow for the calibration of model results to try to adjust for potential biases.[489] Furthermore, the bias amount indicated by the commenter is flawed and is based on limited sampling of model performance evaluations that exist and the tracer tests are limited to only inert pollution dispersion and not chemistry evaluations**.**

In order to develop a coherent understanding of performance of LRT models used for regulatory purposes, for this action, we examined all of EPA's prior LRT model evaluation efforts. These evaluation studies included the 1986 8-Model Study (Carhart , et al., 1989), Rocky Mountain Acid Deposition Model Assessment Project (Godowitch, 1989a, 1989b), IWAQM Phase I and II

[489] App. W, Section 7.2.9(a) "…Therefore, model calibration is unacceptable."

(EPA, 1998a, 1998b), and the 2012 EPA LRT model evaluation study (ENVIRON, 2012).[490] From this review, we drew the following conclusions that are relevant to commenters concerns:

1 The results of both the 1986 and 2012 EPA evaluation efforts clearly identified that LRT model performance is highly sensitive to the quality of the meteorological inputs, meaning that LRT model performance will vary with the performance of the meteorological simulation used to supply meteorological information to the LRT model. Thus, in context, one cannot arbitrarily conclude that any modeling platform will consistently overpredict with every application as LRT model performance is inextricably linked to prognostic meteorological model performance.

2 Carhart et al. (1989) concluded that, in general, LRT models tend to underestimate the horizontal spreading of the plume at ground level resulting in too high peak (centerline) concentrations when compared to the observations. For Lagrangian models compared in the 1986 study, this was believed to be due to using sigma-y dispersion (Turner) curves that are representative of near-source and are applied for longer (> 50 km) downwind distances. The underestimation of the lateral spread of plumes will consistently result in overprediction of ground level concentrations, resulting in higher bias and error scores. This observation is consistent with the findings of the EPA 2012 model study which showed that the model CALPUFF underestimated the observed lateral distance of the plume by as much as 51% for the SRL75 database and 34% for the GP80 on the 100-km monitor arcs (ENVIRON, 2012). This phenomenon was also observed in the original report published in 1998 as part of the IWAQM Phase II process. CALPUFF underestimated lateral plume spread by as much as 24% for the GP80 study and as much as 49% for SRL75 (EPA, 1998a). At greater distances, both the 1998 and 2012 studies showed that this phenomena reversed itself, with much greater lateral distances compared to observed (GP80, 600-km arc). This would result in a lower model bias at greater distances.

The graphical analysis of the ETEX results provided in the 2012 report also shows an underestimation of the lateral spread of almost all models compared to observations. This appears to be an artifact that affects most models used for LRT purposes, irrespective of whether the dispersion is based upon Turner stability classes or not. However, of all the models evaluated in the EPA 2012 study, CAMx scored the highest (best) across all spatially related evaluation metrics for ETEX and second best overall for CAPTEX 3 and 5, indicating that the degree in spatial error is consistently lower than other models in the EPA 2012 study, and thus we feel

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[490] Carhart, R.A., A.J. Policastro, M. Wastag, and L. Coke, 1989: Evaluation of Eight Short-Term Long-Range Transport Models Using Field Data. *Atmos. Environ.*, **23**, 85 – 105.
Godowitch, J.M. 1989a. Evaluation and Sensitivity Analyses Results of the MESOPUFF II Model with CAPTEX Measurements. EPA-600/3-89-056. U.S. Environmental Protection Agency, Atmospheric Research and Exposure Assessment Laboratory, Research Triangle Park, NC.
Godowitch, J.M., 1989b: Evaluation and Testing of the MESOPUFF II Model System with CAPTEX Measurements. 6th Joint Conference On Applications of Air Pollution Meteorology, American Meteorological Society, Anaheim, CA, 56-59.
USEPA, 1998a: A Comparison of CALPUFF Modeling Results to Two Tracer Field Experiments. Tech. Rep., EPA-454/R-98-009, Research Triangle Park, NC, 48 pp. http://www.epa.gov/scram001/7thconf/calpuff
USEPA, 1998b: Interagency Workgroup on Air Quality Modeling (IWAQM) Phase 2 Summary Report and Recommendations for Modeling Long Range Transport Impacts. Tech Rep., EPA-454/R-98-009, Research Triangle Park, NC, 160 pp. http://www.epa.gov/scram001/7thconf/calpuff/phase2.pdf

confident in placing greater overall confidence in CAMx model predictions compared to other model platforms used for single source purposes, such as CALPUFF.

As stated in a response above, our CAMx modeling analysis utilized a technique called RRF that limits the potential impacts of modeling performance issues since the modeling results are used in a relative sense to adjust montored data and absolute modeling values are not directly used. Due to this and other reasons, we do not think that the CAMx modeling overstates the impacts. In fact, several pieces of information related to CENRAP and our modeling indicates the impacts are underestimated. CENRAP and TCEQ did a thorough model performance analysis evaluation in development of the RH modeling and did not see gross overprediction biases as the commenter asserts but actually underestimation issues on many of the higher pollutant days.

We did evaluate our model projections on the worst 20% days, the best 20% days in comparison to speciated monitored values, and we also compared to previous similar comparisons performed with CENRAP's CMAQ modeling results.[491] Overall there was a significant underestimation of total visibility impairment and sulfate compounds compared to monitored values on the 20% worst days with slightly higher underestimation of sulfates in our modeling compared to CENRAP's modeling. Contrary to the assertions of several commenters that CAMx results are biased high, this was not true for the 20% worst days at Class I areas in Texas and near Texas. This is important because it indicates that the CAMx modeling was actually underestimating the SO_2 impacts on most of the 20% worst days, which is opposite of the comment that CAMx results overestimated by a factor of 3.While all models have some bias issues and never replicate the atmosphere exactly, the previous modeling results developed by ENVIRON for CENRAP did include an extensive model performance analysis and were considered acceptable by CENRAP and TCEQ, and we have previously approved the CENRAP modeling database in other CENRAP states. Considering that our modeling and CENRAP's modeling is underestimating sulfate impacts and overall light extinction, this information is much more compelling and directly related to our analysis, where the two tracer study results are not as directly comparable. Based on our assessment and CENRAP/TCEQ's assessment of the CENRAP based modeling databases we strongly disagree with the comment that the CAMx results are overestimated, especially considering the tracer data analysis is based on an inert tracer and our analysis is a cumulative analysis with chemistry and for the same dataset that is pertinent to this specific action.

As discussed in a separate response to comment in this section, the CALPUFF modeling submitted by the commenter had flaws and is not appropriate even before they did their inappropriate calibrating of results, as discussed below.

We note that the commenters proposed calibrating of delta-dv results is not accurate, even if it were permissible. As noted in other comments and in our TSD, a change in concentrations of a certain % does not result in the same percentage of change in the del-dv value since the visibility impairment calculations are not based on a linear relationship and are dependent on the logarithmic light extinction formula and background levels. Therefore the difference in model versus monitor performance for concentrations based on an inert tracer do not change

[491] Environ February 2013 memorandum, "2002 Baseline CAMx Simulation, Texas Regional Haze Evaluation"; 'Memo_TXHAZE_2002CAMx_ENV_21Feb2013.docx'

proportionally the same as the calculated del- dv would change due to the non-linearity of the calculation of the inverse Mm value and the del-dv. The Method 8 “new” or “revised” IMPROVE and del-dv equations are documented in a comment elsewhere in this document and also in our TSD. It should also be pointed out that the studies used inert tracers, therefore the evaluations of the different models and set-ups only analyze performance of dispersion and not the chemistry part of the models.

Comment: [AECOM (0061) p. 6-10, AECOM (0075) p. 6-11] AECOM stated that the magnitude of most modeled visibility benefits relative to average natural conditions for BIBE and GUMO for the emission controls specified by EPA are at or below 0.2 delta-deciview. However, these modeled benefits do not consider the CAMx over-prediction tendency of a factor of about 3 for transport distances on the order of 500 km, which are comparable to the distances involved in this analysis. To account for this factor of 3 over-prediction, the modeled visibility benefits should be adjusted in two ways:

- Divided by 3 to account for the CAMx over-prediction over long distances, and
- Reduced further to account for the adjustments in natural conditions (default assumptions need to add natural impairment, as discussed above), which would reduce the deciview change.

AECOM provided Tables 6-1 through 6-4 (not reproduced here) to illustrate adjustment of EPA's estimated deciview improvement from natural and 2018 background conditions by a factor of 3 to account for CAMx over-prediction for 14 EGUs. Table 6-2 showing the amended deciview improvement from average natural conditions accounting for a CAMx factor of 3 over-prediction indicates that the resulting visibility benefits are below the 0.2 delta-deciview threshold for all affected units. The 2018 background modeled benefits in Table 6-3 are below 0.03 delta-deciviews when considering the factor of 3 overprediction in Table 6-4.

Response: We disagree with the use of a a 0.2 delta dv threshold by the commenter as discussed in responses below.   As discussed in the response to the previous comment, we do not agree with the conclusion that our CAMx results are overpredicting by a factor of 3 and note that EPA’s Appendix W prohibits calibrating model results. As discussed in the previous response, the overall model performance on the 20% worst days is actually underpredicting sulfates and total extinction at the Class I areas in Texas and at the Wichita Mountains. Therefore the information using ‘calibrated’ CAMx model values in the commenter’s tables is invalid and is not an accurate assessment nor acceptable under EPA’s regulations in Appendix W. The commenter has not supported its contention that our modeling or the CENRAP/TCEQ modeling databases are overpredicting at all and definitely not by a factor of 3. EPA disagrees that our visibility impacts and benefits from our CAMx model results are overestimated and they are potentially underestimated.

Comment: [CCP (0075) p. 2] CCP stated that the EPA's model significantly overstates the visibility improvements on which EPA is basing its proposal. When properly adjusted to account for this recognized over-prediction bias, the impacts from Coleto Creek Unit 1 are insufficient to justify installation of controls. CCP's own modeling further demonstrates the lack of impact of emissions from Coleto Creek Unit 1 on visibility conditions and the lack of an improvement in visibility that can be attributed to the proposed controls.

[CCP (0075) p. 9] CCP stated that the EPA arbitrarily used CAMx modeling to model transport of haze from Coleto Creek Unit 1 and other sources, even though EPA has consistently promoted use of CALPUFF and despite significant known limitations with CAMx involving over-prediction of emissions at longer distances. Estimates suggest that CAMx model predictions are consistently over-predicting observations by a factor of 3. Coleto Creek Unit 1 is more than 500km from the nearest Class I area and thus was thus unfairly subject to these model biases and estimates for visibility should be adjusted by a factor of 3 (suggesting a total impact of less than 0.1 dv, and EPA has acknowledged impacts of 0.2 dv as too low to justify further controls, *see* 77 Fed. Reg. 14,604, 14,625 (March 12, 2012)). EPA's modeled benefits in haze reduction from Coleto Creek Unit 1 do not reliably indicate actual impacts and when adjusted for this over-prediction bias do not support the additional controls proposed for Coleto Creek Unit 1.

Response: See our responses to comments above and elsewhere in this section for comments on the calibration of the model, CAMx overprediction by a factor of 3, and model selection of CAMx over CALPUFF. We disagree with the commenter on all of these specific issues and the comment that the Coleto Creek impacts should be 'calibrated' to 1/3 the modeled is not substantiated and not allowed by EPA's regulations.

The commenter is incorrect in their comparison of the estimated impacts of Coleto Creek to a previous action that found that an impact of 0.2 dv was "too low to justify further controls."

Regarding the comment that EPA found that a level of 0.2 dv improvement was too low to justify additional controls in Arkansas, the commenter is misrepresenting EPA's decision and not providing the proper context about the decision as it relates to appropriate interstate consultation. We note that the estimated visibility impairment contribution from *all* sources in Arkansas on Wichita Mountains was 2.3% of the total extinction. For proper context, compare this with the estimated 1.5% total contribution from just *a single source* (i.e. Big Brown) at Wichita Mountains. Modeling results showed that complete removal of Arkansas' contribution would result in the 0.2 dv improvement in 2018 at Wichita Mountains. Both Arkansas and Oklahoma agreed, through consultation, that additional reductions from sources in Arkansas for reasonable progress at Wichita Mountains was unnecessary, and EPA agreed that the consultation was satisfactory. The same conclusion could not be made regarding the consultation between Oklahoma and Texas as the magnitude of emission reductions and associated visibility benefits to Wichita Mountains due to controls on Texas' sources was much more significant relative to Arkansas' impact on Wichita Mountains.

Here, the commenter is erroneously attempting to compare the determination of the significance of impacts from all the emissions of an entire state (Arkansas) to the impacts from a single facility. EPA source apportionment modeling for 2018 estimated the contribution to visibility impairment at Wichita Mountains from the Coleto Creek Unit 1 to be 0.5% and contribution to impairment at Big Bend from Coleto Creek Unit 1 was modeled to be 0.49%, which are very sizeable when you consider that these impacts are approximately 25% of the impact from all the sources in Arkansas.

Comment: [CCP (0075) p. 10] CCP stated that the AECOM technical reports attached to their comment [AECOM (0061/0075) and AECOM/CCP (0075)] document the well-recognized bias of models used by EPA to over-predict actual impacts in the large modeling domains that were necessary to evaluate the emissions from Coleto Creek Unit 1 on Class 1 areas that are each over 500 km away. EPA failed to consider the over-prediction bias in presenting and evaluating visibility impacts that may be attributed to Coleto Creek Unit 1 or the proposed controls. The modeling results with the over-prediction bias correction indicate that actual impacts on Class 1 areas are below levels EPA has used as thresholds for requiring further controls.

Both modeling approaches, which represent somewhat independent analyses, result in consistent conclusions showing the lack of any significant impact on haze conditions. The CALPUFF modeling performed by CCP and included in these comments with worst-case emissions for all pollutants indicate that for the three Class I areas, the visibility impact predictions (corrected for model bias) indicate haze levels below those where EPA rejected additional controls for visibility under the Regional Haze Program. The CAMx modeling performed by EPA that assesses the effects of the WFGD controls indicate that such controls would result in an equivalent visibility result, such that the controls are ineffective in changing the haze levels. In fact, the likely actual impacts are consistent with levels that reflect "no degradation" at all.(64 FR 35730)

Response: See responses to comments above and elsewhere in this document for the calibration of the model, CAMx overprediction by a factor of 3, and model selection of CAMx over CALPUFF. We disagree with the commenter on all of these specific issues and the comment that the Coleto Creek impacts should be 'calibrated' to 1/3 the modeled is not substantiated and not allowed by EPA's regulations**.**

For responses to comment for the CALPUFF modeling performed by CPP, CALPUFF model calibration for potential bias, consistency with other actions, overall impacts and no degradation see responses to comments elsewhere in this document.
In summary, the commentor is incorrect on these issues and presented critically flawed CALPUFF modeling and calibrations of modeling results which is not allowed by App. W. Our analysis that controls for Coleto Creek are beneficial is still valid.

15.i Back Trajectory analysis

General summary: Commenters provided back trajectory data (72 hrs, 500m) and monitored data for 2002 and 2011-2013 for the 20% worst days for Big Bend, Guadalupe Mountains, and Wichita Mountains. The commenters conclude that this data shows that only a small number of back trajectories come from regions with sources being analyzed and considered for controls. For Big Bend, the back-trajectories submitted by the commenters show the majority of back-trajectories coming from Mexico. For Guadalupe Mountains, back-trajectories also primarily come from Mexico and visibility is mostly due to natural sources. Back-trajectories for Wichita Mountains rarely come from sources that EPA is proposing to control.

Comment: [Luminant (0061) p. 105] Luminant noted that back-trajectory data (discussed in section 6i) show that EPA has clearly targeted the wrong source of emissions in its analysis. The subset of Texas sources that EPA has chosen to analyze (to the exclusion of other sources) very rarely are linked to these Class I areas on the days of concern. EPA's small group analysis (discussed below) is thus flawed from the outset. And the emission limitations that EPA proposes in its FIP for these sources will not address visibility conditions at these areas and are completely disconnected from the data before the agency showing that the impacts to these areas come mainly from other sources.

[Luminant (0061) p. 102] Luminant stated that, in point of fact, the visibility impact from international emissions dwarfs the impact from all Texas sources (not to mention the handful of sources EPA is targeting), including on the key worst 20% days. To illustrate, we asked AECOM to develop back trajectories for the 20% worst days at the Texas Class I areas to determine the source of the haze-causing emissions. AECOM identified the 20% worst days from publicly-available IMPROVE data for the 2011-2013 period, and conducted back trajectories to identify the source of the haze-causing emissions. Figure 10 shows the results of this analysis for Big Bend. As seen in Figure 10, the overwhelming majority of haze-causing emissions on the key 20% worst days originates from sources in Mexico, including very large sources of SO_2 emissions close to the U.S.-Mexico border.[660] In fact, for Big Bend, *approximately 96% of the back trajectories passed through Mexico*.[661] Figure 11 shows the same information for Guadalupe Mountains—where *approximately 77% of the 20% worst day trajectories passed through Mexico*.[662]

FIGURE 10: BACK TRAJECTORIES ON THE 20% WORST DAYS FOR BIG BEND, 2011-2013

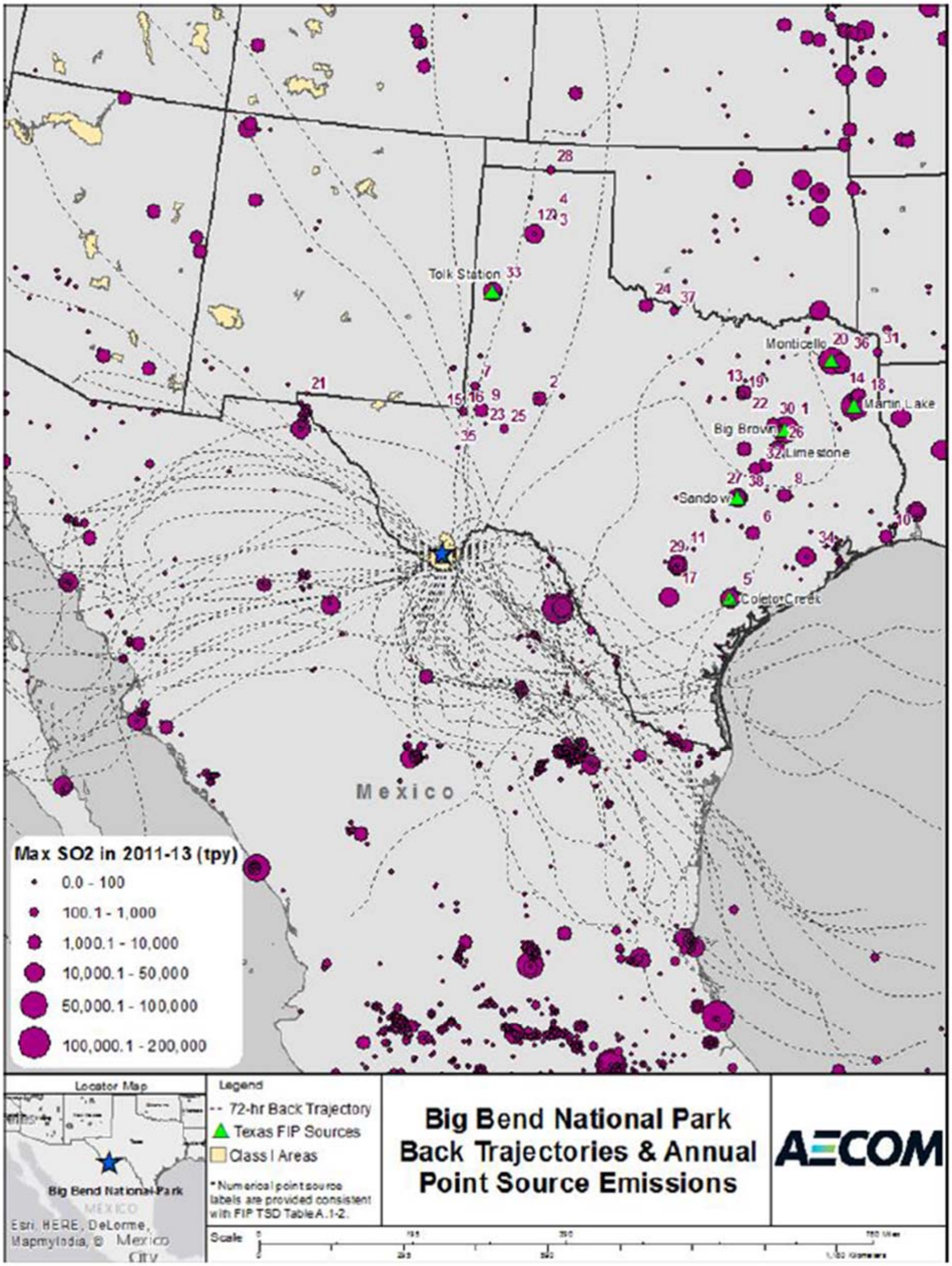
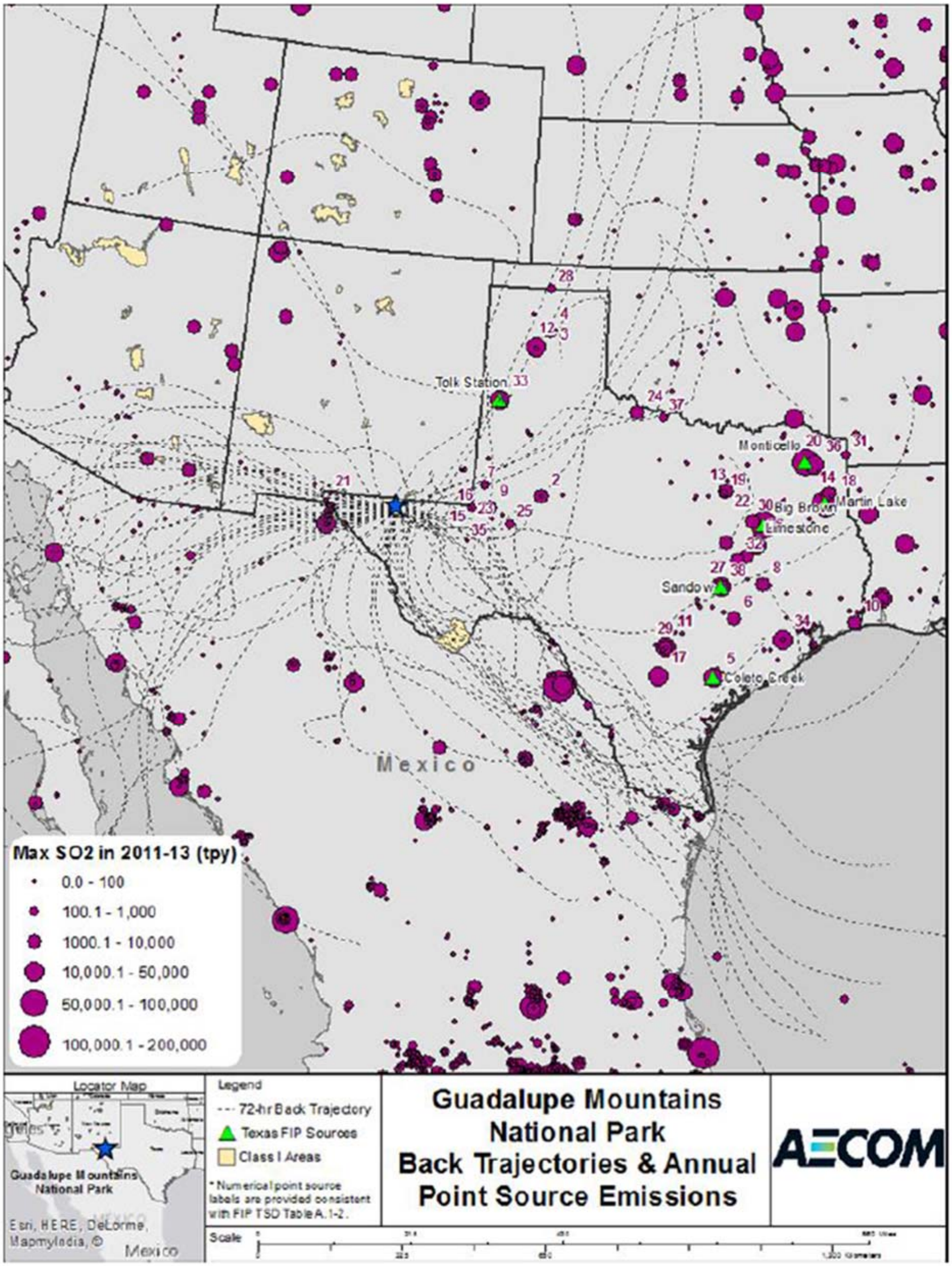


FIGURE 11: BACK TRAJECTORIES ON THE 20% WORST DAYS FOR GUADALUPE MOUNTAINS, 2011-2013



Moreover, Luminant noted that this analysis also shows that very few of the 20% worst days are impacted by Texas sources, much less the targeted Luminant sources. Indeed, for Big Bend, only 14 out of 69 trajectories (about 20%) can be traced to one of the Texas sources for which EPA is proposing further emission reductions.[663] And even more telling, only 3 out of 69 trajectories (about 4%) can be traced to a Luminant facility. For Guadalupe Mountains, only 5 out of 66 trajectories (about 8%) can be traced to a Luminant facility.[664] Yet, those Luminant units would bear well over half of the over $2 billion in costs that EPA claims is reasonable. There is a wide gulf between the data and EPA's findings.

According to Luminant, nevertheless, EPA's proposal ignores this highly relevant information, rendering EPA's conclusions and proposal incomplete and unsupported. EPA purports to determine what amount of progress towards natural visibility at these Class I areas is "reasonable," without taking into account the source of the majority of the problem—international emissions. EPA has thus failed to consider an important aspect of the problem and failed to "examine the relevant data and articulate a satisfactory explanation for its action, including a rational connection between the facts found and the choice made."[665] Based on the data presented, EPA must approve Texas's reasonable progress goals, as it has done for other states facing similar international contributions.

Luminant Footnotes:
[660] As Figure 10 shows, and as further explained in AECOM's report, the "boundary condition" emissions also originate from Mexico point sources south of the modeling domain. EPA's failure to account for these boundary condition emissions in its review of Texas's SIP is arbitrary and capricious.
[661] AECOM Report at 5-1.
[662] Id.
[663] AECOM Report at 4-3.
[664] Id. at 4-7.
[665] Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co., 463 U.S. 29, 43 (1983) (internal quotations omitted).

Analysis of Back Trajectories for 3 Recent Years [AECOM (0061 and 0075) p. 4-1]

To further assess EPA's review of Texas' 2018 RPGs for BIBE and GUMO, AECOM conducted backward trajectory analyses of air parcels arriving at those parks on the 20% worst haze days for the 2011-2013 period. The 20% worst haze days were identified from the IMPROVE data available at the Federal Land Manager Environmental Database.[72] Because EPA does not account for international contributions in its proposed 2018 RPGs, BIBE and GUMO are the focus of this analysis because of their proximity to Mexico. However, the more distant, but still very significant, Mexican haze contributions to WIMO are also separately discussed in the next section.

AECOM stated that the backward trajectories show the areas from which emissions originated on the 20% worst days, and thus provide a basis for determining what sources should further reduce emissions to achieve visibility improvements. As discussed further below, the analysis for these two areas shows that the overwhelming amount of haze-forming emissions on the 20% worst days originate from Mexico, and not the Texas EGUs that EPA is proposing to regulate. This is consistent with Texas' conclusion in its SIP that, "[t]he Texas Class I areas are close to Mexico, and international transport of emissions from Mexico and Central America significantly influence regional haze at these areas."[73] In particular, Texas found that "52 percent of the impairment at Big Bend and 25 percent of the impairment at Guadalupe Mountains is from Mexico and further south."[74] Our analysis confirms Mexico's significance to Texas. EPA's proposal does not consider a backward trajectory analysis. The influence of international emissions is discussed in detail in a subsequent section.

AECOM stated that back trajectories were performed for the 20% worst visibility days measured at each national park's IMPROVE monitor to characterize the nature of these regional haze episodes. Each trajectory was run using the NOAA Air Resources Laboratory (ARL) HYSPLIT Trajectory Model[75] to track the air parcel backward 72 hours, or three days, prior to its arrival at the national park's IMPROVE monitor location from 3 p.m. CST time (21 UTC). A midday time was selected to characterization the air when the boundary layer would likely be well mixed. An initial height of 500 m above ground level (AGL) was used with the ETA Data Assimilation System (EDAS) archive meteorological data which has a 40-km horizontal resolution and a three-hour temporal resolution. This 500 m height represents the air mass within the boundary layer and is commonly used, particularly by users of the HYSPLIT web interface as it is the default setting.[76]

AECOM Footnotes:
[72] Colorado State University Cooperative Institute for Research in the Atmosphere (CIRA), cited 2014: Federal Land Manager Environmental Database. Web site: http://views.cira.colostate.edu/fed/DataWizard/.
[73] https://www.tceq.texas.gov/assets/public/implementation/air/sip/haze/2SIP_ado_rev.pdf at 10-9.
[74] https://www.tceq.texas.gov/assets/public/implementation/air/sip/haze/2SIP_ado_rev.pdf at 10-10.
[75] Draxler, R.R. and Rolph, G.D., 2014: HYSPLIT (HYbrid Single-Particle Lagrangian Integrated Trajectory) Model Version 4. NOAA Air Resources Laboratory, College Park, MD.

Big Bend National Park Back Trajectory [AECOM (0061 and 0075) p. 4-2]

AECOM stated that a total of 69 days represented the 20% worst days at BIBE where data were available. The associated IMPROVE data composition plot is presented in Figure 4-1 which is identical to the previous composition plot, except it provides a more detailed look at 2011-2013. Also, the days where trajectories that passed near the Coleto Creek facility are noted by "C". Many of the worst days occurred in 2011, when Texas experienced one of its worst single-year droughts on record as discussed in a previous section.

AECOM Figure 4-2 shows the back trajectories at BIBE from 2011-2013 on the 20% worst days. The 38 facilities in Texas that were modeled by EPA are labeled in the map. The back trajectories illustrate that BIBE most often experienced air from the west, south, and southeast transport regimes. The most recent facility-aggregated point source SO_2 emissions for Texas and its neighboring states (2011-2013)[77] and Mexico (2008)[78] are shown. It is apparent from the trajectories for the 20% worst haze days that BIBE very rarely experienced northeasterly transport from the Texas facilities indicated for additional emission controls in EPA's proposed FIP. Only 14 out of the 69 trajectories (approximately 20%) passed within 193 km of the Texas sources for which EPA is proposing new SO_2 emission limits. This analysis was performed using ArcGIS. The farthest distance a trajectory must travel to reach a Texas facility with a proposed new emission limit is approximately 860 km away from BIBE. A trajectory uncertainty of 22.5%, the middle of the uncertainty range discussed by NOAA ARL (15 – 30%[79]), was used. Thus, 22.5% of 860 km is 193 km. For Coleto Creek, there were only 5 trajectories (about 7%) that passed within 126 km trajectory uncertainty range (22.5% of 560 km). Using the same methodology, only 3 out of 69 trajectories (approximately 4%) originated from or within 193 km of a Luminant facility.

In contrast, trajectories indicate that emissions from Mexico, particularly the facilities such as Carbon I and Carbon II on the Texas/Mexico border, heavily influenced BIBE haze conditions. These point sources stand out as large emitters just southeast of BIBE and only 230 km away. Trajectories from the west and south further indicate the transport of natural dust events from the Chihuahuan Desert and/or fire activity. For example, as shown in AECOM Figure 4-3 in comment 0061/0075, one of the top five worst haze days (April 21, 2011) indicated southerly to southwesterly transport which brought in smoke from wildfires. As noted previously, TCEQ has identified numerous dust and fire events, particularly in 2011, that adversely influenced particulate matter measurements. Furthermore, a recent long-term dust event climatology identified 16 local dust events during 2000-2007 that specifically affected BIBE.[80] According to the 2011 NEI (version 1), wildfires in 2011 in Texas alone account for approximately 188,970 tons of PM2.5 and 222,985 tons of PM10.[81] These statistics further support the TX ALT NC natural conditions presented above.

AECOM Footnotes:
[77] EPA, cited 2014: Air Markets Program Data 2013. Web site: http://ampd.epa.gov/ampd/.
[78] EPA, cited 2014: Emissions Modeling Clearinghouse: 2011-based Modeling Platform, 2011NEIv2-based Platform (2011v6.2). Web site: http://www.epa.gov/ttn/chief/emch/.
[79] http://www.arl.noaa.gov/documents/workshop/NAQC2007/HTML_Docs/trajerro.html.
[80] Tong, D. Q., M. Dan, T. Wang, and P. Lee, 2012. Long-Term Dust Climatology in the Western United States Reconstructed from Routine Aerosol Ground Monitoring. Atmospheric Chemistry and Physics, 12, 5189-5205.
[81] http://www.epa.gov/ttnchie1/net/2011inventory.html.

Guadalupe Mountains National Park Back Trajectory [AECOM (0061 and 0075) p. 4-6]

AECOM stated that a total of 66 days represented the 20% worst days at GUMO for 2011-2013 where data were available. The associated IMPROVE data composition plot is presented in AECOM Figure 4-4 where "C" denotes days trajectories that passed Coleto Creek. The chart indicates that GUMO often measured more naturally-occurring haze-forming species (CM, OMC, and soil species) than sulfate and nitrate species from manmade activities, particularly in 2011 and 2013.

Similar to BIBE, as shown in AECOM Figure 4-5, back trajectories to GUMO on the 20% worst days show that GUMO's haze conditions were influenced by west, south, and southeast transport regimes. GUMO infrequently experienced northeasterly transport from the direction of the facilities targeted in EPA's proposed FIP during the 20% worst haze days where 21 out of 66 (approximately 32%) trajectories originated from the Texas FIP sources. The farthest distance a trajectory must travel to reach a Texas facility with a proposed new emission limit is approximately 960 km away from GUMO. Like the approach taken with BIBE, the trajectory uncertainty of 22.5% was used. Thus, 22.5% of 960 km is about 216 km. With this procedure, we find that only 8 trajectories (about 12%) originated from within 182 km of Coleto Creek (22.5% of 800 km), and we find that only 5 trajectories (about 8%) originated from within 216 km of a Luminant facility.

As mentioned previously for BIBE, AECOM stated that GUMO is also significantly influenced by emissions from Mexico and by natural events such as windblown dust and fires. In relation to natural events, it is instructive to note that the aerosol composition chart showed GUMO is influenced significantly by uncontrollable naturally-caused haze. Soil and CM represent larger amounts of the total extinction than at BIBE, which reinforces the reasoning behind GUMO's higher TX ALT NC natural conditions. Research has shown that GUMO experiences more dust storms than most other Class I areas in the southwestern U.S. where 27 events where identified from 2000-2007.83 Both TCEQ and the New Mexico Environment Department have submitted demonstrations to EPA of several exceptional event days for particulate matter measurements.84 Also, according to the 2011 NEI (version 1), wildfires in 2011 in Texas and New Mexico account for approximately 270,070 tons of PM2.5 and 318,683 tons of PM10.85

Response: The commenters' back trajectory analysis for the base period and 2011-2013 is flawed and did not follow the NOAA draft guidance they cited and appropriate HYSPLIT modeling techniques.[492] We note that the commenter tried to use a draft NOAA document that indicated potential error in HYSPLIT centerlines may be 15-30% and the commenter used the middle value of 22.5%. EPA notes that the 15-30% value is not supported by any technical analysis by the model developer NOAA and is basically just rough estimate. There are a number of uncertainties in HYPSLIT analyses and on the scale of 72-hours. Luminant's HYSPLIT analysis also used a more restrictive value of 40 km for uncertainty.

The HYSPLIT model yields an estimate of the path an air mass has traveled before reaching a monitor at a specific location and time. Specifically, the model provides the centerline of the probable path. By knowing where an air mass has traveled before reaching a monitor, one can consider what potential areas and emission sources could have contributed to the pollution loadings in the atmosphere that has been trnaported to the monitor. HYSPLIT back trajectories alone do not determine inclusion or exclusion of an area but in fact are supporting information that compliments other information.

The commenter's analysis assigned a trajectory uncertainty of 22.5% (halfway between 15-30% mentioned in the HYSPLIT user guide) in determining an error-bounded minimum distance for a trajectory centerline to pass the point source to claim contribution. In other words, the

[492] NOAA is National Oceanic and Atmospheric Administration. NOAA is the developer of HYSPLIT and has previously provided draft guidance on the use of the HYSPLIT model.

commenter used this uncertainty bound to determine if a back trajectory centerline was near enough to a source to indicate that emissions from the source may have been included in the air mass transported to the receptor. The commenter's analysis used a straight-line distance between source and receptor to calculate this distance. However, the on-line HYSPLIT user information explicitly states an error may be estimated to be 15-30% of the travel distance of the trajectory. Since none of the trajectories are straight-line but take a longer path, all the analyses provided by the commenters based on the 22.5% uncertainty value are invalid and biased to underestimate the number of trajectories that may be 'close' to the source in question since the actual travel path is significantly longer and would result in wider uncertainty values when the back trajectory is nearest to the source. Furthermore, limiting the uncertainty bound to 40 km in assessing the HYSPLIT data for Wichita Mountains is invalid and significantly biased to underestimate the number of trajectories that may be 'close' to the sources in question. EPA's OAQPS office was consulted on this matter and the determination from the office expert was that there are a number of variables that impact the uncertainty and there is not enough information to support selecting any specific value, but it is likely that the actual uncertainty level is higher than the unsupported value of 15-30%. Some of the variables that increase the uncertainty are: resolution of the meteorology and amount of relevant upper air data to help with meteorological model performance, grid resolution, time and length of transport and amount of mixing variability in the atmosphere, accuracy of convective mixing in the modeling, etc. There are also some uncertainties in the back trajectory model itself as is documented in EPA's model performance analysis.[493] Therefore we do not agree with the use of the unsupported trajectory uncertainty to try and limit the potential uncertainty.

HYPLIT back trajectories have some value but they do not do any pollutant dispersion or chemistry, so they are not a full evaluation of transport of emissions from sources to Class I areas. We put more weight on CENRAP's CAMx source apportionment modeling and our CAMx modeling in determining whether a source impacts a Class I area and what the potential visibility improvements from reductions at a source would yield. The commenter is putting too much weight on the HYPSPLIT back trajectories and not enough weight on the CAMx modeling results. Since the overall uncertainty of HYSPLIT back trajectory analysis has a number of variables it is hard to impossible to try and create uncertainty ranges as clear decision points of 'near' a source or 'not near' a source. If HYSPLIT back trajectories show no winds or very limited amounts of back trajectories in the general direction it might indicate the source has a relative small chance of impact if no other analysis exists. In this case we have CENRAP's and TCEQ's source apportionment modeling and our source apportionment modeling that use the same meteorology and both the CENRAP/TCEQ source apportionment modeling and our CAMx modeling indicate the sources that we have identified for control analysis have large contributions to visibility impairment at the Class I areas. Given the limits of a HYSPLIT analysis and larger uncertainties, and the results of our technical anlaysis, we do not agree with the commenter that we are evaluating the wrong sources. As the facts in our FIP TSD and proposal demonstrate, the identified facilities have significant impacts on visibility conditions. Our technical record makes it equally plain that the required controls reduce impacts from these sources and result in meaningful visibility benefits towards the goal of natural visibility

[493] Documentation of The Evaluation of Calpuff and Other Long Range Transport Models Using Tracer Field Experiment Data, Environ International Corporation, EPA Contract No. EP-D-07-102, Work Assignment No. 4-06, Figure 6-13 (2012), *available at* http://www.epa.gov/ttn/scram/reports/EPA- 454_R-12-003.pdf

conditions.While EPA's analysis includes many elements and steps we disagree that we have not laid out our logical steps in performing our analysis and supporting the proposed control decisions and our final decisions.

The commenters assessments of what they consider to be near is inappropriate in the context of the HYSPLIT capability. The results that the commenter provides indicating that for many of the sources there are few trajectories that go near the source is biased extremely low due to the inappropriate and flawed uncertainty analysis.

EPA conducted our own HYSPLIT back trajectories to do a more thorough analysis and to respond to the comments provided with HYPSLIT results. EPA had two different sets of HYSPLIT runs that were completed. We did one run for all days in a year for a 30-year period to develop a climatological baseline for comparing subsets of years and the subset of 20% worst days to compare with the data provided by the commenters. The other set of HYSPLIT runs we conducted were to evaluate for only the 20% worst days at each of the three Class I areas for the baseline period of 2000-2004 and 2011-2013. We did not use the trajectory uncertainty approach as we have a number of concerns with the unsupported values and think the range given does not capture the full uncertainty range of HYPLIT results. For our analysis, we did the following:

a. Run HYSPLIT trajectories for the dates and locations using
    i. EDAS 40 km meteorology when available and the highest resolution sets available for the older years
    ii. Receptor heights 100m AGU
    iii. 72 hour backward

We used 100 m since the visibility impairment is monitored either by a monitor or by a visitor looking at vistas and not towards 500 m and above. In addition, our initial evaluation, discussed elsewhere in this section, shows that the 2011-13 time period is not representative of climatological norms regarding the transport wind flows to the three Class I areas.

We received a number of comments that argued that the 2011-13 time period was normal or worse than normal and monitoring data for 2011-13 was on track for meeting 2018 RPGs at the three Class I areas. To respond to these comments we conducted HYSPLIT runs for a 30 year period (1985 to 2014) develop a climatological transport pattern record for each of the Class I areas). We also evaluated the all days and 20% worst days for the period of 2000-2004 and for the period of 2011-2013 to compare these two groups of years to the 30 year transport patterns.

We have included some of the plots that we generated in the figures below. We also find that the base time period 2000-2004 was more representative of climatological norms.

We performed HYSPLIT modeling of a 30-year period (1985-2014) and concluded that in years with wind flow patterns consistent with the climatological norms over that period a significant number of days have back trajectories that did include areas where the sources proposed for additional controls are located. Furthermore our analysis of the 2011-13 period indicates that it was less representative of normal pollution transport patterns also showed a number of back trajectories went through or near the areas with the sources being considered for controls.

Therefore these back trajectories do indicate the controls being considered for these sources would be expected to reduce visibility impacts at the three Class I areas.

Our analysis of 30-years of back trajectories to assess whether the 2011-13 and 2000-2004 periods were within the climatological norm also indicated that the base period (2000-2004) was more similar to the climatological norm than the 2011-2013 period, so we conclude that using the base period is more representative for projecting 2018 levels.

In sum, the number of trajectories that go near the sources in Texas is large enough to not rule these sources out from consideration for potential control. In general, we have treated back trajectories as a tool to potentially screen an area out if no trajectories go through an area but if some trajectories go through an area then the area may be evaluated further or, as in this case, the full analysis may rely on more sophisticated tools such as CAMx. Moreover, our back trajectory analyses show that the sources for which we are imposing controls through the FIP are the approporate ones.

We have additional HYSPLIT plots and a summary of the results in the docket materials but we have provided some additional plots here in support of our conclusions.
Figures EPA1-6 are back trajectory plots for different periods.
Figures EPA 7-12 are incremental probability plots. These plots compare a specific subset of plots to the 30 years of back trajectories that were completed for the climatological transport characterization for each of the Class I areas. The yellow dot on the map indicates the start point of the back trajectory and the blue color shading indicates areas that had less back trajectories through the plot than the 30 year average and red areas indicate areas that had more back trajectories through the plot area than the 30 year average. The gradual shading represent slightly less/more to the darker shading which is a larger amount of difference compared to the 30 year average. For example a deep red indicated that the back trajectories passed through a particular area significantly more often than the 30 year average.

Big Bend:
Figures EPA 1 and EPA 2 illustrate that the baseline period for BIBE had more back trajectories/transport from areas around the sources we considered for controls during the 2000-2004 baseline than during the 2011-2013 period. Figures EPA 7 and EPA 8 indicate that the baseline period had slightly above average transport for all days from central and south Texas and the 2011-13 period was characterized with less transport from south Texas and higher transport from the border area in Mexico to the Southeast of BIBE. Overall, it can be seen that the 2011-13 period 20% worst days had only a few back trajectories to northeast Texas and this period is atypical compared to the climatological norm and the baseline. Looking at the baseline period and climatological analysis support that controls will be beneficial in the areas with the sources we have proposedto control.

Guadalupe Mtns.:
Figures EPA 3 and EPA 4 illustrate that the baseline period for GUMO had more back trajectories/transport from areas around the sources we considered for controls during the 2000-2004 baseline than during the 2011-2013 period. Figures EPA 9 and EPA 10 indicate that the baseline period had slightly above average transport for all days from north central through south

Texas and the 2011-13 period was characterized with less transport from north central Texas through higher transport from the border areas in Mexico to the Southeast of GUMO. Overall, it can be seen that the 2011-13 period 20% worst days had only a few back trajectories to northeast Texas and this period is atypical compared to the climatological norm and the baseline. Looking at the baseline period and climatological analysis support that controls will be beneficial in the areas with the sources we have proposed to control

Wichita Mtns.:

Figures EPA 5 and EPA 6 illustrate that the baseline period for WIMO had significantly more back trajectories/transport from areas around the sources we considered for controls during the 2000-2004 baseline than during the 2011-2013 period. Figures EPA 11 and EPA 12 indicate that the baseline period had nearly normal levels of transport for all days from east Texas, but slightly less days from central Texas and the 2011-13 period was characterized with much less transport from north central Texas through southeast and south central Texas. Overall, it can be seen that the 2011-13 period 20% worst days had only a few back trajectories to northeast Texas and this period is atypical compared to the climatological norm and the baseline. Looking at the baseline period and climatological analysis support that controls will be beneficial in the areas with the sources we have proposed to control

As discussed above the narrow and inappropriate definition of what constituted 'near' for a back trajectory made all the comments and conclusions suspect. EPA performed this analysis to provide an unbiased analysis. The results indicate that the 2011-13 was somewhat atypical for transport to BIBE and GUMO and very atypical for transport to WIMO

The commenter indicated that a number of back trajectories went through Mexico but failed to mention that many of these also went through or near Texas. Therefore, sources in Mexico and Texas could both contribute emissions to the visibility impairment at the Class I Areas. We have concluded that the back trajectory data provided by the commenter do not support their assertions that transport from the regions with those sources we are controlling is rare. The data they have provided are inconsistent with the HYSPLIT guidance and general practices and are for years that are not representative of normal climatological patterns with respect to transport wind flow to the Class I areas. Furthermore, the back trajectories submitted by the commenter do in fact show transport from regions in Texas for some days. Our additional analysis identified the normal wind patterns over a 30-year period and determined that based on normal conditions, transport does occur from the regions in Texas with those sources we are controlling.

We respond to comments on international and boundary emissions elsewhere in this document.

Comment: EPA's "additional analysis" starts with the wrong group of sources
[Luminant (0061) p. 109]

To illustrate the fault in EPA's approach, Luminant performed a back trajectory analysis for the Wichita Mountains—the Class I area that EPA claims will see the most improvement from its FIP. They performed this analysis for 2002 (the single year that EPA uses for its modeling base case and future projections) and also for 2011-13 to show more recent meteorological conditions. A back trajectory analysis, unlike a Q/D analysis, shows whether the wind blowing toward the Class I area actually originated near a source of interest or from some other region. As shown in

Table 12 below, the Texas sources for which EPA proposes controls are among the sources with ***the fewest*** number of days with a back trajectory from Wichita Mountains passing nearby the facility.

TABLE 12: SUMMARY OF THE TOTAL BACK TRAJECTORIES FROM WICHITA MOUNTAINS NEAR CERTAIN FACILITIES IN 2002 AND 2011-2013

(HIGHLIGHTED ROWS ARE FACILITIES FOR WHICH EPA PROPOSES ADDITIONAL CONTROLS)[685]

State	Facility	FIP Controls Proposed?	Total Back Trajectories Near Facilities on 20% Worst Days / Total # of Days in Period	
			2002	2011-2013
TX	Works No. 4	No	6/24	11/70
TX	Oklaunion Power Station	No	2/24	14/70
TX	San Miguel – Lignite Fired PP	Yes	0/24	12/70
TX	Coleto Creek	Yes	5/24	7/70
TX	TXI – Midloathian Plant	No	5/24	5/70
TX	Calaveras Plant	No	3/24	7/70
TX	Twin Oaks Power	No	4/24	6/70
TX	Holcim – Midloathian Plant	No	5/24	4/70
TX	Fayette Power Project	No	4/24	5/70
TX	Limestone Electric Generating Station	Yes	3/24	6/70
TX	WA Parish EGS	No	3/24	5/70
TX	Big Brown SES	Yes	3/24	5/70
OK	Sooner Generating Station	No	1/24	7/70
TX	Sandow SES	Yes	1/24	6/70
TX	Gibbons Creek	No	1/24	6/70
MEX	CARBON II (International)	No	0/24	7/70
OK	PSO Northeastern Power Station	No	1/24	5/70
OK	Grand River Dam Auth – Chouteau	No	0/24	5/70
OK	Muskogee Generating Station	No	0/24	4/70
TX	Big Spring Carbon Black	No	1/24	4/70
TX	Monticello SES	Yes	3/24	0/70
TX	Welsh Power Plant	No	3/24	0/70
TX	AEP Pirkey Power Plant	No	1/24	1/70
TX	Harrington Station Power Plant	No	0/24	2/70
TX	Sid Richardson - Borger Carbon Black Plt	No	0/24	1/70
TX	Orion – Borger Carbon Black Plant	No	0/24	1/70
TX	Tolk Station	Yes	0/24	1/70
TX	Martin Lake SES	Yes	0/24	1/70

Luminant noted, as Table 12 shows, the units for which EPA proposes controls very rarely have the potential to impact Wichita Mountains. Indeed, Luminant facilities are among the facilities with ***the fewest days*** with a trajectory originating from nearby and should have easily been screened out of EPA's analysis. And EPA's choice of which sources to evaluate was critical because, as discussed in the Background section and elsewhere in these comments, the subsequent steps were constructed to all but assure that some impact would be shown. Much greater occurrences are seen among other Texas sources, international sources, and Oklahoma sources, for which EPA did not even consider whether to require additional controls. It is apparent, then, that EPA's pre-ordained analysis was flawed from the outset, and had EPA's analysis started in a different and proper manner, it would have reached a different result. This is yet another way that EPA's methodology was arbitrary and capricious and cannot support its proposal.

Footnotes:
[683] See FIP TSD at A-4.
[684] Id
[685] Source back trajectory data is from the NOAA HySplit model, using EDAS 40km resolution meteorological data, 120 hour duration, ending at 3 p.m. at the WIMO IMPROVE monitor location 500m above ground. The analysis measures the distance from each facility to the hourly back trajectory endpoints, provided in the data files for each day from the HySplit output, using the Haversine formula. A trajectory is near a facility when the facility is within a linearly increasing radius up to 40 km during the initial 6-hour period, or within 40 km for the remainder of the 5-day period. The 20% Worst days are days based on the total extinction monitored at the WIMO IMPROVE visibility monitor, available at:
ftp://vista.cira.colostate.edu/Public/AirQuality/Data/Aerosol/IMPROVE/DataSetsBySite/WIMO1.csv.

Response: As discussed above, we do not agree with Luminant's narrow definition of 'near' by limiting the definition to within 40 km of the back trajectory center line. It is unreasonable and not accurate to use 40 km as a maximum distance from the HYSPLIT centerline for transport distances that would occur for 5 days. For example, applying this threshold a HYSPLIT centerline might travel on the order of 600 km from GUMO or BIBE back towards Texarkana, TX, but if a facility was not within 40 km of the centerline it would not be considered as a source that could have contributed to pollution levels at the West Texas Class I areas. This does not match with the unsupported NOAA uncertainty range of up to 30 %. While we do not think 30% is an upward limit on HYSPLIT uncertainty, a back trajectory centerline distance of 600 km the bound would be +/- 180 km, not 40 km. This is a fundamental flaw in their analysis and overly biases the results to very low numbers. See our response to multiple comments above regarding sources and HYSPLIT analyses. We address the other comments from Luminant regarding the idneitifcation of sources for additional control analysis elsewhere in this document.

Figure EPA 1 – Big Bend 20% worst days 2000-2004 100 m Back Trajectory

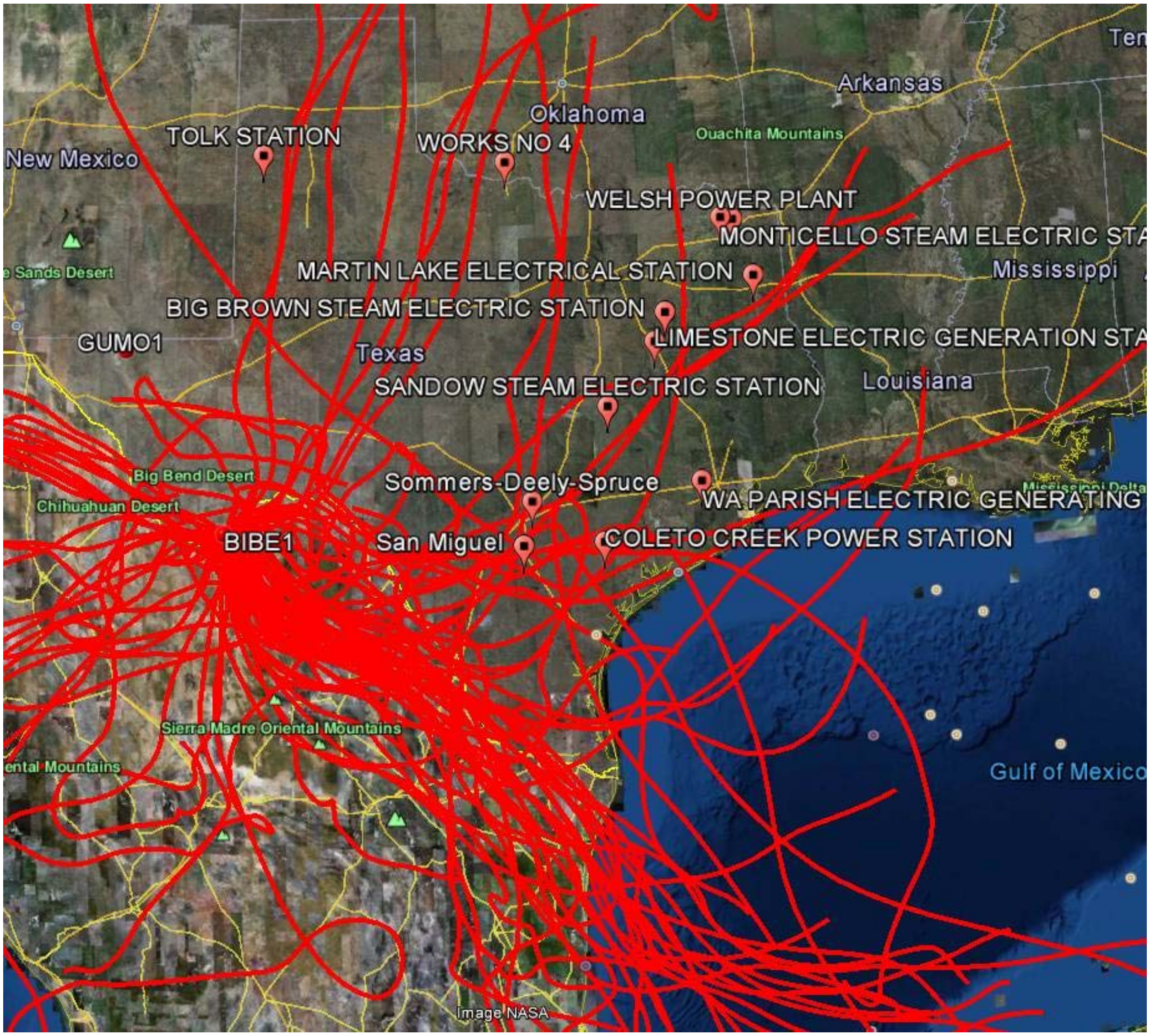

Arkansas
Oklahoma
Ouachita Mountains
TOLK STATION
WORKS NO 4
New Mexico
WELSH POWER PLANT
MONTICELLO STEAM ELECTRIC STA
Sands Desert
MARTIN LAKE ELECTRICAL STATION
Mississippi
BIG BROWN STEAM ELECTRIC STATION
GUMO1
LIMESTONE ELECTRIC GENERATION STA
Texas
SANDOW STEAM ELECTRIC STATION
Louisiana
Big Bend Desert
Sommers-Deely-Spruce
Chihuahuan Desert
WA PARISH ELECTRIC GENERATING
BIBE1
San Miguel
COLETO CREEK POWER STATION
Sierra Madre Oriental Mountains
ental Mountains
Gulf of Mexico
Image NASA

Figure EPA 2 – Big Bend 20% worst days 2011-2013 100 m Back Trajectory

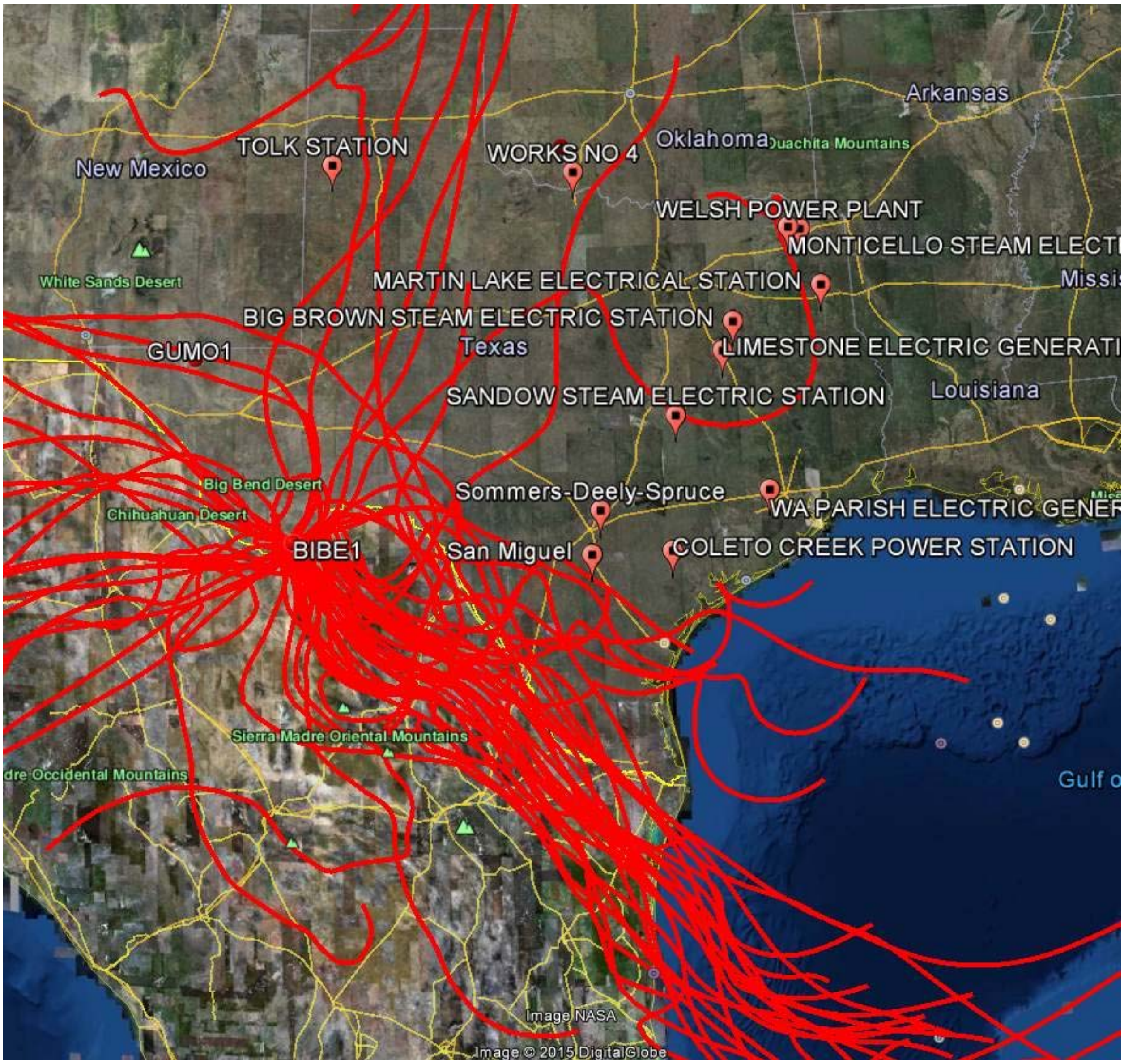


Figure EPA 3 – Guadalupe Mountains 20% worst days 2000-2004 100 m Back Trajectory

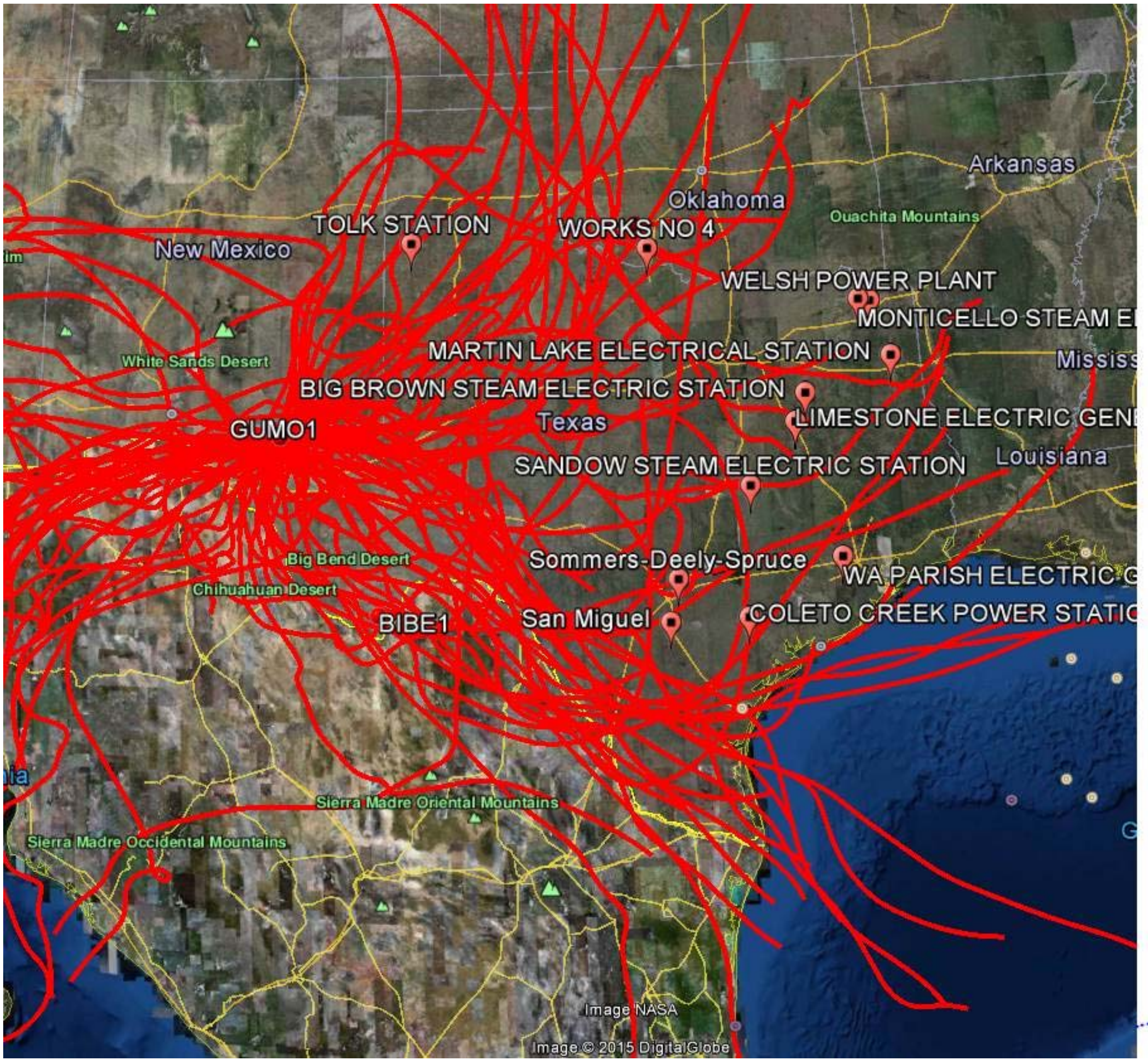


Figure EPA 4 – Guadalupe Mountains 20% worst days 2011-2013 100 m Back Trajectory

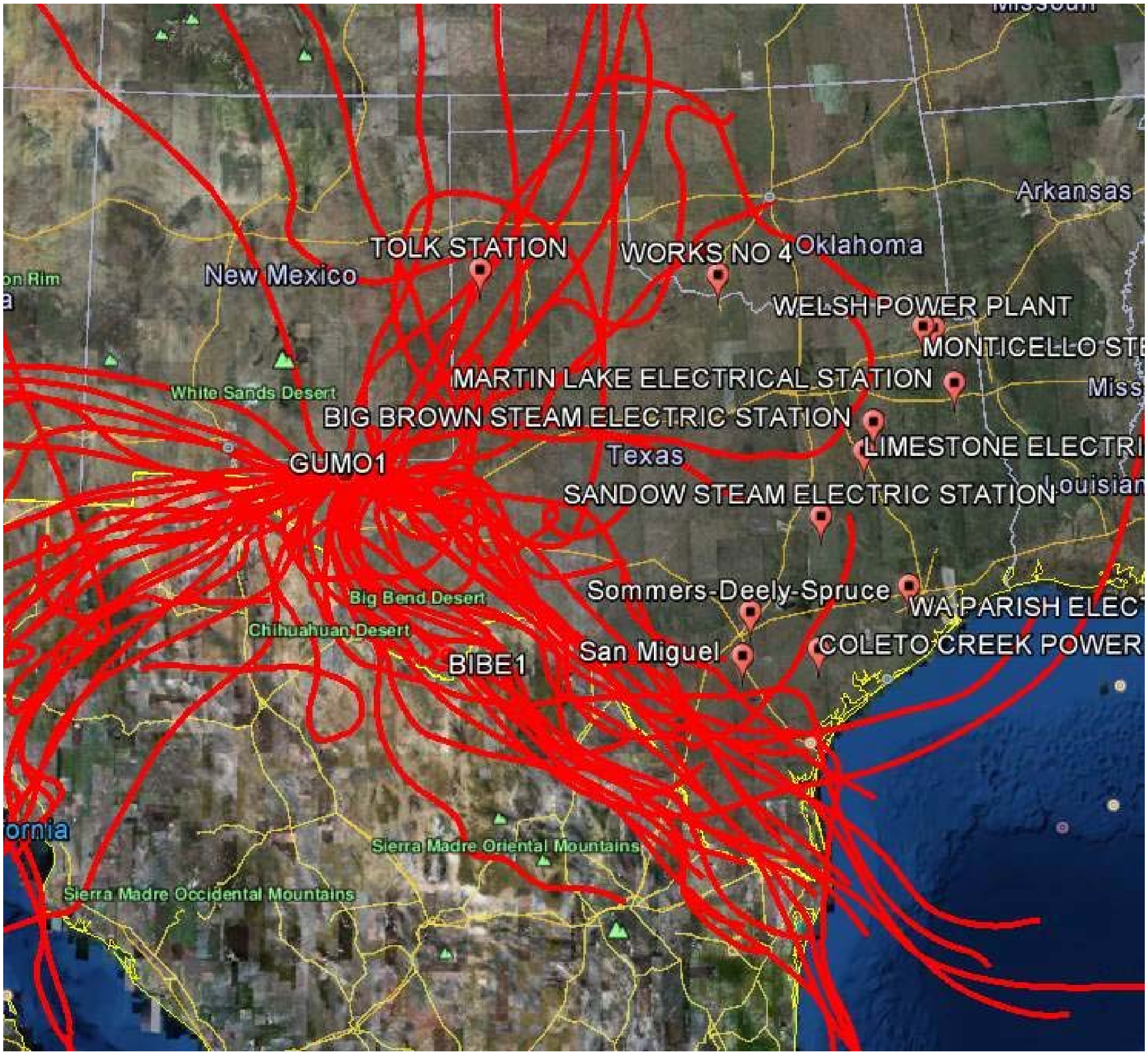


Figure EPA 5 – Wichita Mountains 20% worst days 2000-2004 100 m Back Trajectory

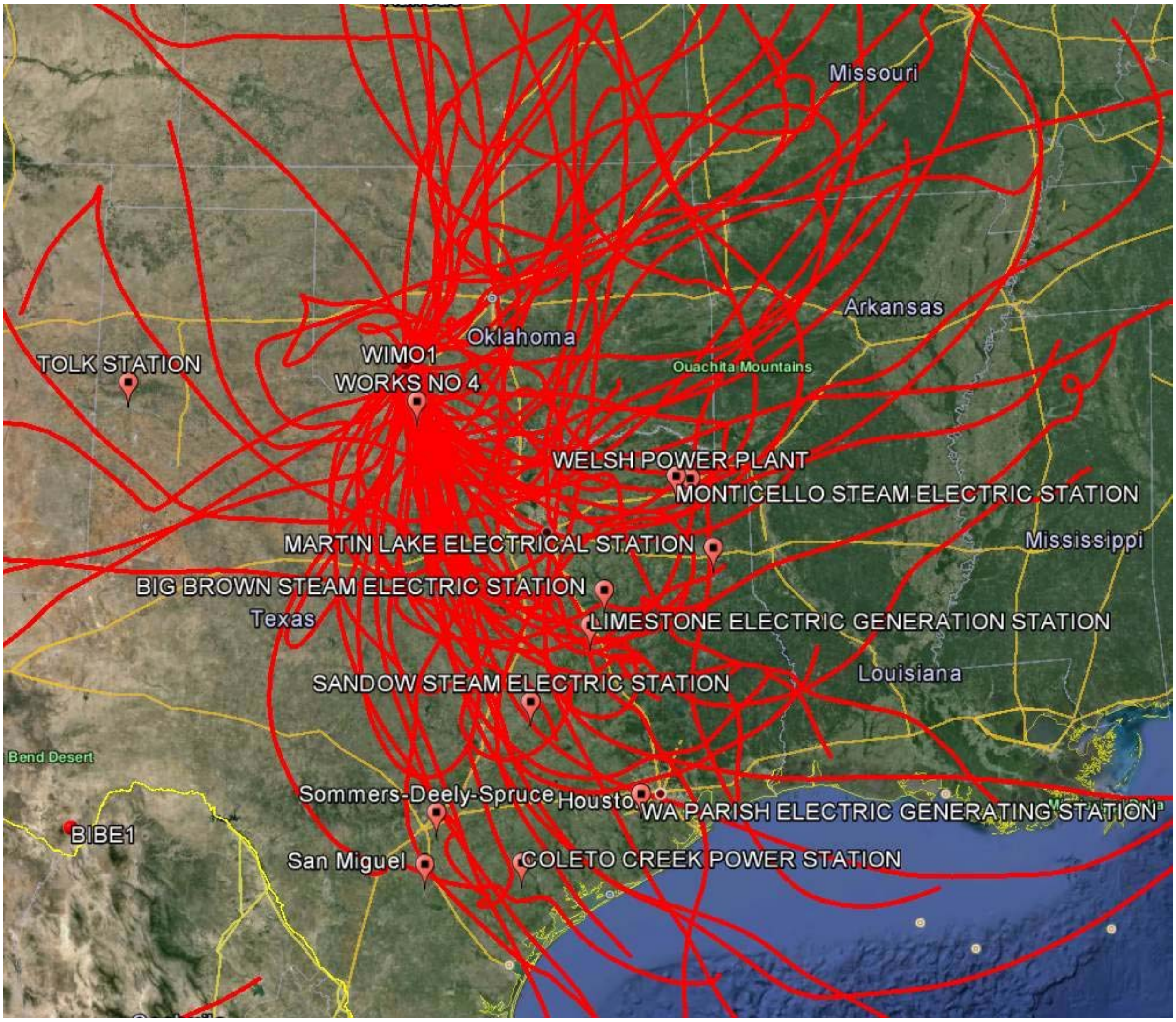


Figure EPA 6 – Wichita Mountains 20% worst days 2011-2013 100 m Back Trajectory

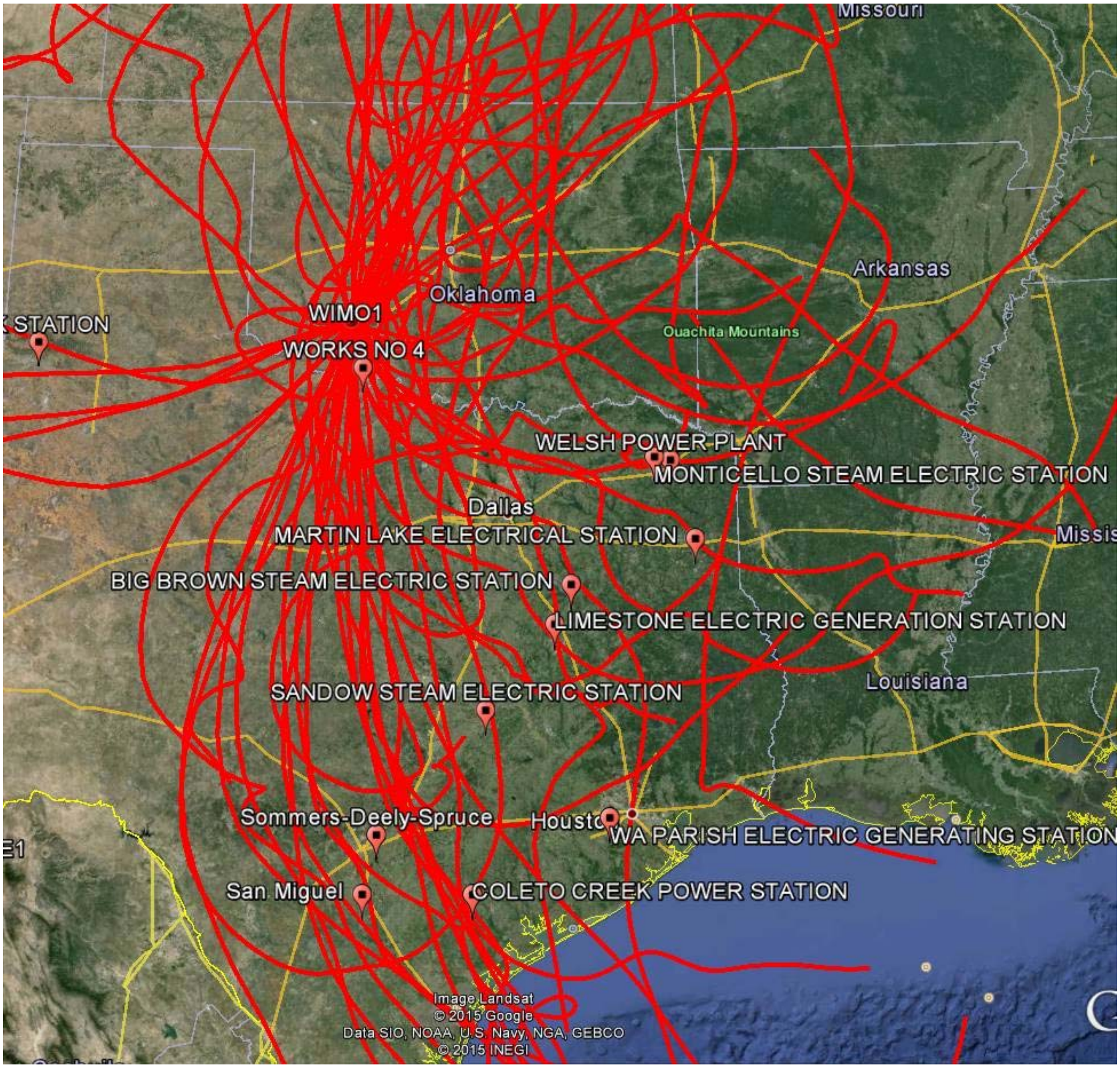


Figure EPA 7 – Big Bend Incremental Probability all days 2000-2004 100 m Back Trajectory

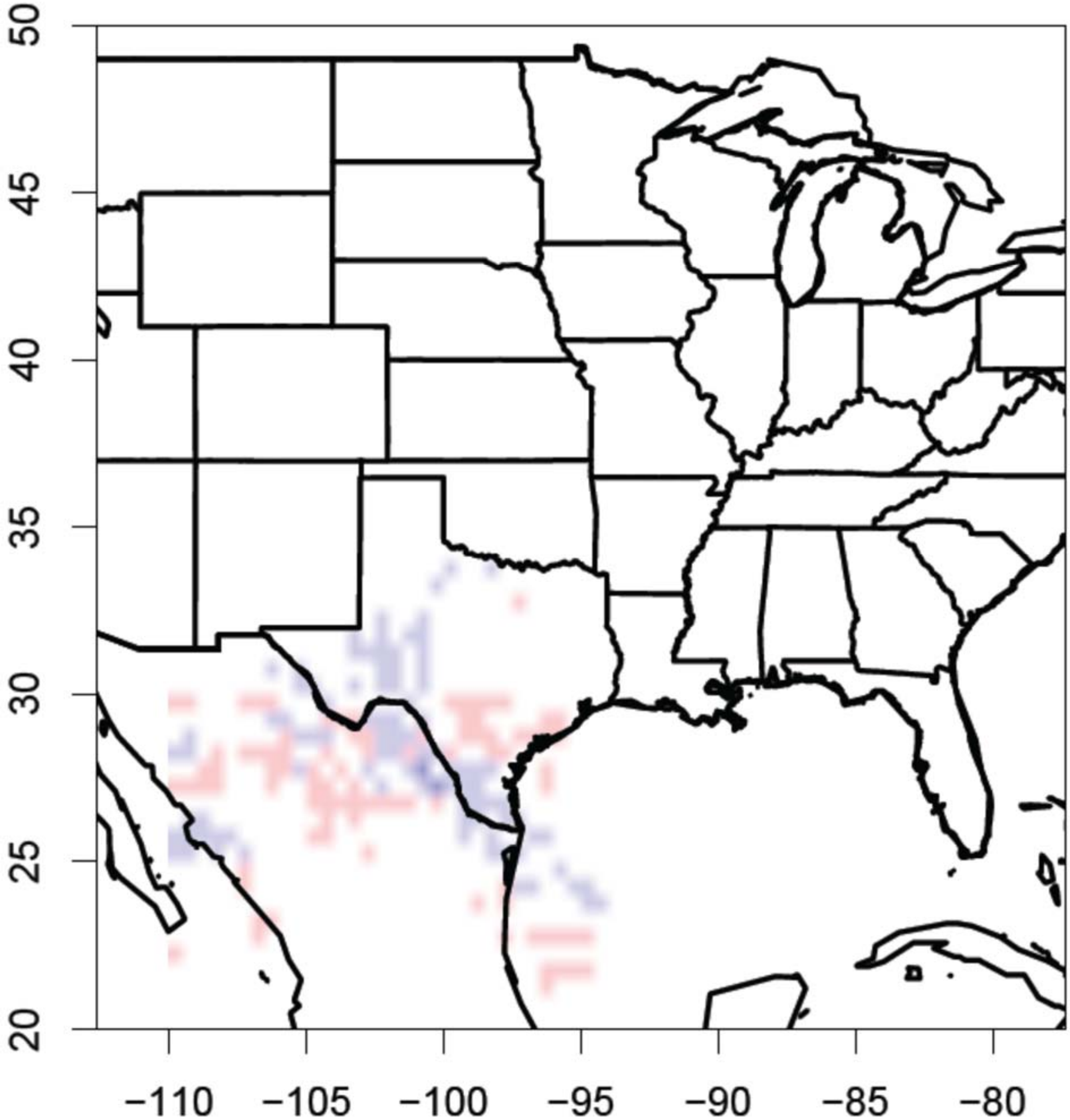


Figure EPA 8 – Big Bend Incremental Probability all days 2011-2013 100 m Back Trajectory

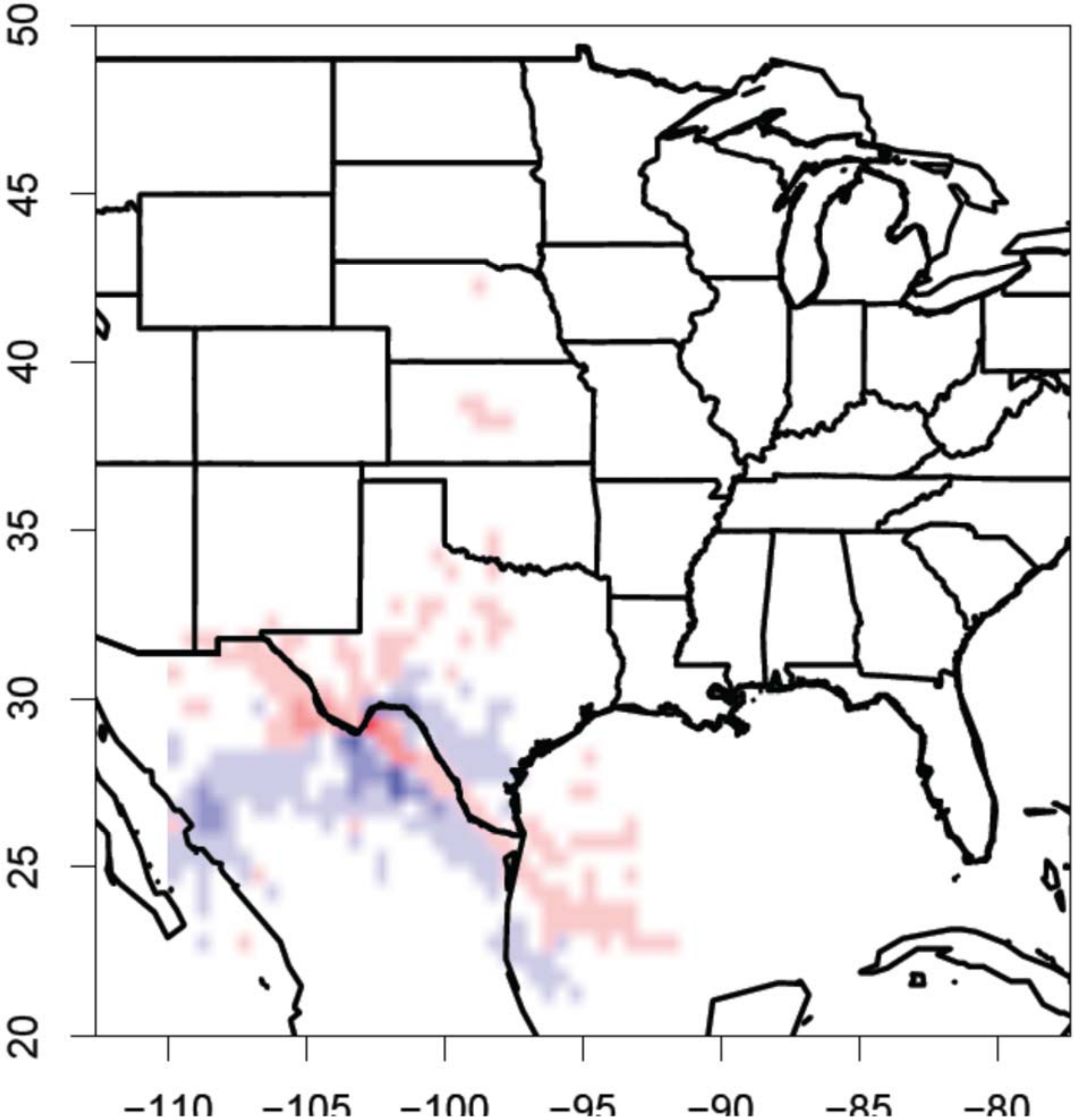


Figure EPA 9 – Guadalupe Mountains Incremental Probability all days 2000-2004 100 m Back Trajectory

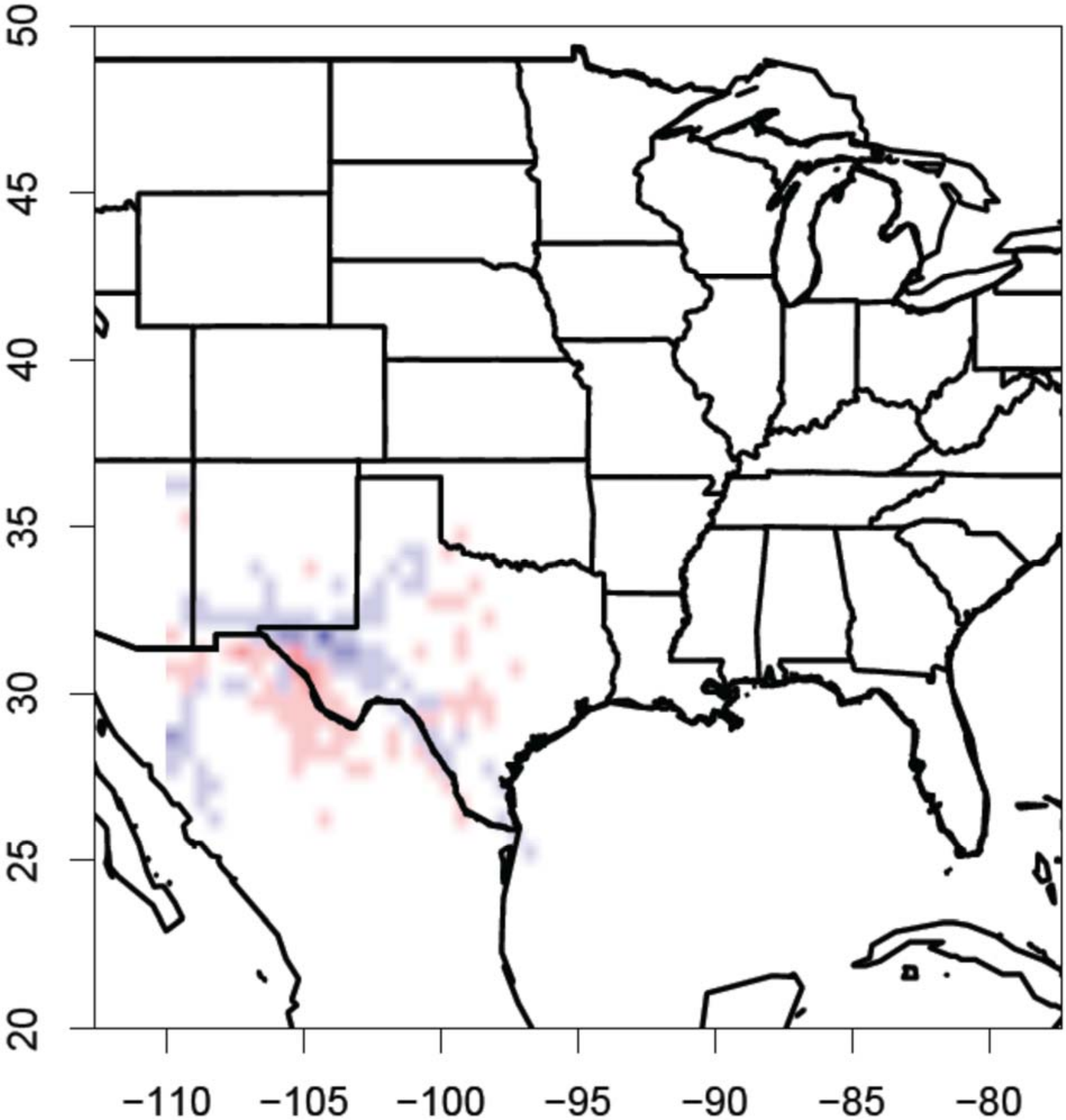


Figure EPA 10 – Guadalupe Mountains Incremental Probability all days 2011-2013 100 m Back Trajectory

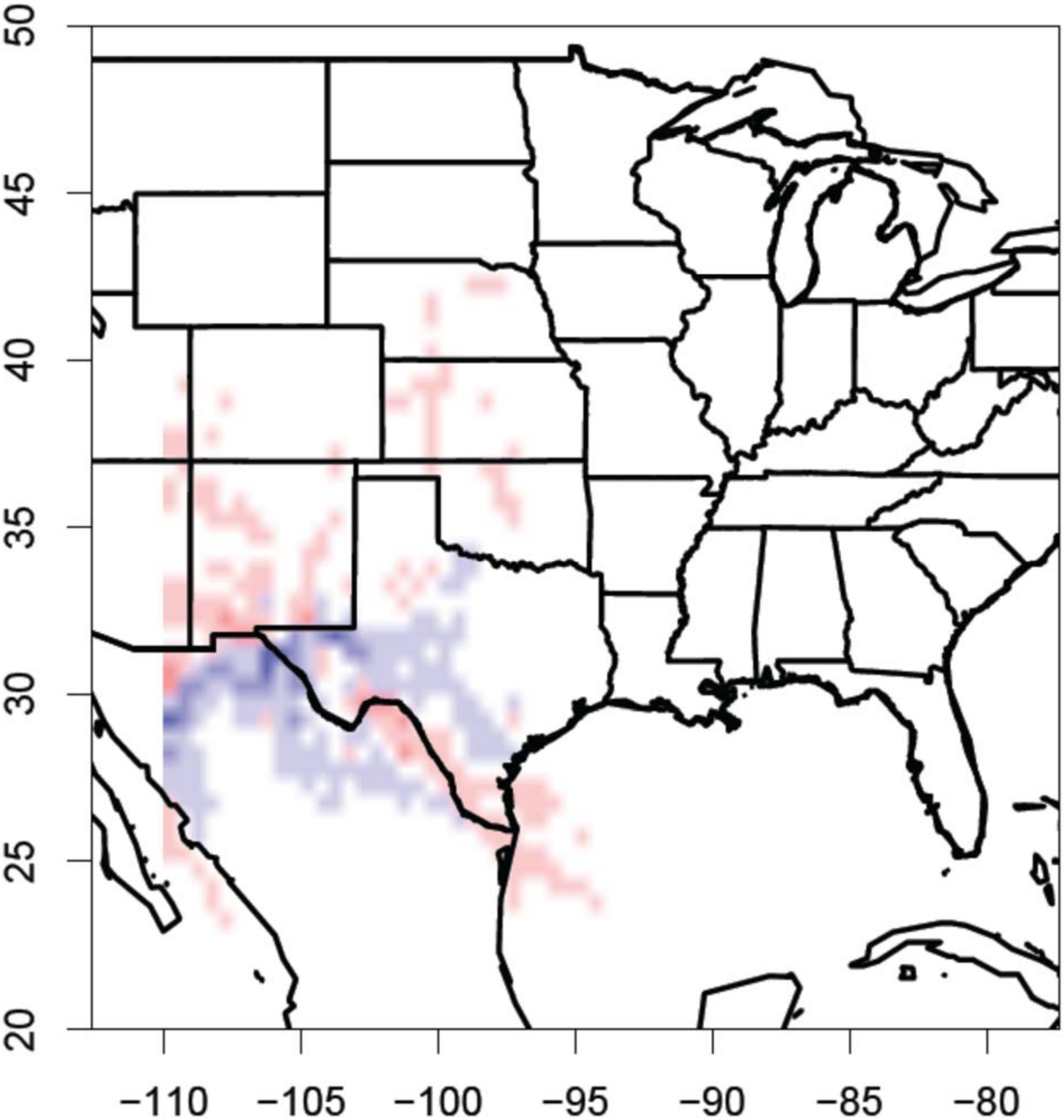


Figure EPA 11 – Wichita Mountains Incremental Probability all days 2000-2004 100 m Back Trajectory

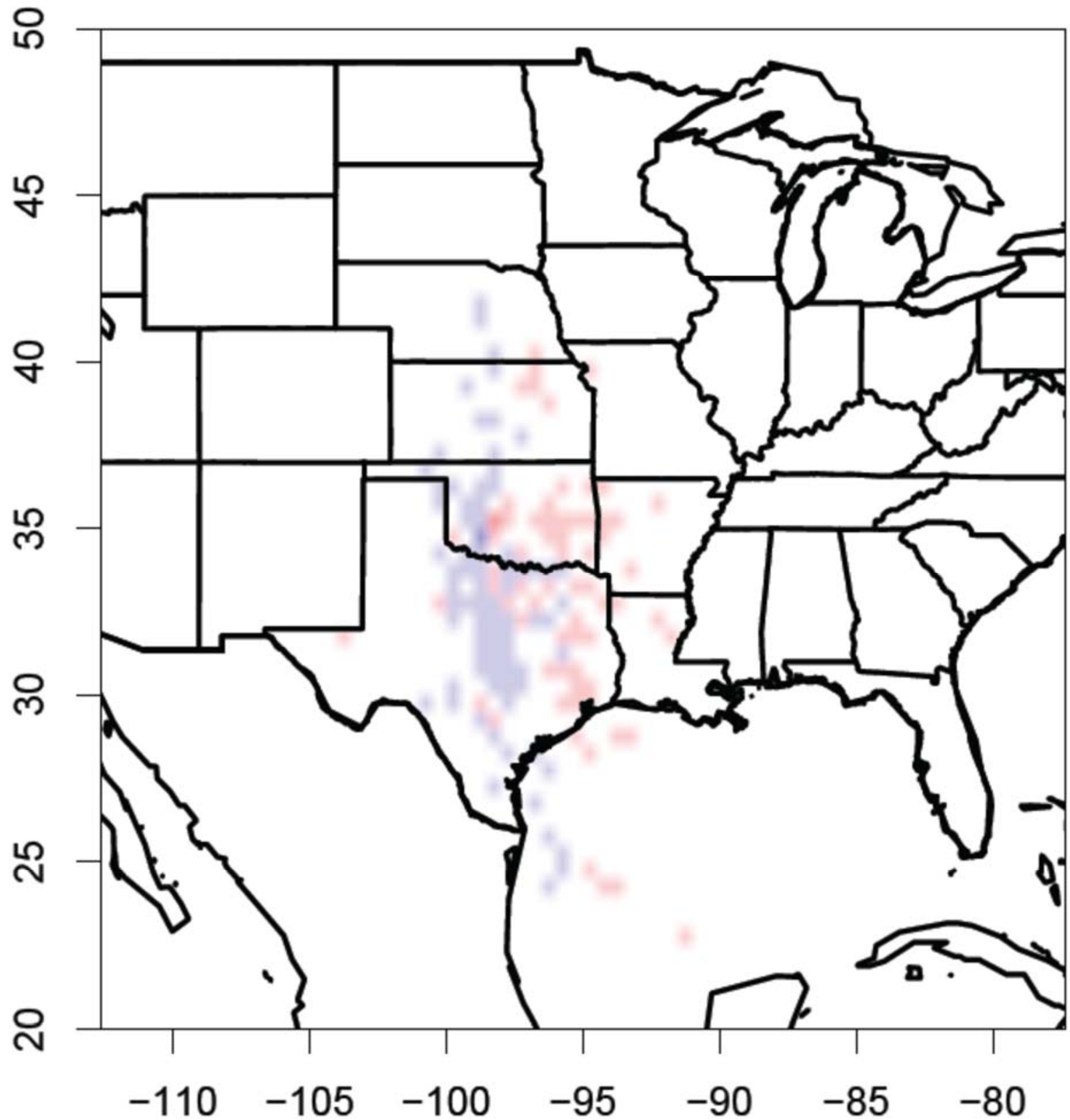
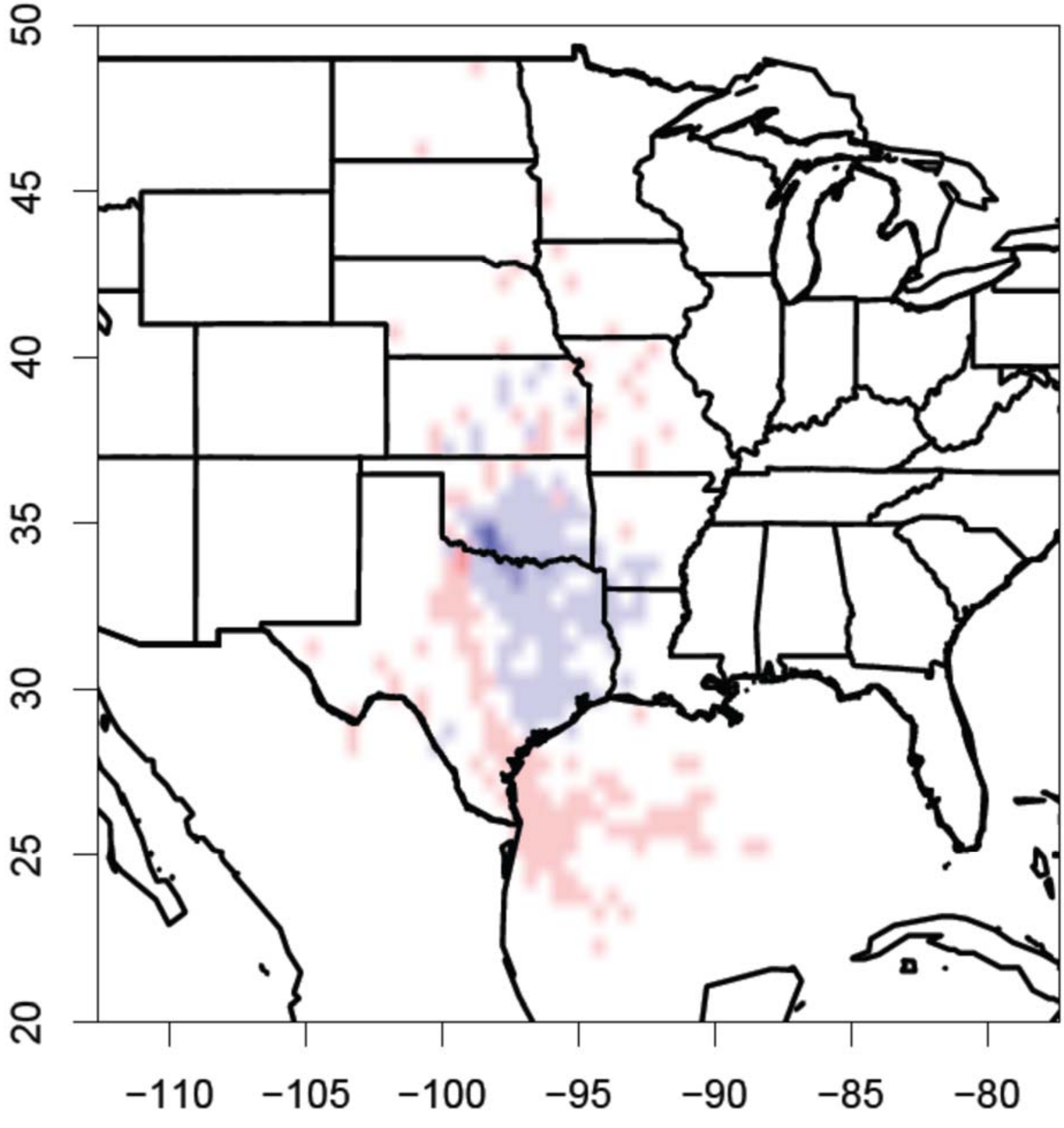


Figure EPA 12 – Wichita Mountains Incremental Probability all days 2011-2013 100 m Back Trajectory



15.j CALPUFF Modeling for Coleto Creek

General Summary: Commenters submitted CALPUFF modeling for Coleto Creek Unit 1 for 2004-2006. Results indicate that visibility impacts from the facility are below the 0.5 dv subject to BART threshold. The commenter states that tracer studies suggest CALPUFF overestimates visibility impacts by a factor of 4.5 (on average) and adjusts the CALPUFF model results down by this factor. The commenter concludes that Coleto Creek's impacts are very small and any visibility benefit from controls would be even smaller.

Comment: [AECOM/CCP (0075), whole report] CCP attached a report by AECOM titled, "*Analysis of Visibility Impacts from Coleto Creek Unit 1 - Using CALPUFF*." (AECOM/CCP, 0075).

Introduction. AECOM noted that, in July 2005, EPA issued BART Guidelines that provide guidance to the States in making Best Available Retrofit Technology (BART) determinations for large power plants and other BART-eligible sources. The BART Guideline states that modeling may be necessary to support a decision by the States about which BART-eligible sources "cause or contribute" to visibility impairment and are subject to BART. EPA recommended that the modeled value be compared to the "contribution" threshold of 0.5 delta dv and the "cause" threshold of 1.0 delta dv to determine if a source does not contribute to visibility impairment and therefore is not subject to BART. In states where source-specific subject-to-BART tests are conducted, sources are exempted from BART review if their predicted impact is below 0.5 delta-dv for a peak predicted day. Impacts of facilities below this level for the 98th percentile predicted day are presumed not to cause or contribute to visibility impairment. AECOM noted that this contribution threshold was also used in Texas in Texas BART screening with CALPUFF[494], but Texas electrical generating units participating in CAIR (or CSAPR) are exempt from facility-specific BART for SO_2 and NO_x emissions.

AECOM stated that the purpose of their analysis was to perform a facility-specific subject-to-BART analysis even though Coleto Creek Unit 1 is exempted from BART for SO_2 and NO_x emissions by rule to assess the potential for the unit to impact visibility conditions in Class I areas. The analysis provides information as to whether that unit would be determined not to contribute to regional haze based upon CALPUFF modeling for impacts at the Class I areas that are the subject of EPA's proposed FIP (Big Bend National Park, Guadalupe Mountains National Park and Wichita Mountains Wilderness). The location of Coleto Creek relative to these Class I areas is shown in Figure 1-1. As shown in Figure 1, all three Class I areas are well beyond 300 km from Coleto Creek (in fact, at least twice that distance). At these distances, EPA guidance,[495] is to use CALPUFF "with caution" because of a demonstrated overprediction tendency and the application of the model beyond a distance for which it has not been validated for use.

[494] This is stated in the Texas BART Rule, available in Appendix 9–2 of the Texas regional haze SIP

[495] Interagency Workgroup on Air Quality Modeling, 1998, available at http://www.epa.gov/scram001/7thconf/calpuff/phase2.pdf

For the CALPUFF modeling, the commenter indicated that there currently exists a 6-kilometer resolution 3-year (2001-2003) CALMET meteorological database produced by CENRAP that covers the necessary area needed to perform the CALPUFF modeling for Coleto Creek Unit 1 and the three Class I areas. This CALMET database relied solely on the 36-km MM5 data as input to CALMET combined with 6-km terrain and land use data. Running CALMET in this manner is known as "No Obs" mode; it does not include supplemental meteorological data from surface and upper air stations. Use of this limited CALMET data would require the conservative use of the highest modeled visibility impairment impact for determining if the source causes or contributes to visibility impairment. The 98th percentile (or 8th highest) ranked days impact can be used for determining if a source causes or contributes to visibility impairment impacts if "refined" CALMET meteorological data is used in the analysis. Refined CALMET data includes the MM5 data (or equivalent) along with actual concurrent surface, upper air and precipitation observations. Therefore, AECOM prepared three years (2004-2006) of "refined" CALMET meteorological data for use in the CALPUFF visibility modeling for Coleto Creek Unit 1.

The remainder of AECOM's CALPUFF report describes the emissions selected for modeling, the preparation of the refined CALMET meteorological data, the CALPUFF modeling (including post-processing), and analysis of the modeling results.

AECOM indicated that in summary, the results of the CALPUFF analysis detailed in their report indicated visibility impacts (corrected for model over-prediction bias) due to peak Coleto Creek emissions for the three Class I areas that are considered insignificant and consistent with "no degradation".

AECOM obtained annual and daily emissions for Coleto Creek Unit 1 over the past 15 years (2000-2015) from the EPA Clean Air Markets Program Database. The annual SO_2 and NO_x emissions trends from 2000-2014. They noted that with the exception of a spike in 2009, the annual emissions profile has remained relatively constant since 2002. Therefore, AECOM used a six-year look-back period in order to determine what they thought was the conservatively high peak daily emissions to be used for the CALPUFF modeling.

In addition to SO_2 and NO_x emissions, they also included estimates of emissions of H2SO4 and PM10. AECOM reviewed the daily actual emissions of SO_2 and NO_x emissions from Coleto Creek Unit 1 for the last six calendar years (2009-2014). They excluded days with emissions due to abnormal (e.g., malfunction) conditions were excluded from consideration, consistent with the BART Rule guidance. The highest normal daily SO_2 emission rate (6,806.7 lb/hr) day was January 27, 2010. The highest daily NO_x emission rate (1.3891 lb/hr) occurred on December 11, 2009. AECOM provided a plot of the daily average SO_2 and NO_x emission rates for the last six years (Figure 2-1 of AECOM report). A separate figure (Figure 2-2 of the report) shows that while the highest SO_2 and NO_x emission days are outliers, they are not substantially higher than some of the other higher days in the period. AECOM indicated that it is conservative to use the highest daily emissions to characterize a full 3-year period of modeling, and also to consider that peak emissions for SO_2 and NO_x (which were not on the same day) were coincident and occurred on every day of the three-year modeling simulation.

AECOM used the model inputs provided in Table 2-1 of the AECOM report to run CALPUFF. AECOM indicated that the PM_{10} and H_2SO_4 emissions are consistent with values proposed in the Coleto Creek Unit 2 permitting effort. The PM10 emissions were further speciated into three components, all of which have different light scattering properties: (1) PMF (fine particulate matter: soils); (2) EC (elemental carbon); and (3) SOA (secondary organic aerosols based on guidance provided by the National Park Service (NPS) for visibility modeling.

CALMET Meteorological Data Processing. AECOM developed a refined three-year (2004-2006) CALMET database using 4-km grid spacing. The modeling domain was based on a 50-km buffer around the source and a 50-km buffer around each of the three Class I areas to account for puff recirculation. The modeling domain is shown in Figure 3-1 of the AECOM report. This design allows for an 856 km (east-west) x 780 km (north-south) domain extent and, at a 4-km resolution, there are 214 x 195 horizontal grid cells.

AECOM used a Lambert Conformal Conic (LCC) coordinate system to account for the curvature of the Earth's surface. The LCC projection for this analysis was based on the WGS-84 datum and standard parallels of 30 and 60 degrees North, with an origin of 31.7 degrees North and 100.6 degrees West.

AECOM used the latest EPA-approved version of CALMET (Version 5.8.4, Level 130731) to produce three-dimensional wind fields for three years (2004-2006). Advanced meteorological data in the form of prognostic mesoscale meteorological data, the Fifth Generation Mesoscale Model (MM5), were used to provide a superior estimate of the initial wind fields. This application considered 3 years (2004-2006) of prognostic MM5 meteorological data all at a 36-km resolution.

These prognostic meteorological data sets were combined with the 4-km grid resolution terrain and land use data to more accurately characterize the wind flow throughout the modeling domain. The gridded terrain data was derived using the U.S. Geological Survey (USGS) 90-meter grid spacing Digital Elevation Model (DEM) files. These files were processed in the TERREL pre-processor program. The gridded land use data was derived from USGS 1:250,000 Composite Theme Grid land use files. Figures 3-2 and 3-3 of the AECOM report show a depiction of the terrain and land use data throughout the modeling domain, respectively.

The Step 2 wind fields were produced using the input of available National Weather Service (NWS) hourly surface and twice-daily upper air balloon sounding data within and just outside the modeling domain. Hourly surface data from both first-order and second-order stations also were considered in this analysis. Hourly precipitation data from stations within and just outside of the modeling domain were also included. Figure 3-4 of the AECOM report shows the meteorological stations that were used in the CALMET modeling.

The CALMET modeling was conducted using the MREG=1 switch which requires specific settings to conform to EPA-recommendations. In addition, the CALMET settings followed the August 31, 2009 EPA guidance document, *"Clarification on EPA-FLM Recommended Settings for CALMET"*[9].

CALPUFF Modeling and Post-Processing. AECOM used the current EPA-approved version of CALPUFF (Version 5.8.4, Level 130731) to model emissions of SO_2, NO_x, H_2SO_4, and PM_{10} from Coleto Creek Unit 1 in order to estimate visibility impacts at the three closest Class I areas. The CALPUFF modeling was conducted using three years (2004-2006) of CALMET meteorological data as discussed above. The CALPUFF modeling results were post-processed with the CALPOST (Version 6.221, Level 080724) and POSTUTIL (Version 1.56, Level 070627) utility programs. For visibility post-processing. Additional details on the modeling inputs and settings are provided in the AECOM report.

CALPUFF Modeling Results. Modeling was conducted by AECOM using CALPUFF for three years (2004-2006) to estimate visibility impacts at three Class I areas, Big Bend National Park, Guadalupe Mountains National Park and Wichita Mountains Wilderness, due to emissions from Coleto Creek Unit 1. It is noteworthy that all of these Class I areas are well beyond 300 kilometers from the Coleto Creek Facility. Therefore, the CALPUFF modeling results of visibility impacts are likely to be overstated.

The AECOM modeling exercise was treated primarily as a typical subject-to-BART modeling exercise even though Coleto Creek Unit 1 is exempt from BART for SO_2 and NO_x emissions by rule. The modeling used peak daily average emission rates for SO_2 and NO_x from recent operating years, along with allowable emissions of particulate matter, as detailed in sections above.

All the modeling was performed in a manner that would meet the expectations of Federal Land Managers for a refined CALMET and CALPUFF modeling analysis. The refined modeling analysis allows for the use of the 98th percentile (8th highest day) results from each year to be used for determining if the source “causes or contribute” to visibility impairment.

The overall objective for the AECOM modeling exercise was to evaluate modeled visibility impacts relative to a natural conditions background. Table 6-1 shows the results of the CALPUFF modeling analysis. The results shown in Table 6-1 indicate that for the three Class I areas being considered for the proposed FIP, the predicted impacts are less than 0.5 delta-dv in all cases. Based on these results, Coleto Creek Unit 1 does not contribute to visibility impairment at any of the modeled Class I areas. Furthermore, Coleto Creek Unit 1 would NOT be subject to BART even if it were not exempt by rule. In addition, we also believe that, based on long-range transport evaluation studies conducted by EPA, the over-prediction tendency of CALPUFF results are likely between a factor of between 3 and 4 to 6 for the distances being evaluated (equating to an average over-prediction bias of at least 4.5). Attachment A provides additional details on the basis for this estimate and a summary of the EPA-conducted evaluations. Therefore, the amended peak CALPUFF impact is likely on the order of 0.1 delta-dv or less, as shown in Table 6-2 of the AECOM report.

AECOM stated that it is noteworthy that EPA Region 6 has previously indicated that a visibility improvement of 0.2 delta-deciviews is too low for applying emission reductions. This action was for the Arkansas RHR SIP, for which EPA stated, “[w]ith regard to the comment that Arkansas sources contributed 2.0% to visibility impairment at Wichita Mountains during the baseline period and are projected to contribute 2.3% in 2018, EPA notes that removal of this 2.3%

contribution to the total extinction results in a visibility improvement of only 0.2 dv from the 2018 projected visibility conditions. ...Consequently, while we are concerned that the RPG at Wichita Mountains is not on the glide path, we believe the technical assessment that Arkansas sources do not have a significant impact at Wichita Mountains is accurate and ADEQ and ODEQ followed consultation procedures."[14]

AECOM noted that the EPA separately determined for the State of Wyoming that a single source's modeled visibility improvement of 0.19 dv for a Class I area was insignificant to require additional controls. EPA stated that, "[a]lthough the cost-effectiveness for SNCR is reasonable, we find it reasonable for the State not to select this control technology based on the incremental visibility improvement for this control technology."[15] Similarly, EPA determined that a visibility improvement of 0.17 dv was too low for application of emission controls.[16] These cases indicate that modeled visibility improvements as high as about 0.2 dv[17] have been determined to be too low for requiring emission controls because such controls would result in minimal improvements.

AECOM concluded that Coleto Creek should be excluded from the EPA FIP proposal because a conservative screening analysis with CALPUFF indicates that its peak daily emissions, even if assumed to be continuous for a 3-year modeling period, results in a modeled impact that below the haze contribution threshold. In addition, the CALPUFF modeling results imply that the current Coleto Creek emissions produce a visibility result in the three Class I areas that is both imperceptible and without any significant visibility impact. The CALPUFF results with worst-case emissions for all pollutants indicate that for the three Class I areas, the visibility impact predictions (corrected for model bias) indicate a haze level consistent with "no degradation". Due to the insignificance of the unit's emissions on the Class I area, the controls proposed by EPA in the FIP on Coleto Creek Unit 1 would be ineffective in changing the haze levels.

Footnotes:
[1] US EPA, 2005. BART guidelines, Federal Register update: July 6, 2005.
[2] This is stated in the Texas BART Rule, available in Appendix 9–2 of the Texas regional haze SIP.
[3] "CAIR" is the Clean Air Interstate Rule and "CSAPR" is the Cross-State Air Pollution Rule.
[4] 79 FR 74818.
[5] Interagency Workgroup on Air Quality Modeling, 1998, available at http://www.epa.gov/scram001/7thconf/calpuff/phase2.pdf (see Appendix C).
[6] 70 FR 39129.
[8] Documentation is available at http://www2.mmm.ucar.edu/mm5/.
[9] Available at: http://www.epa.gov/scram001/guidance/clarification/CALMET%20CLARIFICATION.pdf
[14] 77 Fed. Reg. 14,625.
[15] 78 Fed. Reg. 34,751.
[16] 78 Fed. Reg. 34,752.
[17] EPA's Regional Haze Rule notes that "no degradation" to visibility would be "defined as less than a 0.1 deciview increase." (64 Fed. Reg. 35,730)

Response: We have reviewed the CALPUFF modeling provided for Coleto Creek Unit 1 and do not agree with the conclusions that Coleto Creek's impacts are small. We have a number of concerns with the CALPUFF modeling provided and the technical and policy conclusions that were made in the comments. These comments are linked to an overall conclusion about the impacts and whether the impacts are small as the commenter suggests. Overall, our CAMx based analysis of sources is more robust and even reports provided or cited by the commenter indicate that CAMx is more accurate than CALPUFF and more robust. Furthermore (as addressed in similar comments) CAMx is the better tool to use for analyzing potential RP controls and potential benefits as well as identifying the largest contributors of visibility impairment to Class I areas. CAMx and CMAQ were used by CENRAP and the CENRAP states to evaluate RP on 20% worst and best days and also in specific RP control grouping analyses conducted by CENRAP for its members (Nine States including Texas and Oklahoma). CAMx was the best tool to assess if installing RP controls at Coleto Creek would yield visibility benefit and the relative benefit compared to other Texas sources with the larger impacts on visibility at Class I areas. Even if the commenter had provided acceptable CALPUFF modeling, we would still weigh the CAMx model results as more scientifically robust and more accurate in this situation than CALPUFF results. CALPUFF results are not geared to evaluate benefits and impacts on the 20% worst and best monitored days as they evaluate only a single facility's impacts and not the entire airshed.

To be thorough, we have reviewed the cited CALPUFF report and modeling and we will address our concerns with each subtopic and then with the overall conclusions made by the commenter.

Introduction: The commenter indicates that Texas and EPA recommended the 0.5 delta dv as the contribution threshold. This is correct in the context the commenter raised for BART screening modeling with a regulatory analysis utilizing CALPUFF modeling results of visibility impacts. This is not correct in the context of CALPUFF modeling results for potential visibility benefits for BART controls on a source nor is it appropriate to use as a threshold for potential RP controls.[496]. The commenter raised that EPA guidance indicates to use caution (and consult with EPA which was not done in AECOM's situation) in utilizing CALPUFF at the distances that exist between Coleto Creek and the three closest Class I areas. As the commenter indicated CALPUFF is known to potentially overpredict nitrates in general regardless of distance. Further, CALPUFF has not been validated for these distances in general, and CALPUFF's model performance at these distances is not totally known. As discussed later, performance analyses with CALPUFF indicates it does not perform as well as some other models (including CAMx). This is a concern to EPA and was a general concern to Texas in 2006. Because of concerns with model performance of CALPUFF at great distances (example: 500-1000 km), Texas actually requested to use CAMx with Plume-in-Grid (PiG) and Particulate Source Apportionment (PSAT) to screen potential BART sources. EPA approved the approach of screening of small groups of sources for BART applicability with CAMx modeling using a 0.5 delta-dv maximum impact (not 98th percentile) and using a natural "clean" background approach in 2007. As discussed in other responses, EPA used the same technical tools that Texas did in 2006 for BART screening for our RP analysis using updated CAMx with the PiG and PSAT tools to assess visibility impacts and benefits of controls on individual sources. While the 0.5 delta-dv

[496] If a BARTsource had impacts above 0.5 dv, but the controls being evaluated were less than 0.5 dv in benefit over baseline, this would not preclude the source from being controlled

value has some context in the BART situation to assess visibility impacts, there is nothing in the Regional Haze Rules that indicate that 0.5 delta-dv visibility benefit is a threshold of significance for a single facility in analyzing for potential RP controls.[497]

AECOM indicated that the only CALMET data that existed was the CENRAP dataset (2001-2003) that was known as a "No Obs" data set that required using the maximum CALPUFF value instead of the 98th percentile. This is not correct, a number of facilities in Oklahoma, Texas and Louisiana, reprocessed the 2001-2003 CENRAP met data with CALMET to include observations which allowed use of the 98th percentile. We do not see the need for CALPUFF analysis, but AECOM should have used these datasets instead of creating 2004-2006 datasets if they wanted to conduct CALPUFF modeling. AECOM's CALPUFF modeling strayed from these agreed upon protocols in TCEQ's SIP materials. These CALPUFF modeling protocols were agreed to between EPA, Federal Land Manager Representatives, TCEQ and CENRAP in 2006-2007 and there are a number of areas where AECOM's modeling did not follow the previous protocols that makes AECOM's CALPUFF modeling not acceptable nor relevant.

AECOM used emissions from 2009-2014 CEM data and filtered the data to come up with what they thought was representative emission rates to model. AECOM did not use the 2000-2004 data period that all other applicants used for BART screening modeling. They did not use CEM data in selecting emission rates for the period that they modeled (2004-2006).[498] The BART rule indicates you should model 24-hour maximum emission rates for the period modeled. For BART screening with CALPUFF all sources used either 2001-2003 (met period modeled for CALPUFF pursuant to approved protocols) or 2000-2004 which included the modeled years. AECOM did not compare the rates they modeled to emission rates that would have been modeled if they had used 2001-2003, or 2000-2004 as other BART applicants used.

CALMET Meteorological Data Processing: AECOM did not justify why the 2004-2006 period was used instead of just re-running CALMET for 2001-2003 with observations or using available datasets for the 2001-2003 period. As discussed above many sources did refined modeling protocols with EPA, FLM and Texas to recreate the CALMET data with observations and these files were available through TCEQ and/or EPA. The CENRAP modeling protocol included meteorological performance analysis of the MM5 met data (comparing MM5 model values to actual observations) to ensure that the MM5 data was adequately replicating meteorological conditions prior to CALMET processing. MM5 model performance analysis was one of the requirements from the EPA and CENRAP approved modeling protocols. Once the MM5 data was deemed to meet acceptable model performance it was then used by CENRAP's contractors to generate the CENRAP CALMET data. AECOM did not provide any

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[497] BART Guidelines, FR Vol. 70 No. 128 July 6, 2005 p.39129 "Even though the visibility improvement from an individual source may not be perceptible, it should still be considered in setting BART because the contribution to haze may be significant relative to other source contributions in the Class I area. Thus, we disagree that the degree of improvement should be contingent upon perceptibility. Failing to consider less-than-perceptible contributions to visibility impairment would ignore the CAA's intent to have BART requirements apply to sources that contribute to, as well as cause, such impairment."

[498] BART Guidelines, FR Vol. 70 No. 128 July 6, 2005 p. 39129. "We recommend that the State use the highest 24-hour average actual emission rate, for the most recent three or five year period of meteorological data, to characterize the maximum potential benefit."

meteorological performance analysis to substantiate that its model was performing adequately before it generated CALMET meteorological files. AECOM also used a smaller grid than EPA would have approved by only creating a 50 km buffer beyond the source and the Class I areas of interest. Given the location of Coleto Creek is relatively close to the gulf coastline, Figure 3-1 of AECOM's report demonstrates how plumes could go outside of either the eastern or southern boundaries and they would no longer be tracked, even if the winds shifted and brought the plumes back into the computational grid. EPA has required a much larger buffer to make sure that plumes do not transport out of the grid because the impacts are then lost and do not re-enter even if wind fields would re-entrain the pollutant plumes. In addition, AECOM also used a smaller grid then we would normally accept by using a 4 km grid instead of a 6 km grid as was outlined in CENRAP and TCEQ's modeling protocol and CALMET files. The origin used for the projections also deviates from the CENRAP and TCEQ's modeling protocol.

CALPUFF Modeling and Post-Processing: BART guidelines require the modeling should utilize emissions representative for the baseline period and the meteorology should be from the baseline period[499]. Both Texas and CENRAP's BART modeling protocols agreed to use 2001-2003 CALMET meteorology using MM5 databases that had been approved by EPA, FLM representatives, States and Regional Planning Organizations, including CENRAP.[500] The modeling submitted for Coleto Creek did not follow these agreed protocols.and the computation grid size and buffer are large enough to result in acceptable modeling results regardless of what regulatory purposes the modeling is conducted.

We noted a number of issues when we reviewed the modeling files themselves: 1) AECOM used a much smaller computational grid than we would recommend and what is in CENRAP's modeling protocol; 2) AECOM has less vertical grids and the spacing of the grids in the lower atmosphere is larger (individual layers are vertically thicker) than we would recommend, which likely leads to artificially high dispersion and lower impacts; 3) No primary Carbon emissions (PMC) were included and a very low geometric standard deviation of particle size was used; 4) AECOM limited maximum plume travel to 1 grid cell, which is not appropriate for a 4 km grid (especially considering mid and higher level winds) and EPA has typically used a maximum plume travel of 10 grids with a 6 km grid; 5) AECOM used very low background ozone values to fill missing data (20-38 ppb) when EPA recommends using 80 ppb currently and TCEQ and CENRAP modeling protocols used 40 ppb or higher (which was acceptable at the time); and 6) AECOM used a constant ammonia level of 1 ppb in CALPUFF modeling and a varying ammonia level that was either 1 ppb or just above 1 ppb in the postutil[501] processing when CENRAP and TCEQ modeling protocols indicate 3 ppb should be used in both CALPUFF and postutil. Overall most of these deviations/inconsistencies in AECOM's modeling would result in more dispersion and/or lower visibility impairment at the Class I areas, thus artificially underestimating the impacts of Coleto Creek.

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[499] BART Guidelines, FR Vol. 70 No. 128 July 6, 2005; p. 39162 "2. With the accepted protocol and compare the predicted visibility impacts with your threshold for ''contribution.''…"We recommend that States use the 24 hour average actual emission rate from the highest emitting day of the meteorological period modeled, unless this rate reflects periods start-up, shutdown, or malfunction."

[500] Texas BART Modeling Protocol to Determine Sources Subject to BART in the State of Texas and CENRAP BART Modeling Guidelines

[501] Postutil is the name of the computer code used to post process CALPUFF output files.

CALPUFF Modeling Results: EPA does have concerns with using CALPUFF for these distances (distance between Coleto Creek and each Class I area) that are in the range of 500 km or more. Due to the number of issues identified in the grid used, CALMET, CALPUFF and postutil modeling files above, and the impacts these would have on model results, we do not agree that it is likely the impacts are overstated. Furthermore, the emission rates modeled were not compared to the baseline period used by TCEQ and CENRAP (2000-2004 or 2001-2003) and it is unclear if the emission rates were representative of baseline emissions or included the benefit of controls on RH pollutants. Even if the emissions represent recent emissions visibility impacts from Coleto Creek, the modeling issues identified would most likely lead to higher values if corrected.

It is clear from the issues identified that AECOM did not provide modeling the EPA and FLM representatives would find acceptable. AECOM provided modeling results that indicated the highest 98th percentile value was 0.427 delta-dv at WIMO and, given the modeling issues, this value could be above 0.5 delta-dv if an appropriate modeling analysis was conducted. AECOM used limited model performance data from inert tracer experiments performed for areas of the country and in Europe that are not representative of meteorology, terrain, and dispersion in Texas and Oklahoma. As further discussed in another specific response, use of this data is not allowed and there is not enough information to support that the model performance issues seen in the CAPTEX and ETEX tracer studies also exist at exactly the same level in this analysis.[502] AECOM did not provide any information to substantiate that there were model performance issues with their modeling analyses for Coleto Creek specifically. Regardless, as we previously discussed, the 0.5 delta-dv is not necessarily a safe harbor from being considered for RP. As discussed in our TSD, Coleto Creek was identified as one of the largest visibility impairing sources at Class I areas in Texas and Oklahoma using CAMx, which is the model that CENRAP, Texas, and Oklahoma utilized in evaluating potential facilities and controls for RP.

AECOM's comment that EPA Region 6 had previously indicated that a visibility improvement (from removing impacts of all Arkansas sources) at WIMO of 0.2 delta-dv is too low for applying emission reductions for RP is comparing 'apples to oranges'. The CAMx source apportionment modeling results (0.2 delta-dv) is for all the sources in Arkansas and is for the 20% worst days, not the maximum 98th percentile day that CALPUFF results are given from AECOM. We note that the estimated visibility impairment contribution from ***all*** sources in Arkansas on Wichita Mountains was 2.3% of the total extinction. For proper context, compare this with the estimated 1.5% total contribution from just ***a single source*** (i.e. Big Brown) at Wichita Mountains. Modeling results showed that complete removal of Arkansas' contribution would result in the 0.2 dv improvement in 2018 at Wichita Mountains. Both Arkansas and Oklahoma agreed, through consultation, that additional reductions from sources in Arkansas for reasonable progress at Wichita Mountains was unnecessary, and EPA agreed that the consultation was satisfactory. The metric difference alone is not a reasonable comparison. Comparing one source's impacts with CALPUFF modeling to the impacts from a number of facilities in Arkansas, which would have a much lower individual impact if evaluated individually with CAMx, is not an accurate comparison. It can be concluded that the 0.2 delta-dv impacts when using CAMx and 20% worst metrics was small enough to rule out a state with many sources and the individual source impacts would be much smaller, but it is not reasonable to use this value in comparing with CALPUFF modeling results for a single facility.

[502] App. W, Section 7.2.9(a) "…Therefore, model calibration is unacceptable."

AECOM also points to an EPA notice of proposed approval for sources in Wyoming that EPA evaluated Wyoming's BART control selection. The first example given was where EPA indicated that visibility improvement from installation of SNCR of 0.19 delta-dv was not selected based on the incremental visibility improvement.[503] In this case EPA had evaluated two controls, LNB with OFA that resulted in a 0.13 delta-dv and SNCR controls that would result in 0.19 delta-dv visibility improvement. EPA was evaluating two controls, LNB with OFA which is cheaper and SNCR that is significantly more expensive and in this case EPA proposed concurrence with Wyoming's decision that LNB with OFA gave approximately 2/3 of the visibility benefit of SNCR for a much lower cost and the additional 0.06 delta-dv that SNCR would net was not worth the additional cost. The other EPA proposed approval of state BART was for General Chemical Boiler D NOx BART analysis. Wyoming proposed approval of BART controls as existing LNBs with SOFA added on and also evaluated SNCR and SCR as technically feasible. The cost effectiveness for the three options evaluated were $1280/ton for LNB with SOFA installed, $3176/ton for SNCR, and $3510/ton for SCR. LNB with SOFA netted a 0.07 delta-dv benefit. The incremental cost and benefits of SNCR over LNB with SOFA were $2913/ton and 0.05 delta-dv. The incremental cost and benefits of SCR over SNCR were $4342 and 0.05 delta-dv. EPA was proposing approval of Wyoming's BART decision because the incremental benefits over the 0.07 delta-dv for the BART controls of LNB with SOFA were only 0.05 del-dv for SNCR and an additional 0.05 for SCR but SCR annualized costs were $3,399,266 compared to the BART control selected that was less than $1 million a year ($943,549). In this case Wyoming determined and EPA proposed approval that the visibility benefits were not worth the additional costs. It should also be pointed out that these visibility and incremental visibility benefits were all based on CALPUFF modeling and not comparable to our CAMx modeling. In either case these visibility benefits are much lower than the commenters CALPUFF non calibrated model results. We also note that these evaluations were for NOx controls and not SO_2 and there was some concern that the visibility benefits from NOx controls could be overestimated. While CALPUFF model calibration is inappropriate, if you took the commenters approach the values above should also be scaled by the same factors, so they are not intellectually consistent in their argument that Coleto Creek's impact is below levels that EPA has determined to not control sources in other actions.

Lastly, the commenter referred in a footnote to a cite from EPA's Regional Haze Rule indicating that EPA proposed a target of no degradation to visibility would be defined as less than a 0.1 deciview increase. Again the commenter is mixing metrics and model results inappropriately. The 0.1 deciview was in the context of no degradation of overall visibility conditions on the specific subset of 20% best days (based on monitoring) using photochemical modeling results (such as CAMx).[504] The 20% best days are defined as having the lowest monitored light extinction at a Class I area, and not directly tied to the days when a CALPUFF model may indicate a high impact from a source. Given that these are the lowest monitored days it is unlikely that any day (or very few days) that the source (Coleto Creek) was impacting the Class I area as the transport winds that would transport Coleto Creek's emissions would also transport emssions from many other sources in Texas and/or Mexico to the respective Class I area. Therefore it is highly unlikely (see our responses to the Back trajectory comments) that any of

[503] 78 Fed. Reg. 34751-34752.
[504] Regional Haze Rules, FR Vol. 64 July 1, 1999 p. 35730-35734

the days (or few days) that CAMx would transport the impacts of Coleto Creek emissions to a Class I area would be one of the 20% best days thus the context of 0.1 delta-dv is not directly relatable. The 20% best days are the cleanest (lowest light extinctions) of the days monitored and the light extinction at a specific Class I area commensurate with 0.1 delta-dv on the cleanest days would result in a delta-dv much lower than 0.1 delta-dv on less clean days when emissions from Coleto Creek and other sources would transport to the Class I area of interest. Reference to the 1999 RHR where an increase of less than 0.1 dv on the 20% best days was "no degradation;" this applies to overall conditions, not impacts from a single source.

Even setting aside these issues, AECOM's flawed CALPUFF modeling results indicated impacts from Coleto Creek of 0.427 delta-dv, well above 0.1 delta-dv. (Table 6-1 from AECOM's CALPUFF modeling report is included at the end of this response). As discussed in our TSD and other responses we were specifically evaluating sources to identify the largest impacting sources on the 20% worst days using photochemical modeling which for a number of reasons was more appropriate than using CALPUFF on individual sources. It was this analysis that supports that Coleto Creek does have one of the largest impacts on visibility impairment on the 20% worst days and photochemical grid models are what CENRAP and Texas used to identify potential sources and potential benefits of controls for RP.

In summary, there are a number of issues with the commenter's CALPUFF modeling: (1) it utilizes the wrong years for modeling; (2) the modeling does not comply with the original BART CALPUFF modeling protocol that Texas and EPA approved; (3) modeling grid is too small and inappropriately sized horizontally and vertically; (4) a number of inappropriate issues with the CALPUFF inputs (emissions, background ozone data fill, ammonia levels, etc.); and (5) it uses some inappropriate assumptions, including the calibrating of modeling results based on limited analyses using other databases and locations that are not directly comparable to assessing impacts from Coleto Creek's units. The 0.5 dv threshold was utilized as a BART threshold, but our action is for reasonable progress and the 0.5 dv threshold was not set as an applicable threshold in the Regional Haze Rule for reasonable progress (see responses concerning costs and visibility benefit in this document). We used a photochemical grid model, which is more scientifically robust than the CALPUFF modeling system and is more appropriate for assessing visibility impacts and benefits on the 20% worst days and longer transport distances, such as the distances between Coleto Creek and the Class I areas in Texas and Oklahoma. We performed a multi-tiered analysis in order to identify the Texas facilities with the largest impacts on visibility at Class I areas (in Texas and Oklahoma) and Coleto Creek's facility did rank as one of the largest impacting sources of the more than 1,600 sources considered in Texas. As discussed in another response in this section, calibrating CALPUFF model output values is not contrary to EPA regulations. We discuss the commenters' use of the tracer studies in this section but their analysis and conclusions are flawed and not representative of the larger collection of information available that also is discussed in more detail in our reponse on the issue. In conclusion, based on our analysis with CAMx, we think both the visibility impacts of the sources and the benefits from the proposed emission reductions are large enough to be beneficial for reasonable progress.[505]

[505] Federal Register Vol. 64, No. 126 Thursday, July 1, 1999 p. 35721; "…specific control measures a State must implement in its initial SIP for regional haze. That determination can only be made by a State once it has conducted

Table 6-1 From AECOM's Report: CALPUFF Modeling Results (without Amendment for Over-prediction Tendency)

Class I Area	8th Highest Days Impact (delta-dv)				
	2004	2005	2006	3-Year Average	3-Year Peak
Big Bend National Park	0.293	0.240	0.140	0.224	0.293
Guadalupe Mountains National Park	0.149	0.199	0.170	0.173	0.199
Wichita Mountains Wilderness	0.427	0.389	0.314	0.377	0.427

15.k Consideration of Maximum Impacted Day or Other Days

General summary: Commenters stated that focusing on visibility impacts on the 20% worst days ignores larger impacts from these sources and other sources on other days. This approach is also inconsistent with CALPUFF modeling for BART of the maximum impact from a source for comparison with a 0.5dv threshold. Consideration of impacts on other days will identify sources for control analysis that will result in visibility improvement on other days and make progress towards the goal of natural visibility conditions.

Comment: Initial Source Apportionment Modeling for 38 Q/D Sources [Gray (0070) p.7]

Dr. Gray stated that the second method EPA used to narrow the scope of its review is source apportionment modeling. The metric used by EPA (the worst 20% of days, or W20 days) masks visibility impacts from sources that should have been considered in its control review. (FIP TSD, Section A.2)

Dr. Gray stated that the facilities that were identified as potentially large contributors to downwind Class I areas via the Q/D analysis were then evaluated by EPA "for meteorology/transport to determine which of the 38 facilities had large impacts during the average 20% Worst Days and also their impacts on specific days within the 20% worst days." Modeling was conducted for the 2002 and projected 2018 baseline emissions scenarios using the CAMx dispersion model (v5.41) with plume-in-grid (PiG) treatment of close-to-source emissions and a 12-km nested grid over Texas (within the 36-km grid previously used for

the necessary technical analyses of emissions, air quality, and the other factors that go into determining reasonable progress. As discussed in section II(F), because of the regional, multistate nature of visibility impairment in Class I areas,44 EPA recommends that these analyses and the determination of the extent of emissions reductions needed from individual States be developed and refined through multistate planning efforts using the best available technical tools, such as regional-scale modeling."

CENRAP modeling).

Dr. Gray stated that the EPA relied largely on the emissions inventory used by CENRAP[12] and made minimal adjustments based on definitive changes at the facilities in question, i.e. new units and new controls. EPA lowered emissions based on new controls and actual emissions; it did not adjust emissions upwards to reflect increases relative to the CENRAP modeled emissions. The model results indicated that sulfate is the main constituent that contributes to visibility impairment at the modeled Class I areas for both the best 20% (B20) and worst 20% (W20) days.

Dr. Gray commented that by restricting their analysis to the W20 days, for which a small subset of the 38 sources may dominate the impacts, visibility impacts from other sources that occur on days that are not part of the W20 will be "lost" in this analysis. A BART analysis for some of these "other sources" (which would focus on the maximum or 98th percentile[13] 24-hour average impact from each individual source) could potentially show significant visibility impacts (above the 0.5 dv threshold, for example). A moderate concentration impact on a moderately impaired day (not one of the W20 days) will have a larger dv impact than the same concentration increment on a W20 day.

According to Dr. Gray, the EPA's RPG analysis only identifies the source (or sources) that contribute significantly to the W20 days and therefore may only control the W20 days without sufficiently controlling emissions from other sources that contribute significantly to non-W20 days. The analysis also needs to consider non-W20 days and must confirm that the proposed controls are also effective during non-W20 days. After significant progress is made on reducing visibility impacts on the W20 days, including the proposed Texas controls (and presumably other reductions to meet the desired glide path), there may be other "uncontrolled" Texas sources that still cause significant impacts on other non-W20 days (which may then become the new W20 days – one cannot simply focus on the W20 days when evaluating a control plan). In the long-term, after the proposed controls are placed on the sources affecting the W20 days, many of the days slightly below W20 may still have large visibility impairments (if a different mix of sources contribute to their impacts than for the W20 days which were "controlled"). Furthermore, reasonable progress also requires a demonstration of no degradation on the best 20% days (B20 days).

Dr. Gray stated that the EPA should consider the merits of adding additional sources to the set of proposed sources for control based on a broader definition of "impacts" (i.e. on more than just the W20 days). Adding more sources to the more detailed apportionment modeling may result in greater visibility benefits on the W20 days and also on other non-W20 days, which ultimately will need to be controlled as well (lest they become W20 days). This approach is ultimately more consistent with the Clean Air Act mandate to ameliorate all anthropogenic visibility impairment.

Footnotes:

[12] EPA noted that the 2018 emission projections that were used in the CENRAP modeling were prepared in 2006 and were based on a number of assumptions at that time regarding future controls (including the CAIR program). The effect that current rules or proposed rules (including CSAPR and MATS) will have on 2018 emission rates is uncertain but appears to include few additional major SO_2 reductions. FIP TSD at A-16, A-45.

[13] The 98th percentile metric is typically used with CALPUFF. Results from CAMx have been interpreted using the 1st high value. 79 Fed. Reg. 74,848.

Comment: Commenter states that our analysis focused only on the visibility impacts from sources on the 20% worst days. Focusing only on average visibility impacts on the 20% worst days ignores larger impacts from the sources identified by EPA for additional analysis and impacts from other sources that may be significant on other days. An analysis for some sources not analyzed for controls using CALPUFF and focusing on the 98th percentile or maximum impacted day could potentially show visibility impacts above the 0.5 dv threshold applied to BART sources based on CALPUFF modeling to determine if the contribute to visibility impairment. The commenter states that EPA should also consider analyzing additional facilities for controls based on consideration of visibility impacts on days not included in the 20% worst days. While the controls EPA identified based on impacts on the 20% worst days will improve visibility on the most impacted days, there may be days with significant but slightly less visibility impairment outside of the 20% worst days that are impacted by different sources not addressed by this action. Those days could possibly become the new 20% worst days in the future. To improve visibility in a manner consistent with the Clean Air Act mandate to ameliorate all anthropogenic visibility impairment, impacts on days outside of the 20% worst should be considered.

Response: Under the reasonable progress and long-term strategy requirements of the Regional Haze Rule, the state or EPA in promulgating a FIP must establish reasonable progress goals that provide for improvement on the most impaired days, demonstrate that the established goals are reasonable and develop coordinated emission management strategies to achieve those goals.[506] The most impaired days are defined as the average visibility impairment for the 20% of monitored days in a calendar year with the highest amount of visibility impairment.[507] Because the rule focuses on improving visibility on the most impacted days, we believe it is reasonable and appropriate to focus our analysis on sources that significantly impact visibility on those 20% worst days. While we generally agree with the commenter that this may ignore visibility impacts from sources that impact visibility on days other than the most impaired days, visibility impairment on the current 20% worst days will be reduced as a result of controls implemented to address visibility impairment for this first planning period, and we believe that in the future the most impaired days may shift and be impacted by different sources. Analysis and development of future regional haze SIPs for future planning periods can aim to address those sources that impact any new set of most impaired days. Furthermore, targeted reductions at those sources that significantly impact the most impaired days will also result in improved visibility on days outside of the most impaired days.

CALPUFF modeling is used to provide estimates of the maximum visibility impacts from a source based on maximum emissions and simplified chemistry, irrespective of the relationship to the 20% worst days. It is possible that CALPUFF modeling of some of the subset of the 38 sources identified based on Q/d that were not analyzed for additional controls could show significant impacts on the maximum or 98th percentile day, but our CAMx photochemical modeling (which includes all emissions sources and has a realistic representation of formation,

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[506] 40 CFR 51.308(d)(1)
[507] 40 CFR 51.301, This is the definition in the Regional Haze Rule, but it contains an obvious typographical error. It should be interpreted to mean that visibility on the most impaired days is defined as stated.

transport, and removal processes of particulate matter that causes visibility degradation) provides additional information that allows for the identification of the sources with the greatest impacts on the 20% worst days.

15.l Context for Evaluation of Modeling Results (CALPUFF vs. CAMx)

Comment: Context for Evaluation of Modeling Results [Gray (0070) p.8]

Dr. Gray noted that the modeling performed for EPA's FIP TSD is inherently different from that performed in the context of most BART analyses, and thus the two cannot be straightforwardly compared. EPA's discussion underestimates the differences between the two, later leading it to undervalue the results of its modeling – both the impacts from Texas sources and the benefits of controlling them. (FIP TSD, Section A.3)

Dr. Gray described EPA's approach, noting that on pages A-35 through A-40 of the FIP TSD, EPA discusses five issues related to the comparison of the modeled visibility impact levels from Reasonable Progress (RP) analyses using CAMx (such as conducted by EPA for this FIP) to modeled visibility impacts from BART analyses that typically rely on the CALPUFF model.

First, according to EPA, an RP analysis is designed to control visibility impacts from contributing sources on peak (W20) days, whereas a BART analysis is designed to control peak visibility impacts from individual sources (whenever they occur). As such, the two types of analysis are addressing fundamentally different questions, which make the model results not directly comparable.

Second, different metrics are extracted from each type of analysis. The estimated visibility impact for an individual source when using the RP methodology will represent the visibility impact (extinction) from the source averaged over the W20 days (typically 72 days), whereas the BART analysis measures visibility impact in terms of the maximum or 98th percentile impact (typically the 8th highest daily averaged extinction for each year). As EPA noted, "RP metric results (average impact over the 20% worst days) could easily be several times less than the CALPUFF based BART metrics (1st or 8th high single day impact)."

Third, there is also a significant difference in how emission rates are input to the models in the two different analyses. BART guidelines require that maximum 24-hour (or hourly) average emission rates be modeled by CALPUFF over a 3 to 5 year period. The RP analysis uses annual average emission rates as input to the CAMx model, which is typically run for only one year. After examining this issue, EPA concluded that, "RP results using the same metrics would be 50% or less than the BART based results just due to the differences in emissions modeled for a facility."

Fourth, although CAMx uses a significantly more complex chemical mechanism than CALPUFF, EPA recognized that it is impossible to determine how the different chemical mechanisms would affect the modeled estimates of visibility impairment.

Fifth, the use of either “clean” or “dirty” backgrounds influences two parts of the analysis: modeling and determining deciview (dv) impacts or benefits. Generally, a “clean” analysis measures a source’s impact against natural background conditions, while a “dirty” analysis includes the impacts from other sources. EPA states that, “A facility’s visibility impairment impacts are substantially lower with a dirty background analysis compared to a clean background analysis.” With regard to modeling, EPA states that CALPUFF is a clean analysis; the natural background pre-cursors react only with emissions from that source. CAMx, on the other hand, typically models all sources together. As EPA describes, this “limits the amount of ammonia (and other pre-cursors) that are available to react with the specific facility emissions,” and can therefore lower the impact of any given source. EPA notes that “Due to the inclusion of all these other sources at 2018 estimated emission levels, the estimated impacts from a [given] source…are less than the results” would be with only the given source.

Converting extinction to deciviews is also affected by the chosen background. In the specific example presented in the TSD FIP, the exact same extinction impact yielded a deciview impact three times greater with a “clean” background analysis than with a “dirty” background analysis. EPA explains that “Results based solely on a degraded background, will rarely if ever demonstrate an appreciable effect on incremental visibility improvement in a given area. Rather than providing for incremental improvements towards the goal of natural visibility, degraded background results will serve to instead maintain those current degraded conditions. Therefore, the visibility benefit estimated based on natural or “clean” conditions is needed to assess the full benefit from potential controls.” EPA addresses the issue by calculating the deciview impacts based on annual average natural conditions.

Dr. Gray commented that, as EPA noted, it is difficult to compare the CAMx visibility results from its RP analysis to CALPUFF visibility results from a typical BART analysis. There are significant differences between the two that ultimately cannot be addressed in a generalized comparison. Nevertheless, since both analyses provide visibility improvements in terms of deciviews, it is worth discussing how comparable visibility impacts or benefits would be represented in the output metrics using each methodology.

According to Dr. Gray, EPA’s distinction between the policy purposes of BART and RP analyses (to reduce peak impacts from a source versus reducing impairment on the W20 days, respectively) obscures their shared underlying goal – the Clean Air Act goal of eliminating any anthropogenic visibility impairment. As discussed above, EPA’s emphasis on the W20 metric restricts its analysis and causes it to lose sight of sources that do contribute to visibility impairment. Furthermore, the difference that EPA asserts between the respective purposes of BART and RP is not always, or even typically, the case. In some previous source-specific RP analyses, EPA and states have used CALPUFF to model visibility benefits, and have used largely the same methodology as in BART modeling (i.e. use of 24 hour or hourly maximum emissions, a “clean” background condition, and a maximum or 98th percentile metric).[14]

Dr. Gray stated that the EPA addressed the need for using natural or “clean” conditions as background levels when estimating the benefits of controls by re-calculating the deciview improvements for the various control measures under consideration using average natural conditions (estimated from IMPROVE monitoring data). Tables A-6.2 through A-6.5 of the FIP

TSD show that the estimated visibility benefits (deciview improvements) based on annual average natural conditions are much greater than the estimated visibility benefits based on the "dirty" 2018 modeled background for each of the evaluated control measures. For example, from Table A-6.2 it can be seen that the cumulative dv improvements in all 19 modeled Class I areas using natural conditions are between 3.4 and 4.7 times higher than the dv improvements estimated using the modeled 2018 background for the same controls, and that the ratio is greater than 4.0 for all facilities (and control measures) other than Tolk (ratio = 3.4).

Dr. Gray stated, as EPA discusses, it is necessary to compare results against natural conditions because comparisons to the existing or near-term degraded background will obscure the benefit from controls. However, EPA's approach underestimates impacts in two ways. First, as EPA notes, its modeling in CAMx uses emissions from other sources, which can lower the extinction impact of each source. Second, EPA compares the resulting extinction values to annual average natural background conditions. Using the 20% best days of natural conditions produces impacts that are approximately 30% higher.[15]

Dr. Gray stated that even after the visibility improvements are re-calculated to consider "clean" background conditions, the estimated visibility benefits using EPA's RP analysis (CAMx) will still be lower than the benefits that would be estimated using a BART analysis (CALPUFF) for the same control measure due to a difference in metrics (BART relies on the maximum or 98th percentile impact from CALPUFF, whereas EPA's interpretation of its CAMx results consider the average impact during the W20 days), and also due to a difference in how the modeled emission rates are specified (annual averages versus maximum emission rates).[16] The model results shown in Tables A.4-1a-c can be used to compare the average and maximum modeled extinction on W20 days for the top ten impacting sources at WIMO, GUMO, and BIBE. As expected, the maximum impacts were much higher (by a factor of 2 to 3 or more) than the average for the W20 days. Because this is only the maximum impact during the W20 days (not necessarily the source's maximum impact overall) this still may underestimate the difference between EPA's presented results and those that would be used in a BART analysis.

Thus, according to Dr. Gray, there are at least two effects to combine: the difference in metrics (the use of maximum or 98th percentile dv improvements overall will be at least a factor of 2 greater than average dv improvements on the W20 days), and the modeled emission rate difference (using maximum emission rates, rather than average emission rates, will yield visibility impacts that are at least twice as large). Each of these provides a factor of two or more; thus, it can be concluded that the visibility benefits estimated from a BART analysis will be at least 4 times the visibility benefits obtained from an RP analysis (both using natural background conditions) for a comparable modeled source.

A spreadsheet containing a summary of the deciview improvement on average W20 days was provided with comment 0070.

Footnotes:

[14] *See e.g.* EPA's rulemakings regarding the regional haze plans for Montana, North Dakota, Arizona, and Colorado. 77 Fed. Reg. 23988, (Apr. 20, 2012); 76 Fed. Reg. 58570 (Sept. 21, 2011); 79 Fed. Reg. 9318 (Feb. 18, 2014); 77 Fed. Reg. 18052 (Mar. 26, 2012).

[15] See results in EPA's spreadsheet: "TX116-007-_33_Vis_modeling_summary.xlsx"

[16] EPA recognized this difference in suggesting that Texas use double the annual average emission rates in its BART CAMx modeling, as an estimate of maximum emission rates. Texas SIP, Appendix 9-5, p. 2-6.

Further, as described in the attached Report from Dr. Gray (0070), EPA undervalues the impacts from Texas sources and the benefits of controlling them in its comparison between the CAMx and CALPUFF visibility models. Visibility results from CAMx and CALPUFF are difficult to compare because they model visibility impairment in fundamentally different ways. Here, EPA relied in part on CAMx modeling results to screen out 29 sources from consideration for reasonable progress controls; EPA concluded that the CAMx modeling showed impacts that were too low to justify further analysis.

A rough comparison between the models shows that, in general, results obtained in CALPUFF would be at least 4 times as large as results from using the CAMx model. *See* Gray Report at 9-11. If EPA had considered the magnitude of the impact from these 29 sources using CALPUFF, or at least attempted to translate the CAMx results to CALPUFF results, the values would show significant impacts that should have led EPA to consider controls for these 29 sources.

Response: We agree that we and some states have used CALPUFF to model visibility benefits as part of the reasonable progress analysis, and have used largely the same methodology as in BART modeling (i.e. use of 24 hour or hourly maximum emissions, a "clean" background condition, and a maximum or 98th percentile metric). This approach can provide information on the relative visibility benefits of controls to inform the evaluation of cost-effectiveness as part of the four factor analysis and has the benefit that it is immediately comparable to modeling used for BART determinations. However, this approach models the impacts from the single facility with limited chemistry and focuses on the maximum impacts from a source rather than the visibility impairment on the 20% worst days. Due to the large time and resource demands of photochemical modeling, CALPUFF modeling has been used to provide information on visibility benefits of controls on individual sources for reasonable progress in some cases, but a full photochemical modeling approach using CAMx, as was utilized here, provides information to assess visibility impacts and visibility improvement for the 20% worst days. We discuss why we believe it is reasonable and appropriate to focus our analysis on sources that significantly impact visibility on those 20% worst days in more detail in the response above. We address the selection of the CAMx photochemical model in our analysis over the CALPUFF model is a separate response to comment in the modeling section of this document.

We agree with the comment that "modeling performed for EPA's FIP TSD is inherently different from that performed in the context of most BART analyses, and thus the two cannot be straightforwardly compared." In the FIP TSD, we discuss the difficulties in attempting to compare CAMx results for reasonable progress to CALPUFF model results for BART due to differences in models, model inputs, and metrics used.[508] While we estimate that due only to emission differences between CALPUFF modeling for BART and CAMx modeling for reasonable progress, CAMx model results for reasonable progress would be 50% or less, we also note that "due to chemistry mechanisms, pre-cursor concentrations, and other differences that would introduce variation in comparisons it is impossible to come up with an answer on how this

[508] FIP TSD at A-35

issue should be factored into a comparison of model results from CAMx and CALPUFF except to conclude that they would likely give differing values."[509] We agree with the commenter that many of these differences result in CAMx modeled visibility impacts and benefits that are much lower than the CALPUFF modeled visibility impacts and benefits relied on in other actions.[510] However, as discussed above and in the FIP TSD, due to all of the differences in the CALPUFF and CAMx model results, it is not possible to directly compare these model results. Therefore, it is not appropriate to use these comparisons and thresholds established for CALPUFF modeling for BART to determine the significance of the modeled visibility impairment and benefits using CAMx.

To evaluate the projected visibility benefits of controls from our CAMx modeling in our cost evaluation, we considered a number of metrics, such as change in deciviews under 2018 projected levels of air pollution at the three Class I areas and under estimated natural visibility conditions, change in light extinction, and change in the percentage of total light extinction. We also considered the visibility benefit of emission reductions from recent actual emission levels versus CENRAP 2018 projected emission levels at these sources. As we discuss further in our FIP TSD and in responses in our RTC document, to provide context regarding the significance of individual source impacts, we compared the individual source impacts with CENRAP source apportionment modeling results for impacts from all emission sources within a state and impacts from all emission sources within a state within a specific source type. We also compared these individual source impacts to the impact levels used by the states for triggering consultation with another state about its overall impacts, and the estimated range of anticipated visibility benefits resulting from required controls in other actions.[511] We evaluated recent FIPs that included controls for reasonable progress using CALPUFF modeling[512], and conservatively estimated that just based on emissions and metric differences, the visibility benefits in those actions would be well in the range of CAMx modeled visibility benefits for the required controls in this action.

As we discuss in detail elsewhere in this document where we respond to comments on our identification of sources to evaluate for additional controls, we utilized a 0.3% contribution to total visibility impairment on a unit-level basis to identify those sources with the largest visibility impacts. We then considered the estimated visibility benefit of controls alongside the four statutory factors to identify cost-effective controls that will achieve reasonable visibility benefits required during this planning period towards the national goal. We disagree with the commenter that we undervalued the results of our CAMx modeling. We discuss our determination concerning the impacts and potential visibility benefits from controls on the "other 29" sources that were screened out of additional control analysis in separate responses to comments in this section of this document.

Regarding the comment concerning the use of annual average natural background conditions versus the 20% best days of natural conditions, we agree that use of the 20% best days would result in higher calculated deciview impacts. We calculated the "natural background" using the

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509 FIP TSD at A-37

510 For example the use of maximum or 98th percentile dv improvements compared to average dv improvements on the W20 days and maximum emissions compared to average emissions.

511 FIP TSD at A-75

512 Wyoming 78 FR 34785-34789, Arizona 79 FR 52464-52477

20% worst days natural conditions, annual average natural conditions, and the 20% best days. Initially, we used the three available values for natural conditions to perform this calculation. We note that EPA provided additional guidelines with narrowly defined flexibility regarding the averaging period to be used for calculating natural background. These guidelines indicate that the states may use either annual average natural conditions or the average of the best 20% days for natural conditions.[513] Ultimately, we determined that the annual average value was the more appropriate, conservative approach for this specific analysis at this time. We note this is consistent with the selection of natural visibility background used by Texas in their BART screening modeling using CAMx.[514]

15.m Consideration Of Additional Controls And Impacts At Other Class I Areas

General summary: We received comments that we should have required additional controls on sources above what we proposed in our FIP to assure even greater reasonable progress. The commenter states that certain controls are reasonable and consistent with the proposed controls when impacts at Class I areas other than the Texas Class I areas and Wichita Mountains are considered. In addition, the commenters state that some specific facilities fall above the 0.3% impact threshold for impacts at other Class I areas and should have been evaluated for controls. Visibility impairment from the 29 sources not analyzed for controls are still significant and should be required. Commenters stated that EPA evaluated controls for Parish and Welsh but did not require controls despite significant visibility benefit and reasonable costs. In addition, EPA should have analyzed oil and gas sources and NOx controls for certain point sources in Texas.

15.n Impacts At Other Class I Areas and Consideration of Additional Controls

Comment: Impacts at Carlsbad Caverns [Earthjustice (0067) p.46]

Earthjustice et al. stated that degrading visibility conditions on the best days at Carlsbad Caverns provides further support for controls at those Texas sources that have the highest impacts at that Class I area. Tolk, Big Brown, Big Spring Carbon Black, Sommers-Deely-Spruce, and Harrington are the top 5 contributors to visibility impairment at both Guadalupe Mountains and Carlsbad Caverns, and each is over EPA’s 0.3% contribution threshold. Under the Regional Haze Rule, EPA must adopt emission limits necessary to ensure no further visibility degradation on the least impaired days at all Class I areas. Evidence in the record demonstrates that emission controls at Tolk, Big Spring Carbon Black, Sommers-Deely-Spruce, and Harrington are cost effective.

Earthjustice et al. concluded that given the impacts of these sources at Carlsbad Caverns, there is no reason not to require emission reductions at those sources.

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[513] Paisie, JW. . Regional Haze Regulations and Guidelines for Best Available Retrofit Technology (BART) Determinations. Memorandum to Kay Prince, Branch Chief EPA Region 4. July 19, 2006.
[514] Texas regional haze SIP, appendix 9-5

Response: We approved the RPG for the 20% best days at Carlsbad Caverns in a separate action on November 27, 2012 (77 FR 70693). The commenter presents the highest modeled visibility impacts on the 20% worst days but the comment is focused on impacts on the 20% best days. The commenter also incorrectly compares facility-wide estimated impacts to the unit level 0.3% threshold that we selected to identify sources for additional control analysis. We note that this action does require controls at Tolk and Big Brown that will result in some reduction in visibility impairment at Carlsbad Caverns on the 20% worst and 20% best days. Furthermore, the coal-fired JT Deely units at Sommers-Deely-Spruce complex are scheduled to shut down by 2018 further reducing visibility impairment at Carlsbad Caverns and other impacted Class I areas. Overall, visibility impairment on the 20% best days at Carlsbad Caverns from Texas sources is projected to decrease and therefore Texas sources are not anticipated to contribute to any degradation in visibility at Carlsbad Caverns on the 20% best days. Comments concerning additional controls at specific facilities mentioned above are discussed in more detail in separate response to comments. Comments concerning consideration of impacts at Class I areas other than Big Bend, Guadalupe Mountains, and Wichita Mountains are addressed below in this section.

Comment: Commenter 0053-26 (Sierra Club) questioned why the Caney Creek area in Arkansas is being left out of the rule.

[Gray (0070) p.15] Dr. Gray stated that the EPA's source selection failed to consider impacts at Class I areas outside of Texas and Oklahoma, both individually and cumulatively. Throughout the analyses in Appendix A, EPA has focused on the modeled visibility impacts at WIMO, BIBE and GUMO, despite the fact that the model estimated the visibility impacts at 16 additional Class I areas in the states surrounding Texas. Examination of Figures A.1-3a-h, as well as the CAMx modeling results (impacts on W20 days) at all modeled Class I areas, reveals that there were significant visibility impacts from Texas facilities at Caney Creek Wilderness Area (CACR), Carlsbad Caverns National Park (CAVE), Breton Wilderness Area (BRET), Salt Creek Wilderness Area (SACR), Hercules-Glades Wilderness Area (HEGL), Upper Buffalo Wilderness Area (UPBU), and White Mountain Wilderness Area (WHIT), in addition to the WIMO, GUMO, and BIBE. Utilizing more Class I areas in the analysis would assist in the identification of sources that contribute significantly to Class I areas other than WIMO, GUMO, and BIBE. The benefits of applying controls on these sources will not be apparent if the focus is only on those Class I areas.

In fact, in terms of percent contribution to extinction, Dr. Gray stated that 14 of the 38 modeled sources had the highest impacts at Salt Creek (SACR; 9 sources) or Caney Creek (CACR; 5 sources). These sources are listed below.

Table 3: Sources with Highest % Contribution at CACR or SACR[20]

Source	Facility	Unit[1]	Unit Adjusted[2]	Highest Impacted Class I Area
TEXARKANA MILL	0.15%	N/A	N/A	CACR
WELSH POWER PLANT	**0.59%**	**0.49%**	**0.38%**	CACR
HW PIRKEY POWER PLT	**1.05%**	**1.05%**	0.20%	CACR
MONTICELLO STM ELE STN	**1.76%**	**0.70%**	**0.70%**	CACR
MARTIN LAKE ELECTRICAL STATION	**1.77%**	**0.59%**	**1.16%**	CACR
KEYSTONE PLANT	0.06%	N/A	N/A	SACR
GOLDSMITH GASOLINE PLANT	0.11%	N/A	N/A	SACR
BORGER CARBON BLACK	0.18%	N/A	0.18%	SACR
FULLERTON GAS PLANT	0.20%	N/A	N/A	SACR
SHERHAN PLANT	0.25%	N/A	N/A	SACR
BORGER CARBON BLACK PLT	0.28%	N/A	0.18%	SACR
BIG SPRING CARBON BLACK	**0.58%**	0.19%	0.13%	SACR
TOLK STATION	**1.01%**	**0.51%**	**0.49%**	SACR
HARRINGTON STATION	**1.20%**	**0.40%**	**0.34%**	SACR

1. Estimated unit impacts based on number and size of units. The sources for which unit impacts were not estimated generally have multiple emission points.
2. Estimated unit impacts based on actual emissions per unit.

Dr. Gray stated that the facility and unit impacts above EPA's 0.3% threshold are listed in bold. Four of the facilities with units having the highest impacts at CACR or SACR were evaluated for additional controls (Martin Lake, Monticello, Tolk, and Welsh). The benefits from controls on these units will be underestimated if only WIMO, BIBE, and GUMO are evaluated. Additionally, when impacts to SACR are reviewed, Harrington has impacts above EPA's 0.3% threshold. Even by EPA's criteria, there is no justification for not reviewing the Harrington units for controls.

Dr. Gray stated that the summary tables in the TSD FIP that display the estimated visibility benefits at WIMO, GUMO, and BIBE for implementing source controls should also include the cumulative impacts for all 19 modeled Class I areas. For example, the cumulative impacts at all 19 Class I areas should be added to Tables 20 through 22 (Section 13) and Table A.6-5 (Section A.6; the suggested additional data for Table A.6-5 are shown below).

Footnote:

20 Based on spreadsheets "TX116-007-_29_Source_selection_analysis_TX_RH-1-31-14.xlsx" and "TX116-007-_30_Source_selection_analysis_TX_RH-es_1-31-14.xlsx", tab "All Class I areas data".

Earthjustice et al. commented that we should have considered cumulative visibility impacts and impacts at Class I areas outside of Texas and Oklahoma. Our CAMx model results also show significant impacts at Class I areas in Arkansas, New Mexico, Louisiana and Missouri. The commenter states that consideration of impacts at these other Class I areas would result in identification of additional sources with reasonable controls and that focusing the analysis on Texas and Oklahoma will result in a failure to identify these additional sources, and underestimate of the benefit of controls. The commenter provides a table showing that in terms of percent contribution to extinction, 14 of the 38 modeled sources had the highest impacts at

Salt Creek (SACR; 9 sources) or Caney Creek (CACR; 5 sources). Additionally, when impacts to SACR are reviewed, Harrington has impacts above the 0.3% threshold and therefore there is no justification for not reviewing the Harrington units for controls. The commenter also states that we should provide cumulative visibility benefits to the visibility benefit tables in the FIP TSD.

Table 3: Sources with Highest % Contribution at CACR or SACR[20]

Source	Facility	Unit[1]	Unit Adjusted[2]	Highest Impacted Class I Area
TEXARKANA MILL	0.15%	N/A	N/A	CACR
WELSH POWER PLANT	**0.59%**	**0.49%**	**0.38%**	CACR
HW PIRKEY POWER PLT	**1.05%**	**1.05%**	0.20%	CACR
MONTICELLO STM ELE STN	**1.76%**	**0.70%**	**0.70%**	CACR
MARTIN LAKE ELECTRICAL STATION	**1.77%**	**0.59%**	**1.16%**	CACR
KEYSTONE PLANT	0.06%	N/A	N/A	SACR
GOLDSMITH GASOLINE PLANT	0.11%	N/A	N/A	SACR
BORGER CARBON BLACK	0.18%	N/A	0.18%	SACR
FULLERTON GAS PLANT	0.20%	N/A	N/A	SACR
SHERHAN PLANT	0.25%	N/A	N/A	SACR
BORGER CARBON BLACK PLT	0.28%	N/A	0.18%	SACR
BIG SPRING CARBON BLACK	**0.58%**	0.19%	0.13%	SACR
TOLK STATION	**1.01%**	**0.51%**	**0.49%**	SACR
HARRINGTON STATION	**1.20%**	**0.40%**	**0.34%**	SACR

1. Estimated unit impacts based on number and size of units. The sources for which unit impacts were not estimated generally have multiple emission points.
2. Estimated unit impacts based on actual emissions per unit.

Response: We focused our control analysis on the Texas Class I areas and the Wichita Mountains. As discussed in more detail elsewhere, we are disapproving portions of the Texas and Oklahoma regional haze SIPs, including the Texas long-term strategy consultation, the Oklahoma reasonable progress consultation, the Oklahoma established reasonable progress goal for Wichita Mountains and the Texas reasonable progress/long-term strategy analysis and consideration of reasonable controls at Texas sources necessary to establish the Texas and Oklahoma reasonable progress goals. In developing a FIP to address the deficiencies in the Oklahoma and Texas SIPs, we had to analyze the visibility impacts and the availability of reasonable progress controls at Texas sources that impact visibility at the two Texas Class I areas and the Wichita Mountains and establish reasonable progress goals including consideration of an appropriate reasonable progress control analysis for these areas.

As discussed in the Texas TSD that accompanies the proposed FIP, during consultations for Arkansas and Missouri Class I areas, the participating states determined that the projected 2018 CENRAP modeling and other findings based on existing and proposed controls arising from local, state, and federal requirements indicated that these Class I areas were on the glidepath and projected to more than meet the URP goal for the first implementation period ending in 2018. Arkansas Department of Environmental Quality (ADEQ) and Missouri Department of Natural Resources (MDNR) determined that additional emissions reductions from other states were not necessary to address visibility impairment at their Class I areas for the first planning period, and we approved this portion of the AR RH SIP.[515] In this situation, based on consideration of the overall estimated visibility improvements anticipated by 2018, the relative impacts from Arkansas sources compared to the total impact from sources in other states, and the fact that additional reductions were anticipated from Arkansas sources due to BART, we found that this was reasonable. We note that we disapproved portions of the BART analysis and the reasonable progress analysis in the Arkansas RH SIP and have proposed a FIP to address these deficiencies, including BART and reasonable progress controls that will significantly reduce the visibility impairment to levels well below the uniform rate of progress at Caney Creek.[516] Similarly, Louisiana determined that impacts from Texas sources on their Class I areas were not significant enough to warrant additional controls for this planning period and we approved that determination. We also approved the consultation in New Mexico, as well as the RPGs for New Mexico's class I areas in a previous, separate action.[517] And at that time, we did not receive any comments on that final approval for consultation or comments concerning the impact from sources in Texas. As discussed in that action, based on our review of the New Mexico regional haze SIP, including the Western Regional Air Partnership (WRAP) modeling and emission inventories and additional reductions anticipated due to BART, we determined that the established RPGs for 2018 for the New Mexico Class I areas were reasonable and that "we anticipate additional visibility improvement in 2018 beyond the modeled visibility conditions."

In light of the determinations promulgated in these previous actions and the identified deficiencies in the Texas and Oklahoma Regional haze SIPs, we determined that it was appropriate to focus our analysis on the Texas Class I areas and Wichita Mountains and consider the impacts and potential visibility benefit from controls at these three Class I areas to address these deficiencies. We note that many of the sources identified by the commenter as having their largest impacts at Caney Creek and Salt Creek also have similar impacts at the Class I areas of interest and were included in our control analysis. We also note that visibility improvements will occur at Class I areas in Arkansas, Missouri, Louisiana and New Mexico as a result of the controls required in this action For example, the benefit at Caney Creek from the required controls were estimated at Big Brown (0.179 dv for each unit), Martin Lake (0.35 -- 0.44 dv), and Monticello (0.189 – 0.264 dv). In our analysis, we provided estimates of visibility benefits from the all the FIP required controls at a number of Class I areas in other states.[518] Specific comments concerning Pirkey and Harrington Station are addressed in separate responses to comments in this section. In focusing on the impact of Texas sources on Wichita Mountains and the Texas Class I areas, we addressed the identified deficiencies and establish RPGs for these three Class I areas considering our technical analysis and the emission reductions required in this action. We expect New Mexico, Arkansas, Louisiana, and Missouri to consider remaining impacts from Texas sources on their Class I areas including the information on visibility impacts from specific sources provided by our analysis, as well as incorporate corrections and updates to emission reductions in consultations and development of their regional haze SIPs for the next planning period.

[515] 77 FR 14604 (March 12, 2012)
[516] 80 FR 18944
[517] 77 FR 70693 (November 27, 2012)
[518] See TX-116-007-_33_Vis_modeling_summary.xlsx

Comment: EPA Inappropriately Eliminated Sources from Detailed Four-Factor Analysis of Reasonable Progress Controls. [Earthjustice (0067) p. 45]

Furthermore, even if the CAMx modeling results are considered alone, there would be significant visibility benefits at Big Bend, Guadalupe Mountains, and Wichita Falls associated with controlling some of the other 29 sources and some of the remaining 1600 sources. The total visibility impacts from the other 29 sources collectively account for similar visibility impacts as the total of the nine larger selected sources. While the other 29 sources each have smaller individual visibility impacts than sources like Martin Lake, Big Brown, or Monticello, as Dr. Gray explains, that is not surprising since the facilities EPA is proposing to control are amount the top 15 SO_2 emitters in the entire United States.

Earthjustice et al. stated that there are additional control measures or emission limitations that are very likely cost effective and could be readily implemented for Texas sources that met EPA's 0.3% contribution criteria to be evaluated. As discussed in more detail in the Stamper Report, these include: new SO_2 controls at Harrington station, upgraded SO_2 controls at Oklaunion Power Plant and H.W. Pirkey Power Plant, evaluation of control measures for PPG Industries Works No. 4, enforceable requirements for shutdown of two units at the Sommers-Deely-Spruce Complex, reasonable controls for Big Spring Carbon Black Plant, and pollution reduction measures for the TNP One Steam Electric Station. Given that most of the Class I areas impacted by Texas sources are not on track to achieve natural background visibility by 2064, EPA should amend its proposed FIP to include cost-effective pollution control requirements for the seven additional sources evaluated in the Stamper Report.

Response: Comments concerning additional controls at specific facilities mentioned above are discussed in more detail in separate response to comments in this section. Comments concerning the "other 29 sources" and "remaining 1600" are addressed in a separate response to comment below.

Comment: [Gray (0070) p. 3] Dr. Gray noted that EPA Region 6 has developed a technical support document (TSD) for the Oklahoma and Texas Regional Haze Federal Implementation Plans (FIP TSD). In the FIP TSD, EPA presents the technical support for its proposed control plan for Texas point sources of nitrogen oxides (NOx) and sulfur dioxide (SO_2). Dr. Gray provided an overview of EPA's visibility modeling, EPA's narrowing process for source selection, and EPA's evaluation of the visibility benefits from controls. Dr. Gray concluded:

> A. The controls EPA is proposing to require will provide significant visibility benefits and should be required in the final rule. EPA provides ample technical support for controlling the proposed 14 units at 7 facilities. In fact, EPA's approach ultimately undervalues the benefits from these controls.
>
> B. More sources should have been reviewed for emissions controls. EPA's analysis narrows its scope several times, limiting the sources that it reviews for controls from over 1600 to just 9. In so doing, it fails to evaluate reasonable progress controls to limit emissions responsible for more than half of the impairment from Texas point sources.

C. The controls EPA is proposing not to require will also provide significant visibility benefits and should be required in the final rule.

The overview of EPA's approach provided by Dr. Gray was not excerpted.

Response: We appreciate the commenter's support for the required controls. Our responses to specific comments from Dr. Gray on EPA's approach and additional controls are included elsewhere in this document.

Comment: Impacts at WIMO, GUMO, and BIBE [Gray (0070) p.13]

Dr. Gray stated that, in reviewing the impacts at WIMO, GUMO, and BIBE, EPA should have used a lower threshold and included more sources for control review. As discussed above, there are a large number of sources collectively contributing to cumulative impairment.

Dr. Gray stated that the CAMx modeling results show that these "other 29" sources all have much smaller individual visibility impacts than sources like Martin Lake, Big Brown, or Monticello. This is hardly surprising, since those facilities are among the top 15 SO_2 emitters in the US.18 However the combined impacts from the collection of 29 sources add up to a significant visibility impact at WIMO, GUMO, and BIBE (in addition to other Class I areas).

Dr. Gray stated that Figures A.3-1a-c in the FIP TSD illustrate that Texas sources are responsible for a substantial fraction of the extinction at WIMO, GUMO, and BIBE. Figures A.3-2 through A.3-4 show the estimated contributions to extinction at these three Class I areas from each of the 38 modeled Texas point sources. It can be seen from these figures, and by examination of the source contributions for the other 16 modeled Class I areas, that a large number of different sources have significant impacts in each of the Class I areas, including many facilities that were not included in the "small group of sources" (as selected in Section A-4) that were considered for control measure implementation.

According to Dr. Gray, collectively, the 29 sources that EPA eliminated contribute roughly 33%, 31%, and 24% of Texas's point source contribution at GUMO, WIMO, and BIBE, respectively (roughly 2-4% of the total extinction). These 29 sources alone contribute more than all of the point sources from any other state at each of these Class I areas.19

Dr. Gray stated that these figures clearly demonstrate that there would be additional visibility benefits at WIMO, GUMO and BIBE associated with evaluating controls for the "other 29" sources. The total visibility impacts from the "other 29" sources collectively account for similar visibility impacts as the total of the nine larger selected sources. At GUMO, the "other 29" sources are collectively responsible for almost 3% of the total visibility impact, which is more than the total impact from the nine selected sources combined.

By the same measure, Dr. Gray stated that the EPA's source apportionment work makes entirely clear it was justified in further reviewing the 9 sources it chose. These sources, individually and collectively, have significant impacts at WIMO, GUMO, and BIBE. Their impacts alone are greater than the point source impacts from any other state, and collectively their impacts have increased versus the emissions that were assumed by the original CENRAP modeling.

Dr. Gray stated that overall, Texas point sources contribute 14% to the total modeled extinction at WIMO. Examination of the modeled extinction (average of W20 days) at WIMO (Figure A.6-1e) reveals that the nine selected facilities account for about 6.6% of the total visibility impairment at WIMO. EPA's proposed control scenario (consisting of controls on seven of the nine selected facilities) would address 5.8% of the total visibility impairment at WIMO. The "other 29" Texas point sources account for 4.4%, and the "remaining 1600" smaller sources account for an additional 3.1% of the total visibility impairment at WIMO. By comparison, Oklahoma point sources contribute roughly 3.9%.

Dr. Gray stated that the model results for BIBE are shown in Figure A.6-1f. Texas point sources contribute 8% to the total visibility impairment at BIBE. The nine selected facilities account for about 2.1% of the average extinction at BIBE. The recommended controls would address 1.9% of total visibility impairment at BIBE. The "other 29" (not considered for controls) account for another 2.0% and "the other 1600" Texas sources account for the remaining 4.0% of the total visibility impairment at BIBE. Coleto Creek alone accounts for over 6% of the total Texas point source visibility impact.

Dr. Gray stated that Figure A.6-1g shows the model results for GUMO. Texas point sources contribute 9% to the total extinction (average of W20 days) at GUMO, of which the nine selected sources account for 2.4%. EPA's recommended controls would address 2.2% of the total extinction at GUMO. The "other 29" Texas point sources are responsible for 2.9% and the "remaining 1600" sources account for 3.4% of the total visibility impairment at GUMO. Tolk accounts for nearly 8% of the total Texas point source impact.

Dr Gray summarized these impacts at WIMO, BIBE, and GUMO in the exhibit below (Table 2 of comment 0070). Dr. Gray concluded that clearly, review of controls is warranted at all 9 sources EPA reviewed, along with the "other 29" sources it eliminated, and at least some of the 1600+ additional point sources.

Relative Contribution to Extinction Impacts
(Table 2 provided by commenter 0070)

Table 2: Relative Contribution to Extinction Impacts

	WIMO	BIBE	GUMO
9 sources (% addressed by EPA proposed controls)	6.6% (5.8%)	2.1% (1.9%)	2.4% (2.2%)
"Other 29" (eliminated by source apportionment)	4.4%	2.0%	2.9%
1600+ (eliminated by Q/D)	3.1%	4.0%	3.4%
Next highest state point source contribution	3.9% (OK)	2.6% (LA)	1.2% (NM)

Footnotes:
[18] According to EPA's 2011 National Emission Inventory (NEI), Martin Lake was the 7th largest emitter in US

(68,933 tpy), the Big Brown facility was the 8th largest SO_2 emitter in the US (64,198 tpy), Monticello was the 13th largest (54,439 tpy), and Parish was the 15th largest SO_2 emitter in the US (49,547 tpy).
[19] See FIP TSD at A-64 through A-66 and underlying data in spreadsheet "TX116-007-_23_extinction_charts.xlsx".

[Gray (0070) p.17] Dr. Gray stated that combining the results from the original 2018 CAMx modeling for the 38 facilities (Environ, 2013) with the results from the later 2018 modeling with high controls on the 9 selected facilities (Environ, 2014) provides clear evidence that more widespread emission controls would provide greater improvements in visibility at the Class I areas within the region. The average percent change to the extinction coefficient on the W20 days at four key Class I areas (BIBE, CACR, GUMO and WIMO) from the 9 selected facilities under the assumed high control level (see Section A.5) was applied to the modeled extinction coefficients from each of the remaining 29 of the original 38 facilities. Adjusted total extinction coefficients and deciview values were calculated and the change in deciview was examined. Note that this analysis assumes that controls similar to those considered in the high-control facility could be applied to all remaining 29 facilities, and that those controls would be equally effective.[21] The objective of this exercise was to examine whether more widespread controls are likely to result in further improvements in visibility. Table 2 summarizes the results of this scaling analysis.

Table 4: Estimated Future-Year Visibility (dv) for the 20 Percent Worst Days (W20) with High Controls on 9 versus 38 Facilities

Class I Area	2018 Baseline	2018 with High Controls on 9 Facilities	2018 with High Controls on 38 Facilities	Improvement in Visibility (dV) due to High Controls on 9 Facilities (21 Units)	Improvement in Visibility (dV) due to High Controls on 38 Facilities	Additional Improvement in Visibility (dV) (Estimated)[1]
BIBE	16.80	16.68	16.58	0.12	0.22	0.10
CACR	23.05	22.78	22.70	0.27	0.35	0.08
GUMO	16.36	16.21	16.04	0.15	0.32	0.17
WIMO	21.61	21.28	21.06	0.33	0.55	0.22

1. Improvement is here demonstrated against the 2018 background, not against natural conditions.

Dr. Gray stated that the scaling analysis results indicate even greater improvements in visibility when a larger number of facilities are subject to similar controls to those for the 9 selected facilities under the high-control scenario. Although the scaling was only done for the four key Class I areas, additional benefits at other Class I areas would also be expected.

Footnote:
[21] See the April 17, 2015 Technical Support Document to Comments of Conservation Organizations prepared by Vicki Stamper for detailed analysis regarding the availability of cost-effective controls for these sources.

Earthjustice commented that we should have reviewed controls on the "other 29" facilities that were eliminated from additional control analysis based on source apportionment results. Similarly, controls should have been evaluated from some of the "1600+" sources that were also eliminated from additional analysis based on the Q/d analysis. The commenter provides additional information on the percentage contribution from the "other 29" and the "1600+" and compares that to the percentage impact from nearby states, the percentage due to the 9 facilities evaluated for additional controls and the percentage addressed by controls proposed in the FIP. The commenter states that collectively these sources are responsible for a significant percentage of the total visibility impairment at WIMO, BIBE and GUMO and controls should have been considered for some of these sources. The commenter also provides a scaling analysis to assess potential visibility benefits from controlling additional sources out of the 38 initially identified by the Q/d analysis.

Response: We appreciate the commenter's support for the required controls and agree that the visibility impacts from the nine facilities identified for additional modeling for control analysis alone are greater than the combined point source impacts from any other individual state. Our Reasonable Progress Guidance discusses the steps to follow in identifying reasonable controls and establishing reasonable progress goals. The key pollutants contributing to visibility impairment at each Class I area should be determined. "Once the key pollutants contributing to visibility impairment at each Class I area have been identified, the sources or source categories responsible for emitting these pollutants or pollutant precursors can also be determined. There are several tools and techniques being employed by the RPOs to do so, including analysis of emission inventories, source apportionment, trajectory analysis, and atmospheric modeling" (page 3-1). As discussed in more detail in our proposal and in a separate response to comment in the modeling section of the RTC document, we determined that it was reasonable to focus our analysis on point sources of SO_2 and NO_X.[519] This was based on review of emissions and source apportionment results indicating that these sources were most responsible for anthropogenic contributions to visibility impairment. We then used a Q/d analysis to identify those sources with the greatest potential to impact visibility based on emissions and distance. Additional analysis using photochemical grid modeling was then completed to estimate the visibility impact from those sources. Based on consideration of facility level and estimated contributions to visibility from units at the modeled facilities, we identified those sources that had the greatest visibility impacts to analyze for additional controls. We agree with the commenter that collectively the "Other 29" sources and "1,600+" sources contribute a sizeable percentage of the total visibility impairment. However, on an individual basis, these point sources have lower contributions and smaller potential for visibility improvements relative to the nine facilities evaluated for additional controls. For example, the proposed controls on only 7 facilities address 5.8% of the total visibility impairment at the Wichita Mountains, while controls on all of the "Other 29" sources would address 4.4% of the total visibility impairment. Consistent with our guidance, we identified those key pollutants and sources with the greatest impact on visibility impairment for this first planning period. We also note that the "Other 29" includes impacts from San Miguel and the PPG Glass Works facility that were considered for additional controls, and the JT Deely units that are scheduled to shutdown in 2018.

The Regional Haze Rule requires the identification of reasonable progress controls and the development of coordinated emission control strategies in order to make reasonable progress towards the goal of natural visibility conditions. Faced with a very large and unwieldy universe of sources, we followed our guidance and chose an approach that focused on the portion of the universe of Texas sources that contributed the greatest impact to visibility impairment, by establishing a threshold of 0.3% contribution to total visibility impairment on a unit basis for this

[519] 79 FR 74838

planning period, thereby identifying a reasonable set of units at nine facilities to analyze for additional controls.[520] Our four-factor analysis concluded that controls on units at seven of the nine facilities analyzed for additional controls were required. As these controls are implemented, the percentage impact from those facilities not controlled will become larger (on a percentage basis) and will be analyzed in future planning periods. In other words, some of the "Other 29" will be identified as the greatest impacting sources and should in turn be analyzed for additional reasonable progress controls in a future planning period. This methodology can be used as a consistent procedure to identify facilities for additional control analysis in this and future planning periods and would ensure continuing progress towards the goal of natural visibility conditions. The USDA Forest Service commented that "the methodology and metrics that EPA used are the most comprehensive seen to date for any SIP/FIP in the country that we have reviewed, and should serve as a model for future efforts to consider the contribution and/or potential benefits of individual sources to visibility."

With regards to the scaling analysis presented by the commenter, we agree with the commenter that additional emission reductions would result in additional visibility benefit at the Class I areas. However, as the commenter states, the estimates presented assume that controls are technically feasible and cost-effective for all of these sources and that those controls will result in significant emission reductions for each facility. The additional estimated improvement requires significant emission reductions at multiple units across 29 facilities and at all but one Class I area (GUMO) results in less visibility improvement than controlling units at just 9 facilities. As discussed above, on an individual basis, the units at these 29 point sources have lower contributions and smaller potential for visibility improvements relative to the nine facilities evaluated for additional controls. Some of those remaining 29 sources may be identified for additional control analysis in future planning periods as the sources with the largest visibility impacts and potential for visibility benefit are controlled.

Comment: Other Considerations [Gray (0070) p.16]

Dr. Gray stated that some of the "other 29" sources were removed from consideration after the updated emissions inventory indicated that recent actual emission rates had been much lower than modeled emission rates. As with the Q/D analysis above, this source selection relies on actual emissions that are not enforceable. In particular, EPA relied on lower than modeled emissions to justify not reviewing controls for Oklaunion, Sommers Deely Spruce, Works No. 4, and HW Pirkey. These sources should also be included in the more detailed evaluations of control measure effectiveness; at a minimum, the emission levels that EPA relies on should be enforceable limits.

Dr. Gray stated that even though the RP analysis that is used to evaluate potential controls is done on a unit by unit basis, the threshold for significance impacts should still be the total facility impact, which is the approach EPA recommends that states take when determining whether a facility is subject to BART. Emissions from separate units at a single facility are typically

[520] As discussed elsewhere, San Miguel has already upgraded its scrubber and therefore it was not included in our modeling analysis of additional controls and not included among the nine facilities discussed here. In our FIP, we are finalizing our determination that San Miguel maintains an emission rate consistent with recent monitoring data.

transported together, which means that the impacts from each unit are effectively combined at all downwind receptors. Sources for which this is true (e.g. Big Spring Carbon Black) should be evaluated for controls.

Response: We respond to the comments concerning Oklaunion, Sommers-Deely-Spruce, Works No. 4, Pirkey, and Big Spring Carbon Black in separate responses elsewhere in this section. For a BART analysis, the combined impact from all BART-eligible units considering maximum actual emissions is compared to the selected threshold to determine if the facility is subject-to-BART. The five-factor BART analysis is then applied to the subject-to-BART sources, typically on a unit-by-unit basis, as potential controls would be installed on each unit. As discussed in more detail where we address comments concerning our identification of sources for additional control analysis, we initially evaluated facility-wide impacts in narrowing the list of sources for additional control analysis. We then examined estimated unit level impacts. We concluded that this was a reasonable way to identify sources to analyze for additional controls and established a 0.3% visibility impact threshold to identify those sources with the largest visibility impacts for additional evaluation. We also considered additional information to determine whether or not sources near this threshold should be included in our analysis. We agree with the commenter that the analysis of additional controls is typically done on a unit by unit basis. Our initial consideration of both facility-wide impacts and then ultimately, unit level impacts allowed us to identify a reasonable set of sources with the greatest visibility impacts to evaluate further for unit level controls. We believe that it is appropriate to consider actual emissions because these current emission levels are anticipated to continue in the near future. This approach is consistent with the methodology utilized in photochemical modeling to develop realistic projections of basecase and future visibility conditions and the approach for a BART five-factor analysis utilizing actual emissions rather than permitted emission limits. We discuss the use of recent actual emissions in more depth elsewhere in this section of the RTC document. Should actual emissions at a specific unit increase in the future, that will be considered during future planning periods.

Comment: EPA should impose pollution reduction requirements and/or emission limitations on additional sources to enable the class I areas affected by Texas sources to achieve greater reasonable progress towards the national visibility goal [Stamper (0068) p. 44, 56]

[Stamper (0068) p. 56] Stamper stated that there are additional control measures and/or emission limitations that are very likely cost effective and/or readily implemented for several Texas sources that met EPA's 0.3% contribution criteria to be evaluated. EPA should consider adoption of these controls and emission limitations as part of its reasonable progress control measures in its Texas FIP. It is likely that additional cost-effective and reasonable controls are also available for sources that do not meet EPA's 0.3% threshold, but that nonetheless cumulatively contribute to visibility impairment at the evaluated Class I areas. Given that most of the Class I areas impacted by Texas sources are not on track to achieve natural background visibility by 2064, EPA is justified in requiring implementation of cost effective pollution control requirements at the 7 sources discussed above.

[Stamper (0068) p. 44] Stamper stated that the EPA determined Texas sources to evaluate for controls based initially on an analysis of Q/D (i.e., annual emissions of a source/unit in tons per year, divided by the distance to the closest Class I area in kilometers). EPA used a Q/D value of 10 as a threshold for initial identification of sources to be evaluated for additional pollution controls and summed SO_2 and NOx emissions together for the Q values for each source/unit. FIP TSD at A-1. EPA states that the Q/D value of 10 is supported in the BART Guidelines and also has been suggested by the Federal Land Managers as an initial screening tool.[158] *Id.* at A-1 to A-2. EPA initially calculated the Q/D values based on the 2009 emission inventory, but then updated it with 2010 to 2011 emissions information. *Id.* at A-7. EPA identified 37 facilities as a result of these analyses which it then further evaluated for impacts during the average 20% worst days at the impacted Class I areas. *Id.* at A-15.

Stamper stated that the EPA used a threshold of 0.3% for a unit's impact on a Class I area to determine if further evaluation was necessary for reasonable progress controls. FIP TSD at A-49 to A-50. It is not clear how this 0.3% threshold was derived. Further, it must be noted that in other reasonable progress analyses performed by EPA, a value of Q/D over a specific threshold was sufficient to justify a four-factor analysis of reasonable progress controls (i.e., no modeling was done in addition to a Q/D analysis to select sources to evaluate for reasonable progress controls).[159] EPA also seemed to primarily focus on impacts at three Class I areas (Wichita Mountains, Guadalupe Mountains, and Big Bend) and did not fully consider impacts at other Class I areas in selecting sources to evaluate for reasonable progress controls.

Stamper stated that there were several facilities with Class I area impacts at or higher than EPA's 0.3% threshold which EPA ultimately did not evaluate for additional reasonable progress controls. Those sources include the Works No. 4 Glass Plant, Sommers-Deely-Spruce Power Station, Oklaunion Power Station, H.W. Pirkey Power Plant, Big Spring Carbon Black Plant, and Harrington Station. *Id.* at A-51. EPA did not evaluate these facilities for further controls for various reasons, most of which are not supportable. Below, we review these sources and the additional controls that should have been evaluated by EPA as part of its Texas regional haze FIP.

Footnotes:
[158] As discussed in the Visibility and Health Modeling Technical Support Document accompanying the Conservation Group's comments on EPA's proposed action, it is questionable whether using a Q/D value of 10 is sufficient for identifying all of the Texas sources that should be considered for control to address regional haze. EPA's BART guidelines state that "a larger number of sources causing impacts in a Class I areas may warrant a lower contribution threshold" for BART evaluations, and EPA should the same guidance to reasonable progress control evaluations. *See* 40 C.F.R. Part 51, Appendix Y, Section III.A.
[159] *See* EPA's rulemakings regarding the regional haze plans for Montana, Wyoming, and North Dakota. 77 Fed.Reg. 23988, (April 20, 2012); 24058-9; 78 Fed.Reg. 34738, (June 10, 2013); 3476376 Fed.Reg. 58570, 58624-5 (September 21, 2011).

Response: We appreciate the commenter's support for the required controls. We respond to specific comments concerning additional controls on units at the facilities identified by the commenter in separate responses to comments below. We respond to comments concerning our selection and use of a 0.3% contribution to total visibility impairment threshold and our use of a Q/d threshold of 10 in separate responses to comments elsewhere in this section of this document where we address comments on the identification of sources for additional control analysis. We discuss comments concerning impacts at other Class I areas in a separate response to comment above.

Comment: EPA Should Include Emission Limits on Additional Sources In Order To Make Greater Reasonable Progress. [Earthjustice (0067) p.2, 41]

[Earthjustice (0067) p.2] Earthjustice et al. stated that while EPA should require the controls it proposed in its federal plan, EPA should consider additional control measures as well. EPA's analysis demonstrates that significant emissions reductions at the Welsh and W.A. Parish power plants are cost-effective, would significantly improve visibility, and meet all four of the statutory factors for reasonable progress controls. EPA should require controls at the Welsh and W.A. Parish facilities.

In addition, Earthjustice et al. stated that the EPA failed to conduct a detailed analysis of potential controls at several facilities where controls are available that would result from a four factor reasonable progress analysis. In particular, EPA should conduct such analyses of the potential reasonable progress controls at the following facilities: Harrington Station, the Oklaunion Power Plant, H.W. Pirkey Power Plant, PPG Industries Works No. 4, the Sommers-Deely-Spruce Complex, the Big Spring Carbon Black Plant, and the TNP One Steam Electric Station. We likewise urge the agency to take a closer look at the cost-effective control measures available for reducing emissions from oil and gas sources in Texas.

[Earthjustice (0067) p.41] Earthjustice et al. stated that as demonstrated in the Gray (0070) and Stamper (0068) Reports, EPA's proposed FIP should be revised to include controls on additional sources. First, EPA should require SO_2 controls for the W.A. Parish and Welsh units. Second, EPA should conduct detailed four-factor analyses for the Harrington Station, the Oklaunion Power Plant, H.W. Pirkey Power Plant, PPG Industries Works No. 4, the Sommers-Deely-Spruce Complex, the Big Spring Carbon Black Plant, and the TNP One Steam Electric Station.

Response: We respond to comments concerning controls at specific facilities mentioned in the comment in a separate responses to comments below in this section.

Commenter 0053-11 stated that every single one of the coal-fired power plants in Texas should be considered.

While appreciative of the 230 tons of SO_2 emissions proposing to be cut, commenter 0053-25 suggested that the coal-fired industry should be completely dismantled considering global climate change.

Commenter 0053-41 stated that the best available SO_2 and NOx control technology should be required for all coal-burning facilities in Texas. Given that the TCEQ failed to develop a plan to mitigate pollution from Texas facilities that clearly contribute to haze in Texas and our neighboring states, it is appropriate for EPA to implement a plan to do so.

Commenter 0053-63 stated that coal plants in Texas have made more pollution than in other states. The commenter urged the EPA to move forward as quickly as possible and to include all Texas coal plants in the proposal.

Commenter 0054-39 (Sierra Club) applauded EPA's rule, and noted these power plants (e.g., Big Brown, Martin Lake, Monticello and others) are the largest polluters among 2,000 industrial plants in the state of Texas. The commenter stated that millions of people will benefit from the 230,000 tons of SO_2 reduction and any associated reductions in fine PM, sulfates, and nitrates. These units were built in the 1970's before NSR permitting, so regulation is overdue. The commenter stated that this rule could be strengthened by included more than 15 of the nearly 40 power plants in Texas.

Commenter 0053-26 urged EPA to expand in terms of coal plants, noting that 19 coal plants in Texas are some of those are the oldest and dirtiest coal plants in the country.

Comment: Multiple commenters made statements about Texas coal-fired power plant emissions. Commenters suggested that more coal-fired plants should be affected by the proposed action. There also were comments that these coal-fired power plants contribute to climate change and impact our health and environment, including smog. There was a comment that National Park Service data for Big Bend shows that at least a third of the haze pollution comes from sulfates. Other commenters noted that Texas sources produce more haze-causing pollution than Oklahoma and Arkansas combined.

Response: Elsewhere in this document, we address specific comments concerning our identification of sources to evaluate for additional controls and determination of required controls. We identified those sources with the greatest visibility impacts and considered the estimated visibility benefit of controls alongside the four statutory factors to identify cost-effective controls that will achieve reasonable visibility benefits required during this planning period towards the national goal. We agree that emissions from coal-fired power plants can affect climate change, impact our health and environment. We also agree with the National Park Service Data concerning sulfates. We also agree that Texas sources produce more haze-causing pollution than Oklahoma and Arkansas combined.

Harrington

Comment: EPA Must Consider Requiring New SO_2 **Controls At Harrington Station.** [Stamper (0068) p. 44]

The attached Stamper report to Earthjustice, et al comments stated that the EPA did not evaluate or propose any pollution controls for Harrington Station. Although EPA did not explain why Harrington Station was not evaluated further in its FIP TSD, it appears it was because none of the three Harrington units had impacts over 0.3%. *See* FIP TSD at A-52. EPA listed Harrington Station as ranking number 5 in terms of percent extinction causes in Guadalupe Mountains National Park, with a maximum contribution to the 20% worst days at the Park of almost 1%. Given EPA’s 0.3% threshold, this is a significant impact.

Further, Stamper argued that the EPA ignores its modeling that shows the Harrington plant's contribution to extinction at Salt Creek Wilderness Area in New Mexico is 1.2%.[160] On average, that equates to 0.4% contribution per each Harrington unit. Thus, the Harrington plant's impacts on the Salt Creek Wilderness Area alone should have been sufficient justification for analyses of pollution control measures for the Harrington Station using EPA's 0.3% threshold (including EPA's 0.3% impact per unit threshold).

In addition, Stamper noted that the Harrington units had a combined 0.828% contribution to extinction at the White Mountains Wilderness Class I area in New Mexico.[161] Overall at the 18 Class I areas modeled by EPA, the Harrington plant has the 5th highest cumulative contributions to extinction of the 38 facilities evaluated by EPA.[162] It is arbitrary for EPA to identify an extinction contribution threshold of 0.3% per unit, but then only consider that contribution based on impacts at three Class I areas (i.e., Wichita Mountains, Guadalupe Mountains, and Big Bend) when sources like the Harrington plant have the highest impact at other Class I areas. Since there is ample justification to conduct a pollution control evaluation for the Harrington Station, we have conducted an analysis for SO_2 controls at this currently unscrubbed plant, as discussed below.

Stamper stated that the Harrington Station consists of three EGUs, each with a generating capacity of 360 MW, that burn subbituminous Powder River Basin coal. None of the units have SO_2 controls, and all have low NOx burners with overfire air. Unit 061B has an ESP for PM control, while Units 062B and 063B each have baghouses for PM control.

Stamper stated that the EPA's cost spreadsheets were used to evaluate the cost effectiveness for new wet FGDs at 98% control, a NID™ circulating dry scrubber (CDS) at 98% control, an SDA at 95% control, and DSI at 50% control. The SO_2 control costs for the Harrington units were calculated using the same IPM cost modules used by EPA, but for the reasons discussed above, cost effectiveness was based on a 5-year annual average emissions baseline, 5-year annual average SO_2 rate in lb/MMBtu, and 5-year average gross heat rate and MW-hrs generated, based on actual operating data from 2009 to 2013. DSI was only evaluated at 50% SO_2 removal efficiency because, as stated above, EPA needs to provide additional justification to consider DSI as able to achieve 80-90% control, especially without significantly increasing particulate matter. The results of these analyses are provided in Table 16 of comment 0068.

SO_2 Control Cost Effectiveness Evaluation for Harrington Station Units 061B, 062B, and 063B[163] submitted by Stamper (0068, Table 16)

Harrington Unit	SO2 Control	Total Annualized Costs	Tons SO2 Removed	Cost Effectiveness
061B	Wet FGD	$18,160,560	5,057 tpy	$3,591/ton
061B	NID™ CDS	$17,340,645	5,057 tpy	$3,429/ton
061B	SDA	$17,069,443	4,848 tpy	$3,521/ton
061B	DSI at 50%	$8,846,370	2,738 tpy	$3,232/ton
062B	Wet FGD	$18,966,723	5,411 tpy	$3,505/ton
062B	NID™ CDS	$18,144,000	5,411 tpy	$3,353/ton
062B	SDA	$17,859,232	5,179 tpy	$3,448/ton
062B	DSI at 50%	$7,353,809	2,937 tpy	$2,504/ton
063B	Wet FGD	$18,848,870	5,640 tpy	$3,342/ton
063B	NID™ CDS	$18,052,095	5,640 tpy	$3,201/ton
063B	SDA	$17,771,828	5,408 tpy	$3,286/ton
063B	DSI at 50%	$7,439,016	3,052 tpy	$2,437/ton

According to Stamper, all of these costs are within the range of cost effectiveness values for controls required by EPA and states to meet regional haze requirements. Thus, these costs are reasonable. A NID™ CDS would provide the most cost effective SO_2 reductions. While DSI is most cost effective, that is based on only achieving 50% SO_2 removal, and thus it will not achieve as significant a level of SO_2 reduction as a scrubber at 95-98% SO_2 removal.

Stamper stated, as shown in EPA's FIP TSD, these SO_2 controls (particularly SO_2 scrubbers) have been used at numerous facilities. The energy and non-air quality impacts of these controls are widely known and have not generally been cited as justification for not installing SO_2 scrubbers. FIP TSD at 7-8. Further, the cost estimates provided in the above table address the energy costs, water costs, and waste disposal costs associated with these controls.

With respect to the remaining useful life of the Harrington units, Stamper was not aware of any planned retirements of the units that would justify assuming a shorter life of the pollution controls than 30 years. As discussed in EPA's FIP TSD, there is ample justification that a scrubber or DSI system will have a life of at least 30 years.

Stamper concluded that the Harrington units should be able to install SO_2 controls by the end of 2018.

Stamper stated that the EPA should have thus considered these cost effective controls for the three EGUs at Harrington Station. Based on a review of the four factors, all of SO_2 these controls are justified as reasonable progress controls. Such controls will reduce the Harrington station's contribution to regional haze at the Salt Creek and White Mountains Class I areas, as well as at Guadalupe Mountains National Park and at nearby Carlsbad Caverns National Park.

<u>Footnotes</u>:

[160] See TX116-07-_29_Source_selection_analysis_TX_RH-1-31-14.xlsx at "All Class I areas data" tab.

[161] Id.

[162] Id.

[163] *See* spreadsheets with filenames "Wet_FGD_Cost_IPM_TX_Sources_Revised_VS_Mar 27_2015.xlsx," "NID CDS_Cost_IPM_TX_Sources_VS_Mar 27_2015.xlsx," "SDA_Cost_IPM_TX_Sources_Revised_VS_Mar 27_2015.xlsx," and "DSI_Cost_IPM_TX_Sources_Revised_VS_Mar 27_2015.xlsx," at Exhibits 34, 35, 36, and 37 to this report.

Stamper/Earthjustice et al. state that we should have performed an additional control analysis on the Harrington facility. The modeled visibility impacts from these units exceeds the 0.3% visibility impact threshold at Salt Creek, cumulative impacts are significant, and it is arbitrary to establish a 0.3% threshold but then only consider impacts at Wichita Mountains, Guadalupe Mountains and Big Bend. The commenter also states that the maximum contribution to visibility impairment at Guadalupe Mountains from the facility approaches 1%. Stamper provides additional analysis of the cost and other factors associated with potential SO_2 controls. Estimated costs of controls range from approximately $2500/ton to $3200/ton for DSI at 50% control and $3200/ton to $3400/ton for NID™ CDS at 98 % control. Wet FGD and SDA were also analyzed. The commenter concludes that SO_2 controls are cost-effective and should have been considered for the Harrington units.

Response: As discussed in a separate response to comment above, to address the deficiencies we identified in the Oklahoma and Texas regional haze SIPs, we focused on identifying sources for additional control analysis that could potentially address those significant visibility impacts at Wichita Mountains and the two Texas Class I areas. While we acknowledge commenters concerns for other Class I area impacts, we had previously approved the consultation in New Mexico, as well as the RPGs for New Mexico's Class I areas in a previous, separate action.[521] The largest estimated percent of total visibility impairment on the 20% worst days for one of the Harrington units based on modeled emission rates were 0.137%, 0.056%, and 0.024% at Guadalupe Mountains, Wichita Mountains, and Big Bend, respectively. Percentage impacts based on recent actual emissions were even lower. Because the visibility impacts were well below a 0.3% threshold on a unit basis, we did not perform additional analysis for controls on these units for this planning period and focused on those sources with the largest impacts for this first round of SIPs at the Class I areas of interest. For future regional haze planning periods, we expect New Mexico to consider impacts from Texas sources including the information on visibility impacts from specific sources provided by our analysis, as well as incorporate corrections and updates to emission reductions in consultations and development of their RH SIPs for the next planning period.

Oklaunion

Comment: EPA Must Consider Upgraded SO_2 Controls at the Oklaunion Power Plant. [Stamper (0068) p.47]

Earthjustice/Stamper stated that the EPA did not evaluate the Oklaunion Power Station for reasonable progress controls, even though the 2018 modeling showed the Oklaunion Power Station contributed 0.567% to extinction at the Wichita Mountains Class I area. FIP TSD at A-51. It appears that EPA did not evaluate the Oklaunion Power Station for reasonable progress

[521] 77 FR 70693 (November 27, 2012)

controls because the "Estimated Facility Impact Adjusted to reflect 2008 to 2012 Avg. Emissions" was reduced to 0.286%.[164] *Id.* According to the emissions data provided by EPA, the Oklaunion Power Station had, on average, lower recent annual SO_2 emissions based on the average of 2008 to 2012 emissions (3,611 tpy averaged over 2008-2012 compared to 7,157.8 tpy that was modeled by CENRAP in the 2018 modeling[165]). However, it does not appear that EPA evaluated why SO_2 emissions at the Oklaunion Power Station have been lower than what was modeled in CENRAP's 2018 modeling and if such reductions were permanent. Further, EPA did not evaluate whether there were any limits on emissions that would ensure SO_2 emissions from the Oklaunion Power Station remain at the level of the 2008 to 2012 average rate of 3,611 tpy.

Stamper noted that a 2012 TCEQ Permit Amendment Technical Review document identifies the current allowable SO_2 emission rates of the Oklaunion Power Station as 14,936.0 tpy or 3,410 lb/hr (3-hour average).[166] This annual limit is more than twice as high as the 7,157.8 tpy SO_2 rate modeled by CENRAP in the 2018 modeling.

Stamper stated that the Oklaunion Power Station is a 720 MW coal-fired EGU that is equipped with a wet limestone scrubber for SO_2 control that was installed in 1986.[167] According to data submitted to EPA's Clean Air Markets Database, the unit is also equipped with low NOx burners (dry bottom only) and an electrostatic precipitator. Based on coal data submitted to the Energy Information Administration, the unit burns Powder River Basin subbituminous coal with uncontrolled SO_2 rate (based on sulfur in the coal) ranging from 0.73 lb/MMBtu to 1.07 lb/MMBtu over 2011 to 2013.[168] According to emissions data submitted to EPA's Clean Air Markets Database, the unit emitted SO_2 at a rate of 0.18 to 0.21 lb/MMBtu on an annual average basis over 2011 to 2013[169]. Thus, the unit's scrubber appears to be achieving about 75% - 80% SO_2 removal. The wet scrubber was designed for an 86.8% removal efficiency.[170] However, it also has provisions for bypass.[171]

Stamper stated that the maximum allowable emission rate for Oklaunion of 3,410 lb/hour (3-hour average) equates to an emission rate of 0.50 lb/MMBtu, given the 6,800 MMBtu/hr size of the EGU.[172] Based on the uncontrolled SO_2 emissions in the coal burned in recent years at the Oklaunion facility, the SO_2 limits require, at best, 53% SO_2 removal. Given all of this, the public has no assurances that the Oklaunion Power Station will emit SO_2 at rates lower than the 7,157.8 tpy SO_2 rate modeled by CENRAP in the 2018 modeling – in fact, SO_2 emissions could be much higher. Thus, EPA's decision to exclude the Oklaunion Station from a review of reasonable progress controls is not justified. The Oklaunion Station is ranked 6th of the Texas EGUs modeled by EPA in terms of extinction impacts at the Wichita Mountains Class I area, which is based on the modeling of an annual SO_2 emission rate that is less than half of the EGU's allowable annual SO_2 rate. EPA must evaluate scrubber upgrades for this EGU to ensure that its impacts on visibility at Wichita Mountains and other Class I areas are minimized.

Stamper noted, as discussed in EPA's FIP Cost TSD at pages 25-28, there are numerous options that are available for upgrades to wet scrubbers. Although EPA did not provide any of the cost information for the scrubber upgrades it evaluated, other scrubber upgrade cost data was publicly available in BART analyses. The costs per kW for those example scrubber upgrades was calculated, and it was found that the costs ranges from $1/kW up to a high of $182/kW for Cholla Unit 4 which replaced an existing scrubber tower with a new wet scrubber.[173] The average costs for scrubber upgrades in the publicly available data was $68/kW.[174] Excluding the maximum and minimum scrubber upgrade costs (which reflect a new scrubber retrofit at Cholla Unit 4 and the $1/kW scrubber upgrade costs at Hayden Units 1 and 2), the range of costs for scrubber upgrades based on the cost data we were able to collect was $12/kW to $144/kW. Given that these were all wet scrubber upgrades, it is reasonable to assume a similar range for a scrubber upgrade at the Oklaunion Power Station, which at 720 MW size equates to a range of total capital costs of $8,640,000 to $103,680,000 for scrubber upgrades. Using a cost recovery factor reflective of a lifetime of the upgraded scrubber of 30 years and a 7% interest rate, these costs equate to range of annualized costs of $696,384/year to $8,356,608/year.

Stamper stated, for the same reasons provided by EPA, it is reasonable to assume that at least 95% control can be achieved with upgrades to the Oklaunion wet scrubber. *See*, e.g., 79 Fed.Reg. 74877 (December 16, 2014), *see also* FIP Cost TSD at 27. Based on the worst case uncontrolled SO_2 in the coal in the last few years at the Oklaunion Power Station, 95% control would equate to an emission rate of 0.05 lb/MMBtu and 2,696 tons of SO_2 reduced per year, on average.[175] Thus, using the range of annualized cost of scrubber upgrades of $696,384/year to $8,356,608/year, the cost effectiveness of scrubber upgrades at the Oklaunion Power Station would likely be in the range of $258/ton to $3,099/ton. This range of costs is reasonable as it is within the costs per ton that EPA has found to be cost effective to meet BART and reasonable progress requirements.

Stamper stated that this is an estimate of the possible range of cost effectiveness for scrubber upgrades at the Oklaunion Power Station. Given that scrubber upgrades are most likely available, feasible and cost effective, EPA should undertake further analysis of the upgrades that could be done at the Oklaunion Power Station to reduce this plant's visibility impacts on the Wichita Mountains and other Class I areas.

Footnotes:

[164] EPA also stated that "if just the impacts from SO_2 were examined, the [Oklaunion] facility's impacts would be below the 0.3% value." FIP TSD at A-53. However, it must be noted that 87% of Oklaunion's contribution to extinction at Wichita Mountains Class I area are due to SO_2. *See* TX166-010-03_EPA_txbart3612k_Vis_2002_2018_PSAT_Projected_072913.xlsx at "fac data" tab.

[165] See TX116-07-_29_Source_selection_analysis_TX_RH-1-31-14.xlsx at "All ClassI" tab.

[166] *See* Permit Amendment, Source Analysis & Technical Review, Public Service Company of Oklahoma, Oklaunion Power Station, Permit Number 9015/PSDTX325M2, downloaded from TCEQ's Air/NSRPermits (NSRP) library available at https://webmail.tceq.state.tx.us/gw/webpub, Ex. 56. *See also* Emission Sources – Maximum Allowable Emission Rates, Permit Numbers 9015 and PSDTX325M2, dated February 3, 2012, downloaded from TCEQ's Air/NSRPermits (NSRP) library available at https://webmail.tceq.state.tx.us/gw/webpub, Ex. 57.

[167] *See* Burns & McDonnell, Utility FGD Design Trends, at 21 (Ex. 67).

[168] *See* Worksheet entitled "Pirkey and Oklaunion Coal Info" at Oklaunion tab, data from EIA-923 for 2011 to 2013 (Ex. 58).

[169] *See* Worksheet entitled Oklaunion and HW Pirkey CAMD 2000 to 2014, Ex. 59.

[170] *See* Burns & McDonnell, Utility FGD Design Trends, at 21 (Ex. 67).

[171] *Id.* at 22.

172 *See* Emission Sources – Maximum Allowable Emission Rates, Permit Numbers 9015 and PSDTX325M2, dated February 3, 2012 (Ex. 57).

[173] *See* SO_2 Scrubber Upgrade Cost Data worksheet (Ex. 48).

[174] Id.

[175] *See* Worksheet entitled Oklaunion and HW Pirkey CAMD 2000 to 2014, at Row 38, Ex. 59.

Response: We respond to this comment below where we address comments concerning controls on Pirkey, Oklaunion, and Twin Oaks.

H.W. Pirkey

Comment: EPA Must Consider Upgraded SO_2 **Controls at the H.W. Pirkey Power Plant.** [Stamper (0068) p.49]

Earthjustice/Stamper stated that the EPA also did not evaluate the H.W. Pirkey Power Plant for reasonable progress controls, even though the 2018 modeling showed the H.W. Pirkey Power Plant contributed 0.50% to extinction at the Wichita Mountains Class I area. FIP TSD at A-51. As with the Oklaunion Power Station, EPA did not evaluate the H.W. Pirkey Power Plant for reasonable progress controls because the “Estimated Facility Impact Adjusted to reflect 2008 to 2012 Avg. Emissions” was reduced to 0.097%. *Id.* According to the emissions data provided by EPA, the H.W. Pirkey Power Plant had, on average, lower annual SO_2 emissions in 2008 to 2012 average than what was modeled in the CENRAP modeling (3,809 tpy compared to 19,635 tpy that was modeled by CENRAP in the 2018 modeling[176]). However, it does not appear that EPA evaluated why SO_2 emissions at the H.W. Pirkey Power Plant have been lower than what was modeled in CENRAP’s 2018 modeling. Further, EPA did not evaluate whether there were any limits on emissions that would ensure SO_2 emissions from the H.W. Pirkey Power Plant remain at the level of the 2008 to 2012 average rate of 3,809 tpy. Moreover, the H.W. Pirkey Power Plant was modeled to have a much higher contribution to the Caney Creek Class I area than Wichita Mountains, with a 1.047 % contribution to extinction at Caney Creek Class I area.[177] It appears that EPA did not even consider these much higher impacts from the H.W. Pirkey Power Plant at the Caney Creek Class I area.

Stamper stated that the H.W. Pirkey Power Plant is approximately a 650 MW EGU that burns lignite coal and uses natural gas for ignition and flame stabilization. The EGU is equipped with a wet limestone scrubber, low NOx burners and overfire air, and an ESP, according to EPA’s Clean Air Markets Database. The wet limestone scrubber had a design SO_2 removal efficiency of 85% and has provisions for bypass.[178]

Stamper stated that a review of annual SO_2 emissions and calculated annual SO_2 rates (based on CAMD SO_2 emissions and heat input data) shows that SO_2 emissions have varied widely at this EGU:

> Between 2000 to 2005, annual SO_2 emissions varied from 11,699 tpy to 19,693 tpy.[179] SO_2 emissions decreased significantly beginning in 2006, but not consistently: Annual SO_2 emission rates varied from 0.07 lb/MMBtu to 0.29 lb/MMBtu, and annual SO_2 emissions varied from 1,953 tpy to 7,339 tpy.[180] Based on coal data submitted to the Energy Information Administration, the average uncontrolled SO_2 emission rate over 2009 to 2013 was 2.39 lb/MMBtu, assuming all sulfur in the coal is emitted.[181] Based on the annual average SO_2 rates being achieved in recent years, this means the H.W. Pirkey Power Plant has been achieving between 85%-95% SO_2 removal.

Stamper noted that while this is clearly a reduction in SO_2 emissions from years past, a review of the Title V permit for the H.W. Pirkey Power Plant shows that the most stringent SO_2 limit applicable to the EGU is 1.2 lb/MMBtu, based on the NSPS Subpart D.[182] With a heat input capacity of approximately 7,000 MMBtu/hr[183], this means that the annual allowable SO_2 emissions of the Pirkey plant are 36,792 tpy.

Given that it appears SO_2 removal efficiencies approaching 95% control have been achieved at the H.W. Pirkey Power Plant, Stamper stated that it seems very likely that upgrades to the scrubber have been made in recent years. Indeed, a Sargent & Lundy paper which is in the docket for the Texas Regional Haze FIP discusses recent upgrades of the wet scrubber at H.W. Pirkey Unit 1.[184]

Specifically, Stamper stated that this paper indicates that the natural oxidation wet limestone FGD at H.W Pirkey Power Plant has 4 absorber modules, each with 33% capacity, thus leaving one spare, with a full flow bypass duct and a reheat system to maintain a dry stack.[185] Modifications had previously been made to the FGD system to add an absorption tray to each absorber, add a dibasic acid (DBA) feed system, and reduced limestone grind size.[186] Additional modifications were made in 2006 to achieve 100% flue gas scrubbing, including installation of a new bypass damper and modifications to the existing outlet ductwork, modifications to the stack to provide for wet operation, modifications to the reagent preparation train, and alterations to the mist eliminator washing system.[187] According to the Sargent & Lundy paper, since 2006, the H.W. Pirkey Power plant has "achieved zero bypass."[188] Further, the system "operates regularly at 97% SO_2 removal efficiency...."[189] However, based on the CAMD SO_2 data discussed above, it does not appear that the Pirkey Plant regularly operates the scrubber to achieve 97% SO_2 removal efficiency. In fact, SO_2 removal efficiency based on an annual average basis is often around 85-86% removal efficiency. In the absence of a stringent SO_2 emission limit, it appears that the incentive to consistently reduced SO_2 emissions is not always present.

Thus, Stamper concluded that the EPA's decision to exclude the H.W. Pirkey Power Plant from a review of reasonable progress controls is not justified. As EPA has proposed for the San Miguel plant, EPA should propose a lower SO_2 limit than the currently applicable 1.2 lb/MMBtu limit for the H.W. Pirkey Power Plant to ensure that the recent scrubber upgrades are operated in a manner to consistently achieve low SO_2 emission rates. Based on the uncontrolled SO_2 emission rates (assuming all sulfur in the coal is emitted as SO_2), the uncontrolled SO_2 emission rates have averaged 2.39 lb/MMBtu over the last five years. At the minimum, EPA must impose an SO_2 limit reflective of 95% control, or 0.12 lb/MMBtu, at the H.W. Pirkey Power Plant to ensure that the upgraded wet scrubber is consistently maintained and operated to achieve the lowest SO_2 emission rates. Given that the upgraded scrubber can achieve 97% control, an emission limit of 0.12 lb/MMBtu provides more than an adequate compliance margin. Incorporating this limit into the Texas reasonable progress FIP will ensure that the H.W. Pirkey Power Plant's has a lower contribution to haze at the Caney Creek and the Wichita Mountains Class I areas.

Footnotes:
[176] See TX116-07-_29_Source_selection_analysis_TX_RH-1-31-14.xlsx at "All ClassI" tab.
[177] Id.
[178] *See* Burns & McDonnell, Utility FGD Design Trends, at 13-14 (Ex. 67).

[179] *See* Worksheet entitled Oklaunion and HW Pirkey CAMD 2000 to 2014, Ex. 59.
[180] Id.
[181] *See* Worksheet entitled "Pirkey and Oklaunion Coal Info" at Pirkey tab, data from EIA-923 for 2011 to 2013 (Ex. 58).
[182] *See* Federal Operation Permit, H.W. Pirkey Power Plant, November 22, 2010, at 30 (Ex. 60).
[183] *See* TCEQ's Permit Renewal Source Analysis & Technical Review, Southwestern Electric Power Company, HW Pirkey Power Plant, Permit Number 6269 and PSDTX64, at 3 (Ex. --
[184] *See* Caverly, Don et al., Results of FGD Upgrade Projects on Low-Rank Coals, in Docket ID EPA-R06-OAR-2014-0754-0008, filename TX166-008-063_Results_of_FGD_Upgrade_Projects_on_Low_Rank_Coals_EP2007.pdf.
[185] *Id.* at 3.
[186] Id.
[187] *Id.* at 4-7.
[188] *Id.* at 5.
[189] *Id.* at 7.

Response: We respond to this comment below where we address comments concerning controls on Pirkey, Oklaunion, and Twin Oaks.

Twin Oaks

Comment: EPA Should Have Considered Pollution Reduction Measures for the TNP One Steam Electric Station (Twin Oaks Power Plant). [Stamper (0068) p.54]

Stamper stated that although the TNP One Steam Electric Station (also known as Twin Oaks) did not make EPA's 0.3% extinction contribution threshold, EPA should have evaluated pollution control measures at this facility. Sulfur dioxide emissions in recent years have been significantly higher than what was modeled for this facility. The table below compares what was modeled for the TNP One Steam Electric Station compared to SO_2 emissions data in EPA's Clean Air Markets Database.

Table 18: TNP One Steam Electric Station (Twin Oaks) Actual Emissions Compared to 2018 Modeled Emissions.[207]

TNP One Steam Electric Station Unit	Year	SO2, tpy
1	2008	2,325
1	2009	2,471
1	2010	2,975
1	2011	2,768
1	2012	2,206
1	2013	2,272
1	2014	3,227
1	*Emissions Modeled for 2018*	*841*
2	2008	2,131
2	2009	2,235
2	2010	2,429
2	2011	3,210
2	2012	1,832
2	2013	3,061
2	2014	2,535
2	*Emissions Modeled for 2018*	*847*

Based on the table, Stamper stated that SO_2 emissions have been around three times as high as what was modeled for each unit. Had more accurate emissions been modeled for the TNP One Steam Electric Station, this facility would likely have shown contributions to haze closer to EPA's 0.3% threshold.

Stamper stated that the TNP One Steam Electric Station units are both fluidized bed units with limestone injection, according to data submitted to EPA's Clean Air Markets Database. Annual SO_2 emission rates have been quite variable over the past 7 years, ranging from 0.33 lb/MMBtu to 0.54 lb/MMBtu.[208] According to the Statement of Basis for the Federal Operating Permit for the TNP One Steam Electric Station, the units burn primarily lignite, subbituminous coal, and natural gas, but the units are also able to burn the following: oil filter fluff, tire-derived fuel, petroleum coke, 3-M pelletized tape, waste oil sorbet, waste crankcase oil, waste oil-based floor sweep, waste wax-based floor sweep, waste hydraulic oil, and waste oily rags.[209] A review of the Title V permit shows that the most restrictive limit on SO_2 emissions appears to be a 70% SO_2 control requirement when emissions are less than 0.60 lb/MMBtu, pursuant to NSPS Subpart Da.[210]

Stamper stated that the EPA should evaluate additional SO_2 control technology for the Twin Oaks Power Plant. For example, the units could add dry scrubbers similar to the Sandow 5 generating plant, which could improve SO_2 removal on these fluidized bed boilers to close to 99% control. EPA could also simply impose restrictions on burning of higher sulfur fuels, such as a prohibition or limits on burning petroleum coke and waste oil and/or EPA could require a blend of subbituminous and lignite coal to reduce inlet SO_2 emissions. Further, given that the

Twin Oaks units each have baghouses, DSI could be quite cost effective at providing further reductions in SO_2 from the current fluidized bed with limestone injection.

Stamper stated that given that the Twin Oaks facility has much higher impacts than evaluated by EPA, due to its SO_2 emissions being much higher than modeled and considering the units' high SO_2 emission rate for units with SO_2 controls, the Twin Oaks units should have been evaluated for reasonable progress controls as part of the Texas FIP.

Footnotes:
[207] EPA's Clean Air Markets Database Emission Data for Twin Oaks (TNP One Steam Electric Station) is attached as Ex. 64. The emissions modeled for 2018 are from TX116-07-_29_Source_selection_analysis_TX_RH-1-31-14.xlsx at "All Class I areas" tab.
[208] See EPA's Clean Air Markets Database Emission Data for Twin Oaks (TNP One Steam Electric Station), Ex. 64.
[209] *See* Statement of Basis of the Federal Operating Permit, Optim Energy Twin Oaks, LP, at page 2 (Ex. 65).
[210] *See* Federal Operating Permit for Optim Energy Twin Oaks, LP, April 4, 2011, at page 22 (Ex. 66).

Response: We respond to this comment below where we address comments concerning controls on Pirkey, Oklaunion, and Twin Oaks.

Comment: Stamper/Earth Justice et al. commented that we should have evaluated additional controls or reduced emission limits on Oklaunion Unit 1, H.W. Pirkey Unit 1 and Twin Oaks Units 1 and 2. Modeling results showed the percent of total extinction from the Oklaunion unit at Wichita Mountains was 0.567% and an adjusted impact based on 2008-2012 emissions of 0.286%. For Pirkey, modeling results show a contribution to extinction of 0.50% and an adjusted contribution of 0.097% at Wichita Mountains. The commenter also states that modeled impacts from Pirkey at Caney Creek are even larger than those modeled at Wichita Mountains. While the commenter agrees that actual emissions from the Oklaunion and Pirkey units are lower than the emission rate modeled, the commenter states that permitted emissions are much higher and that there is no assurance that actual emissions will continue at the current, lower rate. The commenter estimates that for Oklaunion, a scrubber upgrade to 95% efficiency would result in a reduction of approximately 2700 tons per year and estimates that the cost would likely be in the range of $258/ton to $3,099/ton. This range of costs is reasonable as it is within the costs per ton that EPA has found to be cost effective to meet BART and reasonable progress requirements. The commenter states that the scrubber at Pirkey has been upgraded and is capable of achieving higher emission reductions than under current operations. Therefore, similar to our proposed action on San Miguel, we should require an emission limit to ensure the scrubber is operated to obtain emission reductions consistent with a 95% control efficiency.
For Twin Oaks, the commenter states that although modeled visibility impacts fell below the 0.3% threshold, modeled emissions are a factor of 3 lower than actual emissions. The commenter suggests that because visibility impacts at actual emissions would be larger, we should have evaluated additional controls at this facility.

Response: Here we respond to comments concerning controls on Pirkey, Oklaunion, and Twin Oaks. As explained in our proposed action and FIP TSD[522], and discussed in a separate response to comment, we selected a threshold of 0.3% of the total visibility impairment on the 20% worst

[522] See FIP TSD at A-39

days to identify units for additional control analysis. This threshold was established to identify a reasonable set of units that had the largest visibility impacts for additional control analysis for this planning period. While impacts at the modeled emission rate of 7,157.8 tpy SO_2 from the 2018 CENRAP projected emissions for Oklaunion unit 1 exceeded that threshold, we noted that actual emissions (3,611 tpy annual average 2008-2012) are much lower and result in an estimated impact of 0.286%, which was less than the threshold. We also noted that a portion of that impact was due to nitrate emissions from the source and therefore, the percentage impact that was due to sulfur emissions would be even smaller than 0.286% and below the 0.3% threshold. This is in contrast to the other EGUs evaluated where sulfur impacts accounted for almost the entire visibility impact on the 20% worst days. Because this unit fell below the threshold based on our consideration of past actual emissions, we did not evaluate additional controls or revised permit limits for this unit for this planning period. Similarly, actual emissions for Pirkey Unit 1 (4263 tpy annual average 2008-2012) are much lower than the modeled emissions (19483 tpy) from the 2018 CENRAP projected emissions and result in an estimated impact of 0.097%, much lower than the 0.3% threshold and the unit at this facility was not selected for additional control analysis. Emissions data from CAMD show that since the scrubber upgrade in 2006, annual emissions at Pirkey have been much less than half the modeled emissions. As discussed in a separate response to comment in this section of the RTC document, we focused our analysis on impacts at the Wichita Mountains Class I area in Oklahoma and the two Class I areas located in Texas. We note, however, that the estimated percent contribution to visibility impairment at Caney Creek from Pirkey also falls below the 0.3% threshold (0.203%) when we consider actual recent emissions. As explained in detail in the FIP TSD[523] we determined it was necessary to consider recent actual emissions from EGUs due to uncertainty in 2018 projected emissions completed in 2006, the cost of SO_2 credits being lower than originally projected, and comments from Texas on a more recent IPM projection indicating that significant SO_2 reductions were not anticipated at these sources and no large SO_2 control projects were planned at most of the sources being evaluated.[524] We also noted that TCEQ has utilized recent emission data for EGUs when developing projected emissions for 2018 (and other future years) when developing ozone attainment demonstrations. While some facilities were considered for additional control because estimated percent contribution to visibility impairment from actual emissions were higher than the CENRAP 2018 projected levels and above the 0.3% threshold (e.g. Parish Plant, Welsh), Pirkey and Oklaunion were not evaluated further for controls or revised permit limits for this planning period as they fell below the threshold when recent actual emissions were considered. Any increases in actual emissions at these facilities in the future should be considered during development of the regional haze SIP for future planning periods. In future planning periods, as the facilities with the largest impacts are controlled, the percent of total visibility impairment due to these lower impact facilities will increase and they will need to be considered for additional control.

With regards to Twin Oaks, when we consider recent actual emission levels, the estimated contribution to visibility impairment still falls below the 0.3% threshold for these units (0.041%

[523] See FIP TSD at A-45

[524] Texas comments on Draft IPM modeling conducted by EPA for potential national rule making platform provided on June 26, 2014. In this docket materials as "TCEQ comment letter to EPA on draft modeling platform dated June 24, 2014. '2018 EMP signed.pdf.

at modeled emissions and 0.12% at actual average emissions for each unit). Because these units fell below our threshold we did not consider additional controls or revised emission limits at this facility for this planning period.

Works No. 4

Comment: EPA Should Have Evaluated Control Measures for Works No. 4
[Stamper (0068) p.51]

Stamper stated that the PPG Industries Works No. 4 glass plant was shown to contribute 0.863% to extinction at the Wichita Mountains Class I area. FIP TSD at A-51. According to EPA, the NOx emissions from Works No. 4 are the primary source of the plant's impacts on Wichita Mountains Class I area. FIP TSD at A-27. Further, each of the two units contribute more than EPA's 0.3% threshold to extinction at Wichita Mountains, with Unit 1 contributing 0.448% and Unit 2 contributing 0.415%. FIP TSD at A-52.

Despite those significant impacts, Stamper noted that the EPA decided to "drop this source from consideration this time." *Id.* EPA stated that the modeled NOx emissions were over five times higher than recent actual emissions and permit limits. *Id.* Based on the permit documents in EPA's docket, it appears that may be true for Unit 1, for which a NOx limit of 894.25 was proposed in a permit application for an oxy-fuel conversion at the Melting Furnace No. 1.[190] Unit 1's modeled NOx emission rate was 4,526.8.[191] However, the Melting Furnace Unit 2 is currently subject to a 2,947.49 tpy allowable NOx emission rate,[192] which is only 30% less than the 4,191.9 tpy NOx rate at which the Unit 2 melting furnace was modeled. Since the modeling of Unit 2 showed a 0.415% contribution to visibility impairment at Wichita Mountains, it is likely that modeling of Unit 2's lower allowable NOx rate would continue to show impacts at EPA's 0.3% contribution threshold.

As justification for not analyzing further controls, Stamper noted that the EPA also states that NOx controls had been installed at one of the two units. FIP TSD at A-52. That is true for Unit 1. According to the 2007 permit application for the Unit 1 oxy-fuel conversion at Works No.4, the NOx emissions were anticipated to be reduced from 2,889.84 tons per year to 894.25 tpy[193], a 69% reduction in emissions from baseline emissions. EPA should have evaluated a similar oxy-fuel conversion for Unit 2 at the Works No. 4 glass plant. Given that Unit 2 had over a 0.3% impact at Wichita Mountains and that PPG Industries apparently determined it was cost effective to convert Unit 1 to oxy-fuel firing, it seems likely that these same controls would be cost effective for Unit 2 as well. Such controls would likely reduced the Unit 2 melting furnace's impacts at the Wichita Mountains Class I area to well less than EPA's 0.3% contribution threshold.

Footnotes:
[190] *See* October 2007 Standard Permit Registration PPG Industries, Inc., Wichita Falls Plant, Line 1 Melting Furnace Oxy-Fuel Conversion, at 13 (in Docket ID EPA-R06-OAR-2014-0754-0008, filename TX166-008-096_PPG_-Std_Pmt_App_83132_part1.pdf).
[191] See TX116-07-_29_Source_selection_analysis_TX_RH-1-31-14.xlsx at "All ClassI" tab.
[192] *See* Permit Alteration Source Analysis and Technical Review, PPG Industries, Inc., at 1 (in Docket ID EPA-R06-OAR-2014-0754-0008, filename TX166-008-099_TRV-PPG_Industries_Permit898_Project178473.pdf).

[193] *See* October 2007 Standard Permit Registration PPG Industries, Inc., Wichita Falls Plant, Line 1 Melting Furnace Oxy-Fuel Conversion, at 11 (in Docket ID EPA-R06-OAR-2014-0754-0008, filename TX166-008-096_PPG_-Std_Pmt_App_83132_part1.pdf.

Stamper/Earthjustice et al. comment that additional analysis of controls should have been performed for the PPG Industries Works No. 4 glass plant. Modeled visibility impacts were above the 0.3% threshold for these two units. Actual emissions for unit 1 are much lower than modeled, but impacts from unit two would likely be above the 0.3% threshold even after accounting for actual emission levels. Furthermore, the recent implementation of NOx controls at unit 1 shows that controls are available, cost-effective, and can significantly reduce emissions and should be analyzed for unit 2.

Response: We agree with the commenter that modeled percent visibility impairment from the PPG Glass Works was above the 0.3% threshold for each of the two units. As discussed in section 4.3 of the FIP TSD and section VII.D.4 of the proposed FIP, we performed additional analysis and gathered additional information from the facility in order to consider recent emission reductions, revised permit limits and the potential for additional controls at this facility. Across the 2 units, average actual annual emissions are only 44% of the projected 2018 emissions for NOx and 81% of the projected SO_2 emissions.[525] Furthermore, permitted emission levels are now at levels below the 2018 projected emissions.[526] These reductions are the result of installation of an oxy-fuel conversion on furnace 1 and a more recent fuel conservation project that involved relocating the burners on furnace 2 at the time furnace 2 was shutdown for rebricking. We also noted that a furnace typically lasts ten to twelve years until rebricking is required. In consideration of the emission reductions already occurring at the facility, the anticipated lifetime of the furnaces, and the fact that furnace 2 had undergone rebricking within the past few years, we determined it was reasonable to not require additional controls at this time and encouraged the State of Texas to consider additional controls when Furnace No. 2 is scheduled for its next rebricking.

Sommers-Deely-Spruce

Comment: EPA Should Adopt Enforceable Requirements for the Shutdown of Two Units at the Sommers-Deely-Spruce Complex. [Stamper (0068) p.52]

Stamper stated that the EPA noted in its FIP TSD that the Sommers-Deely-Spruce complex contributes to extinction at the Wichita Mountains, Guadalupe Mountains, and Big Bend Class I areas in the range of 0.2-0.23%. FIP TSD at A-53. However, these percent contributions reflect only 40% of the modeled 0.569% contribution at Big Bend National Park and 40% of the 0.558% contribution at Wichita Mountains.[194] It appears that EPA may have discounted the modeled impacts due to recently installed pollution controls, but the FIP TSD does not provide

[525] See Table 31 of the FIP TSD for a summary of modeled, permitted and actual emissions.
[526] Standard Permit Registration, PPG Industries, Inc., Wichita Falls Plant, Account No. WH-0040-R. Submitted by ENVIRON, dated October 11, 2007; Permit Alteration, Permit Number: 898, Flat Glass Manufacturing Facility, Wichita Falls, Wichita County, Regulated Entity Number: RN102522950, Customer Reference Number: CN600124614, Account Number: WH-0040-R

justification for only evaluating 40% of this facility's impacts when considering whether to evaluate the facility for additional reasonable progress controls.

Stamper stated, based on the original modeling, the Sommers-Deely-Spruce Complex contributed 0.3% or more at the Salt Creek Wilderness Class I area and the White Mountains Wilderness Class I area in addition to the Wichita Mountains, Guadalupe Mountains, and Big Bend Class I areas.[195] Thus, these units have widespread impacts on regional haze. In fact, before EPA's adjustment to the modeled impacts, the facility was the 6th highest in cumulative Class I area impacts of the 38 sources modeled by EPA.[196]

However, Stamper stated that the EPA did not evaluate or propose additional controls because the owners of the Sommers-Deely-Spruce complex have indicated that two "of their dirtiest sources" will be shut down by 2018. FIP TSD at A-53. Given the widespread impacts from the Sommers-Deely-Spruce facility and that EPA is relying on these unit shutdowns to exclude this facility from further review for reasonable progress requirements, EPA should adopt requirements for these units to cease operation by 2018 as part of its FIP.

Footnotes:
194 *See* TX116-07-_29_Source_selection_analysis_TX_RH-1-31-14.xlsx at "All Class I areas" tab, at cells U77 and U78.
195 *Id.* at "All Class I areas" tab.
196 Id.

Stamper/Earthjustice commented that we noted the FIP TSD that the Sommers-Deely-Spruce complex contributes to extinction at the Wichita Mountains, Guadalupe Mountains, and Big Bend Class I areas in the range of 0.2-0.23%. However, these percent contributions reflect only 40% of the modeled 0.569% contribution at Big Bend National Park and 40% of the 0.558% contribution at Wichita Mountains. The commenter states that it appears we discounted the modeled impacts due to recently installed pollution controls, but the FIP TSD does not provide justification for only evaluating 40% of this facility's impacts when considering whether to evaluate the facility for additional reasonable progress controls. The commenter states that the modeled impacts from the Sommers-Deely-Spruce Complex contributed more than 0.3% at Salt Creek and White Mountains in addition to Wichita Mountains, Big Bend and Guadalupe Mountains. Due to these visibility impacts we should have included a requirement for the shutdown of the two J.T. Deely units in the FIP.

Response: The commenter confuses unit level impacts with facility level impacts. The Sommers-Deely-Spruce complex is comprised of 6 units: two gas-fired units (O.W. Sommers), two older coal-fired units (J.T. Deely), and two newer coal-fired units (J.K. Spruce). The modeled percentage of total visibility impairment from the ***facility*** are 0.558% at Wichita Mountains and 0.569% at Big Bend. Each of the J.T. Deely units are responsible for approximately 40% of the total SO_2 emissions from the facility so in estimating the maximum ***unit*** level impacts from the individual units at this facility, we applied a 40% factor. On a ***unit*** basis, the estimated percentage of total visibility impairment is 0.223% at Big Bend and 0.227% at Wichita Mountains. Unit level impacts at all other modeled Class I areas were below these levels. As explained in our proposed action and FIP TSD, and discussed in detail in a separate response to comment, we selected a threshold of 0.3% of the total visibility impairment (total extinction) on the 20% worst days to identify units for additional control analysis. This threshold was established to identify a reasonable set of units that had the greatest visibility impacts for additional control analysis for this planning period. The units at the Sommers-Deely-Spruce complex all fell below this 0.3% threshold and we determined no additional control analysis was necessary for this planning period. However, we noted in the FIP TSD that because the two J.T. Deely units impacted Wichita Mountains, Big Bend and Guadalupe Mountains at levels around 0.2%, we considered whether further evaluation of controls on these units was appropriate. As we noted in the FIP TSD, Sommers-Deely-Spruce has indicated that the two J.T. Deely units are scheduled to be shutdown by 2018, further supporting our decision that no further analysis was needed if in fact these units would be retired in the first planning period.[527]

Big Spring Carbon

Comment: EPA Should Have Evaluated Reasonable Controls for the Big Spring Carbon Black Plant. [Stamper (0068) p.52]

Stamper stated that, according to EPA's FIP TSD, the Big Spring Carbon Black Plant was modeled to have a contribution to extinction of 0.482% a Guadalupe Mountains Class I area, 0.304% at Wichita Mountains Class I area, and 0.173% at Big Bend Class I area. FIP TSD at A-51. According to the modeling results presented in EPA's "Source Selection Analysis" spreadsheet, the Big Spring Carbon Black Plant was also modeled to contribute 0.579% at Salt Creek Class I area, 0.541% at White Mountains Class I area, 0.482% at Guadalupe Mountains Class I area, and 0.304% at Wichita Mountains Class I area.[197] Other Class I areas at which the Big Spring Carbon Black plant was modeled to contribute between 0.2% - 0.3% include the Pecos Wilderness Class I area, Wheeler Peak Wilderness Class I area, and the San Pedro Parks Class I area.[198] In fact, the Big Spring Carbon Black Plant's cumulative impacts on visibility at the 18 Class I areas modeled shows that it has the 7th highest cumulative impacts of the 38 facilities evaluated by EPA.[199]

Stamper stated that the EPA acknowledged that the Big Spring facility impacts were above 0.3% and stated that there are 9 units with sizeable emissions. However, EPA did not evaluate the Big Spring plant for reasonable progress controls, because "it was unclear whether [the 9 units] could be controlled through one scrubber or would be treated as 9 units with individual impacts much smaller." FIP TSD at A-54. It appears that EPA did not investigate SO_2 scrubber controls or other reasonable progress controls for the Big Spring Carbon Black plant any further. Given that the Big Spring Carbon Black plant contributes at least 0.3% to extinction at four Class I areas and overall is ranked 7th in terms of cumulative visibility impacts at 18 Class I areas, EPA's decision not to evaluate this plant for controls is not justified.

Stamper stated that the total SO_2 and NOx emissions modeled for the Big Spring Carbon Black Plant were 1,135 tpy for NOx and 17,823 tpy for SO_2.[200] The Big Spring Black Carbon Plant's actual emissions in recent years have been reported to be lower than these levels, as shown in the table below, although the plant also appears to have significant startup and shutdown emissions and it is not clear whether those emissions are included in the reported annual emissions.

[527] See FIP TSD at A-53

Table 17. Big Spring Carbon Black Annual Emissions[201]

Year	SO2, tpy	NOx, tpy	PM10, tpy
2013	7,898	588	70
2012	8,508	565	70
2011	6,973	601	74
2010	7,970	609	75
2009	8,877	567	70
2008	8,123	551	68

Stamper noted, according to permit documents available via TCEQ's website, carbon black is produced at the Big Spring plant in three units using the oil furnace process. TCEQ describes the carbon black production process at the Big Spring plant as follows:

> The oil furnace process produces carbon black by the incomplete combustion of feedstock oil. The reactor is heated by the combustion of natural gas with low excess air in the combustion section of the reactor. The feedstock oil is injected into the reactor downstream of the combustion section, where it undergoes incomplete combustion, producing carbon black, reduced sulfur compounds (COS, CS2, H2S), acetylene, and carbon monoxide. The reactor effluent consists of carbon black suspended in the reactor tail gas. The carbon black is filtered from the tail gas, pelletized, dried, and stored. A portion of the tail gas is burned in the dryers. During normal operating conductions, excess tail gas in combusted in an incinerator."[202]

According to the Title V permit, Stamper noted that there is one incinerator stack (Unit 13A) and two dryer stacks (Units 12A and 7A), as well as three flares and 6 feedstock tanks.[203] Thus, there are three units, not nine as EPA asserted, that EPA could have evaluated for SO_2 controls. According to TCEQ, approximately 35% of the tail gas is used for the dryers[204], thus 65% of the tail gas should go to the incinerator. At the minimum, EPA should have evaluated the addition of an SO_2 scrubber for the incinerator and whether the flue gas from all three emission points (the two dryer stacks and the incinerator) could be routed through one scrubber. Further, EPA should consider imposing strict limitations on the operations of the flares, which currently are allowed to be used for up to 792 hours (almost 10% of the year) each.[205] If a scrubber is installed on the incinerator and if venting tail gas to the flares is limited, that will ensure the scrubber is utilized to reduce SO_2 as much as possible. Last, the feedstock oil sulfur content is allowed to be as high as 4.0 (annual average) - 4.5% (instantaneous).[206] That is a very high allowable sulfur content. EPA should have evaluated whether lower sulfur content oil could be used as feedstock to reduce overall SO_2 emissions.

Stamper concluded that the Big Spring Carbon Black Plant clearly meets EPA's criteria for pollution control evaluation based on its contribution to extinction at 7 different Class I areas. Given the significant and widespread regional haze impacts of the Big Spring Carbon Black plant and given that there are really only three units to consider for SO_2 controls instead of 9 units as EPA indicated in its FIP TSD, EPA does not have adequate justification for failing to evaluate reasonable progress controls for this facility, especially in light of the fact that there are really only three units to consider for SO_2 controls instead of 9 units as EPA indicated in its FIP TSD. Controlling SO_2 emissions at the Big Spring Carbon Black plant would have wide reaching benefits for the Class I areas impacted by this plant.

Footnotes:
[197] *See* TX116-07-_29_Source_selection_analysis_TX_RH-1-31-14.xlsx at "All Class I areas" tab.
[198] Id.
[199] Id.
[200] Calculated from emissions listed in "AllClassI" tab in TX116-07-_29_Source_selection_analysis_TX_RH-1-31-14.xlsx.
[201] This data was collected from TCEQ's Annual Contaminant Summary Reports, available through TCEQ's Central Registry Query at http://www15.tceq.texas.gov/crpub/index.cfm?fuseaction=home.welcome.
[202] *See* TCEQ, Construction Permit Amendment, Review Analysis & Technical Review, Big Spring Carbon Black Manufacturing Plant, Permit No. 6580 at 7th page (Ex. 61).
[203] *See* September 25, 2012 Federal Operating Permit for Sid Richardson Carbon Big Spring Facility, at 16th page (Ex. 62).
[204] *See* Statement of Basis of the Federal Operating Permit for Sid Richardson Carbon Company Big Spring Facility at page 3 (Ex. 63).
[205] *See* TCEQ, Construction Permit Amendment, Review Analysis & Technical Review, Big Spring Carbon Black Manufacturing Plant, Permit No. 6580 at 2nd page (Ex. 61).
[206] *Id.* at 7th page.

[NPS (0077) p. 2-3, 4-5] And, according to the NPS, while Big Spring Carbon's facility impacts were above EPA's 0.3% visibility impact threshold, EPA did not include Big Spring in its additional visibility modeling because" ... it was unclear whether [emissions] could be controlled through one scrubber or would be treated as 9 units with individual impacts much smaller." Instead, EPA should have conducted a four-factor analysis to resolve these "unclear" issues.

We received comments from NPS and Stamper/Earthjustice et al. that we should have performed a four factor analysis to evaluate controls at Big Spring Carbon. The commenters state that the modeled visibility impact for Big Spring was above the 0.3% threshold used to identify sources for additional control analysis at Wichita Mountains and Guadalupe Mountains. Furthermore, impacts at some other Class I areas were greater than 0.3% or in the 0.2-0.3% range, and cumulatively, impacts from Big Spring were seventh highest compared to impacts from other modeled facilities. The commenters also state that we did not evaluate the Big Spring plant for reasonable progress controls, because "it was unclear whether [the 9 units] could be controlled through one scrubber or would be treated as 9 units with individual impacts much smaller." FIP TSD at A-54. Earthjustice provided a description of the facility from the permit and identified that according to TCEQ, approximately 35% of the tail gas is used for the dryers, thus 65% of the tail gas should go to the incinerator, and there are only three units to control. The commenter continues that we should have evaluated a scrubber for the incinerator, investigated if the emissions from the dryers and incinerator could be routed to one stack for control, and considered limiting flaring and the sulfur content of the feedstock. The commenter also notes that actual emissions from the facility are lower than the emissions modeled by us. The commenter concludes that the facility meets the criteria for additional control analysis and that controlling the facility would result in visibility benefits at a number of Class I areas.

Response: The commenters confuse facility level and unit level impacts. As explained in our proposed action and FIP TSD, and discussed in detail in a separate response to comment, we selected a threshold of 0.3% of the total visibility impairment (total extinction) on the 20% worst days to identify units for additional control analysis. This threshold was established to identify a reasonable set of units that had the greatest visibility impacts for additional control analysis for this planning period. Big Spring Carbon Black Plant was modeled to have a contribution to extinction of 0.482% at Guadalupe Mountains Class I area, 0.304% at Wichita Mountains Class I area, and 0.173% at Big Bend Class I area on a facility basis. In our proposed action, we stated that it was unclear from the emission inventory what the individual unit impacts would be and that they could be divided into up to 9 individual units with much smaller impacts that would fall below the threshold. Based on additional information from the commenter, actual emissions from the facility are much less (approximately 50%) than modeled values. Considering actual emission levels, the estimated impact from the facility falls below 0.3% at any Class I area, and therefore the impact from any individual unit would fall below the 0.3% threshold used to identify units for additional control analysis for this planning period. Any increases in actual emissions at this facility in the future should be considered during development of the regional haze SIP for future planning periods

Parish and Welsh

Comment: EPA Should Include Emission Limits on Additional Sources In Order To Make Greater Reasonable Progress. [Earthjustice (0067) p.2, 41]

[Earthjustice (0067) p.2] EPA's analysis demonstrates that significant emissions reductions at the Welsh and W.A. Parish power plants are cost-effective, would significantly improve visibility, and meet all four of the statutory factors for reasonable progress controls. EPA should require controls at the Welsh and W.A. Parish facilities.

[Sierra Club mass mail (0072 and 0073)] Approximately 4,550 commenters submitted email communications expressing concern that several large coal plants in Texas avoided requirements to reduce their emissions, including the Welsh and Pirkey coal plants in NE Texas, and the state's largest coal plant, the NRG Parish plant near Houston.

Two public hearing commenters (0053-11 and 0053-28) specifically suggested that the EPA consider including W.A. Parish.

[Earthjustice (0067) p. 41] Stamper noted that the EPA found that the visibility benefits from installing scrubbers on W.A. Parish Units 5, 6, and 7 would not provide enough visibility improvement to be considered for reasonable progress controls at this time. EPA also found scrubber upgrades at Welsh Units 1, 2 and 3 were not justified because the visibility improvements were not large enough. 79 Fed.Reg. 74882 (December 16, 2014). It must be noted that EPA found that the cost effectiveness of scrubber upgrades at these units was reasonable, and that visibility is not one of the factors in a four factor reasonable progress analysis. FIP TSD at 30.

Stamper noted that the EPA's rationale for these contrasting decisions is that the Wichita Mountains (which the W.A. Parish and the Welsh Plants are closest to) has a higher total extinction for the baseline conditions and 2018 projections, so that the relative improvement in visibility impairment at Wichita Mountains from scrubber retrofits at the W.A. Parish and Welsh units would be less noticeable than the visibility improvement at Guadalupe Mountains (which has lower extinction for baseline and 2018 conditions) from the SDA additions at the Tolk units. FIP TSD at 28-29, 31.

Stamper stated, as EPA has acknowledged, the use of CAMx modeling to evaluate benefits from the pollution controls evaluated means that EPA evaluated visibility improvements compared to a "dirty background" (because CAMX "takes into account the entire pollution load in the atmosphere in 2018"). FIP TSD, Appendix A at A-37. EPA stated that "[a] facility's visibility impairment impacts are substantially lower with a dirty background analyses compared to a clean background analysis." *Id.* at A-38. EPA further states:

> ...as a Class I area becomes more polluted, any individual source's contribution to changes in impairment becomes geometrically less. Therefore the more polluted the Class I area would become, the less control would seem to be needed from an individual source.

EPA TSD, Appendix A at A-39, quoting final North Dakota Regional Haze SIP and FIP (77 Fed.Reg. 20912). *See also* 79 Fed.Reg. 74880-1 (December 16, 2014). EPA states that this is why visibility benefits of a particular control should be evaluated against natural visibility conditions, not dirty visibility conditions, and EPA states it was upheld on this point by the Eight Circuit in *North Dakota v. EPA*, 730 F.3d 750, 766 (8th Cir. 2013). FIP TSD at A-39.

Earthjustice et al. stated that the EPA's plan must include "*all measures necessary* to obtain [Texas's] share of the emission reductions needed to meet the progress goal for" each Class I area impacted by Texas sources. 40 C.F.R. § 51.308(d)(3)(ii) (emphasis added). W.A. Parish and Welsh have significant visibility impacts at several Class I areas, including Wichita Mountains, Big Bend, Guadalupe Mountains, and Caney Creek in Arkansas. EPA found that emissions reductions at each of the seven units at Welsh and W.A. Parish would be cost effective, and would yield appreciable visibility improvements at several Class I areas. EPA should revise the FIP to include SO_2 controls at the seven Welsh[48] and Parish units. EPA acknowledges that emission controls at each of the Welsh and W.A. Parish units are within the range of cost that EPA has previously found reasonable and cost effective. 79 Fed. Reg. 74884. Indeed, there is no serious dispute that additional controls for each of these units would be cost effective and reasonable under EPA's four-factor analysis. Nevertheless, EPA concluded that installing or upgrading the scrubbers at either facility would not provide enough visibility improvement to be considered for reasonable progress controls at this time. As visibility is not a factor in determining reasonable progress controls, 42 U.S.C. 7491(g)(1), visibility improvement should not be used to justify a no control outcome.

However, Earthjustice et al. stated that even if it were appropriate to consider visibility improvement, controls at Welsh and Parish would provide significant visibility benefits.[49] Earthjustice et al. and Stamper noted that EPA's modeling showed that the deciview visibility benefits with scrubber retrofits at the WA Parish units and the Welsh units were greater than the visibility benefits from the retrofits EPA proposed for the Tolk units. Controls at the Welsh and Parish units would have benefits ranging between 0.137 – 0.146 dv at Caney Creek alone. As the exhibits below demonstrate, SO_2 controls at the W.A. Parish units would improve visibility at Wichita Mountains by 0.102 dv to 0.127 dv, providing almost the same visibility improvement as SO_2 controls at Monticello Units 1 and 2 at Guadalupe Mountains National Park and providing greater visibility benefits than SO_2 controls at the Tolk units at Guadalupe Mountains. In the exhibits below, Stamper pulled out the visibility improvement for each Class I area compared to natural background just for wet FGD systems at each EGU evaluated, because the assumed level of control of 98% can be met with either a wet FGD system or a circulating dry scrubber as discussed above. Stamper ranked units from greatest deciview improvement to least deciview improvement for these three Class I areas.

Visibility Improvement at Wichita Mountains from Potential SO_2 Controls[50] provided by Earthjustice et al. (0067, Table 5 and Stamper (0068, Table 12)

Emission Unit	Deciview Improvement
Big Brown 2	0.438
Big Brown 1	0.436
Monticello 1	0.254
Monticello 2	0.233
Coleto Creek	0.200
WA Parish 6	**0.127**
WA Parish 5	**0.117**
Welsh 3	**0.116**
Welsh 2	**0.111**
Welsh 1	**0.109**
WA Parish 7	**0.102**
Tolk 172B	0.037
Tolk 171B	0.034

Visibility Improvement at Big Bend National Park from Potential SO_2 Controls[51] provided by Earthjustice et al. (0067, Table 6 and Stamper (0068, Table 13)

Visibility Improvement at Guadalupe Mountains National Park from Potential SO_2 Controls[52] provided by Earthjustice et al. (0067, Table 7 and Stamper (0068, Table 14)

Emission Unit	Deciview Improvement
Coleto Creek	0.136
Big Brown 1	0.089
Big Brown 2	0.089
WA Parish 6	**0.058**
WA Parish 5	**0.054**
WA Parish 7	**0.047**
Monticello 1	0.022
Monticello 2	0.020
Tolk 172B	0.014
Tolk 171B	0.013
Welsh 1	**0.009**
Welsh 2	**0.009**
Welsh 3	**0.009**

Emission Unit	Deciview Improvement
Big Brown 1	0.105
Big Brown 2	0.105
Tolk 172B	0.098
Tolk 171B	0.090
Coleto Creek	0.044
Monticello 1	0.027
WA Parish 6	**0.027**
Monticello 2	0.025
WA Parish 5	**0.024**
WA Parish 7	**0.021**
Welsh 3	**0.013**
Welsh 1	**0.012**
Welsh 2	**0.012**

Stamper stated that, as demonstrated in EPA's Cost TSD and in Stamper's analysis (see Table 10 to comment 0068), the cost effectiveness of scrubber retrofits at W.A. Parish Units 5, 6, and 7 are very reasonable. Given EPA's four factor analysis did not identify any issues with scrubber retrofits at the W.A. Parish units, EPA's decision not to require scrubber retrofits at W.A. Parish Units 5, 6, and 7 has not been justified.

With respect to the Welsh units, Stamper stated that the EPA also found that SO_2 scrubber retrofits were cost effective, but ultimately EPA did not propose SO_2 controls for the Welsh units because the visibility improvements were not large enough. 79 Fed.Reg. 74882 (December 16, 2014). The modeling presented in EPA's proposed rulemaking shows the most significant benefits from SO_2 scrubber retrofits at the Welsh units at Wichita Mountains Class I area based on average natural visibility conditions, ranging from 0.109 dv to 0.116 dv as shown in Table 12 above. However, the Welsh power plant is closer to the Caney Creek Class I area in Arkansas, a Class I area for which EPA has not presented modeling results in its proposed rulemaking. In fact, the Welsh EGUs are the closest Texas EGU to Caney Creek at 161 kilometers distance, slightly closer than the Monticello units which are 165 kilometers away. EPA's modeling files show that SO_2 scrubber retrofits at Welsh Units 1, 2 and 3 would result in visibility improvements of 0.137 dv, 0.140 dv, and 0.146 dv, respectively, at the Caney Creek Class I area.[154]

Earthjustice et al. stated that the EPA's rationale for excluding controls at W.A. Parish and Welsh is that baseline conditions at the closest Class I area (*i.e.*, Wichita Mountains) are more impaired than conditions at Guadalupe Mountains, so that the relative improvement in visibility impairment at Wichita Mountains from scrubber retrofits at the W.A. Parish and Welsh units would be less noticeable than the visibility improvement at Guadalupe Mountains from the SDA additions at the Tolk units. FIP TSD at 28-29, 31. This rationale is flawed, for at least two reasons. First, EPA's analysis seems to imply that Wichita and Guadalupe are in competition to determine which Class I area will receive benefits from controls; but the fact that controls at Tolk will benefit Guadalupe Mountains should not be used to forgo improvement at Wichita Mountains. Improving visibility at the two areas is not mutually exclusive.

Second, this rationale undermines the core purposes of the Regional Haze Rule and the Clean Air Act's visibility provisions. Under this view, Class I areas that are already impaired are less deserving of protection. Third, while EPA considers the total extinction at Wichita and Guadalupe, EPA does not consider the significance of visibility improvement in light of the number of sources impacting the two areas and magnitude of the sources' impacts. If Wichita suffers from greater light extinction because many sources contribute small amounts to impairment, then it may be appropriate to address impairment at Wichita by controlling sources like Welsh and Parish.

Moreover, Earthjustice et al. stated that when Arkansas developed its reasonable progress goal for Caney Creek, it relied upon TCEQ's projected 2018 SO_2 emission rates. As shown in the table below, however, Welsh's actual SO_2 emissions from 2009 through 2013 were significantly higher than Texas projected. Stamper explained that when the TCEQ consulted with the Arkansas Department of Environmental Quality on the projected 2018 impacts at Caney Creek Class I area from Texas sources, TCEQ identified the 2018 SO_2 emission rates in the CENRAP 2018 modeling of the Welsh plants shown in the table below. Welsh Units 2 and 3 are emitting SO_2 at much higher rates than was evaluated in the 2018 CENRAP modeling.

Assumed SO_2 Emission Rates for Welsh Units in 2018 CENRAP Modeling Compared to 2009 to 2013 SO_2 Emissions
provided by Earthjustice et al. (0067, Table 8) and Stamper (0068, Table 15)

Welsh Unit	2018 SO2 Emissions in CENRAP Modeling, tpy[155]	2009 to 2013 average SO2 Emissions, tpy[156]	Percent Reduction Necessary to Achieve Emissions upon which Caney Creek RPG Was Based
1	11,721	9,061	0
2	1,223	9,453	87%
3	1,227	9,543	87%
Total	**14,171**	**28,067**	**50%**

Thus, the RPG for Caney Creek is predicated on emissions from Welsh that are 50 percent less than actual emissions.[55] To meet the RPG for Caney Creek, EPA must require additional emissions reductions from Welsh. Stamper noted, as the above exhibit demonstrates, the 2018 RPG for Caney Creek is dependent on at least a 50% reduction in SO_2 emissions at the Welsh plant as compared to 2009 to 2013 annual average emissions.[157] Stamper stated that if EPA is not going to require SO_2 controls at the Texas EGU that is the closest to the Caney Creek Class I area, then EPA must revise the Caney Creek RPG to account for this change.

Moreover, even with EPA's proposed FIP on Texas sources, Stamper stated that the EPA has proposed RPGs for the Wichita Mountains, Big Bend and Guadalupe Mountains Class I areas that would not achieve natural visibility conditions within the next 50 years (or by 2064). Specifically, EPA projects that, with its proposed FIP controls, it will take 82 years, 173 years, and 141 years, respectively, for the achievement of natural background visibility conditions at Wichita Mountains, Big Bend, and Guadalupe Mountains. 79 Fed.Reg. 74887 (December 16, 2014). Given that EPA has found that it is cost effective to retrofit scrubbers that will reduce SO_2

by 95-98% from the W.A. Parish Units 5, 6, and 7 and at the Welsh Units 1, 2 and 3, EPA is not justified in exempting these units from SO_2 controls. This is particularly important for the Welsh units, at which controls will enable the Caney Creek Class I area to reach its RPG.

For all these reasons, and as described in the attached Stamper Report, Earthjustice et al. stated that the EPA should require SO_2 emission controls at Welsh and Parish in order to make reasonable progress at Wichita Mountains, Big Bend, Guadalupe Mountains, and other Class I areas. Stamper concluded that EPA has no justification for not requiring the SO_2 scrubber retrofits at the W.A. Parish Units 5, 6, and 7 or at Welsh Units 1, 2, and 3. EPA has found that SO_2 scrubber retrofits are cost effective and reasonable at all of these units. FIP TSD at 30. Installation of these controls will aid in the achievement of reasonable progress towards the national visibility goal at several Class I areas.

Earthjustice et al. Footnotes:

[48] We note that pursuant to a federal court consent decree with Sierra Club, Welsh Unit 2 is required to retire by December 31, 2016, which could affect the reasonableness of controls on that unit. *See Sierra Club v. U.S. Army Corps of Engineers, et al.*, No. 4:10-cv-04017-RGK (W.D. Ark. Consent Decree entered Dec. 22, 2011).

[49] As explained in the attached Report of H. Andrew Gray (0070), on a unit basis, operating controls at the Welsh and Parish units would improve visibility at Wichita Mountains by more than 0.1 dv— the "threshold" EPA applied in it's the regional haze context in Wyoming and Arizona. We are not suggesting that the amount of improvement deemed significant should be the same across the country. However, EPA needs to explain why the improvement it deemed significant enough to merit controls in two other states' plans is not enough to merit controls in the Texas plan.

[50] Figures are taken from the FIP TSD, Table A.6-4. The table lists the deciview improvement from 98% SO_2 control with WFGD or CDS evaluated against natural background conditions.

[51] Figures are taken from the FIP TSD, Table A.6-4. The table lists the deciview improvement from 98% SO_2 control with WFGD or CDS evaluated against natural background conditions.

[52] Figures are taken from the FIP TSD, Table A.6-4. The table lists the deciview improvement from 98% SO_2 control with WFGD or CDS evaluated against natural background conditions.

[53] *See* March 25, 2008 letter from TCEQ to ADEQ, at 9 (Table entitled Units Inside the Caney Creek Area of Influence") in Appendix 4_3b of 2009 Texas Regional Haze plan (Ex. --).

[54] 2009 to 2013 SO_2 emissions data in EPA's cost spreadsheets in EPA-R06-OAR-2014-0754-0008.

[55] It must also be noted that even with the retirement of Welsh Unit 2, which is currently slated for December 31, 2016 (FIP TSD at 21), the Welsh plant's SO_2 emissions will exceed the level that was modeled for the plant in the 2018 CENRAP modeling based on 2008-2013 average emissions.

Stamper Footnotes:

[153] This is discussed in further detail in the Visibility and Health Modeling Technical Support Document submitted with the Conservation Organizations' comments in this rulemaking.

[154] *See* TX-116-007-_33_Vis_modeling_summary.xlsx.".

[155] *See* March 25, 2008 letter from TCEQ to ADEQ, at 9 (Table entitled Units Inside the Caney Creek Area of Influence") in Appendix 4_3b of 2009 Texas Regional Haze plan.

[156] 2009 to 2013 SO_2 emissions data in EPA's cost spreadsheets in EPA-R06-OAR-2014-0754-0008.

[157] It must also be noted that even with the retirement of Welsh Unit 2, which is currently slated for December 31, 2016 (FIP TSD at 21), the Welsh plant's SO_2 emissions will exceed the level that was modeled for the plant in the 2018 CENRAP modeling based on 2008-2013 average emissions.

[Gray (0070) p.20] Dr. Gray noted that the EPA is not proposing to require the retrofit with SO_2 scrubbers of the WA Parish (Units 5, 6, and 7) and Welsh (Units 1, 2, and 3). These controls do provide significant visibility benefits and should be required. On a unit basis, the benefits from each of these controls at WIMO are above 0.1 dv – EPA's estimated "threshold" used in Wyoming and Arizona– and are well above our revised estimated "threshold" of 0.045 dv. Thus, using 0.1-0.15 dv as a threshold (as compared to average natural conditions) would necessitate including each of the WA Parish Units 5, 6, and 7 and all three Welsh units on the list of sources recommended for WFGD retrofits.

Dr. Gray noted that wet scrubbers at the Parish and Welsh units provide a benefit of greater than 0.045 dv at 3 Class I areas. Furthermore, WIMO is not the Class I area that benefits the most from controls on the Welsh units. These controls have benefits ranging between 0.137 – 0.146 dv at Caney Creek (versus 0.109 – 0.116 dv at WIMO).

Dr. Gray stated that examination of Table A.6-4 in the FIP TSD and Table 5 shows that the cumulative visibility benefits (delta dv) at all 19 modeled Class I areas, when compared to average natural conditions, were between 0.33 and 0.43 dv for each individual unit at WA Parish and Welsh with the exception of WA Parish Unit 8. On an individual unit basis, the cumulative benefit from these controls are similar to (or above) the cumulative benefits from the controls on Limestone Units 1 and 2 that EPA is proposing to require (0.401 and 0.433 dv, respectively). The total of the modeled cumulative visibility impacts for all three WA Parish units was 1.13 dv. The total modeled cumulative visibility impact for all three Welsh units was 1.23 dv. It is clear that the visibility benefits offered by these controls is significant enough to warrant their requirement.

Likewise, Dr. Gray stated that the EPA proposed not to require a WFGD upgrade at W.A. Parish Unit 8. As we have seen, reductions in SO_2 from W.A. Parish have visibility benefits at Class I areas in the region. The SO_2 emitted from Unit 8 is no different. And in fact, reducing emissions from Unit 8 is more cost effective, on a per ton basis, than reductions from WFGD retrofits on the other three units.27 By the same token, the WFGD upgrade at Unit 8 provides greater dv benefit per cost than the WFGD retrofits. On a cost per ton and cost per dv basis, this control is on par with the other recommended controls. It is reasonable and should not be ignored merely because the sum total of dv improvement is low.

[Gray (0070) p.20] Dr. Gray noted that the EPA's interpretation of the visibility benefits from the potential controls that it evaluated underestimated the significance of those benefits. EPA calculated, but failed to consider, impacts to Class I areas outside of Texas and Oklahoma, both individually and cumulatively. EPA also underestimated how these benefits compare to visibility improvement provided by previous determinations. EPA's analysis supports both the controls that it proposed to require as well as those it proposed not to require. (FIP TSD, Section A.6)

Dr. Gray noted that Tables A.6-3 and A.6-4 show the emissions reductions and the corresponding visibility improvements (dv) that would be expected for SO_2 scrubber upgrades or retrofits on each of the 21 selected units. The modeled visibility benefits are tabulated for WIMO, GUMO, BIBE, and also for the cumulative benefit across all 19 modeled Class I areas.

Dr. Gray noted that the EPA attempted to establish a reasonable threshold for CAMx-derived visibility (dv) impacts as compared to those that have been established for previous BART evaluations using CALPUFF. For example, in their recent FIP for Wyoming, EPA proposed controlling sources that had a modeled benefit, using CALPUFF, of 0.3 delta-dv. A recently finalized Arizona FIP included controls on sources with modeled visibility benefits of 0.18 and 0.24 delta-dv. Considering the differences between RP analyses using CAMx and BART evaluations using CALPUFF, and the difference in metrics, EPA concluded that the 0.18 to 0.3 delta-dv benefits obtained with CALPUFF would be on the order of a 0.1 to 0.15 dv benefit with CAMx modeling. This estimate was based on just the metrics and emissions difference and ignored the other differences discussed above.

Dr. Gray noted that the EPA evaluated the modeled visibility benefits (dv and extinction) and other information for each source unit and concluded that "all of the scrubber upgrades in Table A.6.3 would yield visibility benefits, with the exception of WA Parish Unit 8 which has a very small benefit." FIP TSD at A-75. Regarding the sources that currently do not currently have SO_2 controls, they concluded that "many of the scrubber retrofits in Table A.6.4 would yield visibility benefits." Id. WFGD retrofits were recommended for all uncontrolled units other than Tolk, Welsh and WA Parish. SDA scrubbers were recommended for the two Tolk units. EPA's proposed control scenario was summarized in Table 1, above.

Dr. Gray commented that after reviewing the effectiveness of the various control measures, EPA's proposed control plan includes control measures on 14 units at seven Texas facilities. The controls that EPA proposes are reasonable and should be required because they are cost-effective controls that can be applied to sources that impact visibility at Class I areas.[23] Visibility is not one of the four factors by which reasonable progress controls are evaluated. However, because EPA has evaluated and used visibility benefits in its review, we discuss EPA's results in our comments. With that perspective, the controls EPA has proposed to require are clearly reasonable in that they provide significant visibility benefits at multiple Class I areas.

Dr. Gray stated, when considering the difference in the RP and BART analyses, and the differences in metrics involved, EPA concluded that recent decisions in Wyoming and Arizona to require controls that provided benefits of 0.18 to 0.3 delta dv, using CALPUFF, would be comparable to a delta dv of 0.1 to 0.15 using CAMx.[24] As discussed above, the differences due to metrics is more likely to actually result in a factor of 4, meaning that a visibility improvement result from CAMx would be roughly 4 times greater when modeled with CALPUFF. The comparable estimated "threshold" for the modeled impact would then be even lower than 0.1 dv – reducing 0.18 – 0.3 by a factor of 4 gives a range of 0.045 – 0.075 dv (using an annual average natural background).[25] As demonstrated in Table 5 of comment 0070 (not reproduced here), the benefits from the proposed controls are all well above this threshold at one or more of the three Class I areas EPA evaluated in its analysis (WIMO, BIBE, and GUMO).

Furthermore, Dr. Gray contended that these controls provide benefits at the Class I areas that EPA did not utilize in its analysis. In total, each of the proposed controls has a benefit greater than 0.045 dv at 2 or more Class I areas (up to 8 Class I areas). The results in Table 5 illustrate the benefits at other Class I areas as well as the cumulative benefits in each case, which range from 0.401 to 1.236 dv.

Dr. Gray noted that the EPA is not proposing to require the retrofit with SO_2 scrubbers of the WA Parish (Units 5, 6, and 7) and Welsh (Units 1, 2, and 3). These controls do provide significant visibility benefits and should be required. On a unit basis, the benefits from each of these controls at WIMO are above 0.1 dv – EPA's estimated "threshold" used in Wyoming and Arizona– and are well above our revised estimated "threshold" of 0.045 dv. Thus, using 0.1-0.15 dv as a threshold (as compared to average natural conditions) would necessitate including each of the WA Parish Units 5, 6, and 7 and all three Welsh units on the list of sources recommended for WFGD retrofits.

Dr. Gray noted that wet scrubbers at the Parish and Welsh units provide a benefit of greater than 0.045 dv at 3 Class I areas. Furthermore, WIMO is not the Class I area that benefits the most from controls on the Welsh units. These controls have benefits ranging between 0.137 – 0.146 dv at Caney Creek (versus 0.109 – 0.116 dv at WIMO).

Dr. Gray stated that examination of Table A.6-4 in the FIP TSD and Table 5 shows that the cumulative visibility benefits (delta dv) at all 19 modeled Class I areas, when compared to average natural conditions, were between 0.33 and 0.43 dv for each individual unit at WA Parish and Welsh with the exception of WA Parish Unit 8. On an individual unit basis, the cumulative benefit from these controls are similar to (or above) the cumulative benefits from the controls on Limestone Units 1 and 2 that EPA is proposing to require (0.401 and 0.433 dv, respectively). The total of the modeled cumulative visibility impacts for all three WA Parish units was 1.13 dv. The total modeled cumulative visibility impact for all three Welsh units was 1.23 dv. It is clear that the visibility benefits offered by these controls is significant enough to warrant their requirement.

Likewise, Dr. Gray stated that the EPA proposed not to require a WFGD upgrade at W.A. Parish Unit 8. As we have seen, reductions in SO_2 from W.A. Parish have visibility benefits at Class I areas in the region. The SO_2 emitted from Unit 8 is no different. And in fact, reducing emissions from Unit 8 is more cost effective, on a per ton basis, than reductions from WFGD retrofits on the other three units.[27] By the same token, the WFGD upgrade at Unit 8 provides greater dv benefit per cost than the WFGD retrofits. On a cost per ton and cost per dv basis, this control is on par with the other recommended controls. It is reasonable and should not be ignored merely because the sum total of dv improvement is low.

Dr. Gray stated that Table A.6-5 (page A-76) should include a pair of columns for cumulative impacts (for all 19 Class I areas), as shown below:

Table 6: Estimated deciview improvement (avg 20% Worst days) from actual emissions (3-year average annual 2009-2013 eliminating min and max year)

	Cumulative (19 Class I Areas)	
	2018 "Dirty" Background	Average Natural Conditions "Clean" Background
Recommended Scrubber Retrofits[1]	1.374	5.775
Recommended Scrubber Upgrades[2]	1.134	5.149
Total benefit (delta dv)	2.508	10.924
Controls NOT recommended:		
Scrubber retrofits and upgrade[3]	0.539	**2.408**

[1] WFGD at Big Brown1,2, Coleto Creek, and Monticello 1,2; SDA at Tolk 1,2
[2] WFGD upgrades at Limestone1,2 Martin Lake 1,2,3, Monticello 3, and Sandow4
[3] WFGD at Parish 5,6,7 and Welsh 1,2,3; WFGD upgrade at Parish 8

Dr. Gray stated that in addition to the columns for the cumulative visibility impact at all 19 modeled Class I areas, an additional row has been added to the table (using data from Tables A.6-3 and A.6-4), showing the additional benefits that would be obtained if controls were included on the seven units for which controls were not recommended by EPA. As can be seen in this table, the recommended scrubber upgrades and retrofits are predicted to result in a cumulative visibility improvement in the 19 modeled Class I areas of 10.9 delta dv. Including scrubber retrofits (WFGD) at the six WA Parish and Welsh units and scrubber upgrade and WA Parish Unit 8 would result in an additional improvement in visibility of 2.4 delta dv. These controls are reasonable and should be required.

Footnote:
[23] See the April 17, 2015 Technical Support Document to Comments of Conservation Organizations prepared by Vicki Stamper for detailed analysis regarding the cost-effectiveness of these controls.
24 78 Fed. Reg. 34785 – 34789. 79 Fed. Reg. 52464-52477. Other decisions have required benefits in a similar range (0.16 – 0.46 dv). 77 Fed. Reg. 18078-88 (March 26, 2012).
25 The term "threshold" does not imply in any way that impacts lower than this value would not be worth controlling. It merely provides a point of comparison to some of EPA's recent decisions.
27 Compare EPA's stand-in value for Unit 8 ($500/ton) versus EPA costs for WFGD retrofits on the other WA Parish units ($2,334 - $2,542/ton).

Earthjustice et. al. commented that we should have proposed additional controls on Welsh Units 1, 2 and 3 and Parish units 5, 6, 7, and 8. The commenter states that we determined that these controls are cost effective and then decided not to require these controls because the visibility improvements were not large enough. The commenter also states that visibility is not one of the factors in a four factor reasonable progress analysis. The commenter continues that even if it was appropriate to consider visibility, visibility benefits from these controls are significant and that controls should have been required for this planning period because the EPA's plan must include "*all measures necessary* to obtain [Texas's] share of the emission reductions needed to meet the progress goal for" each Class I area impacted by Texas sources. 40 C.F.R. § 51.308(d)(3)(ii) (emphasis added). Furthermore, we are not justified in exempting these units from SO_2 controls because the Class I areas are not projected to be on track to meet the natural visibility goal by 2064. In support of these comments, the commenter provides a comparison of the visibility benefits of all evaluated controls at Wichita Mountains, Guadalupe Mountains, and Big Bend in terms of deciview improvement ("clean background"). The commenters also compare the cumulative benefit at all 19 modeled Class I areas for the Parish and Welsh units (0.33 to .43 dv for each unit) to the Limestone units that we proposed to control (0.401 – 0.433 dv for each unit)[528], and provide the facility-wide cumulative visibility benefit from controls at Parish and Welsh (2.408 dv) compared to the cumulative benefit of the required controls (10.924 dv).[529] Furthermore, the commenter states that we did not consider benefits from controlling Welsh at Caney Creek ranging between 0.137 – 0.146 dv which are larger than the benefits at Wichita Mountains.

Earthjustice et al. states that our rationale for not controlling these sources is flawed for at least two reasons. First, the analysis seems to imply that Wichita and Guadalupe are in competition to determine which Class I area will receive benefits from controls; but the fact that controls at Tolk will benefit Guadalupe Mountains should not be used to forgo improvement at Wichita Mountains. Improving visibility at the two areas is not mutually exclusive. Second, this rationale undermines the core purposes of the Regional Haze Rule and the Clean Air Act's visibility provisions. Under this view, Class I areas that are already impaired are less deserving of protection. Third, while we consider the total extinction at Wichita and Guadalupe, we do not consider the significance of visibility improvement in light of the number of sources impacting the two areas and magnitude of the sources' impacts. If Wichita suffers from greater light extinction because many sources contribute small amounts to impairment, then it may be appropriate to address impairment at Wichita by controlling sources like Welsh and Parish.

Earthjustice et al. comments that the current emissions at Welsh are higher than what was projected in the 2018 emissions used in the CENRAP 2018 modeling that was the basis for consultations between Arkansas and Texas and establishing the RPG at Caney Creek. Earthjustice et al. provides a comparison between 2018 modeled emissions and recent average annual emissions and estimates that a 50% reduction is necessary to meet the modeled emission level. They note that Welsh unit 2 is scheduled to shutdown in 2016, but this will still leave actual emissions above modeled levels. Therefore, if we are not going to require SO_2 controls at the Texas EGU that is the closest to the Caney Creek Class I area (Welsh), then EPA must revise the Caney Creek RPG to account for this change.

Earthjustice et al. also states that the estimated unit level benefits exceed the "threshold" of 0.1 dv used in our actions in Arizona and Wyoming and the revised 0.045 dv threshold that they develop based on their analysis of the estimated differences between CALPUFF and CAMx modeling results. Using 0.1-0.15 dv as a threshold (as compared to average natural conditions) would necessitate including each of the WA Parish Units 5, 6, and 7 and all three Welsh units on

[528] See Table 5 of Visibility and Health Modeling TSD to comments from the conservation organizations prepared by Dr. Gray
[529] See Table 6 of Visibility and Health Modeling TSD to comments from the conservation organizations prepared by Dr. Gray

the list of sources recommended for WFGD retrofits. The commenter notes that they are not suggesting that the amount of improvement deemed significant should be the same across the country. However, we need to explain why the improvement it deemed significant enough to merit controls in two other states' plans is not enough to merit controls in the Texas plan. The commenter also states that the evaluated controls provide benefits at the Class I areas that EPA did not utilize in its analysis. In total, each of these controls has a benefit greater than 0.045 dv at 2 or more Class I areas (up to 8 Class I areas).

The commenter also discusses upgrading the scrubber at Parish unit 8. Emission reductions are cost-effective on a $/ton basis and should not be ignored because the sum total of dv improvement is low.

We also received comments during the public hearing stating that we should have required controls on Welsh and Parish.

Response: We disagree with this comment. We considered the estimated visibility benefit of controls on units at Parish and Welsh alongside the four statutory factors in considering whether controls are cost-effective and will achieve reasonable visibility benefits required during this planning period towards the national goal. We discuss comments concerning our consideration of visibility benefits under reasonable progress elsewhere in this document. We determined that additional controls were not required under the reasonable progress analysis at this time for the Parish and Welsh units. As discussed in our proposal, we also determined that it was not reasonable to meet the uniform rate of progress goal for this planning period. We established RPGs for Wichita Mountains and the Texas Class I areas consistent with our determination of reasonable progress controls. Therefore, the long term strategy we established for Texas in the FIP does include all measures determined necessary to obtain Texas' share of emission reductions for this planning period as required under 40 C.F.R. § 51.308(d)(3)(ii).

Considering the visibility benefits and costs, we disagree that we should have required controls on units at Parish and Welsh. In evaluating the cost of controls, we also weighed how effective the reductions were in achieving visibility benefits. We considered the anticipated visibility benefit in deciviews (for both a "dirty background" and a "clean background") as well as the reduction in extinction and the percentage of visibility impairment addressed by the controls. Based on our evaluation of these visibility metrics within the cost factor of the four-factor reasonable progress analysis, we determined that additional controls on Parish and Welsh were not required for reasonable progress for the first planning period. In the FIP TSD and the proposed FIP, we note lesser visibility improvement benefits at the three Class I areas for the W. A. Parish and Welsh units compared to the benefits at other facilities that mainly impact the Wichita Mountains. The visibility benefits at Wichita Mountains of scrubber retrofits at the Parish and Welsh units (0.102—0.126 dv) are approximately half of the visibility benefit of scrubber retrofits at the Coleto Creek and Monticello units (0.2 –0.254 dv), and much less than the visibility benefit from controlling units at Big Brown (0.436-0.438 dv). We also note that when considering the costs of controls and the relative visibility benefit, the Parish scrubber retrofits would be slightly more expensive with respect to $/ton but would be much less effective in improving visibility at the Wichita Mountains, when compared to the required controls at units Monticello or Coleto Creek. For the Welsh scrubber retrofits, the costs ($/ton) are approximately

50% greater than the cost of scrubber retrofits at Monticello or Coleto Creek and would result in approximately 50% less visibility improvement at Wichita Mountains. Furthermore, as we noted in the FIP TSD and also noted by the commenter, Welsh unit 2 is under a consent decree[530] to shut down by the end of 2016, eliminating the visibility impact from this unit.

As we discuss in a separate response to comment, we focused our analysis on visibility impacts and benefits at Wichita Mountains, Big Bend and Guadalupe Mountains. We agree that visibility benefits from controls on Welsh units at Caney Creek are larger than the benefits at Wichita Mountains. However, we note that the visibility benefit at Caney Creek from controls on the Welsh units (0.137 – 0.146 dv) are smaller than the benefit from the required controls at Big Brown (0.179 dv for each unit), Martin Lake (0.35--0.44 dv), and Monticello (0.189 – 0.264 dv) and much more expensive on a $/ton basis.[531]

With regards to the comparison of cumulative visibility benefits of controlling units at Welsh and Parish to those at Limestone, the commenter does not consider the considerable difference in costs (both $/ton and total capital costs) between a scrubber upgrade and a scrubber retrofit. Upgrading the scrubbers at Limestone is much less expensive than installing new scrubbers at the Welsh or Parish units. In addition, we determined that the cumulative visibility benefits of each new scrubber at the Parish and Welsh units would be less than those at each of the units where we proposed scrubber retrofits and less than that at each of the units with proposed scrubber upgrades with the exception of Limestone, at a cost significantly higher than the estimated cost of scrubber upgrades. Similarly, the total cumulative visibility benefit of controlling the three units at Welsh and the four units at Parish is less than half the benefit from all the required scrubber retrofits or all the required scrubber upgrades, and at a greater average $/ton cost. While controlling the Welsh and Parish units would result in some additional cumulative visibility improvement, based on our evaluation and weighing of the cost and consideration of the visibility benefits of these controls at Wichita Mountains, we determined their individual projected visibility improvements do not merit the installation of scrubbers at this time. We encourage the State of Texas to re-evaluate this determination as part of its next regional haze SIP submittal and we note that as the required controls are implemented the significance of impacts and potential benefits from the Parish and Welsh units will increase in terms of percentage of extinction. As discussed below, we disagree with comments that this determination is inconsistent with the determination to require controls at Tolk or with the determination of required controls in other states for the purpose or reasonable progress.

We disagree with the commenter's statement that the fact that controls at Tolk will benefit Guadalupe Mountains was used to forgo improvement at Wichita Mountains from controlling Welsh and Parish. The commenters mistake our explanation for determining that it is reasonable to control Tolk during this planning period as a rationale for not controlling Welsh or Parish.

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[530] See Sierra Club et al v. U.S. Army Corps of Engineers, civil 4:10-cv-04017-RGK, also letter from John M. McManus to Mike Wilson, dated May 2, 2013. Under the terms of a consent decree, after the Turk Plant commences commercial operation, Unit 2 will be restricted to a 60% annual capacity factor during any rolling 12-month period. Thereafter, Unit 2 must be retired no later than December 31, 2016.

[531] See TX-116-007-_33_Vis_modeling_summary.xlsx in the docket to this action for visibility benefits of controls. Cost-effectiveness of controls on Welsh units are more than $1000/ton more than controls on units at Big Brown, Monticello, and Martin Lake.

As discussed in the FIP TSD, we evaluated visibility benefits at Wichita Mountains and determined that the visibility improvements for controls at Big Brown, Monticello and Coleto Creek were significant. We also concluded that scrubber installations on Big Brown 1 and 2 would also yield significant benefits at the Guadalupe Mountains, and that a scrubber installation on the Coleto Creek unit would also yield significant visibility benefits at Big Bend.[532] We evaluated the visibility benefits of controlling the two units at Tolk at Guadalupe Mountains and determined that based on evaluation of extinction and percentage of extinction that these controls would provide for meaningful progress towards the goal of reaching natural visibility conditions for this progress period at Guadalupe Mountains. From our initial modeling based on the 2018 CENRAP emissions, we estimated that controls on the two units at Tolk would address approximately 8% of the total visibility impairment from all Texas point sources at Guadalupe Mountains. Similarly, controlling the one unit at Coleto Creek would address over 6% of the total visibility impairment from all Texas point sources at Big Bend. In contrast controlling all three units at Welsh or the three unscrubbed units at Parish would result in addressing a smaller percent of the total visibility impairment from Texas point sources at Wichita Mountains, and the required controls at other facilities (e.g. Big Brown, Monticello) result in addressing a larger percent of the visibility impairment at Wichita Mountains. In explaining our determination in the FIP TSD, we simply noted that in terms of one of the metrics considered, deciview visibility benefit, the visibility benefit at Guadalupe Mountains from controlling the units at Tolk was less than the visibility benefit at Wichita Mountains from controlling the units at Welsh or Parish and pointed out that our decision also considered other metrics, such as percentage extinction and extinction relative to the benefit from controls at units at other facilities.

We disagree with the commenter and believe our consideration of these metrics is consistent with the purpose of the reasonable progress analysis in ensuring that based on consideration of the four factors, reasonable controls are identified that will allow for reasonable progress during this planning period Our methodology and metrics identified reasonable controls for sources in Texas that are cost-effective and result in meaningful visibility improvement towards the goal of natural visibility conditions.. We agree with the commenter that Wichita Mountains suffers from greater light extinction because many sources contribute to impairment and we have identified controls at units across a number of facilities to address a large percentage (~41%) of the visibility impairment from Texas point sources.[533] While controlling Welsh and Parish units would result in some additional visibility improvement at Wichita Mountains, based on our evaluation and weighing of the cost and consideration of the visibility benefits of these controls at Wichita Mountains, we determined their individual projected visibility improvements do not merit the installation of scrubbers at this time. We encourage the State of Texas to re-evaluate this determination as part of its next regional haze SIP submittal and note that as the required controls are implemented the significance of impacts and potential benefits from the Parish and Welsh units will increase in terms of percentage of extinction.

As to the comment concerning the emissions modeled for Welsh and the RPG for Caney Creek, we disagree with the commenter that we must require emission reductions at Welsh for Caney

[532] FIP TSD at page 28

[533] Based on initial modeling using 2018 CENRAP emissions, we estimate that controls on Big Brown, Martin Lake, Monticello, Coleto Creek, Sandow, and Limestone addresses over 41% of the total impairment due to Texas point sources

Creek to meet the RPG or that we must reset the RPG at Caney Creek if Welsh's emissions are not reduced. The Caney Creek RPG was established based on CENRAP 2018 modeling results and projected emissions that included an estimate of emission reductions that would result in Texas due to compliance with CAIR, not a source-specific limit at any EGU in Texas. As discussed in the Texas TSD, during consultations for Caney Creek, the participating states determined that the projected 2018 CENRAP modeling and other findings based on existing and proposed controls arising from local, state, and federal requirements indicated that Caney Creek was on the glidepath and projected to exceed (do better than) the URP goal for the first implementation period ending in 2018. Arkansas Department of Environmental Quality (ADEQ) determined that additional emissions reductions from other states were not necessary to address visibility impairment at Caney Creek for the first planning period, and we approved this portion of the Arkansas regional haze SIP[534]. Earthjustice et al. provides a comparison between 2018 modeled emissions and recent average annual emissions and estimates that a 50% reduction is necessary to meet the modeled emission level. The commenter mistakenly uses a theoretical emission rate that we calculated for other purposes rather than the actual measured emissions at the facility as reported to the US EPA Clean Air Markets Division. The 2009-2013 average emissions of SO_2 for the facility were reported to be 24,523 tpy, not the 28,067 tpy used by Earthjustice. We note that the modeled emissions of 14,171 tpy for the three Welsh units is relatively close to the estimated annual emissions from the facility based on recent actuals after the shutdown of unit 2 in 2016 of approximately 16,500 tpy and the shutdown will eliminate visibility impairment from this unit. Furthermore, despite Welsh being the closest facility in our analysis to Caney Creek, other facilities (e.g. Big Brown, Monticello, and Martin Lake) had larger impacts due to emissions, stack parameters, and meteorology/transport. Significant emission reductions at these facilities are required in this action, resulting in significantly more visibility benefit at Caney Creek than would be achieved by limiting Welsh's emissions to the levels modeled by CENRAP, and overall less visibility impairment than the ADEQ's established RPG based on CENRAP's modeling. We also note that we have proposed additional controls in Arkansas that will result in additional visibility improvements at Caney Creek.[535]

We disagree that there is an inconsistency in the use of "thresholds" for determination of reasonable progress controls in Arizona, Wyoming and in determining controls on Welsh and Parish were not required for reasonable progress this planning period. Earthjustice et al. states that the estimated unit level benefits exceed the "threshold" of 0.1 dv used in our actions in Arizona and Wyoming and the revised 0.045 dv threshold that they develop based on their analysis of the estimated differences between CALPUFF and CAMx modeling results and that we must explain why these visibility benefits were considered significant enough to merit controls in Arizona and Wyoming but not in Texas. We agree with the commenter that the amount of improvement deemed significant should be determined on a case by case basis and might not be the same across Class I areas. There is no explicit threshold for determining significance of visibility benefit in the regional haze rule. Significance is a source- and Class I area-specific evaluation, meaning that it depends on how much visibility improvement is needed at the Class I area(s), how much a specific source impacts the Class I area(s), and the cost effectiveness and potential visibility improvement of available control options. States have

[534] 77 FR 14604
[535] 80 FR 18944

latitude to determine these thresholds[536], providing support and a reasonable and adequate basis for why they selected the thresholds, and to determine BART and reasonable progress controls, in consultation with other impacted states. In the case of Wyoming, our proposed action found that Low NOx burners with Overfire Air (LNB w/ OFA) were reasonable controls on the Dave Johnston units 1 and 2, based on consideration of the low costs of approximately $1000/ton and visibility improvement from controls at each unit of about 0.3 dv (CALPUFF modeling).[537] In our final action we determined based on revised modeling that controls on Dave Johnston units 1 and 2 ranging from 0.11 to 0.12 dv based on CALPUFF modeling were not necessarily justified for this planning period.[538] In Arizona, controls were determined to be required for the Rillito Plant Kiln 4 based on estimated visibility improvements of 0.18 dv and 0.16 dv with CALPUFF modeling at the two most impacted Class I areas in Arizona, the higher anticipated improvement in the western unit of Saguaro National Park, and a cost-effectiveness of approximately $1,850/ton.[539] As we discuss in depth elsewhere in this document, CAMx modeled visibility impacts and benefits are generally much lower than the CALPUFF modeled visibility impacts and benefits relied on in other actions due to the differences between these two modeling platforms, the model inputs, and the metrics used. However, due to all of the differences in the CALPUFF and CAMx model results, it is not possible to directly compare these model results or develop thresholds based on these comparisons. We evaluated these recent FIPs that included controls for reasonable progress using CALPUFF modeling, and conservatively estimated that just based on emissions and metric differences, the visibility benefits in those actions would be well in the range of CAMx modeled visibility benefits for the required controls in this action.

To evaluate the projected visibility benefits of controls from our CAMx modeling in our cost evaluation, we considered a number of metrics, such as change in deciviews under 2018 projected levels of air pollution at the three Class I areas and under estimated natural visibility conditions, change in light extinction, and change in the percentage of total light extinction. We also considered the visibility benefit of emission reductions from recent actual emission levels versus CENRAP 2018 projected emission levels at these sources. As we discuss further in our FIP TSD and in responses in our RTC document, to provide context regarding the significance of individual source impacts, we compared the individual source impacts with CENRAP source apportionment modeling results for impacts from all emission sources within a state and impacts from all emission sources within a state within a specific source type. We also compared these individual source impacts to the impact levels used by the states for triggering consultation with another state about its overall impacts, and the estimated range of anticipated visibility benefits resulting from required controls in other actions.[540] The determination of reasonable progress controls must be based on consideration of a number of factors, and to fully consider the visibility benefits, several metrics should be evaluated. As we discussed with relation to Tolk's impacts on Guadalupe Mountains, extinction and percentage extinction are also important

[536] BART guidelines at 70 FR 39170: However, we believe the States have flexibility in setting absolute thresholds, target levels of improvement, or de minimis levels since the deciview improvement must be weighed among the five factors, and States are free to determine the weight and significance to be assigned to each factor. For example, a 0.3, 0.5, or even 1.0 deciview improvement may merit stronger weighting in one case versus another, so one ‘‘bright line’’ may not be appropriate.
[537] 78 FR 34785
[538] 79 FR 5051
[539] 79 FR 52420
[540] FIP TSD at A-75

factors. In both Wyoming and Arizona, the impacted Class I areas are projected to be much cleaner in 2018 than Wichita Mountains. The appropriate "threshold" in terms of dv may need to be lower in order for progress to be made towards natural conditions at cleaner Class I areas. Failure to take this into account would result in eliminating reasonable controls on potential sources as a Class I area approaches its reasonable progress goal (e.g. cleaner Class I airsheds), having the undesired effect of increasing the difficulty of meeting the RPG.

Lastly, we agree with the commenter that on a $/ton basis, scrubber upgrades on Parish unit 8 are very cost-effective. However, the visibility benefit and reduction in emissions from this control is very low when compared to all the other evaluated scrubber upgrades. The estimated visibility benefit from upgrading the scrubber would be an order of magnitude less than all the other evaluated scrubber upgrades and not large enough to require as reasonable progress for this planning period.

15.o Consideration of NOx Controls

Comment: Selection of pollutants for reasonable progress analysis [NPS (0077) p. 1-2]

The NPS agreed with the Texas Council on Environmental Quality and EPA that "... the predominant anthropogenic pollutants that affects the state's ability to meet the URP goals in 2018 on the worst 20% days at the Texas Class I areas are largely due to sulfate and nitrate, primarily from point sources." However, EPA states that,"... we are limiting our analyses to the consideration of SO_2 controls for these EGU sources, as our modeling indicates that the impacts from these sources on the 20% worst days are primarily due to sulfate emissions." EPA has focused its analysis on controlling SO_2 on the premise that NOx (and nitrate) is not the predominant cause of visibility impairment. While this may be true in many of the Class I areas impacted by emissions from Texas sources, IMPROVE data provided in EPA's Table 25 show that the nitrate contribution from Texas sources is almost as great as their sulfate contribution at Salt Creek Wilderness Area in New Mexico, which may be indicative of nitrate impacts at Carlsbad Caverns NP. Although EPA does not specify the contribution from Texas at Carlsbad Caverns NP, its Table 25 does show 27% of the nitrate impact at Salt Creek WA attributed to Texas. Additionally, while nitrate contributions at Guadalupe Mountains NP are lower than at Salt Creek WA, they are still significant.

According to the NPS, regional Haze regulations (40 CFR 308(d)(1)) require that the reasonable progress goals must provide for an improvement in visibility for the 20% most-impaired days and ensure no degradation of visibility on the 20% least-impaired days. Nevertheless, EPA approved reasonable progress goals for New Mexico that show degradation on the 20% least-impaired days for Carlsbad Caverns NP. EPA attributed 44% of the nitrate impairment and 26% of the sulfate impairment at Carlsbad Caverns NP to emissions sources in CENRAP (including Texas). EPA noted that, for both Salt Creek WA and Carlsbad Caverns NP, "[c]ontributions of nitrate from CENRAP states and New Mexico from mobile sources are projected to decrease significantly, while contributions from area source emissions, including emissions from oil and gas production in New Mexico and the CENRAP states are projected to increase."

The NPS stated that nitrate is a significant contributor to visibility impairment in some Class I areas impacted by emissions from Texas sources, and Texas sources contribute significantly to the projected degradation of visibility of the least-impaired days at Carlsbad Caverns NP. Because we do not have an IMPROVE monitor at Carlsbad Caverns NP, we are concerned that impacts similar to those at Salt Creek WA may be occurring at Carlsbad Caverns NP, which is near several sources of NOx (oil and natural gas) and ammonia (cattle feed lots). As discussed later, we request that EPA begin consideration of the impact of oil and natural gas development in western Texas and southeastern New Mexico on visibility at nearby Class I areas.

[NPS (0077) p. 4] The NPS suggested that nitrate is a significant contributor to visibility impairment in some Class I areas impacted by emissions from Texas and sources of NOx that impact those Class I areas should be evaluated.

[Stamper (0068) p.5] Stamper noted that EPA has proposed scrubber retrofits on 7 EGUs that currently have no SO_2 controls. EPA only evaluated controls on SO_2 because its modeling indicated that the impacts from these sources are due primarily to sulfate emissions. FIP TSD at 3. While the majority of the Class I impacts from Texas sources do seem to be dominated by sulfur dioxide emissions, there are some facilities that EPA should have evaluated for NOx emissions.

[Sierra Club mass mail (0072 and 0073)] The commenters stated that it also appears that the EPA is not asking the coal plants to do anything to reduce their emissions of nitrogen oxides (or NOx), as was done in the neighboring state of New Mexico. The commenters asked that the EPA please consider the impacts of NOx pollution and the additional coal plants as the rule is finalized in 2015.

Multiple public hearing commenters also suggested that EPA should have included NOx emissions in the proposal (0053-11, 0053-26, 0053-28, and 0053-46).

The NPS suggested that nitrate is a significant contributor to visibility impairment in some Class I areas impacted by emissions from Texas and sources of NOx that impact those Class I areas should be evaluated. NPS asserts that we focused our analysis on controlling SO_2 on the premise that NOx (and nitrate) is not the predominant cause of visibility impairment. At Salt Creek, the nitrate impact from Texas sources is 27% of the total nitrate impact and is nearly as big as the sulfate impact from Texas sources. NPS states that nitrate contributions at Salt Creek and Guadalupe Mountains are significant, and it is likely this is also the case at Carlsbad Caverns. We also received comments from Earthjustice et. al and others that other facilities should have been evaluated for NOx controls and that NOx controls should have been evaluated for the facilities that we are requiring install SO_2 controls.

Response: With regards to comments on additional controls for NO_X, as discussed in the proposed FIP, we agree with Texas that the predominant anthropogenic emissions impacting visibility are nitrate and sulfate emissions, primarily from point sources.[541] Projected 2018 statewide emissions of SO_2 are largely due to point sources, and approximately 50% of statewide NOx emissions are from point sources. The remaining portion of NOx emissions are roughly

[541] 79 FR 74838

evenly distributed among area and mobile sources. NPS is incorrect in their assertion that we focused our analysis on SO_2 controls because nitrate is not the predominant cause of visibility impairment at the impacted Class I areas. As described in more detail in the FIP TSD, in our initial analysis we focused on point sources and we identified facilities with the greatest potential to impact visibility based on a Q/d analysis considering both SO_2 and NOx emissions. We then used photochemical modeling to estimate the visibility impacts due to the emissions from these facilities, considering SO_2, NO_X and all other emitted pollutants. Based on the results of that visibility modeling, we identified a subset of facilities for additional control analysis . At this point, we examined the source apportionment results for each identified facility and determined that with the exception of the PPG GlassWorks facility, the visibility impacts due to these facilities was almost entirely due to their sulfate emissions. Therefore, we determined that to address the visibility impacts on the 20% worst days from these sources, it was only necessary to evaluate sulfate controls for this planning period. Because impacts from the PPG Glassworks were significant and NOx emissions were responsible for a large portion of that impact, we investigated NOx controls for this facility as discussed in a separate response to comment in this section of the RTC document. We note that the Q/d analysis did identify a number of facilities based on emissions and their distance to Guadalupe Mountains or Carlsbad Caverns.[542] Photochemical modeling showed that visibility impacts from these sources (considering NOx, SO_2 and other pollutant emissions combined) were small and no additional control analysis for these sources was needed for this planning period.[543]

While overall visibility conditions at some Class I areas may show a significant impact from nitrate, sulfate impacts were significant and these sulfate impacts are primarily due to point sources. The contributing NOx emissions are spread out over numerous sources and source categories, including mobile sources. For Salt Creek, 2018 CENRAP modeling shows a contribution of 2.43 Mm-1 from nitrate from Texas sources (point, area, and mobile sources combined) compared to 3.5 Mm-1 from sulfate from Texas sources (primarily point sources). Our analysis identified those sources that had the greatest visibility impacts, which we then further analyzed for controls. This analysis did not identify any individual point sources (with the exception of PPG Glassworks) with significant visibility impacts due to NOx emissions among the group of sources with the greatest visibility impacts. We address additional comments concerning impacts at Carlsbad Caverns in a separate response to comment above. We address comments concerning oil and gas sources in separate response to comments below.

15.p Oil and Gas Sources

Comment: EPA Should Analyze Reasonable Progress Controls for Oil and Gas Sources. [Earthjustice (0067) p. 47]

Earthjustice et al. stated that the EPA proposed to "agree with the TCEQ's decision to focus the analysis of the four statutory factors on point sources." 79 Fed. Reg. at 74,838. In so doing, it

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[542] For example, Fullerton Gas Plant, Goldsmith Gas Plant, Guadalupe Compressor Station, Keystone Compressor Station, Keystone Gas Plant and Pegasus Gas Plant

[543] See the FIP TSD and "EPA_txbart3612k_Vis_2002_2018_PSAT_Projected_072913.xlsx" in the docket for visibility modeling results for these facilities.

failed to review at least one category of non-point sources that impacts visibility and for which reasonable controls are available, namely area sources of NOx and specifically NOx emissions from oil and gas sources. EPA should disapprove Texas's failure to review area sources of NOx, and should evaluate and require reasonable controls on these sources.

Earthjustice et al. stated that the EPA and Texas both acknowledge that anthropogenic nitrates are a significant source of visibility impairment at Class I areas in the region, and that sources of nitrates were relatively evenly distributed among point, mobile, and area sources as of the base year 2002. 79 Fed. Reg. at 74,834, 74,838. In that modeling, area sources comprised between 12 and 17% of the nitrate impacts at the Class I areas most impacted by Texas sources. *Id*. This is a significant proportion unto itself, and as discussed below, it was inappropriately dismissed by both Texas and EPA. Given that both point and mobile source NOx emissions have decreased while area source emissions have not, the proportion of nitrate impacts from area sources is likely to have increased significantly since the 2002 baseline.[56]

Furthermore, area source emissions as a whole are not enforceably limited – unlike a major stationary source which is limited to existing emission rates and must be re-evaluated for significant increases, area sources are not evaluated comprehensively. The potential for unevaluated, uncontrolled growth makes establishment of reasonable progress controls on existing and new sources all the more important to ameliorate existing and prevent future impairment.

Earthjustice et al. stated that Texas noted in its SIP that the largest contributor to area source NOx was upstream oil and gas emissions. However, it failed to present a detailed breakdown of emissions, so it is impossible to determine what percent of area source NOx was included in this category, and whether there were other categories that should also have been evaluated for reasonable progress controls.

With regard to upstream oil and gas emissions, Earthjustice et al. stated that Texas advanced three rationales for dismissing evaluation of controls: first, that it was taking all measures it had determined were reasonable in its Dallas-Fort Worth (DFW) ozone SIP; second, that it was implementing a grant program for retrofitting gas-fired, rich burn compressor engines; and third, that it would reexamine these sources in its five year progress report. Texas SIP Appendix 10-1 ("By that time, we expect to have much improved information on the inventory and the economic and technical feasibility of additional controls."). Each of these rationales is flawed and none considers the statutory four factors involved in a reasonable progress analysis. Texas's rationale should be rejected by EPA in favor of an actual control evaluation.

Earthjustice et al. stated that Texas's idea of what was reasonable in the context of its DFW ozone SIP is not necessarily the same as what is required for reasonable progress under the Regional Haze Rule, and EPA has the responsibility to review this analysis in the context of the Regional Haze Rule. Further, the DFW SIP covers only a small portion of the state. As seen in the image below, oil and gas wells are present throughout the state, including significant development in close proximity to Wichita Mountains, Guadalupe Mountains, Carlsbad Caverns, and Salt Creek. There are major NOx emissions outside of the DFW area – the Permian Basin in western Texas, for instance, is estimated to be responsible for roughly 166,000 tons of NOx per year.[57] At a minimum, the controls evaluated for the DFW area could be implemented elsewhere.

Earthjustice et al. provided a map of active oil and gas wells in Texas (Figure 1 in comment 0067, not reproduced here). [58]

Earthjustice et al. noted that Texas's second rationale for not considering controls on oil and gas sources—its reference to its grant program—only serves to highlight the fact that there are available controls for at least some of these sources that could be evaluated and required.

Earthjustice et al. argued that Texas's third reason fares no better. Texas promised to re-examine oil and gas sources in its five year progress report. 79 Fed. Reg. at 74,834 ("The TCEQ also noted uncertainty in upstream oil and gas emission estimates."). However, incomplete information is not an excuse for failing to review the information that exists when the SIP was developed. As EPA noted in its evaluation of Wyoming's reasonable progress review, "[i]f the State determined that additional information was needed to potentially control oil and gas sources, the State should have developed the information." 78 Fed. Reg. at 34,765.

Furthermore, Earthjustice et al. explained that Texas's claim that it would re-examine sources of oil and gas emissions in its five year progress report has been disproven by the progress report Texas recently submitted to EPA. Although its final submission contains a discussion of oil and gas emissions that was not present in the version made available for public review,[59] it is limited entirely to a summary of Texas's attempts to improve its emissions inventory. The promised discussion of "economic and technical feasibility of additional controls" – or even a meaningful summary of the inventory itself relative to the 2002 baseline or 2018 projections – does not exist.

For these reasons, Earthjustice et al. stated that the EPA's proposed approval of Texas's dismissal of area sources of NOx is inappropriate. Texas did not perform a four factor analysis of this significant source of visibility impairing pollution. EPA should disapprove the oil and gas portion of Texas's haze SIP and substitute a thorough control analysis based on updated information and consideration of the four reasonable progress factors. It has been widely demonstrated that the emissions from these sources are significant and that reasonable controls are available, cost-effective and are otherwise likely to result in controls following a four factor analysis.[60]

Footnotes:

[56] See, e.g., Texas 2014 Five-Year Regional Haze State Implementation Plan Revision, February 26, 2014, p. 4-5 through 4-7. [This document is attached to comment 0067 - Item 14]

[57] 2011 Oil and Gas Emission Inventory Enhancement Project for CenSARA States, Table E-2.

[58] TCEQ, Texas Oil and Gas Wells, *available at* http://www.tceq.state.tx.us/assets/public/implementation/barnett_shale/bs_images/txOilGasWells.png [This document is attached to comment 0067 - Item 15]

[59] Texas 2014 Five-Year Regional Haze State Implementation Plan Revision, Proposal, June 18, 2013. [This document is attached to comment 0067 - Item 13]

[60] See, e.g., 2011 Oil and Gas Emission Inventory Enhancement Project for CenSARA States; Summary of Oil and Gas Sector TSD: Significant Stationary Source of NOx Emissions, October 2012; Conservation Organization's August 26, 2013 comments to EPA Re: Docket ID No. EPA– R08–OAR–2012–0026, Comments on EPA's Re-Proposed Approval, Disapproval, and Promulgation of Implementation Plans; State of Wyoming; Regional Haze State Implementation Plan; Federal Implementation Plan for Regional Haze, 78 Fed. Reg. 34,738 (June 10, 2013);

Conservation Organizations' comments to EPA Re: Docket ID No. EPA–R08– OAR–2012– 0026, comments on EPA Proposed Approval, Disapproval, and Promulgation of Implementation Plans; State of Wyoming; Regional Haze State Implementation Plan; Federal Implementation Plan for Regional Haze; Environmental Commenters' August 20, 2014 comments to EPA Re: Comments of Clean Air Task Force, National Parks Conservation Association, Earthjustice, WildEarth Guardians, and Southern Utah Wilderness Alliance on Managing Emissions From Oil and Natural Gas Production in Indian Country: Advanced Notice of Proposed Rulemaking, 79 Fed. Reg. 32,502 (June 5, 2014). [Document is attached to comment 0067 - Items 11, 12, 16 and 17]

Earthjustice et al. commented that we failed to review area sources of NOx and specifically NOx emissions from oil and gas sources. We should have disapproved Texas RH SIP for failing to perform a four factor analysis on NOx area sources and should have evaluated and required reasonable controls on these sources. Anthropogenic nitrates are a significant source of visibility impairment, and sources of nitrates were relatively evenly distributed among point, mobile, and area sources as of the base year 2002. The 2002 CENRAP modeling showed area sources comprised between 12% and 17% of the nitrate impacts at the Class I areas most impacted by Texas sources. This is a significant portion and while point and mobile source NOx emissions have decreased, impacts from area sources have likely increased. The TX RH SIP states that oil and gas sources are the largest contributor of NOx to area source NOx emissions but provides no additional information quantifying oil and gas versus other area sources.

Earthjustice summarizes the TX RH SIP with regards to dismissing evaluation of controls for oil and gas emissions: first, that it was taking all measures it had determined were reasonable in its Dallas-Fort Worth (DFW) ozone SIP; second, that it was implementing a grant program for retrofitting gas-fired, rich burn compressor engines; and third, that it would reexamine these sources in its five year progress report. Earthjustice states that there are flaws in this reasoning because the DFW ozone SIP is limited to sources in that region and that controls considered under regional haze may differ from those considered for ozone planning, the grant program serves to demonstrate the availability of controls, and finally that the five-year progress report fails to examine additional controls for these sources. Lastly, the commenter provides additional information that they explain demonstrates that these emissions are significant and controls are available and cost-effective.

Response: As discussed in the proposed FIP, we agreed with Texas that visibility impairment due to anthropogenic emissions is largely due to sulfate and nitrate, primarily from point sources. Projected 2018 statewide emissions of SO_2 are largely due to point sources, and approximately 50% of statewide NOx emissions are from point sources. The remaining portion of NOx emissions are roughly evenly distributed among area and mobile sources. As discussed in detail elsewhere, we evaluated Texas point sources and identified a reasonable set of sources with the greatest estimated visibility impacts for additional control analysis. In identifying these sources we considered impacts from emissions of NOx, SO_2 and other visibility impairment pollutants.

Visibility impacts from NOx emissions from area sources are relatively small compared to impacts from point sources of SO_2 and NOx at the Class I areas impacted by Texas emissions. Table 4 of the TX TSD (copied below) summarizes the percentage of sulfate and nitrate impacts from Texas sources for point, mobile and area sources at five Class I areas impacted by Texas emissions for 2002. Impacts from NOx emissions from area sources range between 12% and 17% and are less than half the impact from NOx point source emissions at these Class I areas (ranging from 26.6% to 35.8%). The 2018 modeling projections estimate impacts from NOx emissions from all Texas area sources combined will comprise 1.08% of the total projected visibility impairment in 2018 at Salt Creek, compared to 9.03% from Texas point sources (NOx and SO_2 combined). The 2018 modeling projections estimate impacts from NOx emissions from all Texas area sources combined will comprise 1.35% of the total projected visibility impairment in 2018 at Wichita Mountains, compared to 13.22% from Texas point sources (NOx and SO_2 combined).[544] Area source NOx impacts at other Class I areas are smaller in terms of percent impact than at these two Class I areas. Oil and gas emissions are the largest component of area source emissions but are only part of the total NOx area source emissions. Furthermore, impacts from sulfate are larger than nitrate impacts on the 20% worst days at all Class I areas.[545] Based on our review of the CENRAP modeling results and the TCEQ's analysis in Chapter 11 and appendix 10-1 of the Texas regional haze SIP we found that the predominant anthropogenic pollutants that affects Texas' ability to meet the URP goals in 2018 on the worst 20% days at the Texas Class I areas are largely due to sulfate and nitrate, primarily from point sources. We focused on point source emissions of NOx and SO_2 and evaluated controls on those sources with the largest impacts on visibility for this planning period.

We agree with the commenter that cost-effective controls have been identified for some area sources associated with oil and gas production. However, we agree with Texas that it was reasonable to not examine these sources for additional control at this time as these sources are not the primary contributors to visibility impairment for this planning period. We evaluated Texas point sources and identified a reasonable set of sources with the largest estimated visibility impacts for additional control analysis. Similar to that process of eliminating those point sources that have less potential to contribute to visibility impairment from additional control analysis, we eliminated area sources from additional control analysis for this planning period. As the visibility impact from the identified point sources are reduced through reasonable controls, the impact from area sources will become a larger percentage of the total visibility impairment and should be addressed in future planning periods. As discussed in the Texas regional haze SIP[546], improved emission inventory information, along with experience gained in implementation of controls for the Dallas/Fort Worth area and through the grant program established to assist with the retrofitting of gas-fired, rich burn compressor engines, will be useful in consideration of controls for these sources in future planning periods. Texas committed to additional examination of these sources and has included information on current efforts to improve the emission inventory in their regional haze Progress Report SIP. Any specific comments concerning the adequacy of the TX Progress Report SIP will be addressed when we take action on that separate SIP submittal. We note that any new sources such as oil and gas sources are covered by new source performance standards.

Percentage Source Category Contributions to SO_4 and NO_3 at the Five Class I Areas Texas Most Impacts

	Big Bend	**Guadalupe Mountains**

[544] CENRAP PSAT data available in the docket for this action as CENRAP_PSAT_Tool_ENVIRON_Aug27_2007.mdb

[545] See Tables 25 and 26 of the TX TSD for a summary of nitrate and sulfate impacts from Texas sources on Class I areas in nearby states.

[546] See section 10-1.2 of the Texas regional haze SIP

	Point	Mobile	Area	Point	Mobile	Area
SO_4	67.1	2.8	6.9	75.6	3.5	8.5
NO_3	26.6	28.6	14.3	29.2	36.5	13.9

	Wichita Mountains			Salt Creek			White Mountain		
	Point	Mobile	Area	Point	Mobile	Area	Point	Mobile	Area
SO_4	78.2	3.7	9.2	73.8	3.9	8.1	75.2	4.1	8.1
NO_3	28.1	44.7	13.4	35.8	29.9	17.1	27.9	40.3	12.0

Comment: Oil and gas emissions near Carlsbad Caverns NP and Guadalupe Mountains NP [NPS (0077) p. 4 and 0077-A3]

The NPS suggested that the EPA should consider emission reductions from some oil and natural gas facilities in western Texas by addressing combined emissions from this small number of sources.

The NPS expressed concern about the increasing emissions from oil and natural gas development near Carlsbad Caverns NP and Guadalupe Mountains NP. The NPS provided a spreadsheet (0077-A3) with Texas and New Mexico Q/D values for several oil and gas plants. For example, the 2011 National Emissions Inventory (NEI) includes eight oil and gas facilities in Texas with combined SO_2, NOx, and PM10 emissions of over 10,000 ton/yr and cumulative Q/d greater than 10 at both Carlsbad Caverns NP and Guadalupe Mountains NP. In New Mexico, the 2011 NEI includes 14 oil and gas facilities with combined SO_2, NOx, and PM10 emissions of over 19,000 ton/yr and cumulative Q/D greater than 10 at Carlsbad Caverns NP and Guadalupe Mountains NP. The NPS noted that EPA recommended future consideration of controls on natural gas facilities in Arizona as part of its FIP actions there, and that EPA determined that Non-Selective Catalytic Reduction represented reasonable progress at a natural gas compressor station in its Montana FIP. The NPS requested that EPA consider similar actions in Texas by addressing combined emissions from this small number of oil and gas sources.

Response: NPS provided a spreadsheet containing 2011 emission inventory and Q/d data for 8 oil and gas facilities in Texas. Of those facilities, only Fullerton Gas Plant and Goldsmith Gas Plant had a Q/d value greater than 10 for either Carlsbad Caverns or Guadalupe Mountains. As discussed in a separate response to comment we used a Q/d threshold of 10 to initially identify those individual facilities with the potential to significantly impact visibility at a nearby Class I area. The Fullerton and Goldsmith facilities were included in our initial source apportionment modeling to estimate the visibility impact of these facilities. The 2018 modeled visibility impact was 0.106% of the total visibility impairment from the Fullerton Plant at Carlsbad Caverns and Guadalupe mountains. The 2018 modeled visibility impact from Goldsmith was 0.072% of the total visibility impairment at Carlsbad Caverns and Guadalupe Mountains. This is much smaller than the modeled impact from Tolk (0.646%) or Big Brown (0.502%) and well below the 0.3% unit impact threshold we applied in identifying sources for additional control analysis. We anticipate that individual impacts from the other 6 facilities would also be small considering their emissions and distance from these Class I areas. The NPS also provided information on emissions and Q/d for 14 oil and gas facilities in New Mexico. We reviewed and approved New

Mexico's RH SIP addressing reasonable progress and long-term strategy requirements in a separate action.[547] Furthermore, SO_2 emissions from these facilities with SO_2 emissions greater than 100 tpy are limited under the SO_2 Milestone and Backstop Trading Program.[548] As the commenter states, in the Montana FIP we determined that Non-Selective Catalytic Reduction represented reasonable progress at a natural gas compressor station. We note that this facility was identified for additional analysis because it had a Q/d value greater than 10. We also note that this is the only source with required controls in Montana under the reasonable progress requirements. As discussed elsewhere, we initially relied on a Q/d analysis to identify 38 sources with the greatest potential to impact visibility. We then conducted a more refined analysis using photochemical modeling to estimate the visibility impacts from the 38 sources and identify the subset of sources with the largest visibility impacts. Some of these sources may be identified for additional control analysis in future planning periods as the sources with the largest visibility impacts and potential for visibility benefit are controlled. We address comments concerning oil and gas sources that fall under the area source category in a separate response to comment above.

15.q Identification of Sources using Q/d and Photochemical Modeling

General Summary: We received comments on the methodology used to identify sources for analysis. Commenters stated that our analysis, beginning with a Q/d analysis and the use of a 0.3% of total impairment threshold for identifying sources for additional analysis was arbitrary, capricious, or improper. In addition, commenters contend that the Q/d analysis selects the wrong sources because it does not consider stack parameters or meteorology. Other commenters suggested that all 38 facilities identified as having the greatest potential to impact visibility by the Q/d analysis should have undergone a four-factor analysis. We also received comments that a lower threshold should have been used, that the threshold was applied inconsistently, and that the 0.3% threshold screened out sources that have a significant visibility impact and should have been evaluated for controls.

Q/d Analysis

Q/d General summary: We received comments on the methodology used to initially identify sources for analysis. Commenters stated that EPA included both NOx and SO_2 emissions for the Q/d screening even though the subsequent control analysis only focused on SO_2 emissions. In addition, the Q/d analysis selects the wrong sources because it does not consider stack parameters or meteorology. Back-trajectory data also shows that EPA selected the wrong group of sources.

We also received comments that our application of Q/d is inconsistent with other states in that it does not capture the majority of emissions in the State, comments that we should have used a

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547 77 FR 70693

548 Under Section 309 of the Federal Regional Haze Rule, nine western states and tribes within those states have the option of submitting plans to reduce regional haze emissions that impair visibility at 16 Class I areas on the Colorado Plateau. Three states -- New Mexico, Utah, and Wyoming -- and Albuquerque-Bernalillo County exercised this option by submitting plans to EPA by December 31, 2003.

lower Q/d threshold, and considered permitted emissions rather than actual emissions. Commenters also suggested that all 38 facilities identified from the Q/d analysis should have undergone a four-factor analysis.

Comment: Luminant provided a summary of EPA's "additional" visibility benefit analysis of a "small group' of Texas sources. [Luminant (0061) p. 27]

Step 1: EPA singles out 38 facilities in Texas out of 1,600 by re-doing the Q/D analysis that Texas used in its SIP to identify sources that EPA would evaluate for additional controls.[217]

At Step 1, EPA identified a list of 38 Texas facilities, out of 1,600 Texas point sources, for visibility modeling.[226] EPA used an emission-over-distance ratio or "Q/D" to perform this screening. However, EPA used both SO_2 and NO_x emissions for its screen, even though its subsequent analysis was focused exclusively on SO_2 emissions.[227] EPA did not select, or consider for selection, any sources from Oklahoma or any state other than Texas. EPA claimed that it had to target only a limited number of facilities for its analysis because of "computation resource limitations" of the model that it had selected (i.e., CAMx).[228] However, EPA never explains why it could not have easily created source regions in its analysis to encompass impacts associated with sources in other states.

[217] FIP TSD at A-2 to A-4.
[224] 79 Fed. Reg. at 74,880–81.
[225] Id. at 74,882–84.
[226] Id. at 74,877.
[227] FIP TSD at A-4 to A-5.
[228] Id. at A-4.

Luminant stated that the Q/d analysis used both SO_2 and NOx emissions even though subsequent analysis focused only on SO_2 emissions. Luminant also comments that while EPA states that computation resource limitations required limiting the number of facilities for analysis, EPA does not explain why source regions were not created to encompass impacts associated with other states.

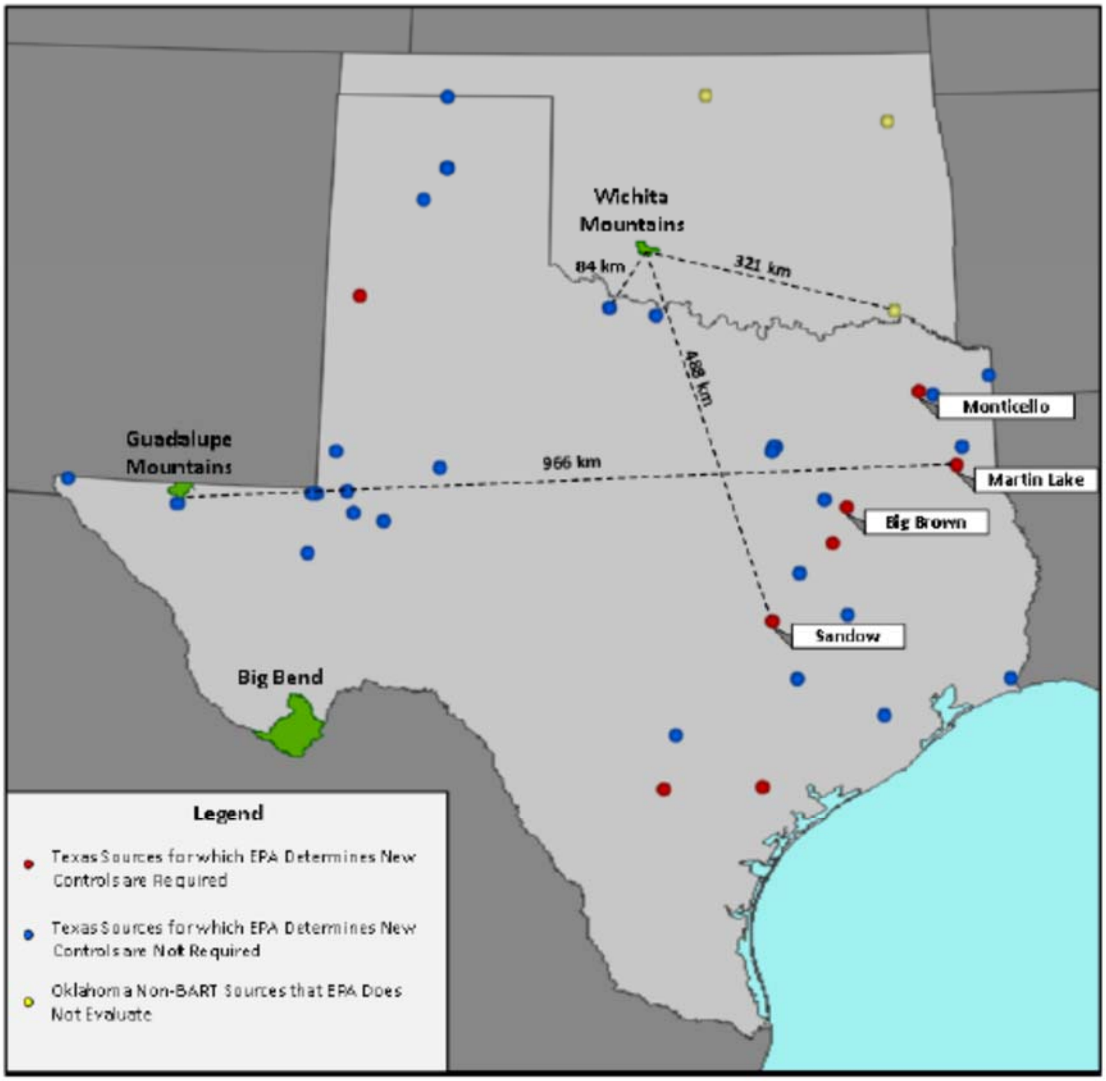
Response: The TCEQ focused its control strategy analysis on point source emissions of SO_2 and NO_X, as the sources of these pollutants are the main anthropogenic pollutants that affect visibility at Class I areas in Texas. In our review of the TX SIP, we agreed with Texas that it was appropriate to focus the analysis on point sources of NOx and SO_2. In order to identify those point sources with the potential to have the greatest visibility impacts, we performed a Q/d screening analysis considering combined emissions of NOx and SO_2 emissions. This screening led to the identification of 38 facilities for additional analysis. We then performed source apportionment modeling for these 38 facilities to estimate the visibility impact due to the emissions from each of these sources. The source apportionment modeling provided information on the total visibility impairment due to all of the source's emissions, as well as the visibility impairment specifically due to emissions of NOx, SO_2, elemental carbon, or other species emissions. Our complete analysis identified those sources with the greatest visibility impacts at Wichita Mountains and the Texas Class I areas based on consideration of a source's emissions (modeled and recent emissions data), location, and modeled visibility impairment. Once identified, we performed additional control analysis on these sources to determine through the four-factor analysis if controls were available and cost-effective. Analysis of source apportionment data for the sources identified for additional control analysis revealed that for all these sources with the exception of one, their contribution to visibility impairment on the 20% worst days was almost completely due to sulfate emissions. Therefore the control analysis for these sources was focused on sulfate controls since controlling other emitted species, such as NOx, would not result in significant visibility improvement on the 20% worst days for this planning period. Source apportionment modeling for the PPG Flat Glass plant showed visibility impacts from both NOx and SO_2 emissions. As discussed in the proposal and FIP TSD, NOx controls were considered along with recent emissions and permit data for the PPG Flat Glass facility. Contrary to Luminant's comments that our analysis focused only on SO_2 emissions, we considered visibility impacts from both NOx and SO_2 emissions, and focused additional control analysis on those pollutants that were primarily responsible for the modeled visibility impact on the 20% worst days from those sources.

As Luminant states, we did not create source regions to analyze impacts from other states. This was not necessary because CENRAP's source apportionment modeling provided estimates of visibility impacts from other states and source categories. The CENRAP states relied upon this data in assessing visibility impacts from source categories and specific pollutants from source within other states. We also relied upon this data in our analysis of the Texas and Oklahoma regional haze SIP and reasonable progress at the relevant Class I areas. The commenter takes our statement on "computational resources" out of context. As we discuss in the FIP TSD, due to computation resource limitations, it is not possible to include a large number of facilities in the photochemical modeling episode utilizing source apportionment. In other words, we could not use source apportionment on all 1600+ point sources to evaluate their visibility impacts. The Q/d analysis and use of the threshold value of ten identified those facilities with the greatest potential to impact visibility due to their location and size. As discussed in a separate response to comment below, this approach is a widely used method as an initial step to evaluate a facility's potential to impact air quality and identify those sources with large enough emissions close enough to a receptor to need additional analysis. We then performed photochemical modeling with source apportionment as a more refined approach for these identified facilities to estimate their visibility impacts considering emissions, stack parameters, chemistry, and meteorology/transport. As explained in more detail elsewhere, our analysis focused on sources within Texas. We reviewed Oklahoma's analysis of its sources and agreed with Oklahoma's determination that no additional controls were necessary for this planning period.

Comment: [Luminant (0061), p. i] Luminant stated that the proposal burdens a handful of Texas generating units, located far away from these Class I areas, with massive costs that would threaten their continued operation and economic viability and the thousands of jobs they provide.

Luminant stated that, to arrive at this conclusion, EPA invents a methodology found nowhere in the statute or regulations and applies it in a seemingly random manner. The map below depicts EPA's skewed and unprecedented approach for Texas, with sources far away from these federal areas somehow being captured by EPA's novel methodology, while closer sources are excluded. There is no discernible rationale for this flawed approach.

Map of Sources and Federal Areas Provided by Luminant (0061)



Luminant asserted that never before has EPA singled out individual sources using the new approach that EPA employs here to derail the regional haze plans by Texas and Oklahoma. The record is irrefutable that EPA has routinely approved other states' regional haze plans that look just like the Texas plan and achieved the same level of progress.

Luminant stated that, with this unprecedented approach, EPA resorts to stretching the science and the law beyond all recognition to justify its preordained result. EPA fails to follow its own modeling protocols or to validate its modeling, and it uses results well outside the model's well-recognized limitations.

Response: Comments concerning costs and economic viability, consistency with actions in other states, and modeling limitations are addressed elsewhere. Comments concerning our selection of sources for additional analysis are addressed in the response to the comment below.

Comment: EPA's "additional analysis" starts with the wrong group of sources
[Luminant (0061) p. 109]

Luminant stated that, moreover, even if the type of individual source visibility analysis that EPA performed were permissible under the statute and regulations, EPA started the analysis with the wrong set of sources, and thus it reached the wrong result. EPA chooses which sources to include in its analysis based on a quantity over distance or "Q/D" analysis to narrow approximately 1,600 Texas sources to 38 (Step 1, as discussed in our Background section). But this rough metric does nothing to determine which sources may be reasonably controlled for the benefit of these Class I areas. This Q/D approach ignores unit specific characteristics of the sources that effect their potential for visibility impacts,[683] ignores all sources outside of Texas which have demonstrated impacts on these areas (including international and Oklahoma sources), and also ignores one of the most important factors—meteorological conditions like wind patterns. EPA claims that it had to use this Q/D threshold to narrow its target sources "[d]ue to computation resource limitations,"[footnote 684] but the result is that EPA's analysis too is of limited value and, in fact, arbitrary. By selecting only a few sources, and then purporting to determine which of them contribute significantly to visibility impairment by comparing them relative to each other, EPA's analysis assumes what it seeks to prove. The truth is that all of the sources EPA evaluated have minuscule, if any, impact on these areas, and trying to distinguish among them is a futile effort—and comparing them is a useless exercise.

It is apparent, then, that EPA's pre-ordained analysis was flawed from the outset, and had EPA's analysis started in a different and proper manner, it would have reached a different result. This is yet another way that EPA's methodology was arbitrary and capricious and cannot support its proposal.

Footnotes:
[683] See FIP TSD at A-4.
[684] Id
[685] Source back trajectory data is from the NOAA HySplit model, using EDAS 40km resolution meteorological data, 120 hour duration, ending at 3 p.m. at the WIMO IMPROVE monitor location 500m above ground. The analysis measures the distance from each facility to the hourly back trajectory endpoints, provided in the data files for each day from the HySplit output, using the Haversine formula. A trajectory is near a facility when the facility is within a linearly increasing radius up to 40 km during the initial 6-hour period, or within 40 km for the remainder of the 5-day period. The 20% Worst days are days based on the total extinction monitored at the WIMO IMPROVE visibility monitor, available at:
ftp://vista.cira.colostate.edu/Public/AirQuality/Data/Aerosol/IMPROVE/DataSetsBySite/WIMO1.csv.

Luminant presents a map of sources and Class I areas and comments that it demonstrates our "skewed and unprecedented" approach, with sources far away from these federal areas "somehow being captured by EPA's novel methodology, while closer sources are excluded." Luminant also made general comments that the approach is random, "found nowhere in the statute," unprecedented, and inconsistent with our actions on other states.

Luminant commented that we started our reasonable progress control analysis with the wrong set of sources. Luminant states that we used a Q/d analysis to identify which sources to include in our analysis and that this approach is flawed because it ignores unit specific characteristics and ignores one of the most important factors – metrological conditions such as wind patterns. Luminant comments that this analysis is of limited value and arbitrary and attempts to determine which of a few sources contribute significantly to visibility impairment by comparing them relative to each other. Luminant claims that all of the sources EPA evaluated have minuscule impacts on these areas, and that trying to distinguish among them or compare them is futile and useless.

Luminant submits a back trajectory analysis for 2002 and 2011-2013 for Wichita Mountains that it claims supports the comment that we started the analysis with the wrong set of sources. Luminant states that the back trajectories show that transport rarely occurs from the Luminant facilities to the Wichita Mountains Class I area and that much greater occurrences are seen among other Texas sources, international sources, and Oklahoma sources.

Luminant states that EPA's choice of which sources to evaluate was critical because the subsequent steps were constructed to all but assure that some impact would be shown. EPA's "pre-ordained" analysis was flawed from the outset, and had the analysis started in a different and "proper" manner, it would have reached a different result. Luminant concludes that this is another way that EPA's methodology was arbitrary and capricious.

Response: We disagree with Luminant's assertion that our analysis, beginning with a Q/d analysis was arbitrary, capricious, or improper. We also disagree with the assertion that our analysis identified the "wrong" sources or that the analysis was "pre-ordained." The map presented by the commenter does not account for the size of the emission source or other important factors that contribute to the level of the visibility impairment due to the source. Just taking into account the level of emissions from the sources presents a very different picture of which sources may be causing visibility impairment at a class I area.[549] As explained below and elsewhere in this document, our complete analysis identified those sources with the greatest visibility impacts at Wichita Mountains and the Texas Class I areas based on consideration of a source's emissions, location, and modeled visibility impairment. Once identified, we performed additional control analysis on these sources to determine through the four-factor analysis if controls were available and cost-effective. Specific comments from Luminant concerning our approach as being new, unprecedented and inconsistent with previous actions are addressed in this and other response to comments in this document. Specific comments concerning sources in Oklahoma are addressed in a separate response to comment in this document.

As we discuss at length in the FIP TSD, EPA, States (including Texas) and RPOs (including CENRAP) have used a Q/d analysis to identify those facilities that have the potential to impact visibility at a Class I area based on their emissions and distance to the Class I area. These identified facilities could then be considered for further evaluation to estimate visibility impacts,

[549] For example, see Figure A.1-3a of the FIP TSD for a map of Q/d values for the Texas sources at Wichita Mountains.

and then undergo the reasonable progress analysis for determination of reasonable controls. The BART guidelines[550] discuss identifying sources with the potential to impact visibility based on a Q/d approach consistent with the method followed in this action. Furthermore, this approach has also been recommended by the Federal Land Managers' Air Quality Related Values Work Group (FLAG)[551] as an initial screening test to determine if an analysis is required to evaluate the potential impact of a new or modified source on air quality related values (AQRV) at a Class I area. In the Texas regional haze SIP, TCEQ relied on a Q/d approach as one of the initial steps to identify sources for additional analysis.[552] We used a similar Q/d approach to identify 38 sources, from the more than 1600 point sources in Texas, that had the most potential to impact visibility due to their location and size. In other words, we started by looking at every point source in Texas[553] and narrowed the field to a much smaller subset of sources with the most potential to impact visibility based on their emissions and location. This approach is a widely used method as an initial step to evaluate a facility's potential to impact air quality and identify those sources with large enough emissions close enough to a receptor to need additional analysis. Using this methodology, we considered every point source in Texas and narrowed the list to a much smaller list of facilities with the greatest potential visibility impacts based on just emissions and distance.

Following the Q/d analysis we took the additional step of using photochemical modeling, utilizing CAMx with Plume-in-Grid (PiG) and Particulate Source Apportionment Tagging (PSAT). As the commenter states, the Q/d analysis does not take into account stack parameters, meteorological conditions, or chemistry. Given the large geographic distribution of sources and distances to the Class I areas, we recognized that it was highly likely that only a subset of these 38 facilities would have the greatest visibility impacts on downwind Class I areas once meteorological and transport conditions, atmospheric dispersion, chemistry and stack parameters were taken into consideration, as CAMx with Pig and PSAT can do. EPA initially tagged emissions from the 38 facilities identified though the Q/d analysis in order to estimate the potential of emissions from a facility to impact visibility. This is a more refined approach than the initial Q/d analysis performed by both Texas and EPA because unlike a Q/d analysis that only considers emissions and distance, this accounts for emissions, location, stack parameters, meteorological conditions, and models both chemistry and transport to the Class I areas. The results of this modeling were used to verify our initial identification of sources and further eliminate sources from a full four-factor reasonable progress analysis based on facility-level impacts and consideration of estimated unit level impacts, as described in detail in the FIP TSD.

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550 See 40 CFR part 51, app. Y, § III (How to Identify Sources "Subject to BART")

551 Federal Land Managers' Air Quality Related Values Work Group (FLAG), Phase I Report—Revised (2010) Natural Resource Report NPS/NRPC/NRR—2010/232, October 2010. Available at http://www.nature.nps.gov/air/Pubs/pdf/flag/FLAG_2010.pdf

552 TX RH SIP Appendix 10-1. "The group of sources was further reduced to eliminate sources that are so distant from any of the ten Class I areas that any reduction in emissions would be unlikely to have a perceptible impact on visibility. The list was restricted to those sources with a ratio of estimated projected 2018 base annual emissions (tons) to distance (kilometers) greater than five to any Class I area."

553 The Texas point sources are defined as industrial, commercial, or institutional sites that meet the reporting requirements of 30 Texas Administrative Code (TAC) §101.10. Permitted point sources in Texas are required to submit annual emissions inventories. The data are drawn from TCEQ's computer-based State of Texas Air Retrieval System (STARS). Annual emission data from 2009 were utilized to calculate the Q/D value for all point sources with reported emissions in Texas. 2009 emissions data available in the docket as "2009statesum.xlsx"

As discussed in the FIP TSD, our modeling results showed that the 38 identified sources from the Q/d analysis were responsible for approximately 80% of the total impact from Texas point sources on the 20% worst days at Wichita Mountains. Similarly, the 38 identified facilities were responsible for approximately 50% of the impact from Texas point sources on the 20% worst days at both Guadalupe Mountains and Big Bend. Contrary to Luminant's claim, the Q/d analysis successfully narrowed the list of sources from over 1600 to those sources with the greatest contributions to visibility impairment at Class I areas in Texas and Oklahoma. Our additional analysis utilizing photochemical modeling and source apportionment showed that some of these sources have large impacts when compared not only to other sources in Texas but when compared to the CENRAP modeled impacts from all point source emissions combined in other states. For example, the Monticello and Big Brown facilities are projected to contribute approximately 1.3 Mm^{-1} and 1.2 Mm^{-1}, respectively to visibility impairment on the 20% worst days at Wichita Mountains in 2018 based on the CENRAP 2018 projected emissions for these facilities. This is 1.7% and 1.5% of the total visibility impairment at Wichita Mountains. In our FIP TSD we noted that Texas used an impact extinction level threshold of 0.5 Mm^{-1} (a level less than half of the estimated impact from the Monticello or Big Brown facilities) from all sources in a state as a threshold for inviting a state to consult.[554] Oklahoma selected a threshold of 1.0 Mm^{-1} to determine which states should consult in analyzing visibility impairment at Wichita Mountains. We also noted that the largest projected contribution from all point sources within a state at Wichita Mountains after Texas (14%) is Oklahoma at 3.9%. Elimination of all point sources in Oklahoma would result in less visibility benefit (3.9%) than the visibility benefit from required controls (greater than 5%).

The CENRAP RPO model results also support our selection of facilities in that these results indicated that over 50% of the visibility impairment at Wichita Mountains due to point sources in Texas is due to EGU sources (7.7% of the total visibility impairment), the majority due to EGU sources located in East Texas modeled region (6.5% of the total visibility impairment). Our final analysis identified those emission units with the largest visibility impacts, including the top three impacting sources at Wichita Mountains (Big Brown, Monticello and Martin Lake), that are all EGUs located in the East Texas modeled region. As these facts demonstrate, the identified facilities have significant impacts on visibility conditions. Our technical record makes it equally plain that the required controls reduce impacts from these sources and result in meaningful visibility benefits towards the goal of natural visibility conditions.

In summary, our analysis properly identified the sources in Texas with the greatest individual visibility impacts for additional control analysis. Luminant is incorrect in their assertion that the visibility impacts from the identified sources are miniscule, or that we started with the wrong sources. Starting from the entire universe of Texas point sources, we systematically eliminated those facilities that had less potential to impact visibility based on careful consideration of emissions, location, and finally modeled visibility impacts. After identifying those facilities with the greatest visibility impacts, we performed the four factor analysis to evaluate whether reasonable progress controls were available and cost-effective.

[554] See Texas Regional Haze SIP Appendix 4-1: Summary of Consultation Calls and Section X.A. of the Oklahoma Regional Haze SIP

With regard to the back-trajectory analysis for Wichita Mountains submitted by the commenter, we respond to this comment in a separate response to comment.

Comment: EPA Inappropriately Eliminated Sources from Detailed Four-Factor Analysis of Reasonable Progress Controls. [Earthjustice (0067) p. 45]

Earthjustice et al. stated that after accepting Texas's narrowing of the scope of review to only point source emissions of NOx and SO_2, EPA further narrowed its review by first employing a Q/D (or "Q over D") analysis, which compares emissions to distance, and secondly by using source apportionment modeling. This process pared a list of more than 1600 sources down to just 9 facilities. Two aspects of EPA's method for screening reasonable progress sources led EPA to inappropriately screen out sources that have significant visibility impacts.

First, considering the high number of sources contributing to cumulative impacts at multiple Class I areas in the region, and its use of actual (rather than potential or allowable) emissions, Earthjustice et al. stated that EPA should have used a lower Q/D threshold than 10 for determining which reasonable progress sources to analyze in detail. EPA's evaluation of impacts on just the worst 20% of days rather than peak impacts from each facility eliminates sources that should have been reviewed. Likewise, EPA's emphasis on just 3 of the Class I areas impacted obscures sources that have higher impacts at other Class I areas or have larger cumulative impacts.

[Gray (0070) p.6] Dr. Gray stated that the first method EPA used to narrow the scope of its review is a screening tool known as a Q/D (or "Q over D") analysis, which compares emissions to distance. EPA used a threshold of 10 but should have used a lower threshold that would have resulted in the inclusion of more sources in its control review. (FIP TSD, Section A.1)

According to Dr. Gray, by using a Q/D threshold of 10 and basing its calculations on actual emissions, EPA removed from further analysis a number of sources, the control of which may provide opportunities for reasonable, cost-effective visibility improvement. The end result of this process was to ignore roughly 49%, 39%, and 22% of the contribution from Texas point sources at BIBE, GUMO, and WIMO, respectively (roughly 3-4% of the total extinction in each case).[6] At GUMO, these ignored sources contribute nearly 3 times more than the next highest[7] state point source contribution (from New Mexico). At BIBE, they contribute 50% more than next highest state point source contribution (from Louisiana). And at WIMO, they contribute roughly the same amount as the next highest state point source contribution (from Oklahoma).[8] Similar to EPA's guidelines around setting a threshold to determine sources subject to BART, any of the thresholds used in EPA's reasonable progress analysis should take into consideration "the number of emissions sources affecting the Class I areas at issue and the magnitude of the individual sources' impacts. In general, a larger number of sources causing impacts in a Class I area may warrant a lower contribution threshold."[9] The same principle applies here, where there are 1600+ Texas point sources collectively contributing to impairment. Indeed, Texas considered a Q/D threshold of 5 in evaluating sources to consider. 79 Fed. Reg. 74,836. EPA correctly notes the Federal Land Managers' Air Quality Related Values Work Group (FLAG) recommendation of a Q/D threshold of 10. This is in the context of new or modified sources, and as such typically uses the source's potential or allowable emissions rather than actual emissions. Because actual emissions are lower than potential emissions, sometimes by a significant margin, and because actual emissions are not enforceable,[10] a lower Q/D threshold should be used in this context (or potential emissions should be used with the Q/D threshold of 10).

Dr. Gray stated that the EPA also selected the threshold of 10 to limit the number of facilities for analysis because of resource constraints (the inability to perform source apportionment on large numbers of facilities using photochemical modeling). While there are obviously logistical and resource-related limits to the number of facilities that can realistically be evaluated, this approach somewhat artificially limits the scope of analysis and excludes sources that do contribute to visibility impairment. EPA could have performed CALPUFF analyses, which are far less resource intensive, for at least some of the facilities. EPA also could have set up something like its model plants for BART – i.e. assuming that any source meeting specific criteria was having a sufficient impact to justify a four factor analysis for reasonable progress control.

Dr. Gray stated that the several sources that screened out of EPA's Q/D analysis were modeled using CAMx as a part of Texas's BART analysis and appear to have significant impacts on visibility (up to 0.42 dv maximum impact based on permit allowable emissions).[11]

Dr. Gray stated that these may be smaller sources relative to the impacts from some of the largest Texas sources, but collectively they are significant contributors, and cost-effective, reasonable controls may be available for many of them.

Footnotes:
[6] See FIP TSD at A-64 through A-66 and underlying data in spreadsheet "TX116-007-_23_extinction_charts.xlsx".
[7] Next highest after Texas.
[8] Id.
[9] 40 C.F.R. Part 51, App'x Y III.A.
[10] The challenges of relying on non-enforceable actual emissions are apparent in the many adjustments EPA was required to perform due to updates to actual emissions, e.g. in its Q/D analysis and source apportionment work.
[11] Texas SIP at 9-15.

Earthjustice et al. comments that EPA should have used a lower Q/d threshold considering the number of sources contributing to visibility impairment and the use of actual rather than potential or allowable emissions. The commenter also states that peak impacts and impacts at other Class I areas should be considered. Using a Q/d value of ten based on actual emissions resulted in EPA ignoring roughly 49%, 39%, and 22% of the contribution from Texas point sources at BIBE, GUMO, and WIMO, respectively. The commenter also states that EPA limit the number of facilities for analysis because of resource constraints but could have used CALPUFF to model some of the sources and as a model plant to identify sources for additional analysis.

The commenter states that EPA screened some sources that had large impacts based on Texas' CAMx modeling as part of its BART screening.

Response: Comments concerning impacts on the 20% worst days versus the peak impacts and consideration of impacts at other Class I areas are discussed in separate response to comments. We disagree with the commenter that a different threshold for the Q/d analysis was appropriate. The use of a threshold value of ten based on actual emissions is consistent with previous EPA actions in Arizona, Wyoming and Montana. We also note that Texas used a Q/d threshold of 5, but applied it separately to total NOx and SO_2 emissions. The purpose of the Q/d analysis is to identify those sources that have the greatest potential to impact visibility at the Class I areas. As seen in table A.1-2 of the FIP TSD, many of the sources have Q/d values well above 10. Q/d values ranged from 10 to 425, and more than half of the facilities have Q/d values over 30. Using a threshold value less than 10 would only serve to identify additional sources that based on emissions and distance will have much less potential visibility impacts relative to those with the largest Q/d. We agree with the commenter that a lower threshold may be appropriate in some situations. It may be necessary to use a lower threshold in future planning periods as controls are implemented to address those sources with the largest Q/d values, but as explained below, that is not the case at this time.

With regard to the comment that the use of a Q/d threshold of ten ignores a large portion of the visibility impairment attributable to Texas point sources, we note that of the 1600+ point sources in Texas that contribute to visibility impairment, the 38 identified facilities for the Q/d analysis contribute more than half of the total visibility impairment due to Texas point sources. In the case of Wichita Mountains, the 38 facilities contribute almost 80% of the total impact from Texas point sources. Clearly, this relatively small subset of Texas point sources are responsible for a large portion of the total visibility impairment. We agree that while some sources may have very small visibility impacts, aggregate impacts can be significant. However, while there are undoubtedly thousands of sources within Texas that individually have small contributions to regional haze; there are also many sources that, even in isolation, have relatively large visibility impacts. In this first planning period, we identified the most significant sources that impact visibility, determined whether cost-effective controls were available for these sources, and balanced the costs of those controls against their visibility benefits. Given the iterative nature of the regional haze program, we think that it was a reasonable approach to require only those cost-effective controls with the largest benefits this planning period. We expect that Texas will control additional sources, which by then will be the largest contributors to impairment, during future planning periods.

Furthermore, we believe that it is appropriate to consider actual emissions levels as these are representative of the emission levels that would be contributing to measured visibility impairment. This is consistent with the BART guidelines recommendations for using actual emissions rates to assess visibility impacts and the use of actual emissions from the baseline period in calculating cost-effectiveness of controls as part of the BART five-factor analysis. We also considered actual emissions in estimating the visibility benefit and emission reductions from controls in our reasonable progress analysis. We considered 2009 emission levels for the Q/d analysis and then compared the analysis to 2010 and 2011 Q/d values and determined there were no significant differences in the sources above the threshold. Should actual emissions from any source increase in the future, that should be considered in assessing the sources visibility impacts and potential benefits from controls in future planning periods.

We discuss our selection of the CAMx photochemical model over the CALPUFF mode in a separate response to comment. We note that the CAMx photochemical model allowed for a consistent basis to assess all identified sources in Texas, including those sources beyond the typical accepted range (<300km) of the CALPUFF model. This modeling approach also provides for an analysis of the visibility impairment on the 20% worst days.

We agree that a few sources had impacts ranging from 0.1 to 0.42 dv based on Texas' CAMx modeling as part of its BART screening were screened out based on our Q/d analysis. Texas' model results for BART screening using CAMx used a conservative approach based on a combination of either annual emission rate multiplied by a factor of 2 to estimate maximum short-term emissions and short-term permit allowable emissions from the 2006-2007 time frame and focused on the maximum impact from the source. Our Q/d analysis examined actual annual emissions from 2009, 2010, and 2011, and the photochemical modeling is based on projected actual emissions and examining the impact on the average of the 20% worst days. We note that some of these facilities are refineries subject to EPA refinery consent decrees that result in emission reductions from 2006 allowable levels. As the sources currently with the largest visibility impacts are finalized for controls in this action, some of the sources not being controlled today by the FIP in this first planning period may subsequently rise to become the sources with the largest visibility impacts for analysis in the next or future SIP planning periods.

Comment: Selection of sources for reasonable progress analysis [NPS (0077) p. 2-3, 4-5]

The NPS agreed with EPA that "... based on their visibility impacts, a smaller subset of the facilities that we have initially analyzed should be further evaluated to determine ... if cost-effective controls are available ..." However, EPA's approach to define sources in Texas for further analysis is not consistent with the approach used in EPA's FIPs for Arizona, Wyoming, and Montana.

The NPS stated that EPA used the ratio of facility emissions (Q) to distance of the facility from a Class I area (d) to identify 38 facilities in Texas for further evaluation. These facilities emitted 617,000 tons of SO_2, NOx, and PM10 in 2011[1], which represents 68% of the statewide total. However, in its Texas FIP, EPA evaluated only nine of these 38 facilities under the reasonable progress provisions with total SO_2 emissions of 346,000 ton/yr representing 38% of the statewide total SO_2, NOx, and PM10 emissions and 67% of statewide total SO_2 emissions. This is both a smaller number of facilities evaluated and a smaller percentage of statewide emissions than EPA evaluated in its FIPs for Arizona[2] and Montana[3]. Had EPA relied upon its Q/d analysis in Texas as it did in Arizona and Montana, it would have achieved approximately the same relative degree of evaluation of the statewide emissions. Instead, EPA used visibility impact as a fifth factor to eliminate 29 of the 38 facilities from consideration.

The NPS expressed concern about this statement in the FIP TSD:

> When we examined the impacts, we noted that some source impacts are quite low and some impacts were spread among several sources at the facility, making individual unit impacts even smaller. We therefore concluded that some of these impacts did not warrant further evaluation for this planning period and dropped them from Table A.4-3.

The NPS asserted that the EPA's approach in Texas in dealing with facilities with multiple emission units appears to be inconsistent with its approach in Arizona where it modeled several emission units (at Apache, Cholla, Coronado, Nelson Lime) together to predict the resulting visibility improvement. We recommend that any visibility modeling evaluate the combined visibility benefits from controlling the affected emission units at a given facility, as EPA did in Arizona.

[NPS (0077) p. 4-5] The NPS concluded that the EPA should have relied upon its Q/D analysis in Texas, as it did in Arizona and Montana, to select sources for the four-factor reasonable progress analysis. This would have broadened the scope of these analyses to encompass a degree of evaluation similar to that carried out by EPA in Arizona and Montana.

Footnotes:
[1] National Emissions Inventory
[2] In its Arizona FIP, EPA evaluated 15 facilities under the BART and reasonable progress provisions with total NOx emissions of 38,000 ton/yr representing 78% of the statewide NOx emissions. (EPA had previously approved Arizona's SO_2 and PMIO SIP provisions.)
[3] In its Montana FIP, EPA evaluated 13 facilities under the BART and reasonable progress provisions with total SO_2, NOx, and PM10 emissions of 44,000 ton/yr representing 71% of the statewide total emissions.

[NPS (0077) p. 4] The NPS expressed appreciation for the 230,000 tons of electric generating unit (EGU) annual SO_2 reductions EPA is proposing and anticipate significant benefits from these reductions. The remaining 145,000 tons of annual SO_2 emissions from its EGUs would still rank Texas EGUs as the seventh-largest SO_2 emitter among US EGU rankings - assuming no other SO_2 reductions occur. (And Texas would still rank #2 with its 135,000 tons of annual EGU NOx emissions.) Review of the information presented in Figures 1 - 3 indicates that the recommended controls on the nine "finalist" facilities address less than half of the visibility impairment attributed to the 38 facilities selected by the initial screening process (in Table A.1-2). Considering that controls were determined to be cost-effective at several of the 29 facilities that were ultimately exempted from additional controls, we believe that implementation of all controls determined to be cost-effective at these 38 facilities should be required.

[NPS (0077) p. 3-4 As NPS noted above, if visibility impacts are modeled, the combined visibility benefits from controlling the affected emission units at a given facility should be evaluated, as EPA did in Arizona. By breaking a facility down into ever smaller pieces, each partial impact may be diminished to the point where it becomes relatively insignificant. As EPA concluded in its FIP TSD:

> The cost-effectiveness of the scrubber retrofits for the Welsh and Parish units are within a $/ton range that we have previously found to be cost-effective in BART determinations. However, we do not believe that their individual projected visibility improvements merit the installation of scrubbers at this time. We encourage the State of Texas to re-evaluate this determination as part of its next regional haze SIP submittal.

According to NPS, the result of this "divide and exempt" approach is that very large emission sources (like Welsh and Parish) with impacts almost three times EPA's 0.3% threshold of concern can escape addition of controls that are determined to be "... within a $/ton range that we have previously found to be cost-effective in BART determinations."

[Earthjustice (0067) p. 45] Earthjustice et al. stated that, in addition to using a Q/D threshold, the second method EPA used to narrow the scope of its review is source apportionment modeling. EPA eventually settled on a threshold that screened out sources that contribute less than 0.3% to the total light extinction at Class I areas. In other reasonable progress analyses that EPA has performed or approved, a value of Q/D over a certain threshold alone qualified the source for a four factor analysis. Instead of following that practice, EPA first eliminated sources with a Q/D less than 10, which left EPA with 38 sources; EPA then added a second step, source apportionment modeling, to screen sources for a detailed, four-factor reasonable progress analysis, which left EPA with 9 sources.

Earthjustice et al. submitted a report by Dr. Andrew Gray as comment 0070. As explained by Dr. Gray, the metric used by EPA (the worst 20% of days, or W20 days) masks visibility impacts from sources that should have been considered in its control review. EPA should consider adding additional sources to the set of sources reviewed for control. By eliminating 29 of the 38 sources remaining after the first screening step, EPA missed an opportunity to identify additional reasonable controls on sources with visibility impacts that are still large relative to many other sources during the worst 20% of days at Big Bend, Guadalupe Mountains, and Wichita Falls. Those sources may also contribute significantly to visibility impairment during other non-W20 days and at other Class I areas.

The NPS agreed with EPA that "... based on their visibility impacts, a smaller subset of the facilities that we have initially analyzed should be further evaluated to determine ... if cost-effective controls are available ..."

Earthjustice et al. stated that “It is reasonable to identify sources that will help achieve reasonable progress this period and compel such reductions in the proposed FIP.” They also state that our modeling “confirmed that individual sources had significantly different impacts, and it is proper to prioritize sources with significant visibility impacts for a four factor reasonable progress analysis.”

NPS and Earthjustice et al. commented that consistent with our approach in Arizona, Wyoming and Montana, we should have relied on only the Q/d analysis to identify facilities for additional control rather than eliminating some of the identified sources based on source apportionment modeling.

NPS states that this would result in a larger portion of the total emissions from Texas being analyzed for additional controls and be more consistent with our actions in Arizona and Montana. Even after the 230,000 tons of SO_2 reductions required by this rule, Texas would still rank as the seventh highest SO_2 emitter among US EGUs. NPS expressed concern that some facilities were eliminated based on our review of the facility’s estimated visibility impacts and consideration of individual unit impacts. NPS suggests that if visibility impacts are modeled the combined visibility impacts from all emissions units should be considered. NPS states that consideration of unit-level impacts rather than facility-level impacts diminishes the impacts to the point where they become relatively insignificant. NPS states that the recommended controls on the nine "finalist" facilities address less than half of the visibility impairment attributed to the 38 facilities selected by the initial screening process and that considering that controls were determined to be cost-effective at several of the 29 facilities that were ultimately exempted from additional controls, all controls determined to be cost-effective at these 38 facilities should be required. Earthjustice et al. also comments that the impacts from the other 29 sources are still large relative to many other sources that impact visibility on the 20% worst days.

Response: In developing FIPs for Montana, Arizona, and Wyoming, we relied on a Q/d analysis to identify sources for additional control analysis. The Q/d analysis only considers emissions and distance and does not consider how meteorology, chemistry or stack parameters influence the potential to impact visibility. In Arizona, after eliminating sources based on more recent emissions and those sources analyzed under BART, units at 9 facilities were identified for additional analysis and reasonable controls were required at 2 units at 2 facilities. In Wyoming, after eliminating sources analyzed under BART, 3 units at 2 facilities were identified for additional control analysis and no reasonable controls were required on these facilities. In Montana, ultimately 9 facilities were identified for additional control analysis and reasonable controls were required at 2 units at 1 facility. A Q/d analysis in Texas resulted in identification of 38 facilities, located at a considerable range of distances from Class I areas. We note that this is a much larger number of sources identified than in the other states mentioned by the commenter.

As discussed in a separate response to comment and in the FIP TSD, we determined it was appropriate to use photochemical modeling to assess the visibility impact from those sources identified by our Q/d analysis. In the same way that Q/d is used as an estimate of the potential visibility impact due to emissions and distance, the photochemical modeling aims to estimate the visibility impact albeit in a much more refined manner that accounts for chemistry and meteorological conditions. We also note that some RPOs and states used a combination of back trajectory analysis, source apportionment modeling results, and Q/d as a more refined approach to identify sources for additional control analysis for RP.[555] Our modeling results indicated that a subset of the 38 facilities were the primary contributors to visibility impairment at each Class I area. There are a number of different approaches used by states in identifying sources for reasonable progress evaluation but it usually centered around the general premise of evaluating the biggest sources and/or the biggest impactors on visibility. Figures A.3-2, A.3-3 and A.3-4 of the FIP TSD show the percent contribution to visibility impairment as a percentage of the total impairment due to Texas sources and the total impairment due to Texas point sources. Some of the facilities identified via Q/d were shown to have relatively small visibility impacts and controls on these facilities would be much less effective in improving visibility. For example, the top 10 facility level modeled visibility impacts at Wichita Mountains accounts for almost 75% of the total visibility impact from all 38 facilities combined. Therefore, we determined it was reasonable to eliminate some of these small impacting sources from the list of sources needing additional control analysis for reasonable progress for this first planning period. As discussed elsewhere in the FIP TSD and response to comments, we eliminated those facilities

[555] To select the specific point sources that would be considered for each Class I area, VISTAS first identified the geographic area that was most likely to influence visibility in each Class I area and then identified the major SO_2 point sources in that geographic area. The distance-weighted point source SO_2 emissions (Q/d) were combined with the gridded extinction-weighted back-trajectory residence times. The distance weighted (Q/d) gridded point source SO_2 emissions are multiplied by the total extinction-weighted back-trajectory residence times (Q/d * Bext-weighted RT) on a grid cell by grid cell basis and then normalized VISTAS Area of Influence Analyses, 2007 available in the docket for this action.

that had relatively low facility-wide impact levels. For EGUs, because of the large differences noted for some of the facilities between the projected 2018 emissions modeled and actual emissions, we scaled the modeled visibility impacts to consider visibility impacts at higher or lower recent emission levels. After evaluation of facility-level and estimated unit-level impacts, we established a 0.3% visibility impact threshold on a unit basis to identify those sources with the greatest visibility impacts for additional control analysis.

Ultimately, we identified 21 units at 9 facilities based on a threshold of percent contribution of visibility impairment of 0.3% that underwent the four-factor analysis, including consideration of additional visibility modeling results, for additional controls. We used the 0.3% threshold only as a way to identify a reasonable set of sources with the largest visibility impacts to evaluate further. Based on our evaluation of the four-factors, including consideration of visibility benefit, we determined that additional controls should be required at 14 units across 7 facilities. In addition to these 9 facilities, as discussed elsewhere, we also examined controls for the PPG Glassworks and San Miguel, and eliminated Sommers-Deely-Spruce from additional analysis due to a planned shutdown of the JT Deely units. Those sources eliminated from additional control analysis for this planning period should be reevaluated in the next planning period.

We disagree with the NPS that all cost-effective controls at the 38 facilities should be required during this planning period. As discussed more fully elsewhere, we believe states (or EPA when promulgating a FIP) can consider the visibility impacts of sources when determining what sources to analyze under the four-factor framework. We also believe that States (or EPA when promulgating a FIP) are permitted, but not required, to consider visibility improvement in addition to the four statutory factors when making their reasonable progress determinations. In selecting what sources or source categories undergo the four-factor analysis, we focused on the sources that have the greatest visibility impacts, as determined by consideration of both Q/d and our more refined analysis relying on photochemical modeling. We identified units at nine facilities for reasonable progress control analysis. We note that NPS states that they agree with us on this matter in their comments. The NPS comments state "The NPS agreed with EPA that '... based on their visibility impacts, a smaller subset of the facilities that we have initially analyzed should be further evaluated to determine ... if cost-effective controls are available ...'". We also note that Earthjustice et al. also supports this approach. Earthjustice et al. stated that "It is reasonable to identify sources that will help achieve reasonable progress this period and compel such reductions in the proposed FIP." They also state that our modeling "confirmed that individual sources had significantly different impacts, and it is proper to prioritize sources with significant visibility impacts for a four factor reasonable progress analysis."

We note that in every action that required controls for reasonable progress, visibility was considered at some point in the reasonable progress analysis. As discussed in more detail in a separate response to comment, while collectively the visibility impacts from the 29 sources not analyzed for controls may be significant, the individual point source visibility impacts are much smaller relative to the subset of sources we identified that impact visibility the most and the relative visibility benefit from controlling these 29 other sources will be much smaller than the facilities we did identify to control. The USDA Forest Service supports this overall approach and comments that "In summary, while the USDA Forest Service has expressed concern to EPA that the use of visibility as a factor to be considered within the reasonable progress context may be outside the statutory framework established for RP (see Clean Air Act, Section 169A (g)(1)), the methodology and metrics that EPA used are the most comprehensive seen to date for any SIP/FIP in the country that we have reviewed, and should serve as a model for future efforts to consider the contribution and/or potential benefits of individual sources to visibility." As the sources currently with the largest visibility impacts are controlled, the "other" sources will become the sources with the largest visibility impacts for analysis in the next planning period.

Our methodology identified those sources with the largest contributions to visibility impairment and addresses a significant portion of the total SO_2 emissions in the state of Texas. As the commenter states, we addressed 67% of Texas' total SO_2 emissions by evaluating the 9 identified facilities for controls and we believe this a very significant portion of the state emissions. This does not include the significant emissions addressed in considering potential controls at San Miguel and the planned shutdown of the JT Deely units. Furthermore, given the large geographic distribution of sources across Texas and the large distances to Class I areas, there is a large portion of the state's total emissions that based on distance, meteorology/transport, and stack parameters are not anticipated to contribute significantly to visibility impairment at the Class I areas examined for this planning period. For example, facilities with significant emissions of SO_2 located in the Houston area will contribute significantly to the total state emissions level, but many of these facilities are too far away and spread around multiple emission sources and lower stacks to significantly impact visibility at Wichita Mountains or the Texas Class I areas. We disagree with the commenter that only considering the percentage of emissions addressed or the number of facilities identified is an appropriate comparison because not all emissions or facilities have the same visibility impact, especially in a state with as many sources and large geographic extent as Texas. What is of the most concern is that the sources with significant visibility impacts are identified and analyzed for controls, and we believe our approach accomplishes just that. We note that our analysis resulted in the identification of a much greater number of reasonable controls than the analyses performed in Arizona, Montana, or Wyoming. The required controls result in a reduction in 230,000 tpy of SO_2, a much larger reduction than the total emissions in Arizona or Montana. We also note that Texas has a significant number of coal-fired EGUs and therefore, total EGU emissions are large.

We disagree with the NPS that our approach is inconsistent with the modeling approach in Arizona for BART. In Arizona, emission units were modeled together to estimate facility level visibility improvement from controls. We used CAMx modeling with source apportionment in our initial modeling to assess facility-level visibility impacts. We also estimated unit-level impacts from these facility impacts based on unit level emissions. As we state in the FIP TSD "For our analysis we tried utilizing an extinction percentage of 1% for a facility's impacts with a consideration that some facilities have two or three units and this metric would equate to 0.5% or 0.33% extinction per unit."[556] We concluded that this was a reasonable way to identify sources to analyze for additional controls and established a 0.3% visibility impact threshold to identify sources for additional evaluation. Our initial consideration of both facility-wide impacts and then ultimately, unit level impacts allowed us to identify a reasonable set of sources with the greatest visibility impacts to evaluate further for unit level controls. We also note that we used source apportionment modeling to evaluate controls at these units and provided the reduction in

[556] FIP TSD at A-49

extinction levels anticipated from controls on each unit. Just as we have estimated the visibility benefit of all controls together (all scrubber retrofits and all scrubber upgrades),[557] we present all the necessary data to assess the visibility improvement from controlling all units at a facility. As we state in the FIP TSD, because our four-factor RP analysis evaluating potential controls would be completed on a unit specific basis, we evaluated visibility benefit on a unit basis as well. We disagree that our consideration of unit-level impacts rather than facility-level impacts diminished the impacts to the point where they became relatively insignificant. We considered both facility-level and unit-level impacts in identifying those sources with the greatest visibility impacts. By conducting our reasonable progress analysis on a unit-level, we have identified those units with the largest visibility impacts and evaluated cost-effective controls on those units that will achieve reasonable visibility benefits required during this planning period towards the national goal. While we agree that visibility impairment on a facility-level for Welsh and Parish is greater than that from Coleto Creek, controlling one unit at Coleto Creek would yield almost twice the visibility benefit of controlling a single unit at Welsh or Parish and controls on Coleto Creek are also more cost-effective on a $/ton basis. As the required controls are implemented, the percentage impact from those facilities and units not controlled will become larger (on a percentage basis) and should be analyzed in future planning periods.

We address specific comments concerning consideration of controls on Parish and Welsh elsewhere in this section of the RTC document, as well as in the Cost-benefit and Cost Comments sections. We also address comments concerning visibility impairment on days other than the 20% worst days in a separate response to comment.

0.3% Threshold

0.3% Threshold General Comments: We received comments on the selection and use of a 0.3% of total impairment threshold for identifying sources for additional analysis. Commenters stated that the 0.3% threshold is without precedent, is arbitrary and not supported statistically or otherwise. Furthermore, the commenters state that the threshold is inconsistent with thresholds approved by EPA in other states for identifying sources for evaluation for controls.
We also received comments that a lower threshold should have been used, that the threshold was applied inconsistently, and that the 0.3% threshold screened out sources that have a significant visibility impact and should have been evaluated for controls.

Comment: EPA's Source Apportionment Modeling Is Reasonable for Determining Priority Sources That Require Controls in the First Planning Period. [Earthjustice (0067) p.35]

Earthjustice et al. stated that the EPA's modeling results showed that controlling a small number of sources will result in significant visibility benefits at both Texas Class I areas. EPA's source apportionment modeling confirmed that individual sources had significantly different impacts, and it is proper to prioritize sources with significant visibility impacts for a four factor reasonable progress analysis. However, as we detail below, additional sources should also make

[557] See tables 43 and 44 of the proposed FIP for an example and Vis modeling summary.xls in the docket for all data and calculations

this first cut in order to make reasonable progress by reducing significant visibility impacts that Texas sources have on Class I areas in the surrounding states.

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Response: We agree with Earthjustice et al. that source apportionment modeling confirms that individual sources have significantly different visibility impacts, significant visibility benefits can be achieved by controlling a small number of sources and it is proper to consider and prioritize sources with significant visibility impacts for a four factor reasonable progress analysis. We address comments concerning additional controls elsewhere in this document.

Comment: [Luminant (0061) p. 112] Luminant noted, even if the regulations permitted EPA to deviate from using the deciview metric, EPA cites no precedent for using a 0.3% extinction threshold or any rational basis for it. EPA concludes that "any unit with an estimated impact greater than 0.3% [extinction] would be further evaluated" for further reductions, but units with a smaller impact would not.[700] But, this new threshold that EPA would require of Texas is well below the 1% threshold used by other states (and approved by EPA) for excluding sources from additional reductions under the reasonable progress analysis.[701] Had EPA used the same 1% threshold that it has previously approved for other states, EPA's analysis would correctly confirm that it is ***not reasonable*** to require further reductions from any of the Texas units that EPA examined, given that none of the units at issue were modeled to have a contribution of 1% or more to visibility impairment at any Class I area.[702]

Footnotes:
[700] FIP TSD at A-50.
[701] See, e.g., 77 Fed. Reg. 3,691, 3,704 (Jan. 25, 2012) (proposing approval of Virginia's "one percent" "threshold to determine which emissions units would be evaluated for reasonable progress control"). In its proposal here, EPA acknowledges its prior approval of a 1% impact threshold "used by states in development of sources for RP evaluation . . . ." FIP TSD at A-49. But it attempts to avoid applying that threshold here by asserting that "utilizing an extinction percentage of 1% for a facility's impacts . . . would equate to 0.5% or 0.33% extinction per unit." Id. at A-49. But in these other instances, EPA has approved a 1% per-unit, not per-facility, threshold, and thus EPA's attempt at distinction fails. See, e.g., 76 Fed. Reg. 78,194, 78,206 (Dec. 16, 2011) ("[T]he Commonwealth [of Kentucky] established a threshold to determine which emissions units would be evaluated for reasonable progress control. . . . The Commonwealth then identified those emissions units with a contribution of one percent or more to the visibility impairment at that particular Class I area, and evaluated each of these units for control measures for reasonable progress, using the . . . four 'reasonable progress factors' . . . . KYDAQ identified 10 emissions units at five facilities in Kentucky . . . with SO_2 emissions that were above the Commonwealth's minimum threshold for reasonable progress . . . ." (emphasis added)).
[702] FIP TSD at A-52.

Luminant commented that there is no precedent or rational basis for EPA's use of a 0.3% extinction threshold for determining which units would be further evaluated for controls.

Luminant states that this threshold is less than and inconsistent with thresholds used by other states and approved by EPA. Luminant cites to EPA's approval of Virginia's and Kentucky's regional haze SIPs as examples. Luminant further states that had EPA used a 1% extinction contribution for emission units in Texas, all units would have fallen below the thresholds and eliminated from analysis for further control.

Response: We address comments concerning the precedent and rational basis for our threshold for determining which units would be further evaluated for reasonable progress controls in a separate response to comment below.

The commenter is incorrect in their comparison of EPA's application of a 0.3% threshold in our analysis of Texas sources and the use of a 1% threshold used by Kentucky, Virginia and other VISTAS states in identification of sources for reasonable progress analysis for controls. We utilized emissions data and source apportionment modeling to estimate the visibility impairment from 38 facilities (identified by a Q/d analysis) and applied a threshold of 0.3% of the total modeled visibility extinction at a Class I area to the estimated impact from an emission unit. In other words, the estimated extinction (in inverse megameters) due to emissions from the emission unit at a Class I area was divided by the total extinction modeled at the Class I area due to emissions from all emission sources. The 1% threshold used by Kentucky, Virginia, and other VISTAS state was applied to a different metric developed by VISTAS that relied on a normalized assessment of residence time and Q/d (emissions divided by distance) [558], and did not rely on modeled visibility impairment. We note that the methodology utilized by the VISTAS states identified those sources with the greatest potential to impact visibility, based on consideration of emissions, location, and typical wind patterns.

The commenter's assertion that we should have used a threshold such that "all units would have fallen below the threshold and eliminated from further controls" is inconsistent with the requirements and purpose of the regional haze rule. The Regional Haze Rule requires the identification of reasonable progress controls based on consideration of the four factors and the development of coordinated emission control strategies in order to make reasonable progress towards the goal of natural visibility conditions. Despite the fact that we and Texas agree that impacts from point sources are significant, the commenter suggests that it would be appropriate to select a threshold that results in no evaluation of any point sources. While based on the four factor analysis, it may be appropriate to determine that controls are not required on some or even all evaluated sources, failing to demonstrate how the four factors were considered for the sources of group of sources with the most significant visibility impacts is clearly at odds with the rule. We note that Texas did identify a group of sources for additional control analysis based on Q/d, and that analysis, while flawed, included some of the same sources we identified in our analysis. We discuss Texas' four-factor analysis in depth in our proposal, TX TSD and in response to comments elsewhere in this document.

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[558] To select the specific point sources that would be considered for each Class I area, VISTAS first identified the geographic area that was most likely to influence visibility in each Class I area and then identified the major SO_2 point sources in that geographic area. The distance-weighted point source SO_2 emissions (Q/d) were combined with the gridded extinction-weighted back-trajectory residence times. The distance weighted (Q/d) gridded point source SO_2 emissions are multiplied by the total extinction-weighted back-trajectory residence times (Q/d * Bext-weighted RT) on a grid cell by grid cell basis and then normalized VISTAS Area of Influence Analyses, 2007 available in the docket for this action.

Comment: Source Apportionment Results – Selection of Sources for Further Evaluation [Gray (0070) p.11]

Dr. Gray stated that the EPA used the source apportionment modeling to narrow the scope of its review from 38 sources to 9 sources. Because the threshold EPA used was too high, and the agency failed to consider cumulative impacts and impacts outside of WIMO, GUMO, and BIBE, EPA eliminated sources it should have reviewed in its control analysis. Controls on an additional set of sources would provide meaningful visibility benefits.(FIP TSD, Sections A.3 and A.4)

Dr. Gray commented that as a preliminary matter, EPA's source apportionment step was not inherently necessary: in other reasonable progress analyses that EPA has performed or approved, a value of Q/D over a specific threshold alone qualified the source for a four factor analysis.17 EPA should have taken that approach here and evaluated controls on all 38 sources.

Dr. Gray stated that the EPA's source selection process focuses on controlling only the largest sources that contribute to visibility impairment at only three of the modeled Class I areas. By eliminating 29 of the 38 initially identified sources, EPA missed an opportunity to include more sources in its subsequent analysis, and thus to identify additional reasonable controls. These 29 sources alone contribute more than all of the point sources from any other state; this is a significant contribution, and these sources should have at least been evaluated for reasonable controls.

As with the Q/D analysis above, Dr. Gray concluded that the EPA's threshold should have been lower to take into account the multitude of sources collectively impacting these Class I areas.

Footnotes:

[17] *See* EPA's rulemakings regarding the regional haze plans for Montana, Wyoming, and North Dakota. 77 Fed. Reg. 23988, (Apr. 20, 2012); 24058-9; 78 Fed. Reg. 34738, (June 10, 2013); 34763; 76 Fed. Reg. 58570, 58624-5 (Sept. 21, 2011).

Response: We respond to comments concerning evaluation of controls on all 38 sources in a separate response to comment above. We address comments concerning the visibility impacts and consideration of controls for the other 29 sources that were not selected for additional control analysis based on our 0.3% threshold in a separate response to comment above.

Comment: Proposed reasonable progress and long-term strategy determination for San Miguel [San Miguel (0060) p. 2-3]

San Miguel stated that they do not believe that it should be included as one of the 15 electric generating units ("EGUs") with a proposed SO_2 limit.[1] EPA, as part of its additional visibility analysis in its FIP TSD document, narrowed the list of sources for additional analysis. San Miguel was identified as having a modeled impact of 0.207% on the most-impacted area (based on estimated unit average extinction percentage impacts on the worst 20% of days for class I areas), as represented on page A-51 of the FIP TSD document. This is below EPA's own 0.3% threshold that EPA used to identify sources for further evaluation. Rather, EPA appears to include San Miguel for further analysis based on the "estimated facility impact adjusted to reflect 2008-2012 average emissions," that demonstrate a 0.333% impact. However, as the model reflects, emissions going forward for San Miguel should be far below those levels and below EPA's 0.3% threshold. Given that EPA's modeled projected impact for San Miguel is below EPA's level for additional visibility analysis, and the continued reduction in emissions from the San Miguel plant with its upgraded scrubber, EPA should completely remove San Miguel from the list of units with source-specific limits.

Footnotes:
[1] As discussed in Section II of this letter, San Miguel believes that the Proposed FIP should be withdrawn and that EPA should approve of Texas' SIP submission. Nothing in this comment letter should be construed as an endorsement of this Proposed FIP, though San Miguel does include the following substantive comments if EPA intends to proceed despite this opposition.

Response: We established a 0.3% contribution to total visibility impairment threshold to identify sources for reasonable progress control analysis. As the commenter states, the modeled visibility contribution at Big Bend was estimated to be 0.207%. However, the CENRAP 2018 estimated emissions for the one unit at this facility developed for the 2007 CENRAP modeling were much lower (6,600 tpy SO_2) than recent average actual emissions (10,601 tpy SO_2 average annual emissions 2009-2013). The estimated visibility impact at the higher, actual emission level was estimated to be 0.333%. Because this estimated visibility impact exceeded the 0.3% threshold, we evaluated additional controls for this unit. We found that San Miguel has already upgraded its scrubber and we proposed that it maintain an emission rate consistent with current controls and recent monitoring data from Dec 2013 – June 2014. As the commenter states, "emissions going forward for San Miguel should be far below those levels and below EPA's 0.3% threshold." The FIP's required emission limit will ensure that the existing scrubber is operated to maintain those lower emission levels and limit the visibility impact from the source. Similarly, had the facility not completed these recent upgrades, we would have evaluated the sources for upgrades and likely would have established the same emission limit after examining the four regulatory factors.

Comment: Luminant provided a summary of EPA's "additional" visibility benefit analysis of a "small group' of Texas sources. [Luminant (0061) p. 27]

Step 3: EPA concludes, based on this new modeling, that it is "worth investigating" a "smaller set of sources."[218]

[218] Id. at A-28; see 79 Fed. Reg. at 74,878

At Step 3, EPA reviewed ENVIRON's modeling of entire facilities (many of which included multiple point sources of emissions) to "narrow[] the list to [a] smaller group of sources" for "a second round of CAMx modeling."[247] EPA concluded that while "there are slight differences in the projected values" between ENVIRON's modeling for CENRAP and its modeling for EPA, "the conclusions are consistent with the original CENRAP work."[248] In evaluating these results—again, results that were "consistent" with the CENRAP modeling results already considered by Texas and Oklahoma—EPA simply "concluded it was worth investigating whether the installation of cost effective controls on a small group of sources, out of the universe of sources in Texas, would result in a significant reduction in Texas' contribution to the visibility impairment at Class I areas."[249] EPA, however, did not examine "the universe of sources in Texas," but only these few, nor did it explain the metric it was using to determine which sources were "worth investigating."

Footnotes:

[247] 79 Fed. Reg. at 74,878.

[248] FIP TSD at A-28.

[249] Id.

Response: We disagree with Luminant that we did not examine the universe of sources or that we did not explain the metrics and process used to determine which sources we examined for additional controls. In the FIP TSD, we state that in evaluating the impacts from individual sources it can be seen that even a smaller set of sources make up the majority of the total impairment impacts from the 38 facilities at these three Class I Areas. Luminant does not provide the proper context in their comment in describing how we evaluated the available information and identified sources for additional analysis. As discussed in a separate response to comment, we stated that our modeling was consistent with the CENRAP modeling in discussing the overall model performance and visibility projections for the Class I areas. However, our modeling evaluated the visibility impacts from 38 individual sources in Texas, whereas the CENRAP modeling only tagged emission source categories within a state or region (e.g. all area sources in Oklahoma). Our modeling provided additional information to investigate the visibility impacts from individual or a small group of sources. Our evaluation began with examining all Texas point sources in the 2009 TCEQ point source emission inventory, a list that included over 1,600 facilities. We calculated the Q/d value for all of these facilities and eliminated those sources with a Q/d value less than 10 for all nearby Class I areas. Modeling was then performed for the 38 remaining sources to estimate the visibility impact from these individual facilities. As we stated in the FIP TSD, "In evaluating the impacts from individual sources it can be seen that even a smaller set of sources make up the majority of the total impairment impacts from the 38 facilities at these three Class I Areas. Therefore, we concluded it was worth investigating whether the installation of cost effective controls on a small group of sources, out of the universe of sources in Texas, would result in a significant reduction in Texas' contribution to the visibility impairment at Class I areas." As described in more detail in a separate response to comment, we established a 0.3% of total visibility impairment threshold to identify a reasonable set of units with the largest contributions to visibility impairment at the examined Class I areas for additional control analysis. We then considered the estimated visibility benefit of controls alongside the four statutory factors to identify cost-effective controls that will achieve reasonable visibility benefits required during this planning period towards the national goal.

Comment: Step 4: EPA "decide[s] to examine the [ENVIRON] results in several different ways to help in identifying a subset of sources for further visibility modeling and control analysis."[219] EPA evaluates all 38 facilities, but apparently draws no conclusions to distinguish among the facilities that ENVIRON modeled.

[219] FIP TSD at A-41

At Step 4, EPA "decided to examine the [ENVIRON] results in several different ways to help in identifying a subset of sources for further visibility modeling and control analysis."[250] The first way EPA "examine[d] the results" was to "rank[] the top 10 impacting facilities [not individual units] for each of the three Class I areas."[251] EPA did not explain why a "top 10" list was relevant. In doing so, EPA compiled its "top 10" list—not in terms of deciviews as reported to EPA by ENVIRON—but as a percentage of total extinction in terms of inverse megameters (1/Mm).[252] EPA says it made this decision "to somewhat normalize the total extinction differences between the differing Class I areas."[253] But EPA never explains why it needed to compare impacts between the three Class I areas, nor did EPA provide any other rationale for using percentage of total extinction as its deciding metric, instead of deciviews as required in the regulations.

From this exercise, EPA concluded that "a number of facilities made the top 10 for more than one Class I area."[254] EPA also reviewed recent SO_2 and NO_x emissions data (2008-2012) for 19 of the 38 facilities and compared it to the emission rates ENVIRON used in its modeling for EPA. EPA noted that some facilities had higher recent emissions than were modeled by ENVIRON, and others had lower emissions.[255] However, despite looking at recent *emissions data* from these selected units,, EPA did not consider in its analysis recent *visibility monitoring*, which, as discussed below, shows that these Class I areas ***already meet EPA's 2018 interim goal***. Moreover, as discussed further below, in its analysis, EPA also decided not to consider or account for SO_2 and NO_x limitations imposed on Texas sources under the CSAPR, which became effective on January 1, 2015.[256] Instead, EPA concluded that "[o]verall this information supports looking at recent actual emissions to represent future emission levels in 2018."[257] EPA did not eliminate any of the 38 facilities at this step based on this assessment.

[250] Id. at A-41.
[251] Id.
[252] To the best of our knowledge, EPA has never used this metric in acting on other regional haze SIPs.
[253] Id.
[254] Id.
[255] Id. at A-49.
[256] Id. at A-45.
[257] Id.

Response: As Luminant states, we considered the modeling results in a number of different ways in order to identify the subset of sources with large visibility impacts at the nearby Class I areas. Our initial Q/d analysis identified 38 facilities with the greatest potential to impact visibility based on emissions and location. Modeling was then performed for the 38 sources to estimate the visibility impact from these individual facilities. As we stated in the FIP TSD, "In evaluating the impacts from individual sources it can be seen that even a smaller set of sources make up the majority of the total impairment impacts from the 38 facilities at these three Class I Areas. Therefore, we concluded it was worth investigating whether the installation of cost effective controls on a small group of sources, out of the universe of sources in Texas, would result in a significant reduction in Texas' contribution to the visibility impairment at Class I areas." As a first step, we identified the top ten impacting facilities at each Class I area. We focused this analysis on Wichita Mountains, Big Bend and Guadalupe Mountains. This provided information on the size of the visibility impacts from each facility relative to each other at each

Class I area. This showed that a handful of the top impacting facilities were responsible for a significant portion of the visibility impairment from the modeled sources at each Class I area. We also noted that a number of facilities were included in the top impacting facilities for more than one Class I area. All of this information provided additional support to the conclusion that a subset of the sources were responsible for the greatest visibility impairment at the Class I areas and that controlling a small number of facilities in Texas would result in significant visibility improvements at the impacted Class I areas. We presented the data in terms of extinction and percent of total visibility impairment, as calculated by ENVIRON.[559] We note that identification of the top ten facilities is not impacted by the choice of using deciview, or extinction, or percent impact at each Class I area.

In the FIP TSD, we also discuss why we utilized extinction and percent extinction metrics and how the fact that Guadalupe Mountains has cleaner background visibility conditions than Wichita Mountains should be considered.[560] For example, a source that has a smaller absolute impact [in terms of extinction] on a relatively cleaner area but a higher percentage impact might be considered for control so that the cleaner area can potentially make progress. We explain that using the percentage of total visibility impairment metric allows us to somewhat normalize the extinction differences between Class I areas so that we can utilize the same approach at each Class I area and identify a reasonable set of sources to analyze that if controlled would result in meaningful visibility benefits towards meeting the goal of natural visibility at every Class I area. For every Class I area to have the opportunity to reach the natural visibility goals, it is necessary to identify the sources or source categories that significantly impact visibility, identify available controls and analyze whether those controls are reasonable. Had we established a strict threshold based on extinction or deciview, we would have had to establish a different threshold for each Class I area. As stated by the USDA Forest Service in its supportive comments, the use of this methodology and metrics, including the use of a small percentage threshold on the 20% worst days is linked to the concept of reasonable progress. We believe it could serve as the model for future efforts to consider the contribution and potential benefits of individual sources to visibility. After identifying which sources to analyze for additional controls based on the percentage impact on a unit basis, we determined which controls were reasonable based on consideration of the four factors, including comparison of cost to the anticipated visibility benefit (deciview improvement, extinction, percentage of total extinction, and the percentage of the total impact from Texas point sources addressed by the control).

As discussed in detail in a separate response to comment below where we address comments concerning the legality of the visibility metrics we used, we disagree with Luminant's assertion that use of the deciview metric is required by the regulations. In this separate response to comment we also further discuss the utility of the percentage of visibility impairment and extinction metrics and the need to consider a number of different metrics to fully consider the potential visibility benefits of controls to address visibility impairment on the 20% worst days. We also discuss that states and RPOs, and particularly Texas, routinely relied on light extinction and percent of total visibility impairment metrics when assessing the various contributions to

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[559] Electronic file in the docket "EPA_txbart3612k_Vis_2002_2018_PSAT_Projected_072913.xlsx" see spreadsheet under tab "Top10SRC" prepared by ENVIRON and FIP TSD Tables A.4-1a, b and c

[560] FIP TSD at A-41

visibility impairment due to either source categories or pollutant species from other states and international sources.[561]

We address comments concerning recent monitoring data in a separate response to comment. As the commenter states, we considered recent emissions data and compared it to the CENRAP 2018 projected emissions that were modeled. We noted that the data indicates that a number of facilities have actual emissions that are much higher than modeled.[562] For instance, Big Brown, Sandow, and Martin Lake were all significantly higher than modeled rates, with Martin Lake having over 90% more SO_2 emissions than modeled based on the 2018 CENRAP projections. As explained in detail in the FIP TSD[563] we determined it was necessary to consider recent actual emissions from EGUs due to uncertainty in 2018 projected emissions completed in 2006, the cost of SO_2 credits being lower than originally projected, and comments from Texas on a more recent IPM projection indicating that significant SO_2 reductions were not anticipated at these sources and no large SO_2 control projects were planned at most of the sources being evaluated.[564] We also noted that TCEQ has utilized recent emission data for EGUs when developing projected emissions for 2018 (and other future years) when developing ozone attainment demonstrations. Therefore, based on Texas' recent comments and other information, we concluded considerable uncertainty exists as to whether any further reductions of SO_2 will occur beyond current emission levels as a result of compliance with MATS or CSAPR. Overall this information supports looking at recent actual emissions to represent future emission levels in 2018.

Comment: Step 5: Instead of asking ENVIRON to update its modeling based on recent data, EPA in-house staff "scale[s]" the visibility impacts modeled by ENVIRON to "adjust[]" the results based on 2008-2012 annual SO_2 emissions at each of the 38 facilities.[220]

Step 6: EPA "drop[s]" 20 of the 38 facilities from further consideration because "some source impacts are quite low and some impacts were spread among several sources at the facility, making individual unit impacts even smaller."[221] EPA never explains what it considers to be "quite low" or "even smaller."

Step 7: EPA in-house staff again "scales" the ENVIRON modeling results to a unit level for the remaining 18 facilities and establishes a 0.3% light extinction "threshold" and concludes that "any unit with an estimated impact greater than 0.3% would be further evaluated."[222] EPA never explains the basis or origin of its 0.3% extinction test.

220 Id. at A-49 to A-50.
221 Id. at A-50 to A-52.
222 Id. at A-50.

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561 See Chapter 11 and Appendix 4-1: Summary of Consultation Calls of the Texas regional haze SIP for examples of the use of extinction (inverse megameters) and percentage of total extinction metrics

562 FIP TSD at A-47, Table A.4-2

563 See FIP TSD at A-45

564 Texas comments on Draft IPM modeling conducted by EPA for potential national rule making platform provided on June 26, 2014. In this docket materials as "TCEQ comment letter to EPA on draft modeling platform dated June 24, 2014. '2018 EMP signed.pdf.

At Step 5, EPA "scaled" the visibility impacts modeled by ENVIRON to "adjust[]" the results based on 2008-2012 annual SO_2 emissions at each of the 38 facilities.[258] EPA does not scale NO_x emissions, even though ENVIRON's modeling showed that many of the 38 facilities contribute to visibility based primarily on their NO_x emissions.[259] Nor does EPA provide any support for or detail on its "scaling" methodology, nor is this approach justified or appropriate.[260] The "scaling" methodology is a direct contradiction to the appropriate application of the PSAT modeling results, as specified in the CAMx User's Guide. The guidance is clear that the non-linear chemical reactions in the photochemical model cannot be used for estimating improvement associated with different control scenarios.[261] EPA then compares average extinction at each facility (both modeled and adjusted SO_2 impacts) for each of the three Class I areas[262] and highlights those facilities that had impacts (either modeled or adjusted, in terms of percentage extinction) of 1% or more on a facility basis or "0.5% or 0.33% extinction per unit."[263] EPA says that "[t]his reduced the sources we had to examine to about a dozen facilities," although it does not specifically identify those facilities.[264] EPA does not eliminate from further review any of the 38 facilities at this step based on this assessment.

At Step 6, without reference to its 1% facility threshold, EPA arbitrarily "drop[s]" 20 of the 38 facilities from further consideration because "some source impacts are quite low and some impacts were spread among several sources at the facility, making individual unit impacts even smaller."[265] EPA never explains what it means by "quite low" and "even smaller," but nevertheless concludes that "some of these impacts did not warrant further evaluation for this planning period."[266] This step leaves 18 facilities for further review.

At Step 7, EPA again "scales" ENVIRON's facility modeling to ***unit level*** for the remaining 18 facilities (which results in a list of 40 units).[267] EPA then establishes a 0.3% light extinction "threshold" for further evaluation.[268] EPA concludes that "***any unit*** with an estimated impact greater than 0.3% [at any one of the three Class I areas] would be further evaluated."[269] EPA fails to cite any precedent or guidance establishing a 0.3% threshold, nor does it provide any rationale for such a threshold.

Footnotes:
[258] Id. at A-50.
[259] Id. at A-47 to A-48; EPA_txbart3612k_Vis_2002_2018_PSAT_Projected_072913.xlsx ("Avg_Impacts" and "emissions data").
[260] Section 7 of the attached report from AECOM explains how EPA's linear scaling method further exaggerated the visibility benefits that EPA asserts would result from the controls in its proposed FIP.
[261] CAMx User's Guide v6.1, Section 1.2.
[262] FIP TSD at A-51.
[263] Id. at A-49.
[264] Id.
[265] Id. at A-50 to A-52.
[266] Id. at A-50.
[267] Id.; TX116-007-_30_Source_selection_analysis_TX_RH-es_1-31-14 ("WIMO & TX Facility (short)" and "WIMO & TX (Short) EI Ranked").
[268] FIP TSD at A-50.
[269] Id. (emphasis added).

Response: As stated by the commenter, we adjusted facility level impacts for the 38 facilities by actual emissions because we determined recent actual emissions were more representative of future emission levels in 2018. We discuss this in more detail in the response to comment above and elsewhere in this document. As we state in the FIP TSD: "We used a linear scalar approach to scale the impacts based on the modeled emission rate and associated impact level to result in an estimated impact based on actual emissions. Since as we have noted earlier, the extinction from most sources was almost all due to SO_2 emissions, we scaled the impacts based on SO_2 emissions."[565] The commenter is incorrect in their assertion that ENVIRON's modeling showed that many of the 38 facilities contribute to visibility based primarily on their NO_x emissions. In support of this statement, the commenter cites to table A.4-2 in the FIP TSD, but this table merely shows the modeled emissions versus actual emission levels for the 38 sources, and not the visibility impacts due to NOx or SO_2 emissions from these sources. The modeling results also cited to by the commenter, and displayed in the FIP TSD in figures A-2.2, A-2.8, and A-2.14 clearly show that visibility impairment from these sources is predominantly due to sulfate. For example, at Wichita Mountains, the only facilities with any significant level of impact from nitrates are Oklaunion and PPG Glassworks and all sources (with the exception of PPG glassworks) have sulfate impacts that are several times greater than nitrate impacts. For those facilities with the largest modeled visibility impacts, the contribution to visibility impairment from nitrate is very small compared to the sulfate contribution.

We discuss the use of scaling visibility impacts by emissions in more detail in a separate response to comment below. We determined that the linear relationship we developed to extrapolate extinction due to emission rates was a reasonable approach in our technical analysis. At this point in our analysis, we scaled the visibility impact up (or down) based on the ratio of actual SO_2 emissions to modeled emissions, as an estimate of the visibility impacts anticipated based on actual emissions from the facility. We considered the modeling results and our scaled modeling results in a number of different ways in order to identify a reasonable subset of sources with the largest visibility impacts at the nearby Class I areas. As we stated in the FIP TSD, "In evaluating the impacts from individual sources it can be seen that even a smaller set of sources make up the majority of the total impairment impacts from the 38 facilities at these three Class I Areas. Therefore, we concluded it was worth investigating whether the installation of cost effective controls on a small group of sources, out of the universe of sources in Texas, would result in a significant reduction in Texas' contribution to the visibility impairment at Class I areas."

The commenter's description in Step 5 does not accurately describe the methodology we used to identify sources for control. The section of the FIP TSD the commenter cites to here is a summary of our approach, describing the different ways we considered the modeling and scaled results.[566] In this summary, we explain that we looked at break points of 1%, 0.5% and 0.3%. We compared these potential thresholds to thresholds used by states to determine which upwind states should consult based on their impact from all sources within the state. We estimated that, based on the thresholds used by states for consultation, an impact from an individual source that may be large enough to be considered for potential control may conservatively be in the range of 0.2% to 1.33%. We then explain that we tried utilizing a 1% facility impact threshold with a

[565] FIP TSD at A-49.
[566] FIP TSD at A-49

consideration that some facilities have two or three units and this metric would equate to 0.5% or 0.33% extinction per unit. We conclude this summary with a general statement that "this was a reasonable way to arrive at some common breakpoints/drop-offs in potential visibility improvements. This reduced the sources we had to examine to about a dozen facilities and helped set a context for what level of impacts may warrant further modeling to assist in a full four factor analysis for our RP/LTS analysis."[567]

For EGUs, because of the large differences noted for some of the facilities between the projected 2018 emissions modeled and actual emissions, we scaled the modeled visibility impacts to consider visibility impacts at higher or lower recent emission levels. We then ranked the facilities based on their maximum modeled impact at a Class I area as shown in Table A-4.3 of the FIP TSD. When we examined the facility-level impacts, we noted "that some source impacts are quite low and some impacts were spread among several sources at the facility, making individual unit impacts even smaller. We therefore concluded that some of these impacts did not warrant further evaluation for this planning period and dropped."[568] As discussed in the summary above, we considered thresholds of 1%, 0.5% and 0.3%. We also considered a unit level threshold of 0.5 or 0.33%. We eliminated those facilities that had relatively low facility-wide impact levels (well less than 0.3%) when compared to the impact threshold levels above.[569] We also eliminated facilities that when considering the large number of units at the facility, would have low unit-level impacts. For example, Waha Plant had a facility-level impact of 0.242% which was spread across 5 emission units.[570]

For the remaining sources, we used unit level emissions to divide the facility level impacts into estimated unit-level visibility impacts. As we explain in the FIP TSD and elsewhere in this response to comments document, we examined unit-level visibility impacts because our four factor RP analysis evaluating potential controls would be completed on a unit specific basis. As we describe below in more detail, we established a 0.3% of total visibility impairment threshold to identify sources for additional control analysis.

Examination of the unit-level scaled impacts (which were typically higher than the modeled impacts) reveals a number of units with impacts of approximately 0.3%.[571] This can be clearly seen in the figure below showing the unit level impacts of the units listed in Table A.4-4 of the FIP TSD. We concluded this was a reasonable common breakpoints/drop-off in visibility impacts and potential visibility improvements. We established a 0.3% threshold only as a way to identify a reasonable set of units with the largest contributions to visibility impairment at the examined Class I areas for additional control analysis. As we discuss in more detail in a separate response to comment below, we continued to evaluate whether to include or exclude sources that were close to the cutpoint, or for which we had additional information that would indicate they should be excluded in the second round of visibility modeling.[572]

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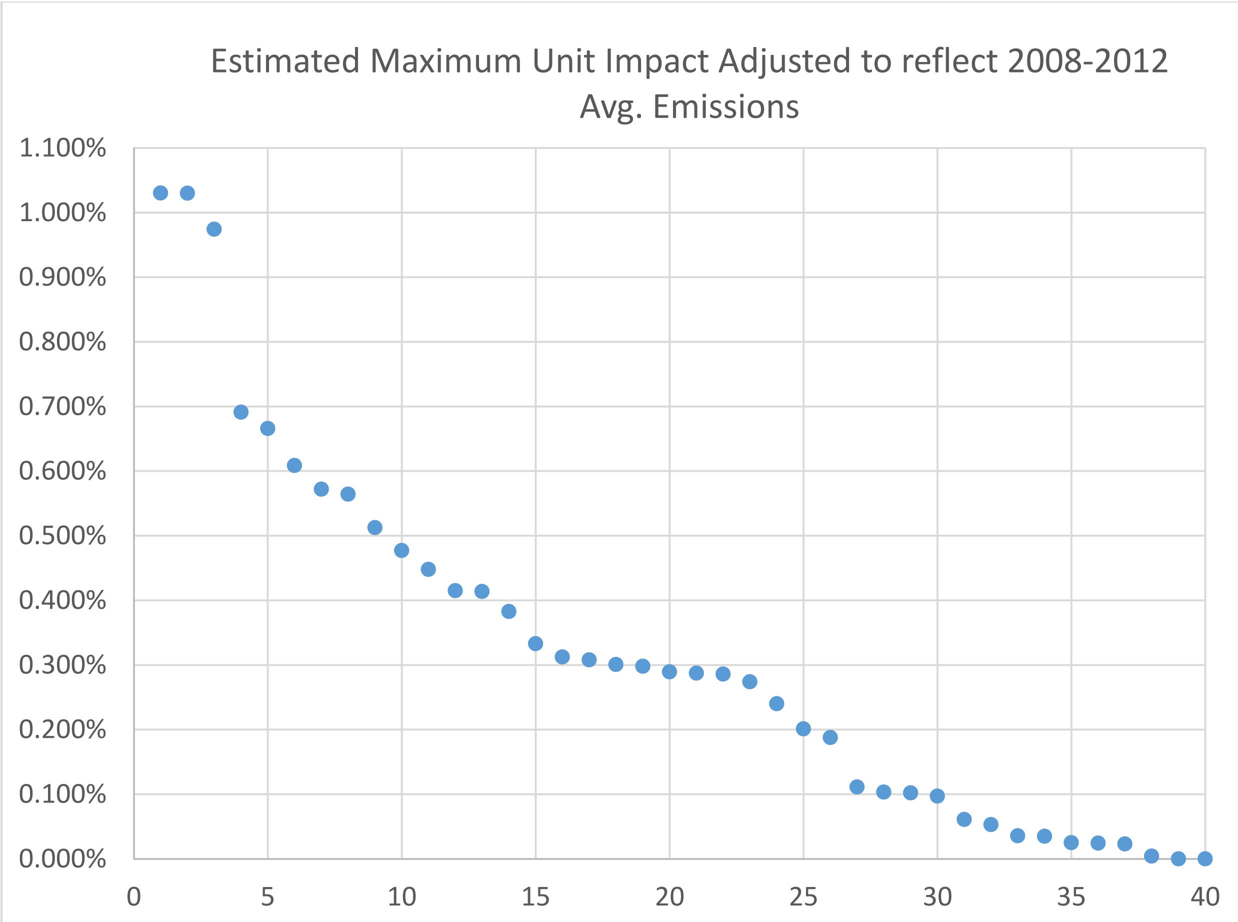
[567] FIP TSD at A-49
[568] FIP TSD at A-50
[569] The impacts of the facilities eliminated at this step ranged from 0.005% to 0.196%.
[570] See TX116-007-_30_Source_selection_analysis_TX_RH-es_1-31-14 for modeled and scaled visibility impacts for facilities and units.
[571] See Table A.4-4. Nine units have impacts ranging from 0.274% to 0.333%
[572] FIP TSD at A-53.



We disagree with the commenter that there is no rational basis for our threshold for determining which units would be further evaluated for reasonable progress controls. As an initial step, most states considered source type emission levels (e.g. point, mobile, area, etc,) and photochemical modeling source apportionment to identify the pollutant(s) and source type(s) that contribute the most to visibility impairment and eliminate other pollutants and source groups from additional evaluation based on consideration of extinction and/or percent of total extinction. For example, Texas determined, and we agreed, that based on the CENRAP model results the predominant anthropogenic emissions impacting visibility are nitrate and sulfate emissions, primarily from point sources. Therefore Texas focused its control strategy analysis on point source emissions of SO_2 and NO_X.[573]

There are a number of different approaches used by states in identifying sources for reasonable progress evaluation but it usually centered around the general premise of evaluating the biggest sources and/or the biggest impactors on visibility. To identify point sources for additional control analysis many states relied on a Q/d analysis. Some states relied on a simple analysis of emissions to determine which sources should be analyzed. As discussed elsewhere, the VISTAS

[573] Texas Regional Haze SIP at 10-2 and Table 3 of Appendix 10-1 showing percent contribution from different source types to SO4 and NO3 at the five Class I areas

RPO relied on a metric derived from Q/d and residence-time.[574] As discussed in depth elsewhere, in selecting which sources or source categories would undergo the four-factor analysis, we focused on the sources that have the greatest visibility impacts as determined by consideration of both Q/d and our more refined analysis relying on photochemical modeling. Our modeling results indicated that a subset of the 38 facilities identified by the Q/d analysis were the primary contributors to visibility impairment at each Class I area. We then used the modeling results to narrow the group of sources further because it was reasonable to conduct a full four-factor analysis only for this subset of sources with the largest visibility impacts, based on facility-level and consideration of estimated unit level impacts. We used the 0.3% threshold (as described above) only as a way to identify a reasonable subset of sources with the largest visibility impacts to evaluate further for reasonable controls. As discussed in the FIP TSD, we also considered including sources that fell under the threshold based on additional information.[575] At this point, the resulting set of sources served as a starting place from which to further analyze individual source impacts and potential benefits from controls in subsequent modeling, and identify reasonable controls using the four-factors. We discuss the relative level of visibility impacts and visibility benefits from controlling those sources eliminated from additional analysis in a separate response to comment.

We note that there is no explicit threshold for determining significance of visibility benefit in the regional haze rule. As we state in the preamble to the final Regional Haze Rule and Guidelines for BART Determinations: "Depending on the facts regarding the number of sources affecting a class I area and their modeled impacts, the State could set a threshold that captures those sources responsible for most of the total visibility impacts, while still excluding other sources with very small impacts."[576] Significance is a source- and Class I area-specific evaluation, meaning that it depends on how much visibility improvement is needed at the Class I area(s), how much a specific source impacts the Class I area(s), and the cost effectiveness and potential visibility improvement of available control options. States have latitude to determine these thresholds[577], providing support and a reasonable and adequate basis for why they selected the thresholds, and to determine BART and reasonable progress controls, in consultation with other impacted states.

Comment: [Xcel Energy (0064) p. 6] Xcel Energy stated that the EPA's method of categorizing sources based on percent of light extinction is non-statistical and unsupportable. Using an

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[574] To select the specific point sources that would be considered for each Class I area, VISTAS first identified the geographic area that was most likely to influence visibility in each Class I area and then identified the major SO_2 point sources in that geographic area. The distance-weighted point source SO_2 emissions (Q/d) were combined with the gridded extinction-weighted back-trajectory residence times. The distance weighted (Q/d) gridded point source SO_2 emissions are multiplied by the total extinction-weighted back-trajectory residence times (Q/d * Bext-weighted RT) on a grid cell by grid cell basis and then normalized VISTAS Area of Influence Analyses, 2007 available in the docket for this action.

[575] FIP TSD at A-53

[576] 79 FR 39121

[577] BART guidelines at 70 FR 39170: "However, we believe the States have flexibility in setting absolute thresholds, target levels of improvement, or de minimis levels since the deciview improvement must be weighed among the five factors, and States are free to determine the weight and significance to be assigned to each factor. For example, a 0.3, 0.5, or even 1.0 deciview improvement may merit stronger weighting in one case versus another, so one ''bright line'' may not be appropriate." (We note that the deciview values here are based on CALPUFF modeling results calculated against a natural "clean" background).

acceptable statistical categorization method, Tolk should be excluded from the group of controlled sources. EPA also imposes on Tolk the highest cost-per-ton controls of all sources that EPA proposes to control for the smallest expected visibility benefit of any source (as measured in deciviews, EPA's preferred visibility metric).

Response: We address Xcel's comments regarding the method we used to identify sources for additional reasonable control analysis is the response to comment below. We address Xcel's comments regarding the cost-effectiveness and visibility benefits of the required controls in elsewhere in the response to comments document.

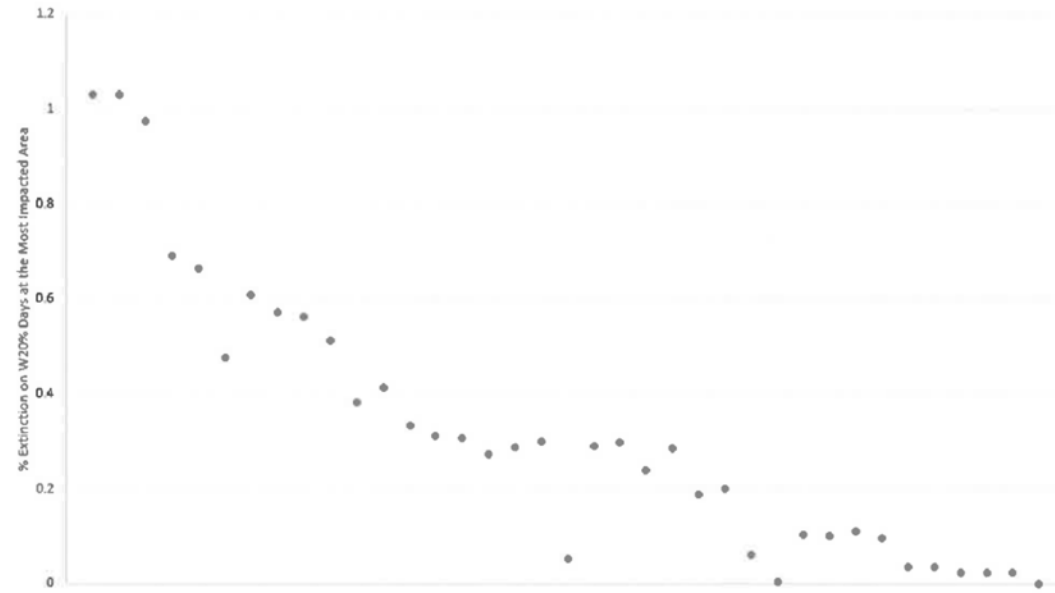
Comment: Xcel Energy stated that the **EPA's 0.3% contribution threshold for the four-factor reasonable progress evaluation is arbitrary.**

According to Xcel Energy, one of the most important errors that EPA made in the Proposal is its selection of a "natural break" in the visibility impact data that EPA used to require controls on some sources and not on others. FIP TSD, at A-49. EPA's analysis and its selection of a "natural break" threshold are seriously flawed. As discussed above, EPA departed from its own guidance and approach to regional haze rules across the country. Instead of relying on deciview impacts to identify sources of visibility impairment and to estimate visibility benefits from controls, EPA resorted to the use of light extinction. This is, on its face, problematic. However, EPA then utilized its analysis of light extinction caused by various sources as a way to decide which sources should be controlled and which could wait until the next planning period.

Specifically, Xcel Energy noted that the EPA plotted the light extinction data for 19 facilities (38 emission units) obtained from CAMx modeling to evaluate visibility impacts.[9] EPA calculated the percent of extinction for the average impacts on the worst 20% (W20%) days at the most impacted Class I area for each emission unit using the PM source apportionment tool ("PSAT"). According to the FIP TSD, EPA then reviewed these adjusted values and identified "natural break points that indicated a significant drop-off in impacts" that would allow them to "select a natural subset of the largest impacting sources" to be included in their reasonable progress analysis. FIP TSD, at A-49. EPA identified natural break points around 1%, 0.5%, and 0.3%. FIP TSD, at A-49. EPA provided no mathematical justification in the FIP TSD to support its assertion that these values represent the natural breaks for the sample population. The selection of the 0.3% light extinction threshold seems to have been made by "eyeballing" the data instead of performing a statistical analysis.

The following scatter plot in Xcel Energy Figure 4 shows the percent extinction for the average impacts on the W20% days at the most impacted area for the 38 emission units.

Scatter Plot of % Extinction on W20% Days at the Most Impacted Area (Figure 4 provided by Xcel Energy)

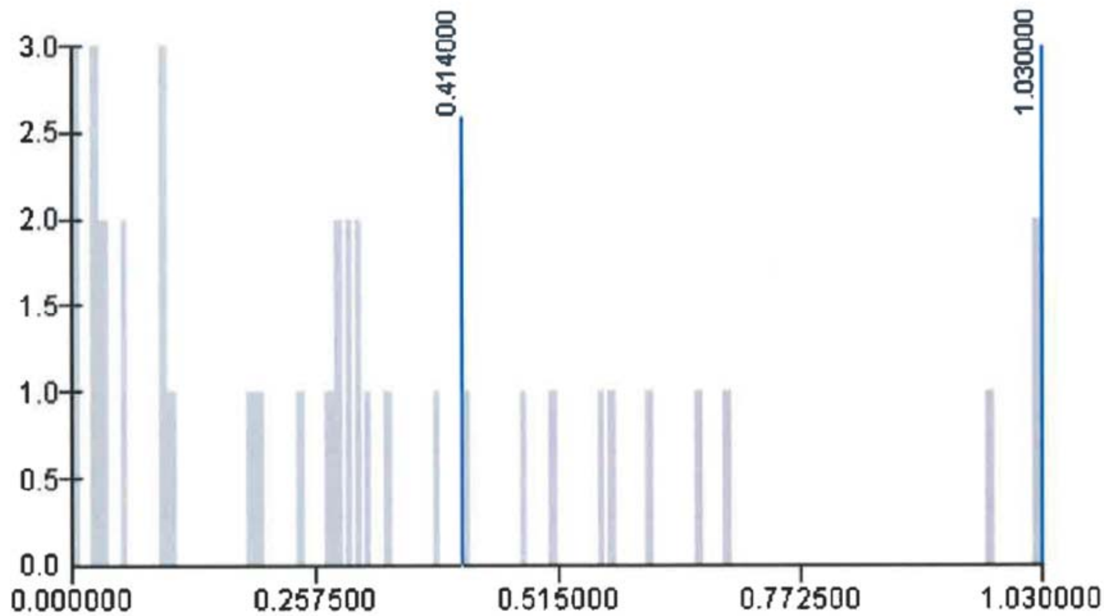


Based on the above plot, there is no obvious break in the data at 0.3% light extinction.

To identify natural breaks in the data using more scientific and mathematical methods, Xcel Energy had the data imported into the ESRI ArcGIS software, excluding zeroes. In ArcGIS, there are multiple classification options that can be selected. The current sample population data, "percent of extinction for the average impacts on the worst 20% (W20%) days at the most impacted Class I area for each emission unit" is a temporally and spatially non-linear data set. For this type of data, Jenks' optimization is the most appropriate statistical methodology to calculate classification. [10]

Xcel Energy noted that Jenks' optimization is a method of statistical data classification that partitions data into classes using an algorithm that calculates groupings of data values based on the data distribution. Jenks' optimization seeks to reduce variance within groups and maximize variance between groups. Jenks' optimization uses an iterative method to calculate multiple breaks in the datasets to determine the natural break with the smallest variance. Class breaks are identified that best group similar values and that maximize the differences between classes. For the purpose of this analysis, two classification options were selected to define the natural breaks to determine which sources should be included in the four-factor reasonable progress analysis and which sources should be excluded.

Natural Breaks for% Extinction on W20% Days at the Most Impacted Area Based on Jenks' Optimization (Figure 5 provided by Xcel Energy)



As shown in Exhibit __ (Xcel Energy Figure 5) above, Jenks' optimization, a statistically sound method that is appropriate to the dataset, would set the natural break for including sources in the group subject to the reasonable progress four-factor analysis at 0.41 %. EPA's utilization of a threshold of 0.3% extinction to determine which units should be included in a reasonable progress four-factor analysis is unjustified and its selection appears to be subjective. It results in an arbitrary threshold specific to this data set that cannot be applied or replicated across other reasonable progress analyses.

Xcel Energy concluded that the EPA should set the threshold at 0.41% for purposes of determining which sources should be evaluated for controls under the four-factor reasonable progress analysis. This would put Tolk in the group of sources *excluded* from the consideration of controls.

Footnotes:
[9] The percent extinction values obtained from the CAMx modeling were adjusted to reflect 2008-2012 average emissions. FIP TSD, at A-52 (Table A.4-4).
[10] The other classification schemes provided in ArcGIS are not appropriate for the data. The Equal Interval methodology calculates the interval based on the equal number of values in each class irrespective of the variance in the data. The calculated value of the equal interval is 0.51 %. The Quantile method classification applies to linear data sets and is not applicable here because the current dataset is a composite of random values derived as a percent extinction at the most impacted Class I area and, therefore, is a spatially and temporally non-linear dataset. The Standard Deviation classification determines numbers of classes to keep the variance between the mean values of the classes to less than one standard deviation. The variance between the current set of values is so large that the Standard Deviation method cannot be applied without classifying the data into a minimum of four classes of sources. Since the purpose of this analysis is to classify the data into two classes, this methodology is not appropriate. Nonetheless, even if one of these classifications were used for the determination of a reasonable progress analysis threshold, none of the methodologies calculate a natural break at 0.3%.

Xcel commented that the 0.3% threshold applied by EPA to identify sources for additional control analysis is non-statistical and unsupported. Xcel states that EPA identified natural break points around 1%, 0.5%, and 0.3%. FIP TSD, at A-49 but provided no mathematical justification in the FIP TSD to support its assertion that these values represent the natural breaks for the sample population. Xcel states that based on a statistical analysis using Jenks optimization, of the data a threshold of 0.41% should have been adopted and the estimated impact for Tolk Station would fall below this threshold. Therefore, Xcel concludes that Tolk Station should not have been included in the sources identified for additional analysis by EPA.

Response: We address comments concerning our use of metrics other than deciview impact in a separate response to comment. We note that in some places the commenter incorrectly characterizes the 0.3% threshold as being determinative of which sources are controlled. The commenter states that we erred in our “selection of a "natural break" in the visibility impact data that EPA used to require controls on some sources and not on others.” However, this threshold was only used to identify those sources to evaluate further for additional controls. The commenter’s description does not accurately describe the methodology we used to identify sources for control. The section of the FIP TSD the commenter cites to here is a summary of our approach, describing the different ways we considered the modeling and scaled results.[578] In this summary, we explain that we looked at break points of 1%, 0.5% and 0.3%. We compared these potential thresholds to thresholds used by states to determine which upwind states should consult based on their impact from all sources within the state. We estimated that, based on the thresholds used by states for consultation, an impact from an individual source that may be large enough to be considered for potential control may conservatively be in the range of 0.2% to 1.33%. We then explain that we tried utilizing a 1% facility impact threshold with a consideration that some facilities have two or three units and this metric would equate to 0.5% or 0.33% extinction per unit. We eliminated some facilities based on consideration of lower facility-level impacts and/or the number of units at the facility. For the remaining sources, we estimated unit –level impacts. As we explain in the response to comment above, examination of the unit-level scaled impacts revealed a number of units with impacts of approximately 0.3%.[579] We concluded this was a reasonable common breakpoint/drop-off in visibility impacts and potential visibility improvements. We used the 0.3% threshold only as a way to identify a reasonable set of sources with the largest visibility impacts to evaluate further for reasonable controls. As discussed in the FIP TSD and above, we also considered including sources that fell under the threshold based on additional information.[580] Ultimately, we identified 21 units at 9 facilities with the largest visibility impacts to evaluate for additional control analysis including visibility modeling including both units at Tolk Station.[581]

The scatter plot presented by the commenter does not provide the data ranked by impact and therefore obscures the trends in the data. As can be seen in the plot (using the same data set) provided in our response to the comment above, there are a number of units with impacts of approximately 0.3%, our selected threshold. As discussed elsewhere, we also considered inclusion of additional units near this threshold based on additional information.

[578] FIP TSD at A-49
[579] See Table A.4-4. Nine units have impacts ranging from 0.274% to 0.333%
[580] FIP TSD at A-53
[581] FIP TSD at A-56, Table A.5-1 shows the 21 units

We disagree with the commenter that our methodology in identifying a threshold was flawed and we disagree with the methodology developed by the commenter and their suggested threshold of 0.41% is appropriate. The Jenks optimization method seeks to divide the data into a specified number of groups by identifying a group of sources most like each other and most different for the other groups. By selecting only one break point, the method applied by Xcel seeks to divide the data set into only two groups rather than looking for multiple groupings within the data. We disagree with the commenter's assertion that the purpose of this analysis is to classify the data into two groups, those sources to be evaluated and those not included in our evaluation. The purpose of this analysis is to identify a reasonably broad set of sources with the largest visibility impacts that will then be analyzed through the four factor analysis, including consideration of modeled visibility benefits of controls. This set of sources would include those sources with the very largest impacts and potentially a subset of sources with smaller impacts. Examination of the data clearly reveals that some facilities have relatively very large (~1%) impacts and should possibly be considered a separate grouping. For example, using the same data set and methodology but seeking to divide the data into three groups reveals break points at 0.2% and 0.6%. Applying the same methodology to the adjusted facility level impacts yields break points at approximately 1% (0.974%) and 0.333%.

Furthermore, despite the fact that Texas and we agree that based on CENRAP 2018 source apportionment data NOx and SO_2 impacts from point sources are the most significant anthropogenic sources impacting visibility at the Class I areas, the commenter supports use of a threshold of 0.41% that would fail to capture even the facility with the very largest modeled visibility impact at Guadalupe Mountains (Tolk Station). While based on the four factor analysis, it may be appropriate to determine that controls are not required on some or even all evaluated sources, failing to demonstrate how the four factors were considered for the sources of group of sources with the most significant visibility impacts is clearly at odds with the rule. As we state in the preamble to the final Regional Haze Rule and Guidelines for BART Determinations: "Depending on the facts regarding the number of sources affecting a class I area and their modeled impacts, the State could set a threshold that captures those sources responsible for most of the total visibility impacts, while still excluding other sources with very small impacts."[582]

Comment: EPA claims that it used a "percent impacts approach" (***as opposed to deciview impacts approach required by the regulations***) "because of its linkage to the reasonable progress concept."[270] But EPA fails to acknowledge that its actual reasonable progress regulations use deciviews as the required unit of measurement, not percent extinction. EPA claims that "a source that has a smaller absolute impact on a relatively cleaner area but a higher percentage impact might be considered for control so that the cleaner area can potentially make progress,"[271] but EPA fails to explain that the relevant progress is measured in 2018 against actual visibility conditions, not artificially pristine conditions.

[270] Id. Compare 40 C.F.R. § 51.308(d)(1) ("For each mandatory Class I Federal area located within the State, the State must establish goals (expressed in deciviews) that provide for reasonable progress towards achieving natural visibility conditions." (emphasis added)).

[582] 79 FR 39121

[271] FIP TSD at A-50.

Response: We address this comment in a separate response to comment where we discuss the legality and utility of the visibility metrics we used. As discussed in detail in that separate response to comment, we disagree with Luminant's assertion that use of the deciview metric is required by the regulations. In this separate response to comment we also discuss the utility of the percentage of visibility impairment and extinction metrics.

Comment: Step 8: EPA examines 40 units at the remaining 18 facilities and concludes that 20 units have a modeled or estimated impact greater than 0.3% at one or more of the three Class I areas.

At Step 8, based on its new 0.3% threshold, EPA then examines the 40 units at the remaining 18 facilities and concludes that 20 units have a modeled or estimated impact greater than 0.3% extinction at one or more of the three Class I areas.[272] EPA, inexplicably, does not consider, or provide anywhere in the record, ***the deciview impact from each unit*** at this step, even though it later attempts to isolate the visibility benefit, by unit, of each control it would impose. EPA's use of percentage extinction masks the extremely miniscule impact of these facilities on actual visibility. For reference, the 0.291% total extinction that EPA / ENVIRON's modeling attributes to the entire W.A. Parish Station (all four units) at Wichita Mountains (which EPA notes in Table A.4-3 of its FIP Technical Support Document ("TSD")) equates to a deciview impact of 0.02538 dv (average of 20% worst days); the 0.44% total extinction attributed to the entire Big Brown Plant at Big Bend equates to a deciview impact of 0.036157 dv; and the 0.444% total extinction attributed to the entire Sommers Deely Plant at Guadalupe Mountains equates to a deciview impact of 0.037297 dv.[273] In other words***, in terms of deciviews*** (the unit of measurement required by the regulations), the impact from these facilities is beyond miniscule and from each individual unit would be even smaller, though EPA does not report those unit-level values. Luminant provided a table (see Table 3 to comment 0061 that shows EPA's estimated total visibility impact (in deciviews, average 20% worst days) for Luminant-operated ***plants*** (all of which include multiple units)[274], at each of the three Class I areas at issue.[275]

TABLE 3: ENVIRON / EPA MODELED TOTAL VISIBILITY IMPACTS OF LUMINANT PLANTS AT THREE CLASS I AREAS (DECIVIEWS, 20% WORST DAYS)[276]

Unit	WIMO Modeled Total Visibility Impact (deciviews, average 20% worst days) (21.34722 dv total)	BIBE Modeled Total Visibility Impact (deciviews, average 20% worst days) (17.68373 dv total)	GUMO Modeled Total Visibility Impact (deciviews, average 20% worst days) (17.18758 dv total)
Big Brown (Units 1 &	0.139274	0.036157	0.042224
Martin Lake (Units 1, 2, &	0.081423	0.013585	0.01869
Monticello Units (1, 2, & 3)	0.151947	0.016356	0.020473

Sandow Unit 4	0.032759	0.013648	0.009957
Sandow Unit 5	0.008672	0.003584	0.002271

272 Id. at A-52, tbl.A.4-4.
273 EPA_txbart3612k_Vis_2002_2018_PSAT_Projected_072913.xlsx ("Avg_Impacts").
274 As reflected in the table, ENVIRON modeled Sandow Unit 4 and Sandow Unit 5 as separate facilities.
275 EPA_txbart3612k_Vis_2002_2018_PSAT_Projected_072913.xlsx ("Avg_Impacts"/col. K); TX116-007-_29_Source_selection_analysis_TX_RH-1-31-14.xlsl.

Response: We explain in the response to comment above how we used the 0.3% threshold as a way to identify a reasonable subset of sources with the largest visibility impacts to evaluate further for reasonable controls. As discussed in the FIP TSD, we also considered including sources that fell under the threshold based on additional information.[583] Ultimately, we identified 21 units at 9 facilities to evaluate for additional control analysis.[584]
We disagree with the commenter that the use of percentage extinction masks the impact of these facilities on actual visibility. To the contrary, as we explain in response to comments below where we discuss the use of natural background conditions and on the legality of visibility metrics we utilized, deciview impacts calculated based on dirty background (as the commenter has presented here) significantly understates the potential benefit from controls and the visibility impact from a source. As explained in the preamble to the final Regional Haze Rule and Guidelines for BART Determinations using a metric that is dependent on current degraded background visibility conditions results in a paradox that the dirtier the existing air, the smaller an individual source's visibility impact will become.[585] In other words, as visibility conditions worsen at a Class I area, the visibility impact from a source would appear to be smaller and controls would be less likely. Therefore, to fully assess the potential visibility impacts and benefits of controls at a source, deciview impacts based on natural "clean" background conditions, as well as extinction and percent extinction should be considered. We explain in the FIP TSD, "Results based solely on a degraded background, will rarely if ever demonstrate an appreciable effect on incremental visibility improvement in a given area. Rather than providing for incremental improvements towards the goal of natural visibility, degraded background results will serve to instead maintain those current degraded conditions. Therefore, the visibility benefit estimated based on natural or "clean" conditions is needed to assess the full benefit from potential controls." [586]

583 FIP TSD at A-53
584 FIP TSD at A-56, Table A.5-1 shows the 21 units
585 Using existing conditions as the baseline for single source visibility impact determinations would create the following paradox: the dirtier the existing air, the less likely it would be that any control is required. This is true because of the nonlinear nature of visibility impairment. In other words, as a Class I area becomes more polluted, any individual source's contribution to changes in impairment becomes geometrically less. Therefore the more polluted the Class I area would become, the less control would seem to be needed from an individual source. We agree that this kind of calculation would essentially raise the "cause or contribute" applicability threshold to a level that would never allow enough emission control to significantly improve visibility. Such a reading would render the visibility provisions meaningless, as EPA and the States would be prevented from assuring "reasonable progress" and fulfilling the statutorily-defined goals of the visibility program. Conversely, measuring improvement against clean conditions would ensure reasonable progress toward those clean conditions. 70 FR 39124
586 FIP TSD at A-39

We note that, consistent with the deciview values presented by the commenter above, the Monticello and Big Brown facilities are projected to contribute approximately 1.3 Mm^{-1} and 1.2 Mm^{-1}, respectively to visibility impairment on the 20% worst days at Wichita Mountains in 2018 based on the CENRAP 2018 projected emissions for these facilities. While the commenter asserts that these impacts are miniscule, these individual facility impacts are 1.7% and 1.5% of the total visibility impairment at Wichita Mountains. In our FIP TSD we noted that Texas used an impact extinction level threshold of 0.5 Mm^{-1} (a level less than half of the estimated impact from the Monticello or Big Brown facilities) from all sources in a state as a threshold for inviting a state to consult.[587] Oklahoma selected a threshold of 1.0 Mm^{-1} to determine which states should consult in analyzing visibility impairment at Wichita Mountains. We also noted that the largest projected contribution from all point sources within a state at Wichita Mountains after Texas is Oklahoma at 3.9%. Elimination of all point sources in Oklahoma would result in less visibility benefit (3.9%) than the visibility benefit from required controls (greater than 5%). We estimated that the required controls provide for over 3 dv improvement at the Wichita Mountains when estimated using a "clean" background. The required controls result in a greater than 5% improvement in overall visibility conditions at the Wichita Mountains on the 20% worst days. We also estimate that the required controls significantly reduce the projected delay in meeting natural visibility, helping to achieve that goal 25 to 30-years earlier at Big Bend and the Guadalupe Mountain by our projections. Our final analysis identified those emission units with the largest visibility impacts. As these facts demonstrate, the identified facilities have significant impacts on visibility conditions. Our technical record makes it equally plain that the required controls reduce impacts from these sources and result in meaningful visibility benefits towards the goal of natural visibility conditions.

The commenter is incorrect in stating that we do not report unit-level deciview impacts. Based on our photochemical modeling results, we estimated uncontrolled unit level deciview impacts based on recent actual emission levels and 2018 CENRAP projected emissions levels and provide that data in the record.[588] We also present visibility benefit of the analyzed control levels for each unit in terms of extinction and deciviews.[589]

Comment: Step 9: EPA deviates from its own 0.3% threshold and "exclude[s]" some of the 20 units with impacts above the 0.3% threshold from "the second round of visibility modeling," but "include[s]" other units with impacts below the 0.3% threshold based on "additional information."[223] EPA's ad hoc review results in a list of 21 units.

At Step 9, even though EPA previously established a 0.3% threshold, it disregards that cut-off by "exclud[ing]" some of the 20 units with impacts above EPA's 0.3% threshold from "the second round of visibility modeling," but "includ[ing]" other units with impacts below EPA's 0.3% threshold based on so-called "additional information."[277] For example, a single unit at the Oklaunion Power Station modeled a 0.567% impact at Wichita Mountains, well above EPA's

[587] See Texas Regional Haze SIP Appendix 4-1: Summary of Consultation Calls and Section X.A. of the Oklahoma Regional Haze SIP

[588] TX116-007- 33 Vis modeling summary available in the docket for this action. See worksheet "no control" for extinction, and deciview impacts (clean and dirty background) of uncontrolled emissions

[589] FIP TSD at Tables A.6-1a,b,c and A.6-2a,b,c

0.3% threshold.[278] Nevertheless, EPA excluded the plant from further consideration because "its impacts are a combination of NO_x and SO_2 impacts," and EPA found that "if just the impacts from SO_2 were examined, the facility's impacts would be below the 0.3% value."[279] As discussed in more detail below, back trajectories from Wichita Mountains travel near this facility on the 20% worst days more frequently than other units that EPA chose to regulate. EPA also fails to explain why it included NO_x as part of its Q/D analysis, but then excluded NO_x impacts to haze conditions at Wichita Mountains in later steps of its analysis. Nor did EPA afford other sources the same treatment as Oklaunion and examine "just the impacts from SO_2" for other units, even though the data suggests that other units (including Luminant's Sandow Unit 4) with a combination of NO_x and SO_2 impacts above 0.3% would fall below that threshold when "just" SO_2 was considered.[280]

Further, even though none of the modeled results for Martin Lake Unit 1 were above EPA's 0.3% threshold, EPA arbitrarily included this unit "because it was above [EPA's threshold] based on actuals and very close to the cutpoint with modeled values."[281] Pirkey Power Plant, like Martin Lake Unit 1, was above EPA's threshold for one scenario but not the other—despite being well above the threshold based on modeled results (0.501%), it was below based on EPA's adjusted results.[282] Without further explanation, EPA excluded Pirkey from additional consideration.[283] EPA's selective treatment of sources at this step resulted in a "final" list of 21 units at only 9 facilities.[284]

277 FIP TSD at A-53.
278 Id. at A-52.
279 Id. at A-53.
280 TX116-007-_22_EPA_txbart3612k_Vis_2002_2018_PSAT_Projected_MSF_v5 ("Avg_Impacts") (showing Sandow Unit 4 with combined impacts of 0.376% at Wichita Mountains, but with SO_2 impacts below those of Oklaunion).
281 FIP TSD at A-53.
282 Id. at A-52.
283 Id. at A-54.
284 Id.

Response: Luminant does not present the full context of our explanation of how we determined which sources would be included in the reasonable progress analysis and additional modeling. In the FIP TSD, we state "we continued to evaluate whether to include or exclude sources that were close to the cutpoint, or for which we had additional information that would indicate they should be excluded in the second round of visibility modeling."[590] We continue by providing specific information that we relied on in determining whether or not to include that source in the reasonable progress analysis after considering the modeled visibility impacts. Luminant also does not provide an accurate description of our rationale for excluding Oklaunion from additional reasonable progress analysis for this planning period. As we explain in a separate response to comment, while impacts at the modeled emission rate of 7,157.8 tpy SO_2 from the 2018 CENRAP projected emissions for Oklaunion unit 1 exceeded the 0.3% threshold (0.567%), we noted that actual emissions (3,611 tpy annual average 2008-2012) are much lower and result in an estimated impact of 0.286%, which was less than the threshold. Because this unit fell below the threshold based on our consideration of past actual emissions, we did not evaluate

590 FIP TSD at A-53.

additional controls or revised permit limits for this unit for this planning period. We also noted that a portion of that impact was due to nitrate emissions from the source and therefore, the percentage impact that was due to sulfur emissions would be even smaller than 0.286% and below the 0.3% threshold. This is in contrast to the other EGUs evaluated where sulfur impacts accounted for almost the entire visibility impact on the 20% worst days. We explain our consideration of both NOx and SO_2 impacts in our Q/d analysis and in evaluating the modeled visibility impacts in a separate response to comment. We note that visibility model results indicated that visibility impairment from those sources with the greatest visibility impacts was almost entirely due to SO_2 emissions, with the exception of Oklaunion as discussed above, and PPG Glass Works, as discussed elsewhere in this document. Therefore, the control analysis for these sources was focused on sulfate controls since controlling other emitted species, such as NOx, would not result in significant visibility improvement on the 20% worst days for this planning period.

We disagree with the commenter that our identification of sources for reasonable progress analysis was "arbitrary" or that our application of the 0.3% threshold was "selective." We note that we considered recent actual emissions at EGUs as more representative of future 2018 emissions from these sources.[591] We explain in the FIP TSD, that similar to Oklaunion, based on consideration of recent actual emissions, estimated percent contribution to visibility impairment from Pirkey fell well below the 0.3% threshold.[592] Therefore, Pirkey was excluded from additional analysis. In this same manner, unit 1 at Martin Lake was just below the threshold at 0.296% based on modeled emissions, however we noted that actual emissions are much higher for this unit and estimated impacts based on actual emissions were well over the 0.3% threshold. Furthermore, we noted that the two other units at Martin Lake were above the threshold considering both recent actual and modeled emissions. Therefore all Martin Lake units were included in our reasonable progress analysis.

With regard to the comment that we did not 'afford' other sources the same treatment as Oklaunion and examine "just the impacts from SO_2" for other units, even though the data suggests that other units (including Luminant's Sandow Unit 4) with a combination of NO_x and SO_2 impacts above 0.3% would fall below that threshold when "just" SO_2 was considered, the commenter is incorrect. With the exception of Oklaunion and PPG glassworks, modeled visibility impacts from the individual sources are almost entirely due to sulfate impacts. For example, contrary to the commenter's assertion, only 1% of the total modeled visibility impact at Wichita Mountains from Sandow 4 is due to NOx emissions compared to over 11% in the case of Oklaunion.[593] The commenter is correct that the modeled extinction due to sulfate is less for

[591] As explained in detail in the FIP TSD (see page A-45) we determined it was necessary to consider recent actual emissions from EGUs due to uncertainty in 2018 projected emissions completed in 2006, the cost of SO_2 credits being lower than originally projected, and comments from Texas on a more recent IPM projection indicating that significant SO_2 reductions were not anticipated at these sources and no large SO_2 control projects were planned at most of the sources being evaluated. We also noted that TCEQ has utilized recent emission data for EGUs when developing projected emissions for 2018 (and other future years) when developing ozone attainment demonstrations.
[592] FIP TSD at A-54, "Pirkey had high modeled emissions and was above 0.3%, but the value was less than 0.1% for the value based on actuals, so we did not include in our additional visibility modeling."
[593] See TX116-007-_22_EPA_txbart3612k_Vis_2002_2018_PSAT_Projected_MSF_v5 ("Avg_Impacts") (showing total extinction from Sandow 4 as 0.277 Mm-1 and nitrate extinction of 0.00295Mm-1 compared to total extinction from Oklaunion as 0.417 Mm-1 and nitrate extinction of 0.0463 Mm-1)

Sandow 4 than for Oklaunion, but based on these modeled emissions, both Oklaunion and Sandow 4 impacts are above the 0.3% threshold, even when only considering SO_2 emissions. Therefore, the commenter is incorrect in stating that had we only considered SO_2 some of the other facilities would fall below the threshold. Furthermore, when considering recent actual emissions, the estimated visibility impact from Sandow 4 is much larger than the modeled value due to recent actual emission being much larger than the modeled values. As discussed above, actual emissions at Oklaunion are less than modeled.

We address comments concerning back trajectories provided by the commenter in a separate response to comment.

Comment: EPA's evaluation lacks clear and objective metrics. [NRG (0078) p. 5]

NRG stated that the EPA's proposal does not identify a clear or objective basis on which EPA identified sources to target for new controls as part of this action.

NRG stated that the EPA should identify such a basis, as EPA's own regulations and practice would require an implementing state to have such a threshold. For example, BART rules require use of such a threshold:

> One of the first steps in determining whether sources cause or contribute to visibility impairment for purposes of BART is to establish a threshold (measured in deciviews) against which to measure the visibility impact of one or more sources … 40 CFR 51, Appx. Y, § III.A.l.
>
> Once such a metric is set, it is a straightforward exercise to "compare the predicted visibility impacts with your threshold for 'contribution. " 40 CFR 51, Appx. Y, § III.A.3, Option 1.

Instead, NRG noted that the EPA's proposal relies on a series of subjective and *ad hoc* decisions about which sources should make emission reductions and the level of reductions that should be made. Among the numerous steps that lacked clear explanation, EPA began by considering a small number of the numerous emissions sources in the state, investigated a smaller subset further without clear explanation, excluded approximately half of those sources based on a non-numerical assessment that their visibility impacts were low, then imposed an unprecedented "light extinction" threshold to exclude some (but not all) facilities below the threshold from controls. This approach does not reflect a reasonable application of the legal criteria applied to determinations of reasonable progress goals.

Response: We disagree with the comment. We established a threshold of 0.3% contribution to total visibility impairment to identify sources to evaluate for reasonable progress controls. We discuss in the FIP TSD and in this RTC document, the steps we followed to identify those sources with the largest visibility impacts for additional analysis. We began using a Q/d analysis with a threshold of ten to identify sources with the greatest potential to impact visibility based on emissions and location. We then used photochemical modeling to estimate the visibility impairment due to each of these facilities. Our modeling results indicated that a subset of the 38 facilities identified by the Q/d analysis were the primary contributors to visibility impairment at each Class I area.   We eliminated a number of sources based on consideration of facility-level impacts that fell below 0.3%. We then used the 0.3% threshold on a unit basis only as a way to identify a reasonable set of sources with the largest visibility impacts to evaluate further for reasonable controls. We disagree with the comment and provided a clear explanation of what thresholds we applied and our methodology to identify sources for reasonable control analysis. As we discuss elsewhere, we believe this methodology and the metrics we utilize are consistent with the Regional Haze Rule, the CAA and our guidance.

15.r Legality of Visibility Metrics Used

General comment: We received comments that that EPA established the deciview as the required metric for establishing and tracking progress towards the reasonable progress goals. EPA's use of extinction or % extinction and establishment of thresholds is arbitrary, capricious, illegal and without precedent.

Comment: [USDA Forest Service (0083) p. 2] The USDA Forest Service noted, in the document entitled "Technical Support Document for the Oklahoma and Texas Regional Haze Federal Implementation Plans" (FIP TSD), EPA stated the following:

> We concluded that any unit with an estimated impact greater than 0.3% would be further evaluated. We believe that using a percent impacts approach is appropriate because of its linkage to the reasonable progress concept. For example, a source that has a smaller absolute impact on a relatively cleaner area but a higher percentage impact might be considered for control so that the cleaner area can potentially make progress. Since we had recent actual emissions, and any feasibility of controls would likely be based on reductions from actuals, we weighed the estimated impacts based on actuals in addition to the modeled impact levels.

In the TSD, the EPA identified that difficulties arise when these modeled visibility impact levels from RP analysis using photochemical modeling are compared to BART modeling metrics for individual sources developed in support of other regional haze actions. The USDA Forest service concurs with the EPA policy analysis that the analytical methods and model metrics used in the RP context should be linked to the reasonable progress concept, including use of small percentage threshold on the 20% worst and best days (20W or 20B) rather than using the FLAG 2010 or Appendix Y fixed threshold of 0.5 dv, 98th percentile to define significance. A potential further ramification identified by your analysis is that use of the BART/FLAG approach could result in eliminating a larger number of potential sources as a Class I area approaches its reasonable progress goal (e.g. cleaner Class I airsheds), having the reverse effect of increasing the difficulty of meeting the RPG. We applaud EPA's effort to ensure that methods and metrics used in the RP context are meaningful and provide tangible information to support making reasonable progress towards the national visibility goal.

In summary, while the USDA Forest Service has expressed concern to EPA that the use of visibility as a factor to be considered within the reasonable progress context may be outside the statutory framework established for RP (see Clean Air Act, Section 169A (g)(1)), the methodology and metrics that EPA used are the most comprehensive seen to date for any SIP/FIP in the country that we have reviewed, and should serve as a model for future efforts to consider the contribution and/or potential benefits of individual sources to visibility.

[Luminant (0061) p. 111] Luminant stated that the various metrics and thresholds that EPA employs in subsequent steps in its analysis—which it uses to judge which sources to further regulate and which not—are random, unsupported, arbitrary and capricious, and inconsistent with thresholds that EPA has previously used to judge reasonable progress in other states. EPA concedes that, despite having already acted on every other state's reasonable progress goals, there is no "prior precedent" for the approach it has taken for Texas.[686] And EPA further concedes that it has never before applied the various "thresholds" that it creates from whole cloth for the current proposal.[687] None of these thresholds withstands even the barest scrutiny.

[686] Declaration of Sam Coleman, Nat'l Parks Conservation Ass'n v. McCarthy, No. 11-01548, at 5 (D.D.C. 2014)
[687] FIP TSD at A-35 ("We have not established specific metrics for use in evaluating single facility impacts on visibility impairment (RP) as downwind Class I areas with a photochemical grid model such as CAMx . . . .").

[Luminant (0061) p. 111] Luminant noted, at the outset, EPA's reliance on percentage extinction as a visibility metric at critical steps is contrary to EPA's regulations and arbitrary and capricious.[688] As EPA has previously explained: "The RHR establishes the deciview (dv) as the principal metric for measuring visibility."[689] EPA has explained the reason the regulations use deciviews as the required metric for establishing and tracking reasonable progress goals:

> This visibility metric expresses uniform changes in haziness in terms of common increments across the entire range of visibility conditions, from pristine to extremely hazy conditions. . . . The deciview is a useful measure for tracking progress in improving visibility, because each deciview change is an equal incremental change in visibility perceived by the human eye. Most people can detect a change in visibility at one deciview.[690]

Despite the fact that the deciview is "the ***required visibility metric*** identified in the [regional haze regulations],"[691] EPA abandons the deciview in its proposal here at critical junctures in its analysis and instead uses percentage extinction to decide which sources are regulated and which are not.[692] EPA claims that it used "the percent [extinction] approach to somewhat normalize the total extinction differences between the differing Class I areas."[693]

But EPA's explanation makes no sense and, in fact, contradicts EPA's rationale for adopting the deciview as the required metric in its regulations. As EPA previously explained in adopting the Regional Haze Rule, there is good reason it adopted the deciview as the required metric—it reflects actual visibility conditions and "provid[es] a scale that relates visibility to perception."[694] In other words, to measure progress toward the national goal, it is critical that changes in visibility be considered against actual ambient conditions at the relevant Class I area (i.e., EPA's so-called "dirty background"), not against a theoretical background that does not exist in the real world. As EPA explained, "EPA supports the use of the deciview metric ***as calculated from***

ambient monitoring data for tracking changes in regional visibility."[695] And EPA further explained that the "fundamental advantage of using the deciview" in its regulations is that it "expresses uniform changes in haziness in terms of common increments ***across the entire range of visibility conditions*** . . . ."[696] In other words, EPA's proposal here has it exactly backwards. It is not necessary or appropriate to "normalize the total extinction differences between the differing Class I areas."[697] Instead, it is appropriate to consider each Class I area, as it exists and as it is projected to exist at each interim step in the process. Under the binding regulations, the relevant question here is what is a reasonable amount of visibility improvement at these Class I areas in 2018 in terms of deciviews—not whether these three areas achieve some "normalized" amount of improvement.[698] In the end, EPA's explanation for using percentage extinction, as opposed to deciviews, is unsupported by the record, inconsistent with the statute and regulations, and not rationally connected to EPA's final decision, and it is thus unlawful.[699]

Footnotes:
[686] Declaration of Sam Coleman, Nat'l Parks Conservation Ass'n v. McCarthy, No. 11-01548, at 5 (D.D.C. 2014)
[687] FIP TSD at A-35 ("We have not established specific metrics for use in evaluating single facility impacts on visibility impairment (RP) as downwind Class I areas with a photochemical grid model such as CAMx . . . .").
[688] Id. at A-50.
[689] 77 Fed. Reg. at 30,250.
[690] Id.
[691] 77 Fed. Reg. 30,454, 30,459 (May 23, 2012) (emphasis added).
[692] FIP TSD at A-50 ("We concluded that any unit with an estimated impact greater than 0.3% extinction would be further evaluated.").
[693] Id. at A-41.
[694] 64 Fed. Reg. at 35,727.
[695] Id. (emphasis added).
[696] Id. (emphasis added).
[697] FIP TSD at A-41.
[698] 40 C.F.R. § 51.308(d)(1).
[699] See Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co., 463 U.S. 29, 43 (1983) (holding that an agency decision is unlawful if the agency has failed to demonstrate that it has "examine[d] the relevant data and articulate[d] a satisfactory explanation for its action including a rational connection between the facts found and the choice made" (internal quotations omitted)).

[UARG (0065) p. 25-26] UARG explained that in this rulemaking, EPA has adopted new analytical approaches that single out Texas and Oklahoma for unique and unfair treatment. EPA, for instance, appears largely to have abandoned use of the deciview in assessing the Texas and Oklahoma regional haze SIPs, opting instead to use an inverse megameter metric. 79 Fed. Reg. at 74,839 n.208. Such an approach is inconsistent with every other EPA regional haze rulemaking action of which UARG is aware. Further, this approach conflicts with EPA's regional haze rule, which speaks in terms of deciviews and requires that the deciview metric be used. 40 C.F.R. § 51.308(d)(1) ("the State must establish goals (expressed in deciviews)"); *id.* § 51.308(d)(1)(i)(B) ("the State must ... determine the uniform rate of visibility improvement (measured in deciviews)"); *id.* § 51.308(d)(2) ("the State must determine the following visibility conditions (expressed in deciviews)"). Indeed, EPA's proposed rule appears to acknowledge that use of the deciview metric is required, yet EPA ignores that requirement. *See* 79 Fed. Reg. at 74,826. EPA's approach obscures the differences between its own evaluation of visibility impacts and the evaluation conducted by Texas. EPA, for instance, provides no direct comparison of the visibility impacts it calculated with those estimated by the state. *Id.* at 74,839. EPA's only explanation for relying on the inverse megameter, moreover, contradicts EPA's long-held position that the deciview is the most reliable metric. *Compare id*. at 74,839 n.208 ("Extinction is an appropriate measure for the visibility impairment contribution from individual sources because it avoids the sensitivity of the logarithmic transformation for calculating deciviews to the overall level of visibility impairment including the impacts of other sources.") *with* 64 Fed. Reg. at 35,727 ("the fundamental advantage of using the deciview remains: the deciview metric expresses uniform changes in haziness in terms of common increments across the entire range of visibility conditions, from pristine to extremely hazy conditions"). Indeed, EPA itself reverts to reliance on deciviews, at times, to support its proposed FIPs. 79 Fed. Reg. at 74,885-87. In short, EPA provides no rational basis for substituting inverse megameters for deciviews in its proposed rule.

[CCP (0075) p. 12] CCP stated that the EPA's extensive reliance on "source apportionment modeling" based on "extinction" to determine that controls at Coleto Creek Unit 1 are necessary is misplaced. Id. At 74,839. EPA attempts to justify its reliance on extinction in the Proposed Rule, but "extinction" is never mentioned in EPA's Guidance for Setting Regional Progress Goals Under the Regional Haze Program or in its own RPG rules. Rather, EPA's regional haze rules confirm that visibility conditions for establishing RPGs should be "measured in deciviews" or "expressed in deciviews." See 40 C.F.R. § 51.308(d)(1) ("the State must establish goals (expressed in deciviews) that provide for reasonable progress"); id. at § 51.308(d)(1)(i)(B) ("determine the uniform rate of visibility improvement (measured in deciviews); id. at § 51.308(d)(2) (requiring calculations of baseline and natural visibility conditions to be "expressed in deciviews") (emphasis added). EPA also has repeatedly confirmed the use of deciviews versus extinction when analyzing visibility associated with regional haze SIPs. See, e.g., 77 Fed. Reg. 11,455 (Feb. 27, 2012) ("Georgia SIP") ("[t]he deciview is a more useful measure for tracking progress in improving visibility than light extinction itself because each deciview change is an equal incremental change in visibility perceived by the human eye."); 64 Fed. Reg. 35,725 (discussing benefits of using deciviews versus extinction).

[Xcel Energy (0064) p. 6, 13-14] [Xcel Energy (0064) p. 6] Xcel Energy stated that the EPA ignored its own guidance and precedent in using "light extinction" rather than deciview impacts, to justify inclusion of Tolk in the group of stationary sources controlled under the Proposal.

[Xcel Energy (0064) p. 13-14] Xcel Energy stated that, disregarding the low deciview improvement projected from installing SO_2 controls on the Tolk units and EPA's own guidance focusing on deciview improvement, EPA chose to "evaluate[] other metrics, such as *extinction* benefit or *percent of extinction* benefits," apparently for the sole purpose of justifying inclusion of Tolk in this Proposal. 79 Fed. Reg. at 74,882 (emphasis added). EPA looks at light extinction to argue "that the overall visibility benefit for installing scrubbers on the Tolk units was superior to either the W. A. Parish or the Welsh units." */d.* In a footnote, EPA says that "[e]xtinction is an appropriate measure for the visibility impairment contribution from individual sources because it avoids the sensitivity of the logarithmic transformation for calculating deciviews to the overall level of visibility impairment including the impacts of other sources." 79 Fed. Reg. at 74,839 n. 208. EPA ignores the other problems with using light extinction for such purposes. But, even if there were a technical justification for use of light extinction rather than deciview impacts, EPA never explains why it uses this approach for the first time in reviewing Texas' SIP or as determinative solely as to the Tolk Generating Station.

Xcel Energy stated that the EPA's resort to "light extinction" is directly contrary to its own guidance. Using light "extinction" to assess visibility impairment is never mentioned in EPA's RPG Guidance or in its own regional haze rules. Rather, EPA's regional haze rules repeatedly state that visibility conditions for establishing RPGs should be "measured in deciviews" or "expressed in deciviews." *See* 40 C.F.R. § 51.308(d)(l) ("the State must establish goals *(expressed in deciviews)* that provide for reasonable progress"); *id.* at§ 51.308(d)(l)(i)(B) ("determine the uniform rate of visibility improvement *(measured in deciviews"); id.* at § 51.308(d)(2) (requiring calculations of baseline and natural visibility conditions to be *"expressed in deciviews")* (emphasis added). EPA also has repeatedly confirmed the use of deciviews versus light extinction when analyzing visibility associated with previous regional haze SIPs. *See, e.g.,* Proposed Georgia SIP Approval, 77 Fed. Reg. at 11,455 ("[t]he deciview is a more useful measure for tracking progress in improving visibility than light extinction itself because each deciview change is an equal incremental change in visibility perceived by the human eye."); RHR, 64 Fed. Reg. at 35,725 (discussing benefits of using deciviews versus extinction). EPA has no reasoned basis to, for the first time, ignore deciview impacts and use "light extinction" to justify imposing controls on Tolk.

Xcel Energy stated that it is indicative of the arbitrariness of EPA's use of light extinction solely for justifying inclusion of Tolk in the group of sources subject to the four-factor reasonable progress analysis that EPA then discusses the visibility benefits of controls *only* in terms of deciview improvement. EPA claims that all of the information it considered regarding the benefits of proposed controls is included in the FIP Technical Support Document ("TSD"). 79 Fed. Reg. at 74,882. However, EPA fails to present the benefits of proposed controls in terms of light extinction in either in the Proposal or the FIP TSD. Failing to consistently represent impacts in terms of light extinction arbitrarily obfuscates the purported benefits of the proposed controls.

Luminant, Xcel, CCP, and UARG commented that use of the inverse megameter or percentage extinction metric is contrary to EPA regulations and is arbitrary and capricious. The commenters state that the deciview is the required visibility metric. The commenters cite to language in our actions in Idaho (77 FR 30250), Oregon (77 FR 30454), and Georgia (77 FR 11455) as well as the Regional Haze Rule (64 FR 35727) that discuss the benefits of using the deciview metric and the establishment of the deciview as the principal metric for measuring visibility. They also state that using light extinction is never mentioned in EPA's RPG guidance or in the regional haze rules, and is inconsistent with other EPA actions on regional haze.

CCP and Xcel comment we relied on extinction and percent of total extinction to justify controlling Coleto Creek and Tolk Station. Xcel continues by stating that we used light extinction rather than deciview as determinative solely for Tolk Station. Xcel also comments that we failed to present the benefits of proposed controls in terms of light extinction in either the Proposal or the FIP TSD.

Luminant also comments that it is not necessary or appropriate to "normalize the total extinction differences between the differing Class I areas."[594] Instead, it is appropriate to consider each Class I area, as it exists and as it is projected to exist at each interim step in the process. Under

[594] FIP TSD at A-41

the binding regulations, the relevant question here is what is a reasonable amount of visibility improvement at these Class I areas in 2018 in terms of deciviews—not whether these three areas achieve some "normalized" amount of improvement.

UARG also comments that our approach obscures the differences between our evaluation of visibility impacts and the evaluation conducted by Texas, and that we fail to provide a direct comparison of the visibility impacts we calculated to those calculated by the State.

The USDA Forest Service expressed their support in their comments on the methods and metrics used in our analysis. The USDA Forest service "concurs with the EPA policy analysis that the analytical methods and model metrics used in the RP context should be linked to the reasonable progress concept, including use of small percentage threshold on the 20% worst and best days…We applaud EPA's effort to ensure that methods and metrics used in the RP context are meaningful and provide tangible information to support making reasonable progress towards the national visibility goal." They conclude by stating that "the methodology and metrics that EPA used are the most comprehensive seen to date for any SIP/FIP in the country that we have reviewed, and should serve as a model for future efforts to consider the contribution and/or potential benefits of individual sources to visibility."

Response: We disagree with the commenters that our use of metrics other than deciviews for certain purposes is contrary to the regional haze regulations. The commenters fail to distinguish between the metrics used to describe overall visibility conditions at a Class I area and the metrics that can be used to describe the visibility impairment due to an individual source, group of sources, a state's sources, or some other portion of the visibility impairment at a Class I area. In describing the overall visibility conditions at a Class I area, we established the deciview as the principle metric. This applies to the calculation of current, baseline, and natural visibility conditions at a Class I area, as well as the reasonable progress goal established as the visibility condition goal for the Class I area at the end of the current planning period. We agree with the commenters that the use of the deciview metric is required in a number of places within the rule that discusses overall visibility conditions and assessing progress towards meeting the desired visibility conditions. Specifically, the state must 1) establish reasonable progress goals expressed in deciviews (40 CFR 51. 308(d)(1)); 2) determine the uniform rate of progress in deciviews (40 CFR 51.308(d)(1)(i)(B)); and 3) determine the baseline and natural visibility conditions expressed in deciviews and the number of deciviews by which baseline conditions exceed the natural conditions (40 CFR 51.308(d)(2)). Consistent with these requirements, we calculated the baseline and natural visibility conditions, the uniform rate of progress, and the number of deciviews by which baseline conditions exceed the natural conditions in deciviews for Big Bend and the Guadalupe Mountains, as well as established reasonable progress goals for the Wichita Mountains and the Texas Class I areas in deciviews.

The deciview metric provides a scale that relates to visibility perception and therefore is useful in assessing the overall visibility conditions that are being or will be perceived at the Class I area. The commenters cite to several actions and the Regional Haze Rule where the benefits of using the deciview metric are discussed, however this is only discussed in the context of overall visibility conditions, such as determining current or natural visibility conditions. This is very different from the fraction of visibility impairment attributable to a source or group of sources.

We note that in the final Regional Haze Rule we do in fact mention the use of light extinction as another metric that states may choose to use.[595]

There is no requirement to use the deciview metric in describing the visibility impairment due to a source or group of sources as part of the analysis required for identifying reasonable controls under reasonable progress. In describing how to identify sources or source categories responsible for visibility impairment, our guidance[596] provides States with considerable flexibility to utilize various tools and techniques that would necessarily involve the use of various metrics other than deciviews. Many states and RPOs, including Texas and CENRAP, relied on a Q/d analysis, described and discussed in depth in separate responses to comments and in our proposed FIP, to identify sources for additional control analysis. The Q/d analysis relies on an annual emissions divided by distance metric, not deciviews. The VISTAS RPO relied on a metric derived from Q/d and residence-time[597], not deciviews. Some states relied on a simple analysis of emissions to determine which sources should be analyzed.

When assessing the various contributions to visibility impairment due to either source categories or pollutant species from other states and international sources, Texas routinely relied on light extinction and percent of total visibility impairment metrics. For example, Chapter 11 of the Texas regional haze SIP describes the contributions due to sulfate, nitrate, and other pollutants on the 20% worst and 20% best days at Guadalupe Mountains and Big Bend in terms of light extinction (inverse megameters, Mm^{-1}). Similarly, the extinction metric is used by Texas (see section 11.2.3 of the TX RH SIP) to assess the level of impact on other Class I areas from Texas sources. Texas relies on the percent of total visibility metric in identifying the types of sources (e.g. point, area, mobile) that contribute the most to visibility impairment from sulfate and nitrate[598] and in identifying the relative contributions to visibility impairment due to emissions from various source areas (e.g. Texas, Mexico, neighboring states).[599] Texas also used the extinction metric to determine which states significantly impact the Texas Class I areas, applying an impact extinction level threshold of 0.5 Mm^{-1} from all sources in a state as a threshold for inviting a state to consult.[600] Source apportionment modeling performed by the RPOs was utilized by every state to assess the various contributions to visibility impairment at their Class I areas in terms of light extinction and percent contribution to total light extinction. The CENRAP PM source apportionment tool (CENRAP PSAT tool)[601] utilized by all CENRAP states,

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[595] "The final rule maintains the deciview as the principle visibility metric used in establishing reasonable progress goals, in defining baseline, current, and natural conditions, and in tracking changes in visibility conditions over time. States may choose to express visibility changes in terms of other metrics, such as visual range or light extinction, as well as in terms of deciview." 64 FR 35,727

[596] "Once the key pollutants contributing to visibility impairment at each Class I area have been identified, the sources or source categories responsible for emitting these pollutants or pollutant precursors can also be determined. There are several tools and techniques being employed by the RPOs to do so, including analysis of emission inventories, source apportionment, trajectory analysis, and atmospheric modeling." Guidance for Setting Reasonable Progress Goals Under the Regional Haze Program, U.S. EPA, OAQPS, June 1, 2007, page 3-1

[597] VISTAS Area of Influence Analyses, 2007, available in the docket for this action.

[598] Texas Regional Haze SIP at Table 3 of Appendix 10-1 showing percent contribution from different source types to SO4 and NO3 at the five Class I areas

[599] Texas Regional Haze SIP Table 10.8 at p. 10-10

[600] See Texas Regional Haze SIP Appendix 4-1: Summary of Consultation Calls

[601] Available in the docket to this action as "CENRAP_PSAT_Tool_ENVIRON_Aug27_2007.mdb"

including Texas and Oklahoma, to review the results of the source apportionment modeling provides results in two ways: light extinction (inverse megameters) and percentage of total extinction. In our action, we also utilized the methodology and metrics used by the RPOs to evaluate the source apportionment results, the only difference being that our source apportionment modeling provided information on visibility impacts from individual sources instead of source categories, or regions/states. In the FIP TSD, we provide information on visibility impacts from the individual sources in terms of extinction, percentage of total extinction, and in deciviews.[602]

We evaluated the information in terms of light extinction and percentage of total impact to identify a reasonable subset of sources with the largest visibility impacts to analyze for additional controls. Because the overall visibility conditions at different Class I areas can vary greatly, particularly Class I areas in the Eastern U.S. compared to Class I areas in the Western U.S., we determined that it is not enough to consider just the magnitude of extinction from a facility, we must also consider the percentage of total impairment metric at each Class I area. As we state in the FIP TSD, "We believe that using a percent impacts approach is appropriate because of its linkage to the reasonable progress concept. For example, a source that has a smaller absolute impact [in terms of extinction] on a relatively cleaner area but a higher percentage impact might be considered for control so that the cleaner area can potentially make progress." Using the percentage of total visibility impairment metric allows us to somewhat normalize the extinction differences between Class I areas so that we can utilize the same approach at each Class I area and identify a reasonable set of sources to analyze that if controlled would result in meaningful visibility benefits towards meeting the goal of natural visibility at every Class I area. Contrary to Luminant's comment, these source apportionment model results are tied to projected conditions in 2018 at each Class I area. The estimated light extinction is based on projected 2018 emission levels and the percentage impact is based on the percentage of the total modeled visibility impairment in 2018. We note that we also considered recent actual emissions at EGUs as more representative of future 2018 emissions from these sources.[603] For every Class I area to have the opportunity to reach the natural visibility goals, it is necessary to identify the sources or source categories that significantly impact visibility, identify available controls and analyze whether those controls are reasonable. Had we established a strict threshold based on extinction, we would have had to establish a different threshold for each Class I area. For example, had we selected a threshold of 0.35 Mm-1 on a facility basis we would have identified ten facilities for additional analysis based on modeled visibility impacts at Wichita Mountains. However, use of this same threshold applied to either Big Bend or Guadalupe Mountains fails to identify the largest individual sources impacting visibility at these Class I areas for additional analysis to determine if reasonable controls are available. Using a percentage approach, such as the 0.3% of total visibility impairment on a unit basis we used in this action, results in identification of a subset of sources that include those sources with the greatest visibility impacts at each class I

[602] As discussed in more detail elsewhere, we estimated deciview impacts using "clean" background and "dirty" background conditions in our assessment of visibility impacts and benefits for individual sources.

[603] As explained in detail in the FIP TSD (see page A-45) we determined it was necessary to consider recent actual emissions from EGUs due to uncertainty in 2018 projected emissions completed in 2006, the cost of SO_2 credits being lower than originally projected, and comments from Texas on a more recent IPM projection indicating that significant SO_2 reductions were not anticipated at these sources and no large SO_2 control projects were planned at most of the sources being evaluated. We also noted that TCEQ has utilized recent emission data for EGUs when developing projected emissions for 2018 (and other future years) when developing ozone attainment demonstrations.

area. As stated by the USDA Forest Service in its supportive comments, the use of this methodology and metrics, including the use of a small percentage threshold on the 20% worst days is linked to the concept of reasonable progress. We believe it could serve as the model for future efforts to consider the contribution and potential benefits of individual sources to visibility. After identifying which sources to analyze for additional controls based on the percentage impact on a unit basis, we determined which controls were reasonable based on consideration of the four factors, including comparison of cost to the anticipated visibility benefit (deciview improvement, extinction, percentage of total extinction, and the percentage of the total impact from Texas point sources addressed by the control).

We disagree with Luminant's comment that "under the binding regulations, the relevant question here is what is a reasonable amount of visibility improvement at these Class I areas in 2018 in terms of deciviews—not whether these three areas achieve some 'normalized' amount of improvement." The RHR requires that we identify reasonable controls based on consideration of the four statutory factors and then establish a reasonable progress goal that reflects the anticipated amount of visibility improvement from implementation of those controls in additional to all other "on the books" controls. One cannot determine what a reasonable amount of visibility improvement at each Class I area is without evaluating reasonable controls at the sources or source categories responsible for the visibility impairment. As an initial step we identify those sources or source categories with the largest visibility impacts at each Class I area. As discussed above, by using the percentage impact approach we were able to somewhat normalize the extinction impacts and identify those sources with the most significant impacts at each class I area. Secondly, within the four-factor analysis we took into consideration the projected visibility benefit of the controls to identify cost-effective controls that will achieve reasonable visibility benefits required during this planning period towards the national goal. At this step, we considered the anticipated visibility benefit in deciviews[604] (for both a "dirty background" and a "clean background") as well as the reduction in extinction and the percentage of total visibility impairment addressed by the controls.

With regards to CCP and Xcel's comments concerning our reliance on extinction and percent of total extinction to determine if controls should be required at Coleto Creek and Tolk Station, we disagree with the comment. As we state in our proposed action and discussed in the FIP TSD, we weighed deciview benefits, as well as extinction benefits and percentage of total extinction information in making our proposed findings about the benefits of potential controls at all the evaluated units.[605] In considering controls on Tolk, we noted that the visibility benefits occur mainly at Guadalupe Mountains. We also noted that in terms of deciview improvement, the visibility benefit from controlling Tolk at Guadalupe Mountains was smaller than the benefit of controls at Welsh or Parish on visibility at Wichita Mountains. However, in comparing the level of visibility benefit at one Class I area to another, the percent extinction benefits are more useful because they avoid the deciview metric's sensitivity to the logarithmic transformation that depends on the total visibility impairment that can vary from Class I area to Class I area. As we

[604] In the FIP TSD we explain in depth the difficulties that arise in trying to use the deciview metric in the context of CAMx modeling for reasonable progress compared to the use of deciviews in the context of single-source BART modeling using CALPUFF (see FIP TSD at A-35.), as well as the need to use clean background conditions for the deciview metric (see FIP TSD at A-39)

[605] 79 FR 74882

discuss above, using the percent extinction metric somewhat normalizes extinction between different Class I areas. In particular, the Wichita Mountains has a much higher total extinction for the baseline and the 2018 projection than the Guadalupe Mountains, so the relative improvement in extinction levels is higher when the Tolk units are controlled for the Guadalupe Mountains, than if the W. A. Parish or the Welsh units were controlled for the Wichita Mountains. We also considered the level of impact from all Texas point sources at each Class I area and the amount of that impact addressed by individual controls. We determined that controls were reasonable for Coleto Creek and Tolk based on consideration of the four factors, including comparison of cost to the anticipated visibility benefit (deciview improvement, extinction, percentage of total extinction, and the percentage of the total impact from Texas point sources). We note that Coleto Creek alone accounts for over 6% of the total Texas point source visibility impact at Big Bend and Tolk accounts for nearly 8% of the total Texas point source impact at Guadalupe Mountains.

Xcel is incorrect in commenting that we failed to present the benefits of the proposed controls in terms of light extinction. Tables A.6-1a, A.6-1.b, and A.6-1.c in the FIP TSD present the average change in extinction levels for different controls at Wichita Mountains, Guadalupe Mountains, and Big Bend. We also note that tables A.6-2.a, A.6-2.b, and A.6-2.c present the change in deciview for different controls at the Class I areas. The FIP TSD also presents modeled visibility impacts from the facilities in terms of extinction and percent of total extinction.

As to UARG's comment that our approach obscures the differences between our evaluation and Texas' and that we failed to provide a direct comparison of visibility impacts, Texas did not assess the visibility impact from individual sources and only estimated the total visibility benefit from controlling those sources that Texas identified based on Q/d and consideration of cost-effectiveness. As we discuss further in our FIP TSD and in other responses elsewhere in our RTC document, to provide context regarding the significance of our estimated individual source impacts and benefits from controls, we compared the individual source impacts with CENRAP source apportionment modeling results for impacts from all emission sources within a state and impacts from all emission sources within a state within a specific source type, examining extinction and percent extinction. We also compared these individual source impacts to the impact levels used by the states for triggering consultation with another state about its overall impacts (extinction levels), and the estimated range of anticipated visibility benefits resulting from required controls in other actions.[606]

As we discuss in more detail elsewhere where we discuss comments concerning legal deference, we disagree with Luminant's cited use of Sam Coleman's declaration and it is taken out of context. While EPA did say that there was no "prior precedent," this was in regards to the particular type of modeling undertaken; Luminant takes Coleman's statement out of context. Coleman's statement is related to the additional modeling we determined was appropriate due to the large distances involved and the large number of sources being analyzed, which was a unique set of facts not encountered by us in the Regional Haze context before. Luminant conflates this context and over broadens the scope of Coleman's statement beyond the modeling to our approach in the proposal overall. Coleman's statement was not stating there was no prior

[606] See our FIP TSD at A-75.

precedent for the basis of our proposal, nor that our approach was inconsistent with other regional haze SIP actions.

15.s Adjustment of CAMx Results: Linear Extrapolation and Nox Vs. SO_2, Natural Background, Recent Actual Emissions

General Summary: We received comments on the method EPA used to adjust CAMx results. EPA developed a linear relationship between emissions and extinction and then adjusted CAMx modeled extinction linearly with emissions to match proposed controlled emission levels. The commenters state that the relationship between emissions and light extinction is not linear and that interactions between nitrate and sulfate create a complicated relationship. The CAMX user guide supports that the relationship is non-linear.

We also received comments on the calculation of a dv impact or improvement based on natural "clean" background conditions and the estimated visibility impacts/improvement based on recent actual emissions rather than projected 2018 emissions.

15.t Linear Extrapolation

Comment: [AECOM (0061 and 0075) p. 7-1] AECOM stated that there are anomalies in how EPA considered and manipulated the results of the CAMx modeling that was performed. For example, with these modeling results, EPA formulated the visibility benefits by using a linear approach that provides an estimate of the extinction for each facility as a function of controlled emissions. However, the relationship between a change in emissions to the corresponding change in deciviews is not linear since: 1) the relationship between an emissions rate and the corresponding effect on light extinction is a complex non-linear system (see section 1.2 of the CAMx Users Guide Version 6.1 (April 2014)), depending on multiple parameters described in more detail below; and 2) the relationship between light extinction and deciviews is an exponential relationship as shown above.

AECOM stated that the assumption of a linear response ultimately assumes that the modeled amount of particulate concentrations will be reduced linearly by decreasing emissions, but there is no certainty this will occur. In the atmosphere, there is competition between sulfate and nitrate for the available ammonia, the interaction that results from this competition creates a rather complicated system. As stated in Seinfeld's widely used textbook on Atmospheric Chemistry, "reductions in aerosol sulfate will result in partial replacement of the reduced aerosol mass by available nitric acid. The sulfate decreases frees up ammonia to react with nitric acid and to transfer it to the aerosol phase."[113] Therefore, sulfate reductions can be accompanied by an increase in the aerosol nitrate, a compound which also contributes to visibility impairment. Thus, the assumption of a linear relationship between SO_2 emissions reductions and visibility improvement does not accurately represent the complexity of the sulfate-nitrate-ammonia system in the atmosphere and could overstate the claimed visibility improvements expected from the EPA FIP requirements.

AECOM stated that, in particular, a limitation of the linear model used by EPA is that although small perturbations relative to model inputs might be approximated by a linear relationship, EPA extended the linear treatment to larger variations. In fact, the proposed level of controls is well outside the range actually used in the photochemical modeling. This was particularly true for the wet flue gas desulfurization controls in which the proposed emissions range from 521 to 700 tons per year (tpy) of SO_2 (depending on the facility), but the high control modeling scenario considered emissions in the range of 1,110 to 4,595 tpy. Therefore, EPA assumes, without justification, that the linear model used to estimate the response to the visibility impairment from emissions will still be valid when the proposed emissions are a factor of 2 to 6 smaller than the emissions used in the CAMx modeling scenario with the highest controls. There is no basis for this assumption.

Footnotes:
[113] Seinfeld J. H. and Pandis S. N. (1998) Atmospheric Chemistry and Physics: From Air Pollution to Climate Change, 1st edition, J. Wiley, New York.

Step 11: In clear contradiction to the CAMx User's Guide, EPA linearly scales the results of the CAMx modeling from ENVIRON to estimate the visibility benefit associated with larger changes in emission rates at the 21 remaining units.

(EJ Gray report pg 18-19): EPA's approach here results in reasonable estimates of the visibility benefits associated with the evaluated controls. The physical (atmospheric) system being modeled by CAMx consists of a number of processes (plume rise, transport, chemistry, deposition, etc.). Many of these are "linear" in nature (meaning a scaling of emissions would result in a scaling of ambient concentration), but some are not (such as the chemical mechanism). However, for relatively small changes in total SO_2 emissions (from all sources), the chemistry (and the overall model results) can be approximated as a linear process, which is the approach EPA has taken here.

The high and low emission rates, developed from actual emissions data and realistic control percentages, are representative of emission rates under typical high and low control scenarios for each unit rather than being associated with control levels from each of the possible controls. Importantly, the collection of emission rates for the high and low control levels for the various units at each facility, together with the 2018 baseline facility emission levels, spanned the possible values of emissions at each facility so that the slope (for each facility) could be determined using linear regression.

The linear regression procedure that EPA used to relate each unit's SO_2 emission rate to its extinction contribution at each modeled Class I area relies on all other variables (other than the SO_2 emission rate from the specific source unit) being constant. Unfortunately, the background conditions (which are made up of contributions from all pollutant sources in the model) are not exactly the same for the low and high (and 2018 baseline) emission scenarios, because the other 20 controlled units are at different levels between the low and high (and baseline) model runs. Examination of the model results for the low versus high control scenarios (with all sources) at numerous modeled Class I areas show that the modeled extinction levels are not very far apart for the purposes of linear regression, so the uncertainty in the estimation of the regression slopes (change in extinction per ton of emissions) for the individual source units should not be large due to this slight mismatch. Thus, EPA's approach was ultimately reasonable for these purposes.

A separate linear regression was performed for each of the nine facilities and at each of the 19 modeled Class I areas. For many of these regressions, few distinct data points were used; for example, at facilities with only one unit (Coleto Creek and Sandow 4) there were only three data points used in the regressions. Many of the high or low control levels at different units within the same facility were only slightly different, resulting in similar emission levels and modeled extinctions, which essentially created duplicate regression points. For many of the facilities, the 2018 baseline facility-wide data point essentially represented a "doubled" or "tripled" unit emission and extinction impact.

Finally, it should be noted that some of the regressions consisted of a single point from the 2018 baseline facility-wide model results combined with one or more additional points that are located "approximately" at the origin (zero modeled impact at a very low relative emissions level). The resulting slopes for these regressions are defined almost entirely by the 2018 baseline model results. However, the source unit/Class I area impacts in the regressions where this issue was observed were very small relative to the impacts that are the primary focus of this analysis (1-2 orders of magnitude lower); their uncertainty does not impact the overall conclusions. For all impacts that play a significant part in EPA's analysis, the regressions appear to have been developed with a reasonable, although small, set of practical data points.

In sum, due to the observed linearity between modeled incremental extinction and SO_2 emission rates, and the fact that the overall modeled extinction levels (from all sources) weren't very different between the low, high, and 2018 baseline scenarios, the resulting regression slopes provide a reasonable estimation of the change in extinction at each Class I area that would result from a change in SO_2 emission rate from units at each facility.

[Gray (0070) p.18] Dr. Gray stated that the EPA used CAMx to establish a mathematical relationship between the tons reduced by a given control at a specific unit, and the resulting visibility benefit to each Class I area. This method produced a reasonable estimate of the visibility benefits from the potential controls. (FIP TSD, Sections A.5 and A.6)
Dr. Gray noted that the EPA's approach to estimate the visibility impacts of the 21 selected source units and the benefits of emission reductions from each unit, EPA developed a linear relationship between tons of emissions reduced and visibility benefit in extinction, allowing it to estimate benefits from any level of control. Using actual emissions data and generalized emission reduction percentages, EPA created a pair of high and low control estimates for each unit. It then modeled the benefits from each scenario using CAMx.

Dr. Gray noted that the high and low control level model results for each unit were combined with the earlier facility-wide model results to create a set of modeled visibility levels (average extinction during W20 days) at each Class I area. EPA found that, "For each facility and Class I area, the modeled data was linear with high correlation. Therefore we used the linear fit to extrapolate the anticipated visibility impact/benefit from a given level of emission/control." The resulting linear regression slope gives the visibility benefit (change in extinction) per ton of SO_2 emissions reduced.

Dr. Gray noted that the EPA then calculated the tons reduced by each control to estimate the visibility benefit from that control. EPA updated the baseline uncontrolled emission rates for each unit based on CEM data for 2009-2013. These baseline emission rates (the maximum and minimum emissions years were eliminated and the three remaining years were averaged) were used to estimate the amount of tons reduced for each control measure. Then the linear relationship described above was used to estimate the visibility improvement corresponding to each potential control measure evaluated at the 21 selected source units.

Dr. Gray commented that the EPA's approach here results in reasonable estimates of the visibility benefits associated with the evaluated controls. The physical (atmospheric) system being modeled by CAMx consists of a number of processes (plume rise, transport, chemistry, deposition, etc.). Many of these are "linear" in nature (meaning a scaling of emissions would result in a scaling of ambient concentration), but some are not (such as the chemical mechanism). However, for relatively small changes in total SO_2 emissions (from all sources), the chemistry (and the overall model results) can be approximated as a linear process, which is the approach EPA has taken here.

Dr. Gray stated that the high and low emission rates, developed from actual emissions data and realistic control percentages, are representative of emission rates under typical high and low control scenarios for each unit rather than being associated with control levels from each of the possible controls. Importantly, the collection of emission rates for the high and low control levels for the various units at each facility, together with the 2018 baseline facility emission levels, spanned the possible values of emissions at each facility so that the slope (for each facility) could be determined using linear regression.

Dr. Gray stated that the linear regression procedure that EPA used to relate each unit's SO_2 emission rate to its extinction contribution at each modeled Class I area relies on all other variables (other than the SO_2 emission rate from the specific source unit) being constant. Unfortunately, the background conditions (which are made up of contributions from all pollutant sources in the model) are not exactly the same for the low and high (and 2018 baseline) emission scenarios, because the other 20 controlled units are at different levels between the low and high (and baseline) model runs. Examination of the model results for the low versus high control scenarios (with all sources) at numerous modeled Class I areas show that the modeled extinction levels are not very far apart for the purposes of linear regression, so the uncertainty in the estimation of the regression slopes (change in extinction per ton of emissions) for the individual source units should not be large due to this slight mismatch. Thus, EPA's approach was ultimately reasonable for these purposes.

Dr. Gray stated that a separate linear regression was performed for each of the nine facilities and at each of the 19 modeled Class I areas. For many of these regressions,[22] few distinct data points were used; for example, at facilities with only one unit (Coleto Creek and Sandow 4) there were only three data points used in the regressions. Many of the high or low control levels at different units within the same facility were only slightly different, resulting in similar emission levels and modeled extinctions, which essentially created duplicate regression points. For many of the facilities, the 2018 baseline facility-wide data point essentially represented a "doubled" or "tripled" unit emission and extinction impact.

Finally, Dr. Gray stated that it should be noted that some of the regressions consisted of a single point from the 2018 baseline facility-wide model results combined with one or more additional points that are located “approximately” at the origin (zero modeled impact at a very low relative emissions level). The resulting slopes for these regressions are defined almost entirely by the 2018 baseline model results. However, the source unit/Class I area impacts in the regressions where this issue was observed were very small relative to the impacts that are the primary focus of this analysis (1-2 orders of magnitude lower); their uncertainty does not impact the overall conclusions. For all impacts that play a significant part in EPA’s analysis, the regressions appear to have been developed with a reasonable, although small, set of practical data points.

In sum, Dr. Gray concluded that due to the observed linearity between modeled incremental extinction and SO_2 emission rates, and the fact that the overall modeled extinction levels (from all sources) weren’t very different between the low, high, and 2018 baseline scenarios, the resulting regression slopes provide a reasonable estimation of the change in extinction at each Class I area that would result from a change in SO_2 emission rate from units at each facility.

Footnote:
[22] Regression results can be found in tab “sorted PSAT data” in EPA’s spreadsheet: “TX116-007-_33_Vis_modeling_summary.xlsx”

CCP and Luminant commented on the method we used to adjust CAMx results based on emission difference between modeled emissions and controlled emission levels. The method relies on adjusting CAMx modeled extinction linearly with emissions to match proposed controlled emission levels. The commenters state that the relationship between a change in emissions to the corresponding change in deciviews is not linear since: 1) the relationship between an emissions rate and the corresponding effect on light extinction is a complex non-linear system and 2) the relationship between light extinction and deciviews is an exponential relationship. The CAMx user guide supports that the relationship is non-linear. As stated in a widely used textbook on Atmospheric Chemistry, “reductions in aerosol sulfate will result in partial replacement of the reduced aerosol mass by available nitric acid. The sulfate decreases frees up ammonia to react with nitric acid and to transfer it to the aerosol phase.”[607] Therefore, sulfate reductions can be accompanied by an increase in the aerosol nitrate, a compound which also contributes to visibility impairment. Thus, the assumption of a linear relationship between SO_2 emissions reductions and visibility improvement could overstate the claimed visibility improvements expected from the FIP requirements. The commenters state that small perturbations relative to the model inputs can be approximated as linear. However, the commenters assert that we extended the linear treatment to larger variations. The commenters continue that the proposed level of controls is well outside the range actually used in the photochemical modeling. For example, the proposed emissions ranged from 521 to 700 tons per year (tpy) of SO_2 (depending on the facility), but the control modeling scenario considered emissions in the range of 1,110 to 4,595 tpy. The use of a linear model is not justified when the proposed emissions are a factor of 2 to 6 smaller than the emissions used in the CAMx modeling scenario with the highest controls.

[607] Seinfeld J. H. and Pandis S. N. (1998) Atmospheric Chemistry and Physics: From Air Pollution to Climate Change, 1st edition, J. Wiley, New York.

We also received comments from Earthjustice et al. that summarized and supported the methodology used to adjust the modeling results:

"EPA's approach here results in reasonable estimates of the visibility benefits associated with the evaluated controls. The physical (atmospheric) system being modeled by CAMx consists of a number of processes (plume rise, transport, chemistry, deposition, etc.). Many of these are "linear" in nature (meaning a scaling of emissions would result in a scaling of ambient concentration), but some are not (such as the chemical mechanism). However, for relatively small changes in total SO_2 emissions (from all sources), the chemistry (and the overall model results) can be approximated as a linear process, which is the approach EPA has taken here… For all impacts that play a significant part in EPA's analysis, the regressions appear to have been developed with a reasonable, although small, set of practical data points.

In sum, due to the observed linearity between modeled incremental extinction and SO_2 emission rates, and the fact that the overall modeled extinction levels (from all sources) weren't very different between the low, high, and 2018 baseline scenarios, the resulting regression slopes provide a reasonable estimation of the change in extinction at each Class I area that would result from a change in SO_2 emission rate from units at each facility."

Response: We disagree with the comments from Luminant and CCP that the methodology used to estimate visibility benefits from control level emissions was unjustified or unreasonable, and agree with Earthjustice that our approach was reasonable. The linear relationship we developed to extrapolate extinction due to controlled emission rates was a reasonable approach in our technical analysis.

The commenter is incorrect in suggesting that we developed a linear relationship between emissions and deciviews and then commenting that this is flawed because the relationship between light extinction and deciviews is exponential. We developed a linear relationship between emissions and light extinction (inverse Megameters), not deciviews.

We agree with the commenters, that in general, the relationship between downwind concentrations and emissions can be complicated and non-linear due to complex chemistry, including the fact that reductions in sulfur emissions can result in an increase in ammonium nitrate. Each modeled emission scenario took this complex chemistry into account in estimating the visibility impacts for that scenario. We estimated control efficiencies for a high and low control case scenario that would span the range and give a reasonable approximation of emission reductions of potential controls and maximize the number of data points available to estimate the visibility benefit due to a reduction in emissions.[608]. Using the unit level High and Low modeled visibility impacts and the 2018 facility level modeling described in the FIP TSD, we examined the relationship between the various levels of emissions from a modeled site and the modeled visibility impact at each Class I area. For each facility and Class I area, the available modeled data was linear with high correlation and the modeled emission levels were relatively close to the estimated control levels examined. Therefore we used the linear fit to extrapolate the anticipated visibility impact/benefit from a given level of emission/control.[609] We agree with Luminant

[608] See FIP TSD at A-54 for a more detailed description

[609] See Vis modeling summary.xlsx in the docket for this action for our calculations and estimates of visibility benefits from the examined levels of controls.

and CCP that small perturbations relative to the model inputs can be approximated as linear. However, we disagree with the commenters that we extended the linear treatment to large variations, and we note errors as discussed below in the commenter's assessment of the differences between modeled and required control levels. The variations between the modeled High control levels and the control levels required in the FIP are relatively small. We agree with Earthjustice et al. that the small level of uncertainty in the visibility benefit from these controls introduced by the linear extrapolation does not impact the overall conclusions. Luminant and CCP are incorrect in stating that the proposed emissions are a factor of 2 to 6 smaller than the emissions used in the CAMx modeling scenario with the highest controls. The table below summarizes the modeled emission levels and compares them to the baseline actual emissions and the controlled emission levels that were used to extrapolated visibility impacts and benefits. The modeled high control scenario emissions for units with proposed scrubber retrofits range from 1,110 to 1,675 tpy compared to a range of 521 to 700 tpy for the proposed control emissions. The absolute difference between the modeled and control emission rates at individual facilities with required scrubber retrofits ranges from 84 tpy to 1,062 tpy, or a factor of 1.08 to 2.73 smaller. The absolute difference between the modeled and control emission rates at individual facilities with proposed scrubber upgrades ranges from -30 tpy to 535 tpy, or a factor of 1.6 or less. The largest difference of 1,062 tpy (a factor of 2.73 difference) for units with required scrubber retrofits is for Big Brown unit 1 and amounts to small percentage difference (~3%) in reduced emissions going from 30,667 tpy uncontrolled emissions down to 1676 tpy (High control case) or 614 tpy (required control level). Using the linear relationship we developed, this also equates to a 3% difference in the reduction of visibility impact (extinction) or visibility benefit going from the baseline level to the control level. This is a small perturbation from the modeled levels, a small difference in estimated extinction benefit from the modeled and required control level, and does not impact our overall decisions on the significance of visibility benefits from the required controls. In every case, the required control level emissions are the same or less than the high control level modeled, and the visibility benefits from controls at the required control level will be the same or more than those modeled at the High control level. Therefore, the High level modeled visibility benefit can be seen as a lower bound and even these support our decision.

The table below summarizes the modeled emission levels and compares them to the baseline actual emissions and the controlled emission levels that we extrapolated visibility impacts for.

Unit #	Facility	3yr average 2009-2013 excluding max and min	EPA/ CENRAP 2018 Phase 1 modeled emissions	low controlled emissions	High control emissions	FIP control emission level	high control modeled to controlled emissions ratio	Difference between high control modeled emissions and control level emissions (tpy)
1	Big Brown	30667	23328	20108	1676	614	2.73	1062

2	Big Brown	30814	23831	13343	1668	646	2.58	1022
1	Coleto Creek	16059	16225	9839	1492	699	2.14	794
lim 1	Limestone	10913	12817	7423	2474	2467	1.00	8
lim 2	Limestone	11946	5023	5230	2615	2615	1.00	0
1	Martin Lake	24495	11442	19278	3856	3706	1.04	150
2	Martin Lake	21580	12080	11652	3884	3663	1.06	221
3	Martin Lake	19940	12495	7444	3722	3551	1.05	171
1	Monticello	17865	19298	13686	1355	537	2.52	818
2	Monticello	16429	19853	9201	1346	522	2.58	824
3	Monticello	13857	11978	3531	1851	1571	1.18	281
4	Sandow 4	22289	8477	22978	4596	4625	0.99	-30
171b	Tolk	10031	11584	7450	1209	836	1.45	373
172b	Tolk	11034	10549	4520	1103	1018	1.08	85
5	WA Parish	14157	3763	10944	1397	708	1.97	689
6	WA Parish	15307	3840	7423	1419	704	2.02	716
7	WA Parish	12335	3324	8108	1244	602	2.07	642
8	WA Parish	2586	4548	1790	1371	836	1.64	535
1	Welsh	8084	1236	5893	1110	610	1.82	500
2	Welsh	8256	1233	3974	1117	647	1.73	470
3	Welsh	8609	11815	5014	1124	650	1.73	474

15.u Natural Background

Comment: EPA's use of "natural background" is inconsistent with its regulations and arbitrary and capricious [Luminant (0061) p. 119]

Luminant stated that EPA's use of an artificial "natural conditions" background by which to judge the Texas and Oklahoma RPGs for 2018, instead of the projected actual conditions in 2018 that CENRAP and ENVIRON modeled, is contrary to the regulations, inconsistent with agency precedent, and arbitrary and capricious. The relevant issue here for the reasonable progress analysis is what will be the visibility in deciviews at the three Class 1 areas of interest in 2018. That issue is not addressed by looking at visibility changes against an artificial "natural conditions" background which will not exist in 2018, without reference to or attribution of other actual emissions of precursors to visibility impairment and the chemical interaction of those emissions within the atmosphere. EPA concedes as much.[740] EPA admits that "[t]he deciview improvement ***based on the 2018 background conditions*** provides an estimate of the amount of benefit that can be anticipated in 2018 and the impact a control/emission reduciton [sic] may have on the established RPG for 2018."[741] Yet, in its individual unit assessment, EPA does not appear to consider the actual deciview improvement in 2018 but instead only a theoretical improvement against artificial conditions that do not exist and can never exist given the uncontrollable impact of international and other emissions. EPA's analysis thus does not address the relevant legal issue and is not rationally connected to EPA's final decision (i.e., what is a reasonable progress goal ***for 2018***). And, as shown in Tables 6 and 7, EPA's use of a "natural" background artificially overstates the estimated visibility benefit from the individual controls that EPA proposes.

Luminant asserted that EPA's use of a "natural background" also fails to take into account the substantial amount of SO_2 emissions from international sources that Texas has no authority to address. EPA has found that "the projected emissions from international sources will in some cases affect the ability of States to meet reasonable progress goals."[742] Thus, EPA specifically instructed that "EPA does not expect States to restrict emissions from domestic sources to offset the impacts of international transport of pollution."[743] Yet, here, EPA would do just that. EPA decides what domestic sources to regulate based on an analysis that assumes the elimination of all man-made sources of pollution from Mexico in 2018—a feat that Texas cannot legally achieve and that EPA does not believe can be attained even by 2064. And this would be no simple feat, given that "52 percent of the impairment at Big Bend and 25 percent of the impairment at Guadalupe Mountains is from Mexico and further south."[744] Because EPA's natural background assessment ignores these substantial uncontrollable emissions, it is arbitrary and capricious and cannot support EPA's proposal.

Moreover, Luminant noted that EPA's reason for adopting the deciview as the required metric for tracking reasonable progress is the exact opposite of the reason it advances here to justify the use of a "natural background" by which to judge Texas sources. The very reason EPA adopted the deciview in its regulations is that it "provid[es] a scale that relates visibility to perception" and "expresses uniform changes in haziness in terms of common increments ***across the entire range of visibility conditions***, from pristine ***to extremely hazy conditions***."[745] Thus, in adopting the deciview in its regulations, EPA has already rejected the notion it puts forward here—that regional haze decision-making should be based on an artificial pristine background in order to ultimately achieve the national goal. The national goal, EPA has previously found, is furthered by "the use of the deciview metric as calculated from ambient monitoring data for tracking changes in regional visibility."[746]

According to Luminant, whatever theoretical shortcoming that EPA now perceives in the deciview as the metric for judging visibility impairment and reasonable progress (based on the fact that it reflects the "nonlinear nature of visibility impairment"[747]), EPA's own regulations dictate that the deciview is the required metric for determining reasonable progress.[748] EPA may not effectively amend those regulations by this action. EPA's use of "natural conditions" background is disconnected from both reality and the regulatory issue at hand—i.e., what will be the visibility at these areas in 2018 measured in deciviews—and thus it is unlawful.[749]

Luminant stated that EPA's attempt to use "natural conditions" here is in no way validated by its prior action on the North Dakota SIP, as EPA wrongly contends.[750] There, North Dakota chose to use a "hybrid cumulative modeling approach" different from the modeling developed by its regional planning organization ("RPO").[751] No other state in North Dakota's RPO "opted to develop its own reasonable progress modeling methodology," and EPA concluded that North Dakota's hybrid approach did not satisfy the regulatory "criteria for the use of alternative models . . . ."[752] The fact that EPA's disapproval of North Dakota's hybrid approach was affirmed by the Eighth Circuit[753] does not justify EPA's use of "clean background" conditions by which to judge Texas's SIP. Texas did not use a unique or hybrid approach to assessing reasonable progress. Texas used the standard approach used by all CENRAP states. In fact, it is EPA that is using an unorthodox and hybrid approach in this instance, mixing modeling parameters, without demonstrating that its approach meets the criteria for alternative models. EPA, like North Dakota, is "***not free***" "to employ its own visibility model and to consider visibility improvement in its reasonable progress determinations" "in a manner that [is] inconsistent with the CAA," as EPA has done here.[754] EPA must follow its own regulations and guidance, just as EPA expects state and regulated entities to do.

Footnotes:
740 FIP TSD at A-37.
741 Id. at A-39.
742 64 Fed. Reg. at 35,736.
743 Id.
744 2009 Texas SIP Narrative at 10-10.
745 64 Fed. Reg. at 35,727 (emphasis added).
746 Id. (emphasis added).
747FIP TSD at A-38 to A-39.
748 40 C.F.R. § 51.308(d)(1).
749 See Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co., 463 U.S. 29, 43 (1983) (holding that an agency decision is unlawful if the agency has failed to demonstrate that it has "examine[d] the relevant data and articulate[d] a satisfactory explanation for its action including a rational connection between the facts found and the choice made" (internal quotations omitted)).
750 FIP TSD at A-39.
751 76 Fed. Reg. at 58,624, 58,627.
752 Id. at 58,624.
753 North Dakota, 730 F.3d at 766.
754 Id. (emphasis added).

Luminant: Step 11: Instead of basing its decision on the modeling provided to EPA by ENVIRON, EPA adjusts the results of ENVIRON's modeling to "estimate[]" "the visibility benefit . . . based on natural [] conditions," instead of ENVIRON's modeled conditions in 2018.[224]

[Luminant (0061) p. 118] Luminant noted, while EPA extolls the virtues of CAMx, it arbitrarily mixes modeling approaches in its analysis, making the results unreliable and nonsensical. EPA goes to great lengths to note the differences between CAMx modeling (which it performed) and CALPUFF modeling (which it did not), yet it arbitrarily mixes modeling standards to reach a contrived result. For example, as EPA explains, "CAMx is a full photochemical model with all the other sources quantified and added to the modeling," whereas CALPUFF modeling "is conducted to determine a facility's impact on a Class I area with no consideration of other pollutants in the air (other than EPA's estimate for natural background conditions) . . . ."[737] But instead of using the results of the CAMx modeling that EPA directed ENVIRON to conduct, EPA attempts to translate those results to a "natural background" (as CALPUFF would have used). That is, EPA adjusted the results of the CAMx modeling from ENVIRON to "estimate[]" "the visibility benefit . . . based on natural . . . conditions," which it said "is needed to assess the full benefit from potential controls."[738] But there is absolutely no precedent for mixing the modeling approaches, and EPA cites none. Having selected CAMx for its modeling—which necessarily includes all sources in the modeling domain and which would more closely reflect actual benefit—EPA cannot then complain that a different "background" is appropriate and adjust the CAMx results on an ad hoc basis. EPA provides zero support for this novel approach. If EPA had wanted to review projected benefits against a "clean" background, it should have employed CALPUFF modeling for its impacts determination, as it has done in all other reasonable progress assessments to date. Having chosen to use CAMx modeling instead, EPA should judge the results of the modeling as they were calculated—not attempt to adjust them to create an artificial justification for its proposal. [739]

Footnotes:
[737] FIP TSD at A-37.
[738] 79 Fed. Reg. at 74,881.
[739] Further, in directing ENVIRON to use a newer version of CAMx than CENRAP used, EPA violated its own guidance that "the better course is to rely on modeling based on the same version of the model that the State employed to ensure we are using a consistent comparison." 77 Fed. Reg. at 20,908 (citing Mont. Sulphur & Chem. Co. v. EPA, 2012 U.S. App. LEXIS 1056 (9th Cir. Jan. 19, 2012)).

[UARG (0065) p. 21] As part of their argument that EPA's proposed FIPs for Texas and Oklahoma are unlawful, UARG stated that the EPA's assessment is irrationally based on visibility conditions modeled against "natural conditions." EPA acknowledges in its FIP TSD that visibility improvement "based on the 2018 background conditions provides an estimate of the amount of benefit that can be anticipated in 2018 and the impact a control/emission reduciton [sic] may have on the established RPG for 2018." EPA, Technical Support Document for the Oklahoma and Texas Regional Haze Federal Implementation Plans (FIP TSD) at A-39 (Nov. 2014), Doc. ID No. EPA-R06-OAR-2014-0754 0007 ("FIP TSD"). Instead of considering real-world visibility impacts, however, EPA relies on a hypothetical visibility benefit measured against pristine conditions that will not exist. Indeed, EPA's approach entirely ignores visibility impairment due to emissions from non-U.S. sources, over which Texas has no control. The effects of those emissions are significant. Texas concluded that they account for "52 percent of the impairment at Big Bend and 25 percent of the impairment at Guadalupe Mountains." 2009 Texas SIP at 10-10. Because EPA's assessment is based on unsupportable assumptions that distort its analysis of reasonable progress, its proposed FIP is arbitrary and capricious. Luminant and UARG comment that the use of an artificial "natural conditions" background by which to judge the Texas and Oklahoma RPGs for 2018, instead of the projected actual conditions in 2018 that CENRAP and ENVIRON modeled, is contrary to the regulations, inconsistent with agency precedent, and arbitrary and capricious. The commenter states that relevant issue for reasonable progress is visibility in deciviews at the three Class I areas in 2018 and is not addressed by looking at visibility changes against artificial "natural conditions" which will not exist in 2018 and do not consider other emissions and chemical interaction of those emissions, as we discuss in the FIP TSD. Luminant states that the analysis does not address the relevant legal issue and is not rationally connected to the final decision (i.e., what is a reasonable progress goal for 2018). The commenter also states that the use of natural background overstates the estimated visibility benefit from the proposed controls.

The commenters continues that we provide an estimate of the deciview improvement from controls in 2018 and the impact controls have on the RPG for 2018, but consider only the deciview improvement on a natural background that do not and will not exist given uncontrollable impacts of international and other emissions. Luminant asserts that this is inconsistent with the Regional Haze Rule that states that "the projected emissions from international sources will in some cases affect the ability of States to meet reasonable progress goals." And "EPA does not expect States to restrict emissions from domestic sources to offset the impacts of international transport of pollution."[610] Luminant claims we decided which sources to control based on analysis that assumes elimination of all anthropogenic emissions in Mexico, a significant portion of the visibility impairment, and is therefore arbitrary and capricious and cannot support our proposal.

Luminant also states that the use of "natural background" is inconsistent with our adoption of the deciview as the required metric for tracking reasonable progress. They state " In adopting the deciview in its regulations, EPA has already rejected the notion it puts forward here—that regional haze decision-making should be based on an artificial pristine background in order to ultimately achieve the national goal. The national goal, EPA has previously found, is furthered by 'the use of the deciview metric as calculated from ambient monitoring data for tracking changes in regional visibility.'[611]" The deciview is the required metric for determining reasonable progress and we may not effectively amend those regulations by this action. The use of "natural conditions" background is disconnected from both reality and the regulatory issue at hand—i.e., what will be the visibility at these areas in 2018 measured in deciviews—and thus it is unlawful. Luminant cites to Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co., 463 U.S. 29, 43 (1983) (holding that an agency decision is unlawful if the agency has failed to demonstrate that it has "examine[d] the relevant data and articulate[d] a satisfactory explanation for its action including a rational connection between the facts found and the choice made" (internal quotations omitted)).

Luminant also comments that the use of natural background is not validated by the prior action in the North Dakota SIP, because North Dakota used a "hybrid cumulative modeling approach" and we found that this approach did not satisfy the regulatory "criteria for the use of alternative models…"[612] Luminant claims that the disapproval of this hybrid approach was affirmed by the Eight Circuit does not justify the use of "clean background" conditions to judge Texas SIP as Texas did not use a unique or hybrid approach. Luminant asserts that we are using an unorthodox and hybrid approach without demonstrating that it meets the criteria for alternative models and we, like North Dakota, are "not free" "to employ its own visibility model and to consider visibility improvement in its reasonable progress determinations" "in a manner that [is] inconsistent with the CAA," as we have done here.[613] We must follow our own regulations and guidance, just as we expects state and regulated entities to do.

Response: We disagree with the commenter that the use of "natural conditions" is contrary to the regulations, inconsistent with agency precedent, and arbitrary and capricious. We disagree with the commenter that the analysis does not address the relevant legal issue, is unlawful and is not rationally connected to the final decision (i.e., as defined by the commenter as what is a

[610] 64 Fed. Reg. at 35,736
[611] 64 Fed. Reg. at 35,727
[612] 76 Fed. Reg. at 58,624, 58,627
[613] *North Dakota v. EPA*, 730 F.3d 750, 766 (8th Cir. 2013)

reasonable progress goal for 2018). We have provided in the proposal, the TSDs, the final action notice, and in the RTC document an examination of all the relevant data, thorough explanations for our final actions and choices, and included rationales describing the connections between the facts and our choices.

We disagree with the commenter that our use of the "natural background" metric is contrary to regulations. As we discuss in a separate response to comment concerning the legality of the deciview, extinction and percent extinction metrics, the commenter fails to distinguish between the required metric used to describe overall visibility conditions at a Class I area at a given point in time and the range of metrics, such as deciview impairment calculated based on natural background conditions and percent of total extinction, that can be used to describe the visibility impairment due to an individual source, group of sources, a state's sources, or some other contribution to the visibility impairment at a Class I area. As explained below, it is necessary to consider the visibility benefit of controls on a "clean" background basis to assess the full benefit from potential controls.

The Regional Haze Rule requires that we identify reasonable controls based on consideration of the four statutory factors and establish a reasonable progress goal that reflects the anticipated amount of visibility improvement from implementation of those controls in additional to all other "on the books" controls. Specifically, Section 51.308(d)(1)(i)(A) requires consideration of the four factors and a demonstration of how these factors were taken into consideration in selecting the goal. We analyzed the time necessary for compliance, energy and non-air environmental impacts, the remaining useful life, and the costs of compliance including consideration of the anticipated visibility benefits of specific controls on individual units. As discussed in depth below, in considering the anticipated visibility benefits from individual controls, it was appropriate to consider estimated benefits on a "clean" or "natural" background.

In the FIP TSD, we discuss the need to estimate visibility benefits using both a "clean" and "dirty" background.[614]

> The deciview improvement based on the 2018 background conditions provides an estimate of the amount of benefit that can be anticipated in 2018 and the impact a control/emission reduction may have on the established RPG [reasonable progress goal] for 2018. However, this estimate based on degraded or "dirty" background conditions underestimates the visibility improvement that would be realized for the control options under consideration. Because of the non-linear nature of the deciview metric, as a Class I area becomes more polluted the visibility impairment from an individual source in terms of deciviews becomes geometrically less. Results based solely on a degraded background, will rarely if ever demonstrate an appreciable effect on incremental visibility improvement in a given area. Rather than providing for incremental improvements towards the goal of natural visibility, degraded background results will serve to instead maintain those current degraded conditions. Therefore, the visibility benefit estimated based on natural or "clean" conditions is needed to assess the full benefit from potential controls.

[614] FIP TSD at A-39

In considering the visibility benefits, we considered deciview improvements based on "clean" and "dirty" background as well as the reduction in extinction and percent extinction. We disagree with the comment that this approach is arbitrary and capricious because the "clean" background analysis assumes elimination of all anthropogenic emissions in Mexico. By definition, the "clean" background analysis using natural conditions eliminates the impact from all other anthropogenic sources, domestic and international. . It is not reasonable to assess the visibility benefit of controls, the value of installing a control in the immediate future that will permanently reduce visibility impacts from a source, only in a manner that is dependent on the current level of emissions or impact from other sources or other countries. For example, in considering only the estimated visibility benefit from controlling Big Brown using a "dirty" background, an increase in visibility impacts from Mexico emissions or emissions from another Texas point source would result in a decrease in the calculated visibility benefit in deciviews from installing controls on Big Brown, making controls appear less beneficial. By using a metric that is independent of all other emission sources ("clean"), we avoid this paradox that the dirtier the existing air, the less likely it would be that any control is required. This was also explained in the preamble to the final Regional Haze Rule and Guidelines for BART Determinations.[615] The use of "clean" background is consistent with our regulations, and necessary to assess the full potential benefit from controls and does not overstate the visibility benefit. We also discuss the consideration of deciview benefits and impacts based on "clean" and "dirty" background conditions in our response to comments concerning our analysis of cost versus visibility elsewhere in this document. We address the footnote about Montana Sulfur elsewhere in this document.

Our use of "clean" background is also consistent with the methodology used by Texas for its BART visibility analysis, which also relied on CAMx photochemical modeling with source apportionment. The TCEQ utilized this approach in assessing the visibility impacts from individual sources and groups of sources to determine their significance for BART screening. As detailed in the screening analysis protocol developed by TCEQ and reviewed by us, "The source's HI [haze index] is *compared to natural conditions* to assess the significance of the source's visibility impact. EPA guidance lists natural conditions (bnatural) by Class I area in terms of Mm-1 (EPA, 2003b) and assumes clean conditions with no anthropogenic or weather interference. *The visibility significance metric for evaluating BART sources is the change in deciview (del-dv) from the source's and natural conditions haze indices*"[616]

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[615] Using existing conditions as the baseline for single source visibility impact determinations would create the following paradox: the dirtier the existing air, the less likely it would be that any control is required. This is true because of the nonlinear nature of visibility impairment. In other words, as a Class I area becomes more polluted, any individual source's contribution to changes in impairment becomes geometrically less. Therefore the more polluted the Class I area would become, the less control would seem to be needed from an individual source. We agree that this kind of calculation would essentially raise the "cause or contribute" applicability threshold to a level that would never allow enough emission control to significantly improve visibility. Such a reading would render the visibility provisions meaningless, as EPA and the States would be prevented from assuring "reasonable progress" and fulfilling the statutorily-defined goals of the visibility program. Conversely, measuring improvement against clean conditions would ensure reasonable progress toward those clean conditions. 70 FR 39124

[616] TX RH SIP, Appendix 9-5, "Screening Analysis of Potential BART-Eligible Sources in Texas" at 2-11, emphasis added.

Luminant asserts that use of natural visibility conditions is inconsistent with the Regional Haze Rule that states, "the projected emissions from international sources will in some cases affect the ability of States to meet reasonable progress goals." And "EPA does not expect States to restrict emissions from domestic sources to offset the impacts of international transport of pollution."[617] We disagree with the commenter and believe this approach using a "clean" background is in fact consistent with the Regional Haze Rule. As we discuss in a separate response to comment concerning the legality of the extinction and percent extinction metrics, the commenter confuses the analysis of visibility benefits from specific controls discussed above and the overall assessment of progress towards meeting the RPG or URP and does not provide the proper context for this comment. The Regional Haze Rule States:

> The EPA agrees that the projected emissions from international sources will in some cases affect the ability of States to meet reasonable progress goals. The EPA does not expect States to restrict emissions from domestic sources to offset the impacts of international transport of pollution. We believe that States should evaluate the impacts of current and projected emissions from international sources in their regional haze programs, particularly in cases where it has already been well documented that such sources are important. At the same time, EPA will work with the governments of Canada and Mexico to seek cooperative solutions on transboundary pollution problems. 64 Fed. Reg. 35714, 35736 (July 1, 1999).

Consistent with this, we agreed with Texas that it was not reasonable to meet the uniform rate of progress at Big Bend and Guadalupe Mountains, in part due to the impact from sources outside of the United States. Based on the CENRAP modeling, Texas determined and we agree that the level of impact from Mexican sources was significant. Using natural visibility conditions to assess the visibility benefit of a specific control in Texas is not inconsistent with the recognition that impacts from Mexico are a significant portion of the total visibility impairment, and in no way requires reductions to offset impacts from Mexico. The established reasonable progress goals include consideration of the impact from Mexico and other source regions, and also includes consideration of the visibility benefits of identified reasonable controls.
As discussed above, in order to fully assess the potential visibility benefit of controls, an analysis utilizing natural background conditions is necessary. We discuss consideration of international emissions in more depth in a separate section of this document.

We also disagree with the commenter and find that the use of natural background is supported by our previous action on North Dakota's regional haze SIP and the associated Eighth Circuit Court decision. The commenter does not present the full context of our rationale in disapproving North Dakota's assessment of visibility benefit of RP controls. The full text of that determination is:

> In addition to evaluating the four statutory factors, North Dakota also considered the visibility impacts associated with the control options for each RP source. However, in modeling visibility impacts, North Dakota used a hybrid cumulative modeling approach that is inappropriate for determining the visibility impact for individual sources. As with the modeling North Dakota conducted for its NOX

[617] 64 Fed. Reg. at 35,736

> BART analysis for MRYS [Milton R. Young Station] Units 1 and 2 and LOS [Leland Olds Station] Unit 2, ***the approach fails to compare single- source impacts to natural background***. While there is no requirement that States, when performing RP analyses, follow the modeling procedures set out in the BART guidelines, or that they consider visibility impacts at all, ***we find that North Dakota's visibility modeling significantly understates the visibility improvement that would be realized for the control options under consideration***. Accordingly, we are disregarding the modeling analysis that North Dakota has used to support its RP determinations for individual sources.[618]

We disapproved the reasonable progress visibility modeling performed by North Dakota specifically because it failed to use a natural background approach and therefore understated the visibility benefit from potential controls. While we note that it does not appear that the modeling approach satisfied the Appendix W criteria for the use of alternate models, that is in the context of the overall visibility projection modeling that North Dakota developed using a CALPUFF/CMAQ hybrid model which used obsolete settings. Failure to satisfy Appendix W was not raised in the context of the individual source visibility assessment using CALPUFF. The Eighth Circuit Court's decision affirmed our position that the use of degraded, or dirty background for individual source visibility assessment, was not consistent with the Clean Air Act.[619] The relevant section of the Eighth Circuit Court's decision on this point reads:

> 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. [620]

The use of natural background conditions to assess visibility benefits of individual controls, as we have done here in this action, is consistent with the goals of the CAA. Furthermore, use of natural visibility background is not a unique or unorthodox approach and the appropriate choice of metric is not relevant to a demonstration meeting the criteria for alternative models. Using CAMx modeling consistent with EPA, Texas and CENRAP modeling protocols does not constitute an "alternative model." Furthermore, in evaluating impacts from individual sources or groups of sources, the use of a natural background and PSAT is consistent with the protocol developed by TCEQ and reviewed by us and utilized in their BART screening modeling.[621] Additional comments concerning deviations from Appendix W are addressed elsewhere.

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[618] 76 FR 58627 (September 21, 2011) emphasis added

[619] *North Dakota v. EPA*, 730 F.3d 750, 766 (8th Cir. 2013)

[620] *North Dakota v. EPA*, 730 F.3d 750, 766 (8th Cir. 2013)

[621] TX RH SIP, Appendix 9-5, "Screening Analysis of Potential BART-Eligible Sources in Texas" at 2-11: "The source's HI is compared to natural conditions to assess the significance of the source's visibility impact. EPA

Finally, we disagree with the commenter that in directing ENVIRON to use a newer version of CAMx than CENRAP used, EPA violated its own guidance that "the better course is to rely on modeling based on the same version of the model that the State employed to ensure we are using a consistent comparison." 77 Fed. Reg. at 20,908 (citing Mont. Sulphur & Chem. Co. v. EPA, 2012 U.S. App. LEXIS 1056 (9th Cir. Jan. 19, 2012)). This is covered in more detail in a response elsewhere in this document.

Comment: EPA's analysis of visibility benefit of individual SO_2 **controls is not a lawful basis for its disapprovals or FIPs** [Luminant (0061) p. 106]

Luminant asserted that EPA's use of visibility modeling of specific control measures at individual sources as the lynchpin of its methodology is unlawful and contrary to the statute. Texas was not required to conduct such an analysis to support its reasonable progress goals and long-term strategy, and EPA may not use such an analysis to disapprove Texas's SIP. EPA explains that "***[p]rior to doing the control cost evaluations discussed in the sections above***," EPA conducted CAMx modeling runs "to evaluate the benefits of the proposed controls and their associated emission decreases on visibility impairment values."[669] EPA uses projected or estimated visibility benefit at several steps in its process to either include or exclude sources from regulation.[670] EPA's approach is random and novel. At some steps, EPA looks to visibility impact from the facility as a whole while at other steps looks to visibility benefit estimated from certain emission reductions at individual units. EPA contracts ENVIRON to perform visibility modeling, but ultimately does not rely on the modeling resulting for its conclusions—choosing instead to rely on its own calculated and inflated predictions of "benefit."

Footnotes:
[669] 79 Fed. Reg. at 74,877–78 (emphasis added).
[670] See supra pages 30–43.

Response: We disagree with the comment. As discussed in depth elsewhere, the disapproval of the TX RH SIP was based on our evaluation of the analysis in the SIP. Additional analysis including modeling of specific controls at individual sources was necessary to determine if the noted flaws in the SIP affected the ultimate determination in the SIP and to inform the FIP. The control scenario modeling performed by ENVIRON for EPA was conducted at the same time as the analysis of potential controls and controlled emission rates. Because the exact controlled emission rates were not available at the time, we modeled a High and Low control level. As discussed in depth in a response to comment above, the modeling results provided estimates of visibility benefits at these estimated controlled rates, representative of the level of control anticipated due to use of scrubbers and DSI. These modeled visibility benefits then had to be adjusted to reflect the final determination of the proposed controlled emissions based on results of the analysis of the potential controls and control performance. After adjusting the modeled results to reflect the actual estimated controlled emission rates, the estimated visibility results

guidance lists natural conditions (bnatural) by Class I area in terms of Mm-1 (EPA, 2003b) and assumes clean conditions with no anthropogenic or weather interference. The visibility significance metric for evaluating BART sources is the change in deciview (del-dv) from the source's and natural conditions haze indices" were evaluated using a number of metrics, including visibility benefit at both 2018 degraded background conditions and annual average natural conditions. As discussed in the comment above, we disagree with the comment that this results in "inflated" predictions of benefit.

We disagree with the commenter and believe that our approach is reasonable and consistent with the Regional Haze Rule. The RHR requires that we identify reasonable controls based on the four statutory factors and establish reasonable progress goals that reflect the anticipated amount of visibility improvement from implementation of those controls in additional to all other "on the books" controls. After an initial Q/d analysis, we modeled emissions from 38 facilities with the greatest potential visibility impacts in order to further evaluate the potential of emissions from these sources to impact visibility. This is a more refined approach than the initial Q/d analysis performed by both Texas and EPA because unlike a Q/d analysis that only considers emissions and distance, this accounts for emissions, location, stack parameters, meteorological conditions, and models both chemistry and transport to the Class I areas. The results of this modeling were used to further eliminate sources from undergoing the four-factor analysis based on consideration of facility-level impacts and estimated unit level impacts, as described in detail in the FIP TSD and a separate response to comment. We then considered the four factors, including visibility benefit of controls on those individual units identified through this process as having largest visibility impacts. In evaluating the visibility benefits from controls, we considered deciview visibility improvements, as well as reductions in extinction and percent extinction.

Comment: Luminant provided a summary of EPA's "additional" visibility benefit analysis of a "small group' of Texas sources. [Luminant (0061) p. 27]

Step 10: After further altering the modeling results that ENVIRON previously provided, EPA hires ENVIRON a second time to conduct "further visibility modeling" using CAMx for the 21 remaining units. ENVIRON models the improvement in visibility in 2018 at the three Class I areas from various SO_2 emission control scenarios that EPA directs ENVIRON to include in the model.

Step 11: Instead of basing its decision on the modeling provided to EPA by ENVIRON, EPA adjusts the results of ENVIRON's modeling to "estimate[]" "the visibility benefit . . . based on natural [] conditions," instead of ENVIRON's modeled conditions in 2018.[224] In clear contradiction to the CAMx User's Guide, EPA linearly scales the results of the CAMx modeling from ENVIRON to estimate the visibility benefit associated with larger changes in emission rates at the 21 remaining units.

Step 12: Based on its estimates of visibility benefits, EPA excludes 7 of 21 units from regulation and establishes emission limitations for the remaining 14 units.[225]

At Step 10, after altering ENVIRON's first modeling results to reach its "final" list of target sources, EPA again hired ENVIRON (which it excluded from Steps 3-9) to conduct "further visibility modeling" using CAMx for the 21 remaining units on EPA's list. EPA explained that its "final modeling analysis" was "used to evaluate the benefits of the proposed controls and their associated emission decreases on visibility impairment values."[285] However, ENVIRON did not model the units with specific controls identified through consideration of the reasonable progress four factors; instead, the visibility modeling was performed "[p]rior to" EPA's analysis of the costs of controls and other statutory factors.[286] Indeed, the controls EPA modeled did not even match the controls it would later propose—EPA "formulated model runs that would span the range of potential controls/emissions we planned to examine."[287] Using this approach, "ENVIRON assisted EPA in conducting two additional [model] runs," which "used a general estimate for what low controls and high control might achieve."[288] In other words, EPA simply "provided [] ENVIRON" two estimates of SO_2 emissions for each of the remaining 21 units—one so-called "low control" value and one so-called "high control" value.[289]

These two additional model runs misrepresented the Luminant facilities, and potentially all facilities, where additional scrubber controls were evaluated in ways that overstated the visibility benefit from the proposed controls. For example, after adding new scrubbers or upgrading the existing scrubbers at each unit, the stack temperatures and velocities will be considerably lower than they would be prior to the addition or upgrade. The typical stack temperatures for a coal-fueled boiler with and without a wet scrubber are 180°F and 350°F, respectively. Lower stack temperatures result in less dispersion of air emissions and thus less visibility impact at large distances. In air dispersion modeling for other purposes (e.g., a Prevention of Significant Deterioration permit amendment), EPA would surely not allow the use of the same stack parameters for the source before and after a scrubber installation project, as EPA did here. EPA provides no basis for its inconsistent approach here.

ENVIRON's additional CAMx modeling "focused on calculating the extinction and visibility impacts and benefits" at the three Class I areas from EPA's specified SO_2 reductions.[290] "In evaluating the impacts and benefits of potential controls," EPA "utilized a number of metrics."[291] EPA explained that by using CAMx, which "include[d] modeling all emissions in the modeling domain, the model results are inherently a degraded background analysis and the results are impacted by emissions from other sources."[292] Thus, EPA explained that the CAMx results "provide[] an estimate of the amount of benefit that can be anticipated in 2018 and the impact a control may have on the established RPG for 2018."[293] Table 4 shows the results of ENVIRON's CAMx modeling for Luminant's units under the "high" SO_2 controls scenario established by EPA, in terms of deciview improvement in 2018 at each Class I area. As shown in Table 4 to comment 0061 provided by Luminant (not reproduced here), the most improvement that EPA's controls would produce for any Luminant unit at any Class I area is miniscule— 0.0678 deciview for Big Brown Unit 2 at Wichita Mountains.

Instead of relying on these modeling results provided by ENVIRON, which show miniscule projected benefits, EPA ***adjusted*** the ENVIRON results by "updat[ing] the baseline uncontrolled emission for each unit based on [SO_2 emissions] data for 2009-2013."[295] EPA's adjustment substitutes higher "scaled" emission numbers that artificially increase projected visibility improvement from the proposed controls. Luminant provided a table (Table 5 to comment 0061 [not reproduced here]) that shows the results of EPA's adjustments to ENVIRON's CAMx modeling for Luminant's units under the "high" SO_2 control scenario established by EPA, in terms of deciview improvement in 2018 at each Class I area. But as Table 5 shows, even the "scaled" improvements are all less than a tenth of a deciview.

Response: As the commenter states, the control scenario modeling performed by ENVIRON for EPA was conducted at the same time as the analysis of potential controls and controlled emission rates. Because the exact controlled emission rates were not available at the time, we modeled a High and Low control level.[622] As discussed in depth elsewhere, the modeling results provided estimates of visibility benefits at these estimated controlled rates, representative of the level of control anticipated due to use of scrubbers and DSI. These modeled visibility benefits then had to be adjusted to reflect the final determination of the proposed controlled emissions based on results of the analysis of the potential controls and control performance. After adjusting the modeled results slightly to reflect the actual proposed emission rates, the estimated visibility results were evaluated using a number of metrics, including visibility benefit at both 2018 degraded background conditions and annual average natural conditions.

We disagree with the commenter that the High and Low control modeled scenarios misrepresented the Luminant facilities, and potentially all facilities, where additional scrubber controls were evaluated in ways that overstated the visibility benefit from the proposed controls. The only example the commenter raises is the stack temperature and flow velocity. We agree with the commenter that we did not account for the difference in stack temperature and velocity, however these differences would only serve to make the visibility benefit of controls larger. The addition of a scrubber would result in a decrease in stack temperature and as the commenter states, lower stack temperatures would result in less dispersion of air emissions and thus less visibility impact at large distances. Therefore, the visibility impact from a unit with a scrubber would be even less than what was modeled and the visibility benefit larger. These changes would not impact our overall determination of reasonable controls.

As to the comment that we adjusted the modeled results by updating the baseline uncontrolled emission for each unit based on SO_2 emissions data for 2009-2013, this was a necessary step to assess the visibility benefit of controls relative to the visibility impairment due to future anticipated emission levels at these units without the required controls. Comparison of 2018 CENRAP projected emissions to recent actual emissions showed that a number of facilities have actual emissions that are much higher than CENRAP 2018 modeled emissions.[623] For instance, Big Brown, Sandow, and Martin Lake actual emissions were all significantly higher than 2018 CENRAP modeled rates, with Martin Lake having over 90% more SO_2 emissions than projected by CENRAP for 2018. Both Pirkey and Oklaunion had much smaller actual SO_2 emissions than projected. As we discuss in the FIP TSD, we believe that recent actual emissions are more representative of anticipated future emissions at the sources evaluated than the CAIR projections developed in 2006 and adopted by CENRAP. [624]

The CENRAP modeling was based on an IPM (Integrated Planning Model) that estimated EGU future emissions in 2018 including reductions for CAIR across the eastern half of the United States. This analysis was conducted in 2006 and projected that Texas would actually be a purchaser of SO_2 credits, and not as much high level controls would be placed on Texas EGU sources. Given the length of time between 2006 when the IPM analysis was conducted, and 2013 when we were conducting this analysis, we had some concern that projections could be off for

[622] See FIP TSD at A-54
[623] See Table A.4-2 in the FIP TSD
[624] FIP TSD at A-45

the EGUs in Texas. Information available also indicates that SO_2 credits are much cheaper than originally projected, therefore more credits may have been used in lieu of emission reductions. We also weighed the technique that Texas has used in estimating emissions from EGUs for future years (including 2018) in ozone attainment demonstration SIPs in Dallas-Fort Worth and Houston-Galveston-Beaumont[625]. For these photochemical modeling analyses with CAMx Texas has relied upon the recent CEM data that is also included in CAMD's databases in conjunction with information on recently permitted EGUs for estimating the emissions to model for EGUs in Texas in 2018 as these emission levels are already near levels projected under CAIR Phase II control such that further emission reductions are doubtful in the absence of some new requirements.

The actual SO_2 allowances for Texas under CSAPR are not much different than the CAIR Cap for Texas, so large additional reductions over current emission levels were not expected. However, because we had earlier projected with IPM that controls for the Mercury and Air Toxics Standards (MATS) may generate the installation of additional scrubbers in Texas that could potentially result in further SO_2 reductions, we again investigated this possibility. Texas recently submitted comments to us on a more recent IPM projection that was at the time intended by EPA to be part of a new modeling platform for national rule making.[626] In these comments and comments from several EGU owners in Texas, the assertion was that no significant amount of additional SO_2 controls are expected due to compliance with MATS. The comments also pointed out that, as some of our cursory research had also indicated, no large SO_2 control projects were planned at most of the sources we were evaluating. Therefore, based on Texas' recent comments and other information, we concluded considerable uncertainty exists as to whether any further reductions of SO_2 will occur beyond current emission levels as a result of compliance with MATS or CSAPR. Overall this information supports looking at recent actual emissions to represent future emission levels in 2018.

In summary, this adjustment from CENRAP 2018 to the a baseline calculated from recent actual emissions was not an "artificial adjustment" and was necessary to account for the large difference between specific unit-level emissions in the 2018 CENRAP emissions and a baseline more representative of anticipated future emission levels in 2018. The results considering the 2018 CENRAP emissions baseline were also needed to provide a comparison with the Texas regional haze SIP and an estimate of the change from the 2018 CENRAP modeled reasonable progress goal to a new reasonable progress goal including the controls required in the FIP. The visibility benefit of individual controls calculated based on the CENRAP 2018 emissions baseline represents the additional level of visibility benefit from controlling individual units, consistent with the assumptions/emission projections in the Texas regional haze SIP.

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[625] HGB 1997 8-Hour Ozone standard attainment demonstration approved by EPA in 2013, see TSD materials for 2010 "Appendix B Emission Modeling for the HGB Attainment Demonstration SIP Revision for the 1997 Eight-Hour Ozone Standard" on page B-78, "09017SIP_ado_Appendix_B.pdf".; DFW 1997 8-Hour Ozone standard attainment demonstration submitted to EPA, see TSD Appendix B: Emission Modeling for the DFW Attainment Demonstration SIP Revision for the 1997 Eight-Hour Ozone Standard, Page B-39, "AppB_EI_ado.pdf"; DFW 2008 8-Hour Ozone standard attainment demonstration proposed for adoption Dec. 10, 2014 and posted October 2014, see TSD materials "Appendix B Emissions Modeling for the Dallas-Fort Worth Attainment Demonstration State Implementation Plan Revision for the 2008 Eight-Hour Ozone Standard" Starting Page 40.,DFWAD_SIP_Appendix B.pdf

[626] TCEQ comment letter to EPA on draft modeling platform dated June 24, 2014. '2018 EMP signed.pdf'

We disagree with the commenter that these estimated visibility benefits based on 2018 projected conditions are small, considering that they represent a "dirty" background approach and the visibility benefits averaged over the 20% worst days. As we discuss in detail elsewhere, a "dirty" background approach underestimates the visibility benefits of controls and a "clean" background approach is necessary to fully assess the potential benefit from controls.

Comment: At Step 11, still not satisfied with the miniscule benefits being predicted, EPA further adjusted the results of the ENVIRON's CAMx modeling to "estimate[]" "the visibility benefit . . . based on natural … conditions," which it said "is needed to assess the full benefit from potential controls."[297] EPA noted that CALPUFF, which it did not use to evaluate these Texas sources, "simulates 'clean' background conditions with no other sources included than the source(s) being evaluated."[298] As EPA explained:

> CALPUFF modeling (for BART and other analyses) is conducted to determine a facility's impact on a Class I area with no consideration of other pollutants in the air (other than natural background conditions) to challenge and consume the pre-cursors that are modeled to react with the facility's emissions . . . CAMx is a full photochemical model with all the other sources quantified and added to the modeling, such that emissions from other facilities, non-point sources, mobile sources, etc., all react with available pre-cursors such as ammonia . . . CAMx takes into account the entire pollution load in the atmosphere in 2018….[299]

EPA estimated that the same emission reductions compared against a "natural" background would yield a deciview "improvement 3 times greater than" against actual conditions.[300] Based on this explanation, EPA "estimated" what the visibility change would be from the SO_2 controls at each unit against "natural conditions," in isolation, as if there were no other sources of emissions. EPA used two "natural conditions"—the natural conditions of the 20% worst days and the average annual natural conditions. EPA does not explain why it used two different "natural conditions" or what the difference is between the two. Both are presented below in Tables 6 and 7. Note that EPA's "natural background" artificially eliminates all international sources of emissions, which in reality contribute significantly to visibility impairment in these areas and which EPA concedes Texas cannot control or reduce.

Luminant provided a table (Table 6 to comment 0061 [not reproduced here]) that shows the results of EPA's estimates under EPA's "high" control scenario, in terms of deciview improvement against a "natural" background at each Class 1 area using ENVIRON's 2018 baseline emissions.

EPA also adjusted the projections by combining both its "scaled" emissions and its "natural" conditions after-the-fact alterations to ENVIRONS's modeling. These adjustments, together, result in further inflated visibility improvement numbers that EPA relies on for its proposal.[302] Luminant provided a table (Table 7 to comment 0061 [not reproduced here]) that shows the results of EPA's dual adjustments.

Response: As discussed in depth in a separate response to comment in this section of this document, we disagree with the commenter and believe it is necessary to use a "natural background" approach to fully assess the visibility benefits of controls. Use of a "dirty" background when evaluating an individual source's visibility impact and potential controls, underestimates the visibility benefit of controls. By definition, the "clean" background analysis using natural conditions eliminates the impact from all other anthropogenic sources, domestic and international. This approach is aimed at assessing the full potential visibility benefit of controls. It is not reasonable to only assess the visibility benefit of controls, the value of installing a control in the immediate future that will permanently reduce visibility impacts from a source, in such a manner that is dependent on the current level of emissions or impact from other sources or other countries. For example, in considering only the estimated visibility benefit from controlling Big Brown using a "dirty" background, an increase in visibility impacts from Mexico emissions or emissions from another Texas point source would result in a decrease in the calculated visibility benefit in deciviews from installing controls on Big Brown, making controls appear less beneficial. By using a metric that is independent of all other emission sources ("clean"), we avoid this paradox that the dirtier the existing air, the less likely it would be that any control is required. This was also explained in the preamble to the final Regional Haze Rule and Guidelines for BART Determinations.[627] The use of "clean" background is consistent with our regulations, and necessary to assess the full potential benefit from controls and does not overstate the visibility benefit. We also discuss the consideration of deciview benefits and impacts based on "clean" and "dirty" background conditions in our response to comments in the Cost versus visibility section of this document. TCEQ utilized this same "adjustment" to natural background in assessing visibility impacts from individual sources or groups of sources for BART screening purposes using CAMx modeling and source apportionment.[628]

As the commenter states, we calculated the "natural background" using the 20% worst days natural conditions and the annual average natural conditions. We note that we also made this calculation using the 20% best days. Initially we utilized the three available values for natural conditions to perform this calculation. Furthermore, EPA provided additional guidelines with narrowly defined flexibility regarding the averaging period to be used for calculating natural background. These guidelines indicate that the states may use either annual average natural conditions or the average of the best 20% days for natural conditions.[629] Ultimately, we determined that the annual average value was the more appropriate, conservative approach for this specific analysis at this time. WE note this is consistent with the selection of natural visibility background used by Texas in their BART screening modeling. In summary, it was

[627] Using existing conditions as the baseline for single source visibility impact determinations would create the following paradox: the dirtier the existing air, the less likely it would be that any control is required. This is true because of the nonlinear nature of visibility impairment. In other words, as a Class I area becomes more polluted, any individual source's contribution to changes in impairment becomes geometrically less. Therefore the more polluted the Class I area would become, the less control would seem to be needed from an individual source. We agree that this kind of calculation would essentially raise the "cause or contribute" applicability threshold to a level that would never allow enough emission control to significantly improve visibility. Such a reading would render the visibility provisions meaningless, as EPA and the States would be prevented from assuring "reasonable progress" and fulfilling the statutorily-defined goals of the visibility program. Conversely, measuring improvement against clean conditions would ensure reasonable progress toward those clean conditions. 70 FR 39124

[628] TX RH SIP, Appendix 9-5, "Screening Analysis of Potential BART-Eligible Sources in Texas" at 2-11

[629] Paisie, J.W.. Regional Haze Regulations and Guidelines for Best Available Retrofit Technology (BART) Determinations. Memorandum to Kay Prince, Branch Chief EPA Region 4. July 19, 2006.

appropriate to use a "clean" background approach and to adjust the baseline to reflect recent actual emissions.

Comment: At Step 12, EPA used the so-called visibility benefits it had estimated to decide which units would be subject to regulation. For example, EPA said that there was a "decrease in visibility improvement benefits at the three Class I areas for the W.A. Parish and Welsh units compared to the benefits at other facilities that mainly impact WIMO."[304] EPA did not, however, state what threshold cut-off it was applying, nor did it compare its estimated visibility improvements to the projected costs for each unit. That is, EPA did not rely on or even calculate the amount of visibility improvement per dollar spent at each of the units it examined. Instead, based exclusively on its estimates of visibility benefits, EPA excluded 7 of 21 units from regulation and established emission limitations for the remaining 14 units.[305] EPA also established emission limits for San Miguel, which it did not model for visibility improvement.[306]

Response: We disagree with the commenter. Our determination of reasonable controls was based on an evaluation of the four factors, including cost and consideration of estimated visibility benefits of controls in terms of deciview, and reduction in extinction and percent extinction. As we discuss in more detail elsewhere, we reject Luminant's contention that we should have used the $/dv metric. While we do not believe it is appropriate to use a $/dv metric, we did consider the cost-effectiveness in $/ton and the relative visibility benefit anticipated from the controls. We did not establish a threshold cut-off for visibility benefit for controls but considered cost and visibility benefit in a relative sense in making our control decisions. Significance of visibility benefits is a source- and Class I area-specific evaluation, meaning that it depends on how much visibility improvement is needed at the Class I area(s), how much a specific source impacts the Class I area(s), and the cost effectiveness and potential visibility improvement of available control options.

For example, in the FIP TSD and the proposed FIP, we note lesser visibility improvement benefits at the three Class I areas for the W. A. Parish and Welsh units compared to the benefits at other facilities that mainly impact the Wichita Mountains. The visibility benefits at Wichita Mountains of scrubber retrofits at the Parish and Welsh units (0.102—0.126 dv) are approximately half of the visibility benefit of scrubber retrofits at the Coleto Creek and Monticello units (0.2 –0.254 dv), and much less than the visibility benefit from controlling units at Big Brown (0.436-0.438 dv). We also note that when considering the costs of controls and the relative visibility benefit, the Parish scrubber retrofits would be slightly more expensive with respect to $/ton but would be much less effective in improving visibility at the Wichita Mountains, when compared to the required controls at units Monticello or Coleto Creek. For the Welsh scrubber retrofits, the costs ($/ton) are approximately 50% greater than the cost of scrubber retrofits at Monticello or Coleto Creek and result in approximately 50% less visibility improvement at Wichita Mountains. Furthermore, as we noted in the FIP TSD and also noted by the commenter, Welsh unit 2 is under a consent decree[630] to shut down by the end of 2016, eliminating the visibility impact from this unit.

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[630] See Sierra Club et al v. U.S. Army Corps of Engineers, civil 4:10-cv-04017-RGK, also letter from John M. McManus to Mike Wilson, dated May 2, 2013. Under the terms of a consent decree, after the Turk Plant commences

Comment: [TCEQ/PUCT (0056) p. 18] The TCEQ urged the EPA to remove all text about benefits of emission reductions from "actual emission levels" from its final action and technical support documents. These discussions exaggerate the potential benefits of the EPA's proposed FIP and are irrelevant to the approvability of the 2009 RH SIP.

In comments on the EPA's proposed FIP, the TCEQ noted that both Table 44: *Calculated RPGs for 20% Worst Days ... and* Table 45: *Anticipated Visibility Benefit...* should be removed from the final action because they tabulate calculated benefits that will not occur by 2018, the only year that is appropriate for evaluating the visibility impacts of proposed controls. The 2018 visibility conditions that the 2009 RH SIP will produce are the appropriate starting points for evaluating the effects of the EPA's proposed FIP.

The TCEQ stated that the EPA inappropriately suggests in its proposal and technical support documents that emission rates in 2011, 2012, or 2013 are relevant to what the Texas 2009 RH SIP will achieve by 2018. The RHR sets 2018, the last year in the first planning period, as the time by which a state's SIP must provide for reaching the state's RPG. The RHR does not imply the need for particular emission levels during any intermediate year between the baseline period and 2018.

The TCEQ stated that there is no technical basis for the EPA's selection of actual emissions from 2009 through 2013 as the base from which to calculate the benefit of applying the FIP controls. During the 2009 through 2013 period, the emissions were not affected by the full range of additional emission reduction requirements contained in the 2009 RH SIP.

The TCEQ stated that choosing 2011 ignores seven more years of emissions reductions required under Texas' long-term strategy. As Texas' 2014 Five-Year RH SIP submittal shows in Figure 4-1: *Texas Modeled Emissions Inventory Summary for 2002* and Figure 4-2: *Updated Texas Emissions Inventory Summary for 2005,* the SO_2 and NO_x emissions in Texas are already lower than the straight line between the 2000 through 2004 baseline condition period and the 2018 SO_2 and NO_x emissions estimates used to develop the 2009 RH SIP.[15]

The TCEQ stated that Table 45 misleads a reader to believe that the EPA's proposed FIP action would produce a 0.62 deciview improvement in visibility at Wichita Mountains. However, as discussed in comment A.2., the potential 0.14 deciview improvement at Wichita Mountains is almost certainly an overstatement of the incremental benefit from the proposed FIP in 2018 because SO_2 emission reductions are occurring due to other requirements and the actual SO_2 emissions will likely be lower than those in the CENRAP 2018 emissions projections.

Footnotes:
[15] See https:/ jwww.tceq.texas.govjassets/publicjimplementation/air/sip/haze/13012SIP _ado. pdf.

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commercial operation, Unit 2 will be restricted to a 60% annual capacity factor during any rolling 12-month period. Thereafter, Unit 2 must be retired no later than December 31, 2016.

Response: We disagree with the commenter that using recent actual emissions exaggerates the benefit of controls. As explained in detail in the FIP TSD (see page A-45) and elsewhere in the response to comments, we determined it was necessary to consider recent actual emissions from EGUs due to uncertainty in 2018 projected emissions completed in 2006, the cost of SO_2 credits being lower than originally projected, and comments from Texas on a more recent IPM projection indicating that significant SO_2 reductions were not anticipated at these sources and no large SO_2 control projects were planned at most of the sources being evaluated. We also noted that TCEQ has utilized recent emission data for EGUs when developing projected emissions for 2018 (and other future years) when developing ozone attainment demonstrations. Overall this information supports looking at recent actual emissions to represent future emission levels in 2018.

We agree with TCEQ that overall state-level emissions have decreased from the baseline. However, TCEQ provides no specific information to support the assertion that additional emission reductions are anticipated at the specific sources we are requiring controls on between now and 2018. We provide a comparison of the current emissions to the 2018 CENRAP projected emissions in Table A.4-2 of the FIP TSD. We note that the data indicates that a number of facilities have actual emissions that are much higher than modeled. For instance, Big Brown, Sandow, and Martin Lake were all significantly higher than modeled rates, with Martin Lake having over 90% more SO_2 emissions than modeled. As we mention above, we do not anticipate any additional significant reductions at any of these facilities due to MATs or CSAPR/CAIR, or any other requirements by 2018. This is consistent with comments from Texas on a more recent IPM projection indicating that significant SO_2 reductions were not anticipated at these sources and no large SO_2 control projects were planned at most of the sources being evaluated.[631] It is unclear if the implementation of the sulfur dioxide (S02) National Ambient Air Quality Standard (NAAQS) will result in any emission reductions at these specific sources as areas in Texas have yet to be designated and it is unclear the amount of emission reductions that would be necessary to attain the standard for those areas that might be designated non-attainment. We believe that recent actual emissions (2009-2013 annual average, excluding the maximum and minimum years) is a reasonable estimate of the anticipated future emissions in 2018 at these sources. We note that none of the effected sources provided information in their comments suggesting emission reductions were anticipated in the near future. Furthermore, there are no enforceable emission limits on these specific sources to secure any specific emission reductions beyond current emissions at this time. Based on the above information, we disagree with the commenter's assertion that actual emissions will be lower than projected for the sources with required controls or that the estimated 0.14 dv improvement at Wichita Mountains due to scrubber upgrades is an overstatement.

We utilize the 2009-2013 baseline to estimate the potential visibility benefits from controls required by the FIP, noting that emission reductions will occur from this emission level and not a 2018 level estimated by CENRAP in 2006, which in many cases is much lower than current actual emissions. We disagree with the commenter that it is not appropriate to include this

[631] Texas comments on Draft IPM modeling conducted by EPA for potential national rule making platform provided on June 26, 2014. In this docket materials as "TCEQ comment letter to EPA on draft modeling platform dated June 24, 2014. '2018 EMP signed.pdf.

information in our proposal. Table 45 is necessary to present the full visibility benefit of the required controls that would result from reducing recent actual emission levels at the affected units down to the controlled emission levels. The FIP controls are estimated to provide for a 0.62 dv improvement in projected 2018 visibility conditions (as projected by CENRAP) at Wichita Mountains when all required controls are implemented when considering reductions from recent actual emission levels. This provides for an apples-to apples comparison between the level of additional estimated visibility improvement from the CENRAP 2018 projected visibility conditions based on reducing CENRAP 2018 emissions in Tables 43 and 44 and reducing actual emissions in Table 45.

We include an estimate of the visibility benefit from the required controls compared to the CENRAP modeled 2018 baseline as shown in Tables 43 and 44. This was necessary to assess how the RPG estimated by the CENRAP modeling would change based on the required controls. As this was the 2018 baseline used for the CENRAP modeled RPGs, we needed to use the same baseline to calculate the adjustment to the RPG. Table 43, which TCEQ does not object to, contains this information for the scrubber upgrades that are required to be in place by 2018. Table 44 includes this same information for the scrubber retrofits. It is appropriate to include this information to assess the visibility benefit of these required controls with respect to the CENRAP modeled RPG.

We disagree with the commenter that the visibility benefits from the scrubber upgrades are irrelevant to the approvability of the 2009 TX RH SIP. As discussed in more detail elsewhere, we disapproved the TX RH SIP in part because we determined that the analysis of reasonable controls in the Texas FIP was flawed. In order to determine if the ultimate decision that no additional controls were necessary was reasonable, and if we determined it was not reasonable then to inform our development of a FIP, we had to conduct our own analysis. Our analysis, including the analysis of the visibility benefits of scrubber retrofits, showed that cost-effective controls were in fact available that resulted in significant visibility benefits and provided for meaningful improvements in visibility conditions at the Class I areas of interest. Because these retrofits are not anticipated to occur before 2018, we evaluated the visibility benefit from them separately, however this does not impact the fact that they are reasonable controls. We discuss the comment on requiring controls beyond 2018 in a separate response to comment.

15.v EPA Miscalculated The Rpgs, Rpgs Do Not Account for Reductions Outside of Texas (E.G. OK FIP)

General Summary: EPA's methodology to estimate revised RPGs for Big Bend, Guadalupe Mountains, and Wichita Mountains is without precedent and is not supported by the record. The commenters also state that the revised RPGs are incorrect because they do not account for reductions in OK emissions.

Comment: EPA's proposed RPGS, and thus its FIPS, are unlawful and arbitrary and capricious [Luminant (0061) p. 123]

Luminant stated that the last step in EPA's reasonable progress analysis—its attempt to "quantify[]" new RPGs for the three Class I areas as part of its proposed FIPs—is one of the most unsupportable aspects of EPA's proposal. EPA's new proposed RPGs suffer from many flaws that render them unlawful and arbitrary and capricious, even putting aside the numerous legal and technical errors and deviations in EPA's analysis previously discussed. When EPA undertakes to issue a FIP, "EPA steps into the State's shoes" and "must meet the same requirements" as the state.[767] Here, however, EPA's recalculated RPGs do not meet even the most basic requirements for establishing an RPG that a state would be required to meet. EPA's RPGs, if developed and submitted to EPA by a state, would surely be disapproved by EPA.

[767] 77 Fed. Reg. at 40,164.

First, Luminant noted that EPA cites no precedent or support for its method of "adjusting" or "reset[ing]" an RPG in the manner that is has.[768] EPA did not develop its proposed RPGs as states would—that is, by modeling all existing and reasonable controls and comparing the results to the URP.[769] Instead, EPA simply took CENRAP's prior modeling (using one modeling platform) and apparently subtracted the results of its new unit-level modeling of specific Texas sources (using a different modeling platform) from the CENRAP results. EPA provides no explanation of how it accomplished this calculation or any basis for it. For example, EPA says that 0.14 deciview is the "[p]redicted additional benefit [at Wichita Mountains] due only to FIP scrubber upgrades," Id. at 36, and it subtracts that number from the 2018 CENRAP projection, but nowhere does EPA explain how it calculates the 0.14 deciview benefit, nor can we locate that number in any of the various spreadsheets in the record[770] And, and although EPA has now reviewed every other state's regional haze SIP, we have found no examples of where EPA has re-calculated an RPG in this manner. To allow for meaningful comment on its current proposal and new methodology, EPA must issue an amended notice or notice of data availability that explains how EPA calculated the final RPGs in its proposed FIP and the justification for doing so in this unorthodox manner.

[768] 79 Fed. Reg. at 74,886, 74,889.
[769] EPA Reasonable Progress Guidance at 2-3.
[770] FIP TSD at 36–37. For example, EPA says that 0.14 deciview is the "[p]redicted additional benefit [at Wichita Mountains] due only to FIP scrubber upgrades," Id. at 36, and it subtracts that number from the 2018 CENRAP projection, but nowhere does EPA explain how it calculates the 0.14 deciview benefit, nor can we locate that number in any of the various spreadsheets in the record.

EPA then attempts to "quantif[y]" new RPGs for the three Class I areas.[312] EPA "quantif[ies]" the new RPGs using "the results of our reasonable progress analysis of point sources as described in detail in our FIP TSD."[313] However, in doing so, EPA does not use the visibility modeling from ENVIRON or its own unit-level quantification of benefits that were used to justify the controls EPA determined to impose in its FIP. Nor does EPA model the visibility conditions in light of the recently finalized BART requirements on Oklahoma sources. Instead, EPA reverts back to the original CENRAP modeling used by Texas and Oklahoma to quantify the states' original RPGs. EPA apparently subtracts from the 2018 CENRAP projection the so-called visibility improvement that EPA separately estimated (under different modeling) from the controls it would impose on Texas sources by 2018

Response: We disagree with the comment and believe we took a reasonable approach to estimate the change in overall visibility impairment anticipated due to the required controls and provided all calculations for review. We also disagree with the commenter's description of how the states estimated the reasonable progress goals. While our guidance suggests that the reasonable progress goals should be established by modeling all existing and reasonable controls, in practice all RPOs including CENRAP completed the modeling early in the process. The 2018 CENRAP modeling was completed before any states had completed their BART and RP determinations. In many cases, the 2018 projection included an assumption of BART level controls and "on the book" controls. Once final BART determinations and reasonable progress determinations were completed, the RPO did not go back and remodel to reassess the reasonable progress goals. In our proposed action in Arkansas[632], as well as our actions in Arizona[633] and Hawaii[634], the modeled reasonable progress goals were adjusted based on a methodology of scaling of visibility extinction components in proportion to emission changes. We noted that although we recognize that this method is not refined, it allows us to translate the emission reductions achieved through the FIP into quantitative RPGs, based on modeling previously performed by the RPOs. However, in this case, our analysis using CAMx and source apportionment, provided a somewhat more refined means to estimate the visibility benefit from specific individual controls on the 20% worst days in 2018. While there is limited precedent for adjusting the RPO calculated RPGs to account for emission reductions achieved in a FIP or revised SIP, we took a reasonable approach based on the information available. We adjusted each RPG established by Texas or Oklahoma for 2018 by the amount of visibility benefit anticipated from all scrubber upgrades estimated by our modeling analysis based on CAMx source apportionment modeling. In estimating the deciview visibility benefit in 2018 compared to the CENRAP modeled 2018 RPGs, we considered reductions from 2018 CENRAP emissions levels and 2018 "dirty" background conditions. We believe that this is a reliable estimate of the amount of visibility benefit anticipated from controls (e.g. 0.14 dv for the Wichita Mountains) beyond the projected 2018 CENRAP RPGs. We then simply adjusted the RPGs established by the state by the amount of visibility benefit anticipated from the additional controls.

The commenter is incorrect in stating that we did not provide this calculation in the record. We discuss the proposed RPGs in Section 13 of the FIP TSD and direct the reader to the appropriate document in the record for our calculations and estimates of visibility benefits.[635] For example, the 0.14 deciview benefit is seen in the referred to document available in the docket[636] ("Vis modeling summary.xls," spreadsheet "Summary Vis 2018"), as well as in the FIP TSD at Table 20, 21 and A.6-6. In describing this value, we state that it is the total visibility benefit from all scrubber upgrades beyond the 2018 CENRAP modeled emissions calculated based on the 2018 "dirty" background conditions. The spreadsheet includes all the calculations behind these values. The included spreadsheet sums the estimated reduction in extinction from all the required scrubber upgrades based on 2018 CENRAP emission levels and then calculates the deciview improvement based on "dirty" 2018 background conditions. Because we provided all

[632] 80 FR 18944, 18997
[633] 79 FR 52420, 52468
[634] 77 FR 31692, 31708
[635] See FIP TSD at p36 and footnote 24 on the same page.
[636] See Vis modeling summary.xls in the docket to this action. The extinction levels for individual sources are calculated in the "ext. summary" spreadsheet column "O" and the total extinction benefit and deciview benefit calculations are found in the "summary vis 2018" spreadsheet.

the relevant information and calculations in the docket at proposal, we disagree that we "must issue an amended notice or notice of data availability that explains this calculation and the justification for doing so in this unorthodox manner".

As discussed above, we adjusted the CENRAP modeled reasonable progress goals to translate the emission reductions required in this FIP for Texas sources into quantitative reasonable progress goals. Luminant's comment concerning consideration of required emission reductions in Oklahoma is addressed in a separate response to comment below.

We note that unlike the emission limits that apply to specific reasonable progress sources, the reasonable progress goals are not directly enforceable. Rather, the reasonable progress goals are an analytical tool used by EPA and the states to estimate future visibility conditions and track progress towards the goal of natural visibility conditions.

With regard to the comment that we subtracted from the 2018 CENRAP projection the visibility improvement that we separately estimated (under different modeling) from the controls it would impose on Texas sources by 2018 the commenter is correct we did use the CENRAP CMAQ projections and our CAMx model projection in our calculations.

Comment: Second, Luminant noted that EPA's proposed RPGs have no relationship to EPA's underlying analysis of Texas sources and its justification for the new emission limits. EPA justifies its proposal to require emission reductions at a few Texas sources by altering ENVIRON's modeling in at least two ways: 1) using "adjusted actual emissions" (which do not reflect the actual emissions at these units, as shown in Table 11 and Figure 9) and 2) based on projected visibility improvement against "natural conditions." As shown in Tables 4, 5, 6, and 7, these two alterations artificially inflate the projected visibility improvements that EPA relies on to justify its decision to require additional controls. As discussed elsewhere in these comments, EPA provides no justification for altering ENVIRON's modeling in this manner. But even putting that error aside, when EPA subsequently calculates the RPGs for the Class I areas, it does so on an entirely different basis. EPA explains that its "proposed RPGs are established based on an adjustment of the 2018 RPGs established by Texas and Oklahoma that were based on the 2018 CENRAP modeling."[771] CENRAP modeling was performed—correctly—against realistic 2018 conditions, not the artificial background EPA claims to use for its decision-making, and without the alterations that EPA makes for its unit-level assessment. In other words, EPA's "adjustment" to the RPGs is apparently quantified against the actual "dirty" background that EPA previously rejected in its analysis as inconsistent with the Clean Air Act.[772] And, EPA's justification for its proposal (visibility improvement using "adjusted" emissions against "natural conditions") is entirely disconnected from and does not support its final decision to adjust the RPGs.

Response: Luminant's comments concerning the use of natural background and actual emissions are addressed in detail elsewhere. We disagree with the comment that we provide no justification for the "adjustments" made to the model results to account for recent actual emissions and natural background. We provide a thorough explanation of why it was appropriate to consider recent actual emissions and use natural background conditions to assess the full visibility benefit of individual controls in separate response to comments. We disagree with the comment that the proposed RPGs have no relationship to EPA's underlying analysis of Texas sources. The commenter fails to recognize that the methodology necessary to assess visibility impacts from individual sources is different from the methodology necessary to estimate overall visibility conditions in 2018. Our determination on what controls were reasonable was made considering the four factors and the estimated full potential for visibility benefit from individual controls based on consideration of natural background and recent actual emissions. Based on our determination of the reasonable controls, we then estimated the reasonable progress goal for 2018. In order to estimate the RPG for 2018, we started with the CENRAP modeled RPG and adjusted it to account for the additional emission reductions due to the required controls. This calculated adjustment to the 2018 CENRAP RPG had to be based on reductions from CENRAP 2018 emission levels that were modeled for the 2018 CENRAP RPG and considering the 2018 "dirty" background since the adjustment is made to 2018 visibility conditions. As we describe in the FIP TSD, CAMx is inherently a "dirty" background analysis because it models all emissions from all sources. However, as discussed elsewhere, it is appropriate to adjust the CAMx estimated extinction to a natural background analysis to estimate the full benefit of a potential control.

We disagree with the commenter that our adjusted actual emissions do not reflect the actual emissions at these units, as shown in Table 11 and Figure 9 of the Luminant comments. We used actual annual emissions taking a three year average of emissions from 2009-2013, excluding the maximum and minimum years. Table 11 and Figure 9 show emissions from this same period and more recent data but break up annual emissions into quarters and combine emissions across all Luminant units with proposed controls. We note that 3rd quarter SO_2 emissions are roughly constant from 2009-2014 and this period is typically when high sulfate impact days are observed. We used the most recent complete data that was available at the time we developed our analysis, 2009-2013, and excluded the max and minimum years to get a reasonable estimate of typical actual emissions. We provide additional information on recent emissions data from these sources in a separate response to comment.

Comment: Third, Luminant noted that EPA's RPGs are contrary to its own regulations. EPA's regulations define an RPG in terms of "an improvement in visibility for the most impaired days . . . and no degradation in visibility for the least impaired days . . . ."[773] Texas's and Oklahoma's SIPs thus provide visibility goals for both the "worst" and "best" days.[774] EPA's proposal, however, only addresses half of the states' RPGs—i.e., the "worst" days—but provides absolutely no analysis of the part of the RPGs addressing the "best" days. Thus, EPA's "additional analysis" is an inadequate basis for disapproving Texas's and Oklahoma's RPGs and an unlawful basis for its FIP. EPA's analysis provides absolutely no basis for disapproving Texas's and Oklahoma's RPGs for the 20% best days, even though EPA claims to be disapproving them.[775]

Footnotes:
[767] 77 Fed. Reg. at 40,164.
[768] 79 Fed. Reg. at 74,886, 74,889.
[769] EPA Reasonable Progress Guidance at 2-3.

770 FIP TSD at 36–37. For example, EPA says that 0.14 deciview is the "[p]redicted additional benefit [at Wichita Mountains] due only to FIP scrubber upgrades," Id. at 36, and it subtracts that number from the 2018 CENRAP projection, but nowhere does EPA explain how it calculates the 0.14 deciview benefit, nor can we locate that number in any of the various spreadsheets in the record.
771 Id. at 36.
772 Id. at A-38 to A-39.
773 40 C.F.R. § 51.308(d)(1).
774 2009 Texas SIP Narrative at 10-3 to 10-4.
775 79 Fed. Reg. at 74,822; Oklahoma TSD at 11.

[UARG (0065) p. 21] UARG stated that the EPA's assessment also fails to address reasonable progress for the 20 percent best days, as required by the regional haze rule. EPA's assessment is focused exclusively on visibility impacts on the 20 percent worst days and, accordingly, fails to satisfy the minimum requirements of the regional haze rule

Response: We disagree with the comment. Our basis for disapproving the relevant reasonable progress goals for the 20% best days arises, as was noted in our proposal, from our determination that the analysis developed by Texas to evaluate reasonable progress controls was flawed and additional controls are necessary for the first planning period. Finalizing requirements for additional controls, as we now accomplish with our final rule, makes "visibility on these days better than Texas projects," as we noted in our proposal.[637, 638] The submitted reasonable progress goals for the 20% best days did not consider reductions from the reasonable controls, so they cannot be approved. We understand the comment to request a quantitative assessment of the projected visibility conditions for the 20% best days. These calculations have been completed and add to our position that visibility will be better than Texas projects. These numbers, following the same methodology that we employed with the 20% worst days, are summarized in the table below.

Estimated RPG for the 20% Best Days Based on Predicted Benefit of Scrubber Upgrades Beyond 2018 CENRAP Projected Visibility Conditions

	Baseline (dv)	2018 CENRAP Projection (dv)	Predicted additional benefit due only to FIP scrubber upgrades (dv)	**Proposed RPG (dv)**	Additional benefit predicted due to FIP scrubber retrofits (dv)	Total benefit from proposed controls	RPG Assuming all controls in place by 2018
Wichita Mountains	9.78	9.23	0.007	**9.22**	0.032	0.039	9.19
Big Bend	5.78	5.6	0.008	**5.59**	0.042	0.050	5.55

637 79 FR 74843.
638 "No degradation," as distinctly needed for the 20% best days, is ensured because added controls do not significantly impact the 20% best days and would serve only to improve visibility on these days. Even so, what we provide as the 20% best day reasonable progress goals for 2018 (i.e., the "least impaired days") for Big Bend, Guadalupe Mountains and Wichita Mountains numerically differ from the numbers that Texas had submitted by very small amounts. By the design of 40 CFR 51.308(d)(1), improvements for the most impaired days provide a more vital benchmark for progress that may be made.

Guadalupe Mountains	5.95	5.7	0.001	**5.70**	0.030	0.031	5.67

Comment: [Luminant (0061) p. 125] Luminant stated that EPA's proposed RPG for the Wichita Mountains is unlawful because it fails to take into account emission reductions for all Oklahoma sources. EPA's regulations require a state, and thus EPA when it steps into the state's shoes, to account for all emission reductions that are expected to result from compliance with existing rules and other reasonable measures and compare the results to the URP in order to determine reasonable progress.[776] But EPA fails to do that here in determining what is reasonable progress for the Wichita Mountains. For example, EPA's RPG does not take into account the additional SO_2 emission reductions from several Oklahoma sources that are required by EPA's recent BART FIP and Oklahoma's revised SIP finalized in 2014.[777] As EPA explains:

> [I]n our earlier action on the Oklahoma Regional Haze SIP, we disapproved the SO_2 BART determinations for six EGUs at three power plants in Oklahoma and promulgated a FIP setting more stringent SO_2 emission limits for these EGUs. Although we subsequently approved a SIP revision from Oklahoma addressing the BART requirements at one power plant, and removed the FIP requirements for this facility, ***our FIP and the revised Oklahoma SIP require greater reductions overall in emissions of*** SO_2 ***than was assumed [by Oklahoma] in setting the RPGs for the Wichita Mountains***.[778]

EPA faults Oklahoma's RPG for Wichita Mountains because it does not take these reductions into account.[779] Yet, in assessing Oklahoma's RPG and calculating its proposed RPG for Wichita Mountains, EPA itself fails to calculate or quantify the visibility benefit at Wichita Mountains from these now required controls.[780] Indeed, although EPA claims the failure to account for these reductions is one basis for its disapproval of Oklahoma's RPG,[781] EPA's remedial FIP also fails to take these on-the-books emission reductions into account.[782] Thus, for the exact same reason that EPA offers for disapproving Oklahoma's RPG—that it does not account for all existing required controls—EPA's FIP is equally deficient and cannot stand. As discussed in Section V, EPA's RPG also fails to include SO_2 and NO_x reductions from EPA's Cross-State Air Pollution Rule ("CSAPR"), which became effective January 1, 2015, and serves as the BART-equivalent for Texas sources. EPA's RPG for Wichita Mountains thus fails to comply with EPA's regulations.

Footnotes:
[776] EPA Reasonable Progress Guidance at 2-3.
[777] 76 Fed. Reg. 81,728, 81,753 (Dec. 28, 2011); 79 Fed. Reg. 12,944, 12,954 (Mar. 7, 2014).
[778] Oklahoma TSD at 11 (emphasis added) (internal citations omitted).
[779] Id.
[780] 79 Fed. Reg. at 74,886.
[781] Oklahoma TSD at 11.
[782] 79 Fed. Reg. at 74,886.

Response: The comment is taken out of context and does not fully capture the rationale for our disapproval. The full text is:

> However, for the reasons discussed below, we are proposing to disapprove Oklahoma's RPG for the Wichita Mountains. First, in our earlier action on the Oklahoma Regional Haze SIP, we disapproved the SO_2 BART determinations for six EGUs at three power plants in Oklahoma and promulgated a FIP setting more stringent SO_2 emission limits for these EGUs.8 Although we subsequently approved a SIP revision from Oklahoma addressing the BART requirements at one power plant,9 and removed the FIP requirements for this facility,10 our FIP and the revised Oklahoma SIP require greater reductions overall in emissions of SO_2 than was assumed in setting the RPGs for the Wichita Mountains. Second, we are proposing to disapprove Oklahoma's RPGs for the Wichita Mountains because they were based on an incomplete consultation with Texas under 51.308(d) (1)(iv) that resulted in inadequate reasonable progress towards the national visibility goal. For these reasons, the RPGs for Wichita Mountains do not reflect the degree of visibility improvement anticipated from these measures.[639]

We considered the comment concerning consideration of the reductions required by the BART FIP in Oklahoma in setting the 2018 reasonable progress goals and we note that the CENRAP 2018 modeling did include an assumption for anticipated BART reductions for the Oklahoma sources reflecting an emission limit of 0.15 lb/MMBtu on all six coal-fired EGU subject-to-BART units. We believe these assumptions are a reasonable approximation of the anticipated BART reductions in Oklahoma at this time, considering the uncertainty of the timing of the reductions for some of the sources and the uncertainty in the final control scenario chosen by the owners to meet the requirements. The BART requirements for the Sooner and Muskogee facilities must be met by January of 2019; therefore, it is unclear if any reductions at these facilities will occur during the first planning period to be considered in the 2018 reasonable progress goal. Furthermore, while the BART FIP requires emission limits consistent with the installation of scrubbers at four units across the two facilities, there is uncertainty at this time as to the facilities owner's plans for compliance through installation of controls or retirement of the some of the BART units and the schedule for those plans. In the case of the AEP Northeastern facility, an Oklahoma SIP revision has been approved that requires, in addition to emission limits on the Northeastern facility, an enforceable commitment that obligates ODEQ to "obtain and/or identify additional SO_2 reductions within the State of Oklahoma to the extent necessary to achieve the anticipated visibility benefits estimated" by the CENRAP in the 2018 CENRAP projections.[640] The required enforceable emission limits in the Oklahoma and Texas FIPs remedy the deficiencies in the SIPs and our finalized reasonable progress goals for 2018 properly consider the visibility benefits anticipated by those required emission reductions anticipated by 2018. We address comments concerning emission reductions due to CSAPR elsewhere in this document.

We note that unlike the emission limits that apply to specific reasonable progress sources, the reasonable progress goals are not directly enforceable. Rather, the reasonable progress goals are an analytical tool used by EPA and the states to estimate future visibility conditions and track progress towards the goal of natural visibility conditions.

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[639] OK TSD at 11.
[640] 79 FR 12954

15.w General Four-Factor Analysis Comments

Comment: Every factor of EPA's proposed reasonable progress analysis fails.
[GCLC (0063) p. 14]

GCLC stated that the four-factor analysis for the purpose of Texas' SIP has no relation or bearing on Texas' LTS analysis. EPA has failed to demonstrate that its proposed FIP will comply with the four-factor analysis for determining reasonable progress.[65] The Proposed FIP will result in miniscule and non-perceivable changes in visibility compared to the Texas SIP; at the same time, it will cause serious economic harm and jeopardize electric reliability in the state, all while imposing requirements that would extend beyond the planning period.

According to GCLC, one of the primary reasons EPA's analysis is so flawed is due to its reliance on the BART guidelines and EPA's insistence on applying source-specific limitations for a rule that is meant to look beyond specific sources and look at source-categories or state-wide contributions more broadly. This is not to say that EPA's source-specific four-factor analysis is correct, either, as it seriously underestimates the harms of the rule to those individual units regarding all of the factors of the reasonable progress analysis.

Footnotes:
[65] See 42 USC§ 7491(g)(1).

Response: We address specific comments concerning these issues are addressed elsewhere in this document.

Comment: EPA's Proposal to Require Installation of Scrubbers at Tolk Would Produce Miniscule Visibility Benefits. [Xcel Energy (0064) p. 6, 25-28]

[Xcel Energy (0064) p. 6] Xcel Energy stated that the EPA's proposal to impose costly controls on Xcel Energy's Tolk Generating Station ("Tolk") is technically and legally unjustifiable. It is based on an incomplete and inadequate analysis of the four statutory factors. It also effectively ignores the minute-to-nonexistent visibility benefit that would result from the proposed controls.

Response: We address specific comments concerning our four-factor analysis and the justification for the required controls elsewhere in this document. We address comments concerning the magnitude of visibility benefit of controls where we address comments on our analysis of cost versus visibility in this document.

16. Interstate Visibility Transport

Comment: Multiple commenters argued that EPA should not disapprove NAAQS infrastructure SIPs as part of this action.

[NRG (0078) p. 14] NRG argued that the proposed infrastructure SIP must not be finalized because they rest on the same reasoning as EPA's disapproval of Texas' regional haze plan. 79 Fed. Reg. at 74,892 (proposed 40 C.F.R. § 52.2304(d)-(e)).

[UARG (0065) p. 32-33] UARG stated that EPA has no authority to disapprove Texas's Section 110(a)(2)(D)(i)(II) interstate transport SIP revisions.

[GCLC (0063) p. 18-19] GCLC stated that EPA's proposed disapproval of Texas' infrastructure SIP submittals for interstate transport and visibility protection is contrary to the CAA**.** EPA has no basis to disapprove portions of Texas' NAAQS SIPs. Texas' SIP submittals comply with all requirements of the CAA and must be approved.

[Luminant (0061) p. 49, 142] Luminant argued that EPA's proposed disapproval of Texas's NAAQS infrastructure SIPs is contrary to law. EPA claims that those prior submissions do not satisfy the so-called "good neighbor" provision of the Clean Air Act, § 110(a)(2)(D)(i)(II). 79 FR 74823. According to EPA, that provision required Texas's SIP revisions that addressed the NAAQS to "*have adequate provisions to prohibit in-state emissions from interfering with measures required to protect visibility in any other state*." *Id.* EPA's proposal is flawed both legally and factually.

[Luminant (0061) p. 49] Luminant noted that the EPA proposes to disapprove Texas's SIP submittals for multiple NAAQS (1997 $PM_{2.5}$; 1997 ozone; 2006 $PM_{2.5}$; 2008 ozone; 2010 NO_2; and 2010 SO_2) because Texas, like many states, "*relied on the improvement in visibility expected to result from the implementation of CAIR in developing their long-term strategy*." 79 FR 74888. EPA proposes that its CSAPR FIP, which relies on emission reductions from the implementation of CSAPR in lieu of BART, would address "*this deficiency in the Texas SIP*." Id.

[Luminant (0061) p. 49] Luminant noted that EPA proposes to disapprove Texas's SIP submittals for three NAAQS (1997 $PM_{2.5}$; 2006 $PM_{2.5}$; and 2010 SO_2) because of EPA's "*proposed conclusion that additional control of* SO_2 *emissions in Texas is needed to prevent interference with measures required to be included in the Oklahoma SIP to protect visibility*." Id. EPA proposes that its reasonable progress FIP "*addresses this deficiency in the Texas SIP*." Id.

Structural requirements. [Luminant (0061) p. 142; GCLC (0063) p. 18-19]. Luminant and GCLC argued that EPA misinterpreted the scope and intent of CAA § 110(a)(2)(D)(i)(II). EPA is attempting to impose substantive requirements and emissions limitations via the § 110(a)(2)(D)(i)(II), rather than what is clearly contemplated in the CAA - a requirement to have structural requirements in place. This present-day interpretation conflicts with EPA's own historical interpretation of this CAA provision, including that the purpose of this provision is to "*assure that the air agency's SIP contains the necessary* ***structural requirements*** *for the new or revised NAAQS*." EPA, Guidance on Infrastructure State Implementation Plan (SIP) Elements under Clean Air Act Sections 110(a)(1) and 110(a)(2), at 2 (Sept. 2013). (emphasis added). EPA has gone on to add that "*the infrastructure SIP submission process provides an opportunity for the responsible air agency, the public, and the EPA to review* ***the basic structural requirements*** *of the air agency's air quality management program in light of each new or* *revised NAAQS."* Id. (emphasis added). EPA's proposal here does not find that Texas's SIP does not contain the basic structural requirement needed to protect visibility—such as adequate funding, monitoring and reporting requirements, and an enforcement program. Instead, EPA's disapproval is premised on EPA's assertion that the Texas SIP does not meet the specific requirements of a separate Clean Air Act provisions—the visibility provision at CAA §169A (42 U.S.C. § 7491). The specific requirements of CAA §169A are not "basic structural requirements" that are required to be addressed in a § 110(a)(2)(D)(i)(II) infrastructure SIP. Therefore, EPA is in error.

Luminant noted that the specific substantive requirements for a state's regional haze SIP are found in CAA § 169A, not in § 110(a)(2)(D)(i)(II). It is axiomatic that the more specific statutory provision controls over the more general one.[874] Congress plainly intended § 169A to provide the substantive requirements for a state's regional haze SIP, not § 110(a)(2)(D)(i)(II). Certainly, § 110(a)(2)(D)(i)(II) does not create any additional requirements for Texas's regional haze SIP beyond those in § 169A, and thus for all the reasons that EPA must approve Texas's submission under § 169A as discussed in these comments, it must approve it under CAA § 110(a)(2)(D)(i)(II).

SIP Timing. [Luminant (0061) p. 142; GCLC (0063) p. 18-19]. Luminant and GCLC asserted that EPA's proposed disapproval of Texas' infrastructure SIPs also conflicts with the timing of NAAQS and regional haze SIP submittal deadlines. GCLC explained that there is no statutory or regulatory syncing of time lines between the NAAQS and regional haze programs. Luminant noted that regional haze SIPs must be submitted at specific intervals (every 10 years) and in accordance with specific deadlines, which have nothing to do with the deadlines for NAAQS SIP revisions.[875] Luminant and GCLC explained that if EPA continues to proceed with this proposed plan of effectively reading the substantive requirements of § 169A into § 110(a)(2)(D)(i)(II), it would force states to disregard the regional haze SIP deadlines in favor of the NAAQS deadlines. This result contradicts the clear requirements of the CAA and highlights the errors of EPA's proposed action. Luminant noted that if a state fails to submit a regional haze SIP EPA would then likely claim the authority and obligation to issue a FIP within two years addressing all of the substantive requirements of a regional haze SIP, including establishing reasonable progress goals and a long-term strategy. This outcome and EPA's position make no sense and contravene the statute and EPA's own regulations.

Footnotes:.
[874] Morales v. Trans World Airlines, Inc., 504 U.S. 374, 384 (1992) ("[I]t is a commonplace of statutory construction that the specific governs the general . . . ."); Gozlon-Peretz v. United States, 498 U.S. 395, 396 (1991) ("[A] specific [statutory] provision controls one of a more general application . . . .").
[875] 40 C.F.R. § 51.308(f).

Response: The EPA acknowledges the background information provided by the commenter. We take no position with respect to the commenter's synopsis. We are not approving Texas's Regional Haze submission under § 169A. EPA's rationale for disapproval of Texas' regional haze plan is discussed elsewhere in this document. EPA has the authority to disapprove Texas's 110(a)(2)(D)(i)(II) interstate transport SIP revisions. "Section 110(a)(2) specifies the *substantive elements* that infrastructure SIP submissions need to address, as appropriate, for EPA approval." EPA, Guidance on Infrastructure State Implementation Plan (SIP) Elements under Clean Air Act

Sections 110(a)(1) and 110(a)(2), at 1-2 (Sept. 2013) (EPA i-SIP Guidance) (emphasis added). "Under section 110(a)(2)(D)(i)(II), an infrastructure SIP submission cannot be approved with respect to prong 4 (visibility transport) until the EPA has issued final approval of SIP provisions that the EPA has found to adequately address any contribution of that state's sources to impacts on visibility program requirements in other states." EPA i-SIP Guidance at 32-33. This requirement is substantive.

> One way in which prong 4 may be satisfied for any relevant NAAQS is through an air agency's confirmation in its infrastructure SIP submission that it has an approved regional haze SIP that fully meets the requirements of 40 CFR 51.308 or 51.309. 40 CFR 51.308 and 51.309 specifically require that a state participating in a regional planning process include all measures needed to achieve its apportionment of emission reduction obligations agreed upon through that process. *See*, for example, 40 CFR 51.308(d)(3)(ii). A fully approved regional haze SIP will ensure that emissions from sources under an air agency's jurisdiction are not interfering with measures required to be included in other air agencies' plans to protect visibility. *Id*, at 33.

EPA has disapproved such SIPs for failure to comply with this provision for various other states. *See* 78 FR 46142, July 30, 2013 (Arizona); 77 FR 14604, March 12, 2012 (Arkansas); 76 FR 52388, August 22, 2011 (New Mexico); 76 FR 81728, December 28, 2011 (Oklahoma). We disagree that our disapproval is contrary to the CAA and that Texas's SIP submittals comply with all requirements of the CAA**.**

With respect to the $PM_{2.5}$, NO_2 and ozone NAAQS submittals, as we discussed in our proposal, we gave limited disapproval to the Texas Regional Haze SIP based on its reliance on CAIR. CAIR provided limits on emissions of SO_2 and NOx. SO_2 is a precursor for $PM_{2.5}$. NOx is a precursor for ozone. NO_2 is a component of NOx. With CAIR no longer in effect and controlling Texas may not rely on its regional haze SIP to ensure that emissions from Texas do not interfere with measures to protect visibility in nearby states.

We did not misconstrue the scope and intent of CAA section 110(a)(2)(D)(i)(II) as it explicitly provides that states must have SIPs with adequate provisions to prevent interference with the efforts of other states to protect visibility. See 76 FR 81728, 81738, December 28, 2011. As noted in our proposal, when Congress enacted section 169A as part of the 1977 CAA Amendments it also amended section 110 to require that all SIPs "contain adequate provisions prohibiting . . . any source or other type of emissions activity within the State from emitting any air pollutant in amounts which will … interfere with measures required to be included in the applicable implementation plan for any other State … to protect visibility" (79 FR 74818, 74824, December 16, 2014). The two sections work together. In many other i-SIP actions across the country, we've allowed states to rely on their approved regional haze plan to meet the substantive requirements of the visibility component of 110(a)(2)(D)(i)(II) because the regional haze plan achieved at least as much emissions reductions as projected by the RPO modeling. *See* 76 FR 34608, June 14, 2011 (California); 79 FR 60985, October 9, 2014 (New Mexico); 76 FR 36329, June 22, 2011 (Idaho); and 76 FR 38997, July 5, 2011 (Oregon).

Our position concerning the requirements of the visibility protection portion of CAA 110(a)(2)(D)(i)(II) does not contradict and render superfluous the Regional Haze SIP deadlines and planning periods. In the SIP submittal for a new or revised NAAQS a state may refer to its Regional Haze SIP, as Texas has done. So long as a state has an approved Regional Haze plan upon which it relies to comply with 110(a)(2)(D)(i)(II), that requirement of the relevant NAAQS SIP is met, regardless of the intervals in which these submittals are due. Likewise, if the state relies on an unapprovable regional haze plan to meet 110(a)(2)(D)(i)(II), then the state's relevant NAAQS SIP is not approvable. Because we found that the Texas Regional Haze SIP is deficient, the interstate transport and visibility protection requirement of CAA 110(a)(2)(D)(i)(II) is not met.

We proposed to rely on CSAPR and the emission reductions required in our Texas FIP to address these deficiencies in Texas' SIP submittals, but we have determined that it is not appropriate to finalize this determination at this time. Given the uncertainty following the D.C. Circuit Court's partial remand of the CSAPR budgets, we do not consider it appropriate to rely on CSAPR at this time to address the interstate visibility transport obligation with respect to visibility. Therefore, today's action does not finalize the portion of our proposed FIP addressing Texas' visibility transport obligations, as that portion of the FIP would have partially relied on CSAPR. We will address the visibility transport requirements for Texas in a future rulemaking, once the issues surrounding the partial remand are resolved.

Comment: [TCEQ/PUCT (0056) p. 18-19] The TCEQ disagreed with the EPA's proposed disapproval of §110(a)(2)(D)(i) requirement for visibility protection for the Texas infrastructure SIP submittals for ozone, particulate matter ($PM_{2.5}$) nitrogen dioxide (NO_2), and SO_2 NAAQS. The EPA fails to go into any detail on the reasons for disapproving these multiple, separate SIPs.

The TCEQ noted that for the 1997 eight-hour ozone standard, the EPA only states that Texas originally failed to make a timely submission, and notes that CAIR was then promulgated and implemented by the EPA. Texas was not in CAIR for ozone, and subsequently submitted a separate transport SIP for the 1997 eight-hour ozone NAAQS. The EPA neglects to offer any reason or explanation for why this submission was inadequate or deserving of disapproval, other than the promulgation and implementation of the CSAPR. Although Texas was included in CSAPR for the 1997 eight-hour ozone standard, Texas has from the beginning challenged that inclusion, and litigation over the matter is on-going. Additionally, the EPA failed to act on, or even mention the Texas ozone transport SIP submission before including Texas in CSAPR for the 1997 ozone standard.

The TCEQ noted that for the 1997 $PM_{2.5}$ NAAQS, Texas was included in CAIR, and subsequently complied with CAIR requirements. The EPA included Texas in CSAPR for the 1997 $PM_{2.5}$ NAAQS at final promulgation of the rule, without having given Texas proper notice of this inclusion by including Texas in the proposed rule. Texas has challenged its inclusion in CSAPR for the 1997 $PM_{2.5}$ NAAQS, and litigation over this matter is also on-going. The linkage of Texas to a single monitor in an area already attaining the relevant NAAQS is a clear case of over-control, something explicitly prohibited by the CAA, as acknowledged by the Supreme Court. *See EPA v. EME Homer City Generation, L.P., 134 S.Ct. 1584, at 1608 (Apri1 29,* *2014).* Texas also submitted a transport SIP for the 2006 $PM_{2.5}$ NAAQS. Although this SIP did rely on CAIR, the EPA has failed to offer any substantive reason why this is inappropriate, given that CSAPR replaced CAIR, and the sole Texas linkage in the final CSAPR for 2006 $PM_{2.5}$ are to the same inappropriate monitor in an area already attaining the NAAQS.

As for the 2008 ozone, 2010 SO_2, and 2010 NO_2 standards, the TCEQ stated that Texas has submitted transport SIPs for each of these standards demonstrating that Texas does not have transported emissions out of state that interfere with attainment or maintenance in any downwind state.

The TCEQ argued that the EPA fails to offer any rational or reasoned explanation for why these SIP submissions are inadequate. In fact, the EPA fails to offer any analysis of these SIP submissions at all; therefore, this proposed disapproval is arbitrary, capricious, and not supportable.

Response: In the infrastructure SIP submittals for the ozone, $PM_{2.5}$, NO_2 and SO_2 NAAQS Texas indicated that the Regional Haze SIP, which relied on CAIR, fulfilled its obligation for interference with measures required to be included in the SIP for any other state to protect visibility. With respect to the ozone, $PM_{2.5}$, NO_2 and SO_2 NAAQS, because CAIR is no longer controlling Texas emissions of NOx and SO_2 from EGUs the portions of the SIPs for these NAAQS do not demonstrate that Texas emissions would not interfere with measures to be included in the SIP for any other state to protect visibility. Additionally, with respect to the $PM_{2.5}$ and SO_2 NAAQS, our finding that additional SO_2 controls are needed to prevent interference with measures required to be included in the Oklahoma SIP to protect visibility means that the portions of the SIPs for these NAAQS do not demonstrate that that Texas emissions would not interfere with measures to be included in the SIP for any other state to protect visibility. We discuss *EPA v. EME Homer City* elsewhere in this document. In this rulemaking we are taking no action on the portions of the SIP submittals that pertain to prohibiting Texas emissions that interfere with attainment or maintenance of the NAAQS in any downwind state (CAA 110(a)(2)(D)(i)(I)). We plan to address these portions of the SIPs in separate rulemaking.

Comment: [Luminant (0061) p. 142] Luminant noted that § 7410(a)(2)(D)(i)(II) specifically limits EPA's authority to require one state to adopt binding emission limits for the benefit of another state. Section 7410(a)(2)(D)(i)(II) requires only that a SIP contain "*adequate provisions . . . prohibiting . . . any source or other type of emissions activity within the State from emitting any air pollutant* ***in amounts which will***--*. . . interfere with measures required to be included in the applicable implementation plan for any other State under part C of this subchapter . . . to protect visibility*." Here, it is undisputed that actual visibility conditions at Oklahoma's Wichita Mountains already meet the 2018 progress goals determined to be reasonable by EPA, without any further reductions from Texas sources. Thus, EPA has no authority to require any further reductions or to disapprove Texas's SIP revision on the basis that it does not include those further reductions, as the Supreme Court has recently held in interpreting this very same "good neighbor" provision. *See EPA v. EME Homer City Generation, 134 S. Ct. 1584, 1608 (2014) ("EPA cannot require a State to reduce its output of pollution by more than is necessary to* *[protect visibility] in every downwind State or at odds with the [reasonable progress] threshold the Agency has set."*).

Response: We disagree that CAA section 110(a)(2)(D)(i)(II) specifically limits our authority to require one state to adopt binding emission limits for the benefit of another state. In previous actions for New Mexico and Oklahoma, we have promulgated emission limits for the visibility protection benefit of other states (76 FR 52388, August 22, 2011; 76 FR 81728, December 28, 2011). Further, this action does not require Texas to reduce its output of pollution by more than necessary to protect visibility in Oklahoma or at odds with reasonable progress, rather, EPA is requiring Texas to reduce visibility pollutants by the amount sufficient to protect visibility in Oklahoma's Class I area as well as its own Class I areas. We address monitoring data for the Wichita Mountains in our responses to other comments.

Comment: Multiple commenters noted that §110(a)(2)(D)(i) is pollutant-specific.

[TCEQ/PUCT (0056) p. 18-19] The TCEQ noted that EPA states that because it is proposing the need for additional SO_2 controls on Texas sources to prevent interference with measures required to be included in the Oklahoma Regional Haze SIP to protect visibility, the EPA must therefore disapprove the §110(a)(2)(D)(i) submittals for the 1997 $PM_{2.5}$, 2006 $PM_{2.5}$, and 2010 SO_2 NAAQS. The EPA fails to offer any support for this contention, or the inclusion of the $PM_{2.5}$ standards in this list. The EPA has repeatedly stated that infrastructure requirements, including transport requirements, are pollutant specific. Therefore, a requirement to increase SO_2 controls does not, without further explanation, necessarily include the requirements for $PM_{2.5}$ Although the EPA has taken other actions in conflict with its guidance on this issue, there is no rational reason to continue to perpetuate this error.

[Luminant (0061) p. 142; GCLC (0063) p. 19] Luminant noted that EPA errs by ignoring the "pollutant specific" nature of § 110(a)(2)(D)(i)(II).[877] EPA claims to be disapproving Texas's SIP submissions for different NAAQS (1997 $PM_{2.5}$; 1997 ozone; 2006 $PM_{2.5}$, 2008 ozone; 2010 NO_2 NAAQS, and 2010 SO_2) but EPA only finds that Texas's SIP is inadequate to protect visibility because it does not contain certain limitations on SO_2 emissions. 79 FR 74888. EPA finds no deficiency with respect to $PM_{2.5}$, NO_2, or ozone, and thus EPA's reliance on those NAAQS is unsupported and arbitrary and capricious.

[Luminant (0061) p. 142; GCLC (0063) p. 19] Luminant and GCLC noted that EPA refers to the "protect visibility" requirement of § 110(a)(2)(D)(i) as "Prong 4" in its guidance on infrastructure SIPS, interpreting "*this prong to be pollutant-specific, such that the infrastructure SIP submission need only address the potential for interference with protection of visibility caused by the pollutant (including precursors) to which the new or revised NAAQS applies.*"[74] Luminant noted that EPA claims to be disapproving Texas's SIP submissions for different NAAQS (1997 $PM_{2.5}$; 1997 ozone; 2006 $PM_{2.5}$, 2008 ozone; 2010 NO_2 NAAQS, and 2010 SO_2) but EPA only finds that Texas's SIP is inadequate to protect visibility because it does not contain certain limitations on SO_2 emissions. 79 FR 74888. Luminant and GCLC stated that EPA's action to impose disapprovals with respect to the $PM_{2.5}$, NO_2, and ozone NAAQS is completely unsupported and arbitrary and capricious given that EPA has found no error in Texas' program regarding those pollutants or a visibility effect from those pollutants. GCLC concluded that since Texas has fully complied with the requirements of the CAA through its SIP submission, while also complying with the infrastructure SIP requirements, EPA must approve of Texas' SIP submittals.

Footnotes:.
[74]EPA, Guidance on Infrastructure State Implementation Plan (SIP) Elements under Clean Air Act Sections 110(a)(1) and 110(a)(2), at 33 (Sept. 2013).

Response: We did not ignore the pollutant specific nature of CAA section 110(a)(2)(D)(i)(II) as we interpret the visibility protection portion of CAA 110(a)(2)(D)(i)(II) to be pollutant specific such that the infrastructure SIP submission need only address the potential for interference with protection of visibility caused by the pollutant (including precursors) to which the new or revised NAAQS applies. See September 13, 2013 EPA memo "Guidance on Infrastructure State Implementation Plan (SIP) Elements under Clean Air Act Sections 110(a)(1) and 110(a)(2)", page 54-55 (www3.epa.gov/airquality/urbanair/sipstatus/docs/Guidance_on_Infrastructure_SIP_Elements_Multipollutant_FINAL_Sept_2013.pdf). In its regional haze SIP, Texas relied on CAIR to address regional haze requirements for controlling emissions of NO_X and SO_2. As CAIR is no longer a valid rule, the Texas SIP cannot ensure that regional haze requirements for controlling emissions of NO_X and SO_2 are met. NO_X and SO_2 emissions have the potential for interference with protection of visibility. As (1) NO_X is a precursor of ozone and $PM_{2.5}$ and (2) NO_2 is a component of NO_X, the potential for interference with visibility protection for the ozone, $PM_{2.5}$ and NO_2 NAAQS apply to NO_X emissions. As SO_2 is (1) a pollutant with its own NAAQS and (2) a precursor of $PM_{2.5}$, the potential for interference with visibility protection for the SO_2 and $PM_{2.5}$ NAAQS apply to SO_2 emissions. As the Texas SIP cannot ensure that Texas NO_X and SO_2 emissions will not interfere with visibility protection measures required for any other State, we are disapproving those portions of the SIP submittals for the ozone, $PM_{2.5}$, NO_2 and SO_2 NAAQS.

Comment: [Nucor Steel (0058) p. 1-2] Nucor Steel disagreed with EPA's interpretation and determination that the Regional Haze Rule and the Clean Air Act allow EPA to disapprove the Texas SIP and to therefore issue a Federal Implementation Plan on the basis that the Texas SIP does not include "*measures to prohibit emissions that would interfere with the reasonable progress goals set to protect Class I areas in other states*." 79 FR 74820. The visibility protection requirement in §110(a)(2)(D)(i)(II) of the Clean Air Act does not require a SIP to contain provisions that prohibit emissions that will interfere with visibility "reasonable progress goals" of other states; it requires adequate provisions prohibiting emissions that will interfere with "***measures*** *required to be included in the applicable implementation plan for any other state.*" The SIP requirements for visibility are different from the language in §110(a)(2)(D)(i)(I) for protection of the NAAQS, which requires adequate SIP provisions to prohibit emissions that contribute to nonattainment of or that interfere with another state's maintenance of a national ambient air quality standard. The visibility protection requirement in §110(a)(2)(D)(i)(II) is narrower and requires only provisions necessary to prevent interference with control measures included in another state's plan to achieve a visibility standard. Reasonable progress goals, projected deciview improvements and the like are standards; they are not "measures", i.e. they are not actions taken or enforced by a state to achieve a standard or goal. EPA's interpretation ignores and improperly eliminates the differences in the language Congress used for NAAQS SIP requirements, and the language used for visibility SIP requirements. To the extent that EPA's disapproval of the Texas and Oklahoma SIPS is premised on the language in §110(a)(2)(D)(i)(II), but is not based on direct interference with a specific control measure in another state's regional haze SIP (as opposed to interference with a regional haze related goal in or underlying another state's SIP), EPA's interpretation is contrary to the clear and express language of section 110 of the Clean Air Act.

Response: We agree that the CAA requirement is to prohibit sources within a state from emitting any air pollutants in amounts that will interfere with measures required to be included in the SIP for any other State to protect visibility. We disagree that the visibility protection requirement in §110(a)(2)(D)(i)(II) "requires only provisions necessary to prevent interference with control measures included in another state's plan to achieve a visibility standard." As we noted in our proposal, (79 FR 74818, 74820), we interpret §110(a)(2)(D)(i)(II) as requiring states to include in their SIPs measures to prohibit emissions that would interfere with the reasonable progress goals set to protect Class I areas in other states. We also noted that this is consistent with the requirements in the regional haze program that explicitly require each state to address its share of the emission reductions needed to meet the reasonable progress goals for surrounding Class I areas (64 FR 35714, 35735, July 1, 1999). We are disapproving the Texas interstate transport SIP because (1) Texas may not rely on its regional haze SIP, which relied heavily upon CAIR, to ensure that emissions from Texas do not interfere with measures to protect visibility in nearby states and (2) additional control of SO_2 emissions in Texas is needed to prevent interference with measures required to be included in the Oklahoma SIP to protect visibility. The SO_2 controls found in our FIP address in part Texas emissions that interfere with reasonable progress at the Wichita Mountains Class I area in Oklahoma.

As previously discussed, we have allowed states to rely on their approved regional haze plan to meet the substantive requirements of the visibility component of 110(a)(2)(D)(i)(II) because the regional haze plan achieved at least as much emissions reductions as projected by the RPO modeling. As noted previously, the visibility component of interstate transport may be met if it has an approved regional haze SIP that fully meets the requirements of 40 CFR 51.308 or 51.309. 40 CFR 51.308 and 51.309 specifically require that a state participating in a regional planning process include all measures needed to achieve its apportionment of emission reduction obligations agreed upon through that process. We are disapproving the Texas Regional Haze SIP submittal because it does not include all measures needed to achieve Texas' apportionment of emission reductions obligations. We are not disapproving the Texas interstate transport SIP submittals because of our disapproval of the RPGs or projected deciview improvements. We are disapproving it because we are disapproving the Texas' Long Term Strategy because the analysis underlying it was flawed. Because of these flaws, Texas' SIP submittal does not include all the measures necessary to secure Texas' apportionment of the emission reductions needed to meet the progress goal that should account for all reasonable control measures for the Wichita Mountains and the two Texas Class I areas. See elsewhere our other responses to comments concerning consultation.

Comment: [Anonymous (0046) p.1] The commenter stated that throughout the proposed rule, EPA Region 6 consistently refers to Clean Air Act Section 110(a)(2)(D)(i)(II) (prongs 3 and 4) as the "good neighbor" provisions when addressing visibility requirements. This is inconsistent with EPA's past informal naming convention that indicate Section 110(a)(2)(D)(i)(I) (prongs 1 and 2) is the "good neighbor" provision. Examples of this include EPA's own website, www.epa.gov/airtransport, and EPA's Jan. 22, 2015 memo from Stephen Page, both describe the "good neighbor" provision as (D)(i)(I) and not (D)(i)(II). The commenter suggested that EPA Region 6 change the description throughout the final rule, when issued, so that only prongs 1 and 2 are the "good neighbor" provisions so as to eliminate any confusion between contribution to nonattainment and interference with maintenance (prongs 1 and 2 - the "good neighbor" provisions) and interference with PSD and visibility requirements (prongs 3 and 4).

Response: We agree that EPA Region 6 and other EPA offices have not been consistent when referencing the Clean Air Act "good neighbor" provisions. In our August 15, 2006 guidance memo "Guidance for State Implementation Plan (SIP) Submissions to Meet Current Outstanding Obligations Under Section 110(a)(2)(D)(i) for the 8-Hour Ozone and PM2.5 National Ambient Air Quality Standards" we referred to the "good neighbor" provisions as those covering all four requirements (or prongs) in CAA sections (D)(i)(I) and (D)(i)(II) (http://www.epa.gov/ttn/naaqs/aqmguide/collection/cp2/20060815_harnett_final_section_110(a)(2)(D)(i)_guidance.pdf). The final rule does not use the term "good neighbor", but instead refers to the interstate visibility transport requirement of CAA 110(a)(2)(D)(i)(II).

Comment: Transport [ODEQ (0079) p. 2] ODEQ supports EPA's proposed remedy to address the impacts of anthropogenic emissions from Texas. The Texas and Oklahoma SIPs agree that transport of air pollutants from Texas causes the majority of visibility impairment at Oklahoma's Class I Area so the emission reductions from Texas sources should be the most effective means to improve visibility in the Wichita Mountains. However, ODEQ noted that it is ironic that the CAA and EPA regulations justify more stringent actions to protect visibility by reducing transport than they do to protect public health under the ozone NAAQS by preventing the transport of ozone and ozone precursors to our downwind state during ozone season. While all areas in Oklahoma are currently designated attainment/unclassifiable, ODEQ special studies of ozone concentrations in counties along the Texas border demonstrate those areas are significantly impacted by transport from Texas.

Response: We appreciate ODEQ's support of our proposed remedy. ODEQ's comments concerning requirements for the ozone NAAQS are outside the scope of this rulemaking.

17. Disapproval of the Oklahoma and Texas Reasonable Progress Goals

Comment: [ODEQ (0079) p. 1] The ODEQ stated that it understands and expects that no emission reductions or other additional steps will be required of sources in Oklahoma under EPA's proposed FIP. Oklahoma firmly believes that further additional reductions from sources in Oklahoma are not needed, and if EPA makes such a determination, Oklahoma expects that EPA will accept comment on such a finding in a proposed rule.

Response: The commenter's understanding that no additional emissions reductions are required from sources in Oklahoma under our proposed FIP is correct. Our final FIP does not impose requirements on any sources in Oklahoma.

Comment: EPA Must Disapprove Oklahoma's RPGs. [Earthjustice (0067) p.25] Earthjustice et al., stated that the EPA's proposed disapproval of Oklahoma's RPGs for Wichita Mountains, *see* 79 Fed. Reg. at 74,864-73, is proper and required by the Clean Air Act. Oklahoma set RPGs for the Wichita Mountains that do not reflect any reasonable emission reductions from Texas beyond those that will be achieved by compliance with other requirements of the CAA. Under Oklahoma's RPGs, the Wichita Mountains would not have achieved natural visibility until 2102–nearly four decades after the 2064 goal set forth in the Regional Haze Rule. *Id. at* 74,865. This rate of progress cannot be characterized as "reasonable progress" toward the statutory goal of remedying any existing visibility impairment, especially because the record is clear that control measures satisfying the four reasonable progress factors are available for some of the largest sources of visibility impairment at Wichita Mountains, yet Oklahoma's RPG does not reflect installation and operation of these reasonable controls. Accordingly, EPA properly disapproved Oklahoma's inadequate and unreasonably delayed progress goals.

Earthjustice et al., stated that Oklahoma's RPGs also failed to satisfy the Regional Haze Rule because Oklahoma did not consult with Texas adequately. Texas coal plants, such as Big Bend [sic] and Monticello, are the worst sources of visibility impairment at Wichita Mountains. The visibility impairment caused by these Texas sources is far greater than the visibility impacts of Oklahoma's own sources. *Id. at* 74,866-67. In order to engage in a meaningful consultation, an upwind state such as Texas must provide other states with sufficient technical information detailing the visibility impacts of individual sources and the feasibility and cost-effectiveness of control measures on those sources. A downwind state such as Oklahoma must take a hard look at this information and request that upwind states require the control measures that satisfy the four factors laid out in the statute for making reasonable progress.[32] As EPA explained, the consultation process must "ensure that all states, including downwind states, take a hard look at what measures are necessary for ensuring reasonable progress towards improving and maintaining visibility at Class I areas." *Id. at* 74,867.

Earthjustice et al., stated that, because Texas did not provide Oklahoma adequate information, EPA correctly concluded that Oklahoma should have requested that Texas further investigate control measures on these sources and require appropriate control measures. *Id. at* 74,867, 74,871. Earthjustice et al., strongly supported EPA's conclusions as to what constitutes a proper and meaningful consultation under the regional haze program. Given the regional, interstate nature of regional haze, it is imperative that states substantively consult with each other and set reasonable progress goals based on sources in other states installing control measures that meet the four factors for reasonable progress.[33] Oklahoma did not do so here and, therefore, EPA has no choice but to disapprove the state's RPGs.

<u>Footnotes</u>:

[32] The reasonable progress goals must be based on measures that will result in natural visibility conditions by 2064, unless the state demonstrates, based on a consideration of the four reasonable progress factors, that achieving the 2064 goal is unreasonable and the alternative goal is reasonable. 40 C.F.R § 51.308(d)(1)(ii).
[33] As mentioned above, the reasonable progress goal for each area must ensure that natural visibility conditions are achieved in 2064, unless the state demonstrates that this is unreasonable and an alternative goal that makes slower progress is reasonable. 40 C.F.R 51.308(d)(1)(ii).

Response: We appreciate the commenter's support of our proposed disapproval of Oklahoma's RPGs for the Wichita Mountains and of our proposed disapproval of the consultations between Oklahoma and Texas to address the impact of emissions from sources in Texas at the Wichita Mountains. We assume that the reference above to Big Bend in the sentence "Texas coal plants, such as Big Bend and Monticello, are the worst sources of visibility impairment at Wichita Mountains" actually refers to Big Brown.

Comment: [Luminant (0061) p. i and 1] Luminant stated that EPA should withdraw its proposal and instead fully approve Texas's and Oklahoma's regional haze SIPs. Luminant stated that there is no legal or technical basis for EPA's proposed FIP because the SIP submitted by Texas fully complies with the statute and all regulatory standards. According to Luminant, the Clean Air Act's regional haze program is about making reasonable incremental improvements to visibility at national parks and certain other federal areas—it's not about what is purported to be technologically possible or achieving alleged potential health benefits. Here, even though the visibility goals EPA proposes for Texas and Oklahoma are already being met—as evidenced by real-world monitoring data—EPA's proposal would require Texas to spend $2 billion for what EPA projects would be no perceptible improvement in visibility. On every level, EPA's proposal exceeds the agency's authority under the Clean Air Act and EPA's regional haze regulations. As explained elsewhere in their comments, Luminant stated that EPA's proposal suffers from many fatal legal and technical flaws, including:

1. EPA ignores state primacy
2. EPA is applying an unlawful standard to Texas
3. EPA's methodology is contrary to the Clean Air Act
4. EPA invents new requirements for Texas sources
5. EPA arbitrarily disapproves the consultation between Oklahoma and Texas
6. EPA's proposal is unnecessary and outside of its authority because EPA's visibility goals have already been achieved
7. Texas sources have negligible impacts under EPA's own thresholds
8. EPA's proposal would achieve no detectable change in visibility
9. EPA treats Texas differently than every other CSAPR state
10. The costs of EPA's proposal are extreme and unjustified
11. EPA's proposal exceeds its regulatory authority

Response: We address these general comments in our responses to more specific comments elsewhere in this document.

Comment: Luminant provided a summary of EPA's proposed disapproval of Texas's and Oklahoma's RPGs. [Luminant (0061), p. 43] Based on its unprecedented and fatally flawed "additional analysis," EPA proposes to disapprove Texas's RPGs for Big Bend and Guadalupe Mountains, Texas's long-term strategy, and Oklahoma's RPGs for Wichita Mountains. EPA agrees with Texas's conclusion "that it is not reasonable to provide for rates of progress at … Big Bend or the Guadalupe Mountains that would attain natural visibility conditions by 2064 (i.e., the URP)" and that a "slower rate of progress is reasonable."[307] EPA also does not find error in Texas's assessment of any of the four factors, but instead claims that "TCEQ's analysis is insufficient to determine the visibility benefit of controlling the source or subset of sources with the most effective controls for improving visibility conditions," although EPA fails to point to any regulatory requirement to do so.[308] As to Oklahoma, EPA does not take issue with Oklahoma's four-factor analysis, but instead proposes to "reset Oklahoma's RPGs based on our [Texas small group] analysis."[309]

As to the RPG for the Wichita Mountains, EPA finds that disapproval is necessary because "the RPGs selected by the ODEQ for the Wichita Mountains do not include" the emission reductions from the "SO_2 BART FIP and the revised BART SIP for the AEP units" that have subsequently been imposed.[310] However, EPA's proposed FIP does not correct this error, nor does EPA calculate or model visibility conditions in 2018 at Wichita Mountains with the BART controls in place. EPA also finds that, even though Oklahoma "did not request that the TCEQ further investigate" emission reductions from certain sources, Texas somehow "denied [Oklahoma] the knowledge it needed—the visibility impacts of individual sources in Texas with the largest potential to impact the visibility at the Wichita Mountains and the extent to which cost-effective controls were available—in order to properly construct its RPG for the Wichita Mountains."[311]

EPA then attempts to "quantif[y]" new RPGs for the three Class I areas.[312] EPA "quantif[ies]" the new RPGs using "the results of our reasonable progress analysis of point sources as described in detail in our FIP TSD."[313] However, in doing so, EPA does not use the visibility modeling from ENVIRON or its own unit-level quantification of benefits that were used to justify the controls EPA determined to impose in its FIP. Nor does EPA model the visibility conditions in light of the recently finalized BART requirements on Oklahoma sources. Instead, EPA reverts back to the original CENRAP modeling used by Texas and Oklahoma to quantify the states' original RPGs. EPA apparently subtracts from the 2018 CENRAP projection the so-called visibility improvement that EPA separately estimated (under different modeling) from the controls it would impose on Texas sources by 2018. EPA cites no other examples of states or EPA calculating an RPG in this manner. Moreover, in their total aggregate effect, these so-called improvements in visibility from the controls EPA is mandating are even smaller than when viewed at the unit level. In other words, the individual visibility benefit that EPA modeled for each controlled unit (which forms the basis for EPA's decision to regulate) ***overstates*** the overall benefit that would actually be achieved in reality at each Class I area in 2018.

The differences between the states' RPGs and EPA's proposed RPGs are miniscule (0.03, 0.04, and 0.14 dv for Big Bend, Guadalupe mountains, and Wichita mountains, respectively).[314] EPA only proposes new RPGs for the 20% worst days for these areas, but not for the 20% best days.[315]

Footnotes:
[307] Id. at 74,887.
[308] Id. at 74,841.

[309] Id. at 74,889.
[310] Id. at 74,871.
[311] Id. at 74,871, 74,873.
[312] Id. at 74,886.
[313] Id.
[314] Id. at 74,887, tbl.43.
[315] See id. at 74,887.

Response: We acknowledge the background information provided by the commenter. We take no position with respect to the commenter's synopsis. We address these comments in our responses to more specific comments elsewhere in this document.

Comment: [TCEQ/PUCT (0056) p. 9] The TCEQ agreed with the EPA's proposal to find that Texas' submission meets the requirements of §51.308(d)(1)(iv) regarding reasonable progress goal minimum and state consultations for the two Texas Class I areas.

Response: We appreciate the TCEQ's support of our proposed determination that the regional haze SIP submitted by Texas meets the reasonable progress goal minimum requirement of section 51.308(d)(1)(vi) and the consultation requirement of section 51.308(d)(1)(iv). We are finalizing this determination.

Comment: [TCEQ/PUCT (0056) p. 9-10] The TCEQ stated that the EPA's proposed disapproval of Texas' RPGs and its substitution with new RPGs in the proposed FIP is based on EPA's flawed interpretation of what the CAA requires for "reasonable progress goals." This action is based on the EPA's conclusion that "reasonable progress" must be determined based on source-specific cost of controls even though such a requirement did not exist in the statute, the RHR, or the guidance available in 2009.

The TCEQ noted that the Texas 2009 RH SIP established RPGs for both Big Bend and Guadalupe Mountains that provide for visibility improvement for the most impaired days over the period of the SIP and ensure no degradation in visibility for the least impaired days over the same period. The EPA agrees the SIP meets these requirements. The EPA also agrees that the TCEQ considered the four statutory factors in establishing the RPGs for its Class I areas, in accordance with the RHR. The RHR requires states to establish RPGs that " .... must 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"(§51.308(d)(1)). The four statutory factors in subparagraph (i) are factors the state must consider in developing the RPGs. These factors in and of themselves do not determine the reasonableness of the goals for the planning period. The RHR, in 40 CFR 51.308((d)(1)(iii), requires the EPA to evaluate whether the state's goal for visibility improvement provides for reasonable progress based on a demonstration of which the four statutory factors are only one element.

Response: The CAA requires that the implementation plan for a State contain such emissions limits, schedules of compliance, and other measures "as may be necessary to determine reasonable progress." The CAA additionally dictates the factors that shall be taken into consideration in determining reasonable progress. The recitation of those factors does not make approvable an unsound analysis and demonstration, which is the case here. To the extent the comment means to assert that meeting the terms of 51.308(d)(1) can justify a flawed or weak demonstration and analysis of reasonable progress under the statutory factors, we disagree. The comment's citation to 40 CFR 51.308(d)(1)(iii) in fact reinforces our position that we have the task of "evaluating the demonstrations developed by the State." In so doing, we have the authority to disapprove any demonstration that is not approvable and fails to meet the requirements, which again is the case here. The bases for partial disapproval of the SIP were detailed in our proposal and have been elaborated on at length in the responses we offer to more specific comments. We do not agree with the comment's assertion that our action is based on a particular conclusion regarding "source specific costs of controls," rather than the SIP's failure to meet CAA requirements, and we offer more detailed responses to comments on "source specific" approaches and costs locatable in several sections of this document.

See our specific responses to the other comments elsewhere in this document.

Comment: [AEP (0055) p. 2] AEP stated that the EPA has provided new guidance with its "interpretations" that fails to demonstrate that the Texas and Oklahoma SIPs do not represent reasonable progress; especially given the length of time to achieve the goal by 2064. EPA also fails to take into consideration recent information, the TCEQ's 2014 Five-Year Regional Haze SIP Revision or the effects of early action or emission reduction accomplished or to be accomplished by other EPA programs before imposing additional requirements beyond the state submitted SIPs. Considering that the visibility improvements of these programs have not yet been quantified, and the gradual progress anticipated in establishing such a long term goal, EPA should be patient and not take such aggressive action in overriding reasonable state SIPs and imposing additional controls. EPA's actions are not timely and will not be realized during the progress planning period and are therefore unlawful.

Response: We discuss AEP's comment regarding "new guidance" and "interpretation" in this document in the sections where we discuss our Clarified Interpretation of the Reasonable Progress and Long-Term Strategy Requirements, as well as our final action. We disagree with AEP's contention that we have failed to demonstrate that the Texas and Oklahoma SIPs do not represent reasonable progress. Our rationale for why the RPGs established by Texas and Oklahoma do not represent reasonable progress was presented in our proposed rule and is discussed further in this document. AEP points to "the length of time to achieve the goal by 2064," in support of its contention that the Texas and Oklahoma SIPs represent reasonable progress. It is not clear what point AEP intended to make with this statement, but in so far as it is contending that 2064 is far enough into the future that there will be sufficient time to achieve progress in future planning periods such that there is no need to require additional controls for Texas sources in this planning period, we remind the commenter that under the Texas and Oklahoma RH SIPs, Texas and Oklahoma Class I areas are not on the glide path to achieve the national goal of natural visibility conditions by 2064 as calculated by the respective states. Texas calculated that under the rate of progress it selected as reasonable, it would attain natural visibility conditions at Big Bend in 2155 and at the Guadalupe Mountains in 2081. Oklahoma calculated that under the rate of progress it selected as reasonable, it would attain natural visibility conditions at the Wichita Mountains in 2102. Therefore, we disagree that the amount of time available to achieve the national goal of natural visibility conditions justifies full approval of the Texas RH SIP and the remaining portions of the Oklahoma RH SIP.

With regard to the TCEQ's 2014 Five Year Progress Report SIP revision, we stated in our proposal that the TCEQ submitted the first five-year report in March 2014, but we are not including our analysis of that SIP revision within this action.[641] The five-year progress report is a requirement that is separate from the regional haze SIP required for the first planning period as well as the subsequent planning periods, and it has separate content and criteria for us to review. We therefore believe we are not obligated to consider or take action on the five year progress report at the same time we take action on the regional haze SIP for a planning period, such as this Texas regional haze SIP for the first planning period. Even so, we acknowledge that recent monitoring data from IMPROVE monitors indicates that the five-year average measurements of visibility extinction at Texas and Oklahoma Class I areas on the 20% worst days are lower (*i.e.*, indicate better visibility conditions) than the numerical RPGs we are establishing for these Class I areas. This is addressed in detail elsewhere in this document. Notwithstanding the greater than anticipated visibility improvement that has taken place at Texas' and Oklahoma's Class I areas, we continue to hold that the states' RPGs are not approvable because the states have not demonstrated that their RPGs constitute reasonable progress based on reasonably considering the four reasonable progress factors under section 51.308(d)(1). We remind the commenter that the RPGs, unlike the emission limitations that apply to specific sources with BART requirements and reasonable progress requirements, are not directly enforceable. Rather, the RPGs are an analytical tool used by EPA and the states to evaluate whether measures in the SIP are sufficient to achieve reasonable progress. As discussed in more detail in our proposal and in our final action, Texas has not satisfied all the requirements under section 51.308(d)(1) and (3) in determining whether additional controls for Texas sources are reasonable. We continue to hold that the emission limitations we are establishing for specific sources in Texas in our final action's FIP constitute reasonable progress for this planning period and were arrived at in accordance with the CAA and the regional haze regulations. As discussed in our proposal and in the TSD associated with it, we estimated the revised numerical RPGs for the 20% worst days in 2018 for Texas' two Class I areas and Oklahoma's Class I area to reflect the additional anticipated visibility benefit from the controls in our FIP that will be in place by 2018.[642] We did not conduct additional photochemical modeling to calculate the revised RPGs, but instead we adjusted the 2018 RPGs established by Texas and Oklahoma that were based on the CENRAP modeling projections for 2018. We recognize that the RPGs we calculated are not as refined as they would be had we conducted photochemical modeling to estimate them. We discuss this issue in greater detail in the modeling responses elsewhere in this document.

We disagree with the commenter's contention that we should not impose additional controls on Texas sources due to potential visibility improvements that have not yet been quantified resulting from early actions and emission reductions accomplished or expected to be accomplished through other EPA programs. If it is determined based on the demonstrations developed pursuant to section 51.308(d)(1)(i) and (d)(1)(ii) that there are reasonable and cost-effective controls available that would provide for reasonable progress, the statute and regional haze

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[641] 79 FR 74864

[642] 79 FR 74886.

regulations do not allow for a delay in requiring these controls to allow time for the quantification and consideration of possible future visibility improvements.

Comments contending that our action is unlawful because it is not timely and the FIP requirements will not be realized during the first planning period are addressed in the document installation of controls beyond the first planning period.

Comment: [TCEQ/PUCT (0056) p. 4] The TCEQ stated that the Texas 2009 RH SIP, as submitted, would ensure more than Texas' proportional contribution to progress toward improved visibility conditions at Wichita Mountains through the first planning period that runs through 2018.

The TCEQ stated that by 2018, Texas' 2009 RH SIP reduces Texas' apportioned contribution to total visibility extinction at Wichita Mountains by more (26.1%) than the reduction from all other states combined (24.5%). Also, Texas' 2009 RH SIP reduces Texas' visibility impairment impact at Wichita Mountains by slightly more than its proportional share of the total baseline visibility impact at Wichita Mountains. Additionally, the CENRAP states were in agreement about the amount of progress that was reasonable at Wichita Mountains during the first planning period.

The TCEQ stated that the EPA's proposed partial SIP disapproval and partial FIP undervalue the effectiveness of the long-term strategy embodied in the Texas 2009 RH SIP. Without presenting evidence, the EPA dismisses the progress made as being due to "meteorological conditions, reduction in the impacts from SO_2 emissions, and a reduction in the impacts from coarse materials" (79 FR 74843). The EPA makes the meteorological assertion in spite of the fact that 2011 was one of the hottest and driest years in Texas history and there were unprecedented wildfires that year. The current visibility conditions in Big Bend, Guadalupe Mountains, and Wichita Mountains are already better than the respective state-established and the EPA-proposed RPG for these three Class I areas.

Response: In support of Texas' 2009 RH SIP, the TCEQ contends that the SIP reduces Texas' apportioned contribution to total visibility extinction at Wichita Mountains by 26.1%, while the total reduction to the apportioned contribution from all other states is 24.5%. We do not believe that the information presented by the TCEQ warrants full approval of Texas' 2009 RH SIP. We discuss in our proposal, in our final rule, and elsewhere in this document why we are partially disapproving the Texas RH SIP and promulgating a partial FIP. Furthermore, we remind the TCEQ that other states individually have a very small baseline visibility impact on the Wichita Mountains, especially when compared to Texas' impact. As a state's individual baseline visibility impact on a Class I area becomes smaller, it is reasonable to expect that it will become more difficult to find emissions reductions in that state that are both cost-effective and result in a sizable improvement in visibility at the affected Class I area. Therefore, it is not unreasonable for the total percent reduction in the apportioned contribution to total visibility extinction at Wichita Mountains from all other states combined to be lower than the percent reduction in Texas' apportioned contribution.

As we discussed in our proposal, both states failed to meet the consultation requirements. See the consultation discussion elsewhere in the document for more information. In summary, Oklahoma had sufficient evidence from the CENRAP analyses to know it should have requested that Texas further investigate controls at certain Texas sources or explicitly request Texas to obtain additional reductions from Texas sources to address the impacts of emissions from these sources at the Wichita Mountains. Because of the Texas flawed LTS analysis investigating controls at certain Texas sources for Wichita Mountains, however, we believe that Oklahoma did not have adequate information to reasonably establish its RPGs for the Wichita Mountains. The record indicates that both Oklahoma and Texas acknowledged during the development of their respective RH SIPs that based upon the CENRAP results, Texas point sources have a significant visibility impact at the Wichita Mountains and that cost-effective controls were likely available for these sources. However, this matter was not pursued further during the consultations between the two states. We discussed in our proposal that there was a lack of development of critical information related to Texas sources during Oklahoma's consultations with Texas and other states.[643] Texas did not provide the information necessary to identify reasonable reductions from its sources, and inform consultations in order to develop coordinated management strategies with Oklahoma. Considering the absence of the development of critical information regarding Texas sources, the states did not have sufficient information to make a reasoned decision about the amount of progress that was reasonable at Wichita Mountains during the first planning period. Regardless of the agreement between the states, the basic intent of the consultation requirements under the RH rule were not met.

Comments contending that current visibility conditions at the three Class I areas are already better than the RPGs established by the states and the RPGs proposed by EPA are discussed in the section where we respond to comments alleging we cannot disapprove the Texas SIP because the RPGs are already being met. Comments contending that we dismiss the progress made as being due to meteorological conditions, reduction in the impacts from SO_2 emissions, and a reduction in the impacts from coarse materials are addressed in the section of this document where we discuss modeling issues.

Comment: No additional controls [on Limestone Units 1 and 2] are needed to assure reasonable progress. [NRG (0078) p. 2] NRG stated that the EPA has proposed to require substantially upgraded SO_2 controls on NRG's Limestone Electric Generating Station Units 1 and 2 on the basis that these controls are necessary to assure reasonable progress in reducing regional haze. NRG believes that such controls are unnecessary to achieve reasonable progress, and are objectively unreasonable. Thus, EPA should not disapprove and replace the reasonable progress goals or impose the additional controls on Limestone Units 1 and 2 contemplated by the proposal.

Response: We discuss the issue of why we have disapproved Texas' reasonable progress and long-term strategy demonstrations in our responses to more detailed comments elsewhere throughout this document. In summary, we believe that Texas's reasonable progress and long-term strategy demonstrations are flawed and must be disapproved. Our own analysis demonstrates that scrubber upgrades to Limestone Units 1 and 2 are cost-effective, will result in

643 79 FR at 74867 and 74871.

significant visibility improvement, and should be included in our FIP in order to address Texas' reasonable progress and long-term strategy.

Comment: The Regional Haze Process Must Be Implemented Reasonably Going Forward. [EEI (0076) p. 2-4] According to EEI, the CAA regional haze program tasks states with determining what is reasonable progress toward elimination of man-made visibility impairment, for which EPA has set a goal of 2064, along with specific progress milestones (10-year planning and SIP revisions, with program reviews in the middle of the 10-year planning periods).[2] The regional haze program contemplates gradual visibility improvements along a "glide path" that considers the 2064 goal, and does not require immediate reductions that exceed making "reasonable progress", as determined by the state based on four statutory factors,[3] in the first planning period through 2018 or in any subsequent planning period. Thus, it neither requires nor authorizes the frontloading of extensive control requirements. Instead, the regional haze program should be implemented in a manner that allows states, through state environmental and electric utility regulators and in conjunction with power companies, to plan the optimal timing of emission control projects. This planning process is vital in order to minimize impacts on the cost and reliable provision of electric power and to allow investment decisions to be made over suitable planning horizons. It is additionally justified given the, at best, minimal visibility benefits EPA claims would be achieved in the proposed rulemaking.

Thus, as EPA and the states begin to implement the next rounds of the regional haze program to continue reasonable progress, EEI suggested that EPA should allow states to consider the timing and scope of additional control activities, consistent with effective long-term utility planning. EPA also must take into consideration the progress already made through the installation of controls to satisfy Best Achievable Retrofit Technology (BART) requirements and BART-equivalent measures such as the Cross-State Air Pollution Rule (CSAPR) and through other CAA regulations that can result in reduced emissions that may contribute to visibility impairment.

Further, EEI noted that it will be necessary to use the most up-to-date and accurate implementation tools available as EPA and the states move forward with the regional haze reasonable progress determinations. To that end, EPA should update both its atmospheric modeling platforms as part of the upcoming Appendix W rewrite and the cost manual in order to support reasonable future assessments of visibility impacts and appropriate control strategies. The Agency should do this consistent with the Consolidated Appropriations Act of 2014. See H.R. 3547, P.L. 113-76. EPA also should consider the latest available visibility monitoring data for Class I areas when assessing potential controls needed to meet RPGs.

Response: EEI's contention that the regional haze program does not require immediate reductions that exceed making reasonable progress as determined by the state based on the four statutory factors is premised on the assumption that the emissions reductions that are part of the state's long-term strategy and upon which its RPGs are based do in fact constitute reasonable progress. We remind the commenter that the determination of what constitutes reasonable progress must be made pursuant to section 51.308(d)(1). Based on its analyses under section 51.308(d)(1), a state (or EPA in the context of a FIP) may determine that a greater or lesser amount of visibility improvement than what is needed to get on the glide path is what constitutes reasonable progress.[644] As discussed in our proposal and our final action, we disagree with the set of potential controls identified by the TCEQ as having the greatest impact on visibility on the three Class I areas and how it analyzed and weighed the four reasonable progress factors in a number of key areas.[645] Therefore, we proposed to disapprove Texas' RPGs for its Class I areas and conducted our own analysis of the four reasonable progress factors to fill in the regulatory gap that would be created by our disapproval action. Based on our analyses under section 51.308(d)(1), we determined what level of control for Texas sources constitutes reasonable progress and proposed this level of control in our FIP proposal. Therefore, we disagree that the level of emissions reductions in the Texas regional haze SIP constitutes reasonable progress and we disagree with the commenter's contention that we are frontloading extensive control requirements for Texas sources, and we explain this in greater detail elsewhere in this document, in our final action, and in our proposal. We are replacing Texas' flawed reasonable progress analysis with our own and are finalizing the cost-effective reasonable progress controls we proposed on the small number of Texas point sources that have the greatest visibility impacts on the Class I areas of interest.

With regard to the comment that the regional haze program should be implemented in a manner that allows for planning the optimal timing of emission control projects in order to minimize impacts on the cost and reliable provision of electric power and to allow investment decisions to be made over suitable planning horizons, the commenter does not specify how the regional haze program should be implemented to allow for such planning. In so far as the commenter is contending that delaying the requirement to install controls at electric utilities until a later planning period would allow for planning the optimal timing of these emission control projects, the CAA and regional haze regulations do not provide for delaying these requirements when it has been demonstrated through our analysis that there are reasonable controls currently available that would be cost-effective and would result in reasonable progress at the affected Class I areas.

We acknowledge the commenter's concerns and suggestions with regard to our and the states' work on the RH SIPs for future planning periods. However, these types of comments are outside the scope of this rulemaking. We agree with EEI that the states and we should always strive to use the most up-to-date and accurate implementation tools available. We provide information concerning this issue in the section of this document where we discuss stay of effective date and the Consolidated Appropriations Act. Comments with regard to the latest available IMPROVE monitor data for Big Bend, Guadalupe Mountains, and Wichita Mountains are addressed in the section where we respond to comments alleging that we cannot disapprove the Texas SIP because RPGs are already being met. Comments on updates to Appendix W and the cost manual are addressed in our responses related to the Consolidated Appropriations Act.

Comment: EPA Failed to Conduct the Same Four Factor Reasonable Progress Analysis for Oklahoma as it Did for Texas.

Luminant stated that EPA fails to even consider the four statutory factors with respect to non-BART sources in Oklahoma that are impacting visibility at Wichita Mountains and to make a

[644] 64 FR 35732
[645] 79 FR 74838

determination of whether additional controls are reasonable for those sources. In its SIP, Oklahoma identified several sources in the states—including EGUs—that were not subject to BART, but that are leading sources of SO_2 emission in the state, including one of the top four point source emitters of both SO_2 and NO_x (Grand River Dam Authority). Luminant submitted the information in the following table:

Q/D Calculations for Three Oklahoma Sources Not Included in EPA's Reasonable Progress Analysis

Facility	SO_2 **Emissions (tpy, 2009)**	**NOx Emissions (tpy, 2009)**	**Distance to Wichita Mountains (km)**	**Q/D for Wichita Mountains**
Grand River Dam Authority (GDRA) (Oklahoma)	18,010.86	14,209.48	350	92.1
Western Farmers Electric Cooperative—Hugo Plant (Oklahoma)	9,709.60	3,207.01	321	40.2
Great Lakes Carbon Corporation (Oklahoma)	3,929.26	558.35	214	21.0

EPA failed to consider the visibility benefit from imposing the same levels of control on these (Oklahoma) sources as it is proposing to impose on the targeted Texas sources, and to determine whether all existing and reasonable controls on Oklahoma sources, including BART, are sufficient to attain a reasonable rate of progress for Wichita Mountains for the first planning period. EPA apparently does not consider it reasonable to regulate these sources, yet their visibility impact may the same as the Texas sources EPA does seek to regulate. According to Luminant, EPA is applying a different standard to Texas sources than it is to sources in other states.

EPA's analysis assumes, but does not demonstrate, that Texas sources are having greater impact at Wichita Mountains than these Oklahoma sources. EPA offers no explanation of why it failed to conduct the modeling and perform the statutory analysis that it would expect a state to conduct in determining a reasonable progress goal. Had EPA not artificially limited its analysis to just a few Texas sources, the likely outcome would be that Texas sources would show the same minimal impact as these Oklahoma sources and other sources that EPA excluded—further demonstrating that additional controls are unreasonable and unnecessary for all, as Oklahoma and Texas concluded. The perceived error in Texas's long-term strategy hinges entirely on EPA's "reset" of Oklahoma's RPG; there is no dispute that Texas's long-term strategy is adequate to meet the RPG as established by Oklahoma.

EPA's "reset" RPG is unlawful. EPA has no basis for disapproving Oklahoma's RPG, no basis for issuing a FIP with a substitute RPG for Wichita Mountains, no basis for disapproving Texas's long-term strategy, and no basis for imposing additional SO_2 limits on Texas sources.

Response:

In previous rulemakings, we partially approved and partially disapproved portions of the Oklahoma Regional Haze SIP.[646] We concurrently approved portions of the SIP and promulgated a FIP that established SO_2 BART emission limits, which would result in emission reductions for six Oklahoma sources,[647] to remedy these deficiencies in the Oklahoma RH SIP. Subsequently, we replaced our FIP for two of the sources with approval of Oklahoma's SIP Revision BART determinations for those two sources. Implementation of the original FIP and the SIP Revision will result in greater reasonable progress and greater emission reductions across these BART sources than was anticipated in Oklahoma's February 19, 2010, Regional Haze SIP submittal.

We also reviewed Texas' analysis of its sources regarding its impacts on surrounding Class I areas and found that Texas did not perform an adequate evaluation under the long-term strategy requirements as required under the Regional Haze Rule (we discuss this in our proposal, TSDs, and in other responses to comments in this document). In our December 16, 2014 proposal, we agreed with Oklahoma that no additional reasonable progress measures for Oklahoma sources were necessary during this first planning period, which is further discussed in this response.

In the February 19, 2010, Oklahoma Region Haze SIP, Oklahoma considered the four statutory factors under Section 51.308(d)(1)(i)(A) in its evaluation of the potential for additional controls. The ODEQ's analysis focused on moderate cost controls for sources likely to contribute to visibility impairment at the Wichita Mountains.

The ODEQ evaluated the major sources of each visibility impairing pollutant within the State. In its analyses of additional SO_2 control, it noted that the three largest sources of sulfur emissions in the State, OG&E Muskogee, OG&E Sooner, and AEP/PSO Northeastern, were subject to BART. ODEQ also evaluated the non-BART EGU sources mentioned by Luminant, the commenter - GRDA Units 1 and 2, Hugo Unit 1, and Great Lakes Carbon Corporation. Oklahoma considered these sources and other sources for additional control under reasonable progress, but concluded that retrofitting additional point sources of NOx and SO_2 would impose unreasonable costs for small visibility improvement, given that many point sources were already being controlled through BART, consent decrees or other regulatory mechanisms; units already had adequate controls in place; or units are located too far from the Wichita Mountains, and therefore have too little visibility impact to

[646] We approved certain core elements of the Oklahoma Regional Haze SIP, including Oklahoma's: identification of sources that are BART eligible and subject to BART; its determination of baseline and natural visibility conditions; its coordination of regional haze and RAVI; monitoring strategy and other implementation requirements; its coordination with States and federal land managers; and a number of the State's NOx, SO_2, and PM BART determinations. We disapproved Oklahoma's submitted SO_2 BART determinations for Units 4 and 5 of the OG&E Muskogee plant; Units 1 and 2 of the OG&E Sooner plant; and Units 3 and 4 of the AEP/PSO Northeastern plant. We also disapproved the long-term strategy in Oklahoma's Regional Haze SIP because it failed to include appropriate, enforceable controls for these six sources. To remedy these deficiencies in the Oklahoma Regional Haze SIP, we promulgated a FIP. (Proposal: 76 FR 16188 (March 22, 2011); Final action: 76 FR 81728 (December 28, 2011)). We subsequently replaced our FIP for two of the sources in the Oklahoma FIP with approval of Oklahoma's SIP revision BART determinations for those two sources. (Approval of Oklahoma's partial replacement for FIP: 79 FR 12944 (March 7, 2014). Partial FIP withdrawal: 79 FR 12954 (March 7, 2014)).

[647] 76 FR 81728.

justify the cost of retrofitting them. For instance, GDRA, by far the largest non-BART source[648], is already partially controlled for SO_2 through flue gas desulfurization. We agreed with this analysis and believe that Oklahoma provided a logical explanation for its approach and reasons for excluding additional Oklahoma sources, including GRDA Units 1 and 2, Hugo Unit 1, and Great Lakes Carbon Corporation. We also noted in our OK TSD that GRDA plans to install low NOx burners and overfire air, and that Unit 1 (which is not scrubbed) is scheduled to be retired or converted to natural gas.[649]

In our December 28, 2011 Oklahoma SIP approval and FIP, we proposed no action on whether Oklahoma satisfied the reasonable progress requirements of our RH SIP requirements found at section 51.308(d)(1). In this current action, we are finalizing our disapproval of Oklahoma's RH SIP that addresses the requirements of Section 51.308(d)(1) to establish reasonable progress goals, except for Section 51.308(d)(1)(vi).[650] Oklahoma's lack of adequate information from Texas prevented it from properly developing its reasonable progress goals for the Wichita Mountains, and we disagree that we are applying a different standard to Texas sources than we are sources in other states. We note that we were not required to do a four-factor analysis for Oklahoma's non-BART sources because, as discussed in our proposal[651] and OK TSD, we reviewed Oklahoma's four-factor analysis for Oklahoma's non-BART sources, and agree with Oklahoma that it has demonstrated that it is not reasonable to require additional emission reductions for those sources for this planning period. We agree with Oklahoma's reasonable progress analysis for sources within Oklahoma and its assessment that the Wichita Mountains would not meet the uniform rate of progress without significant reductions from Texas sources. Because the reasonable progress goals Oklahoma established for the Wichita Mountains does not include appropriate consideration of reductions at Texas sources, we were required by the Regional Haze Rule to disapprove Oklahoma's reasonable progress goals.

We disagree that the visibility impact of the remaining sources in Oklahoma have the same visibility impact as the Texas sources we seek to regulate under the proposal and also disagree that the visibility benefit from imposing the same levels of control on these remaining Oklahoma sources as we propose to impose on the targeted Texas sources is appropriate. The 20% worst days at the Wichita Mountains are dominated by days impacted by emissions from sources in Texas. The largest impacts from sources in Oklahoma rarely occur on the 20% worst days as identified by the IMPROVE monitor data during the baseline period. Texas (all sources and pollutants) is projected to contribute 27.5% of the visibility impairment at the Wichita Mountains in 2018 based on CENRAP modeling that included projected reductions due to CAIR, compared to 16.3% for Oklahoma sources. Texas point sources are projected to contribute 14% of the total visibility impairment, including 7.7% impairment from EGUs across the state and 6.5% from EGUs in the northeast portion of the state. This compares to only 3.9% of the total visibility impairment from all Oklahoma point sources. As we discuss in the OK TSD, we note that the total contribution from SO_2 emission from Oklahoma sources not identified for control is only a fraction of the 1.23 Mm^{-1} projected from all SO_2 point sources, and none of those non-BART

[648] GDRA has nearly twice the SO_2 emissions the Western Farmers Electric Cooperative—Hugo Plant, and nearly five times the SO_2 emissions of Great Lakes Carbon Corporation.
Unit 1.
[649] OK TSD at 26.
[650] 79 FR 74889.
[651] 79 FR 74871

sources are located and have emission levels such that we would anticipate a significant fraction of the 1.23 Mm-1 visibility impairment at the Wichita Mountains on the 20% worst days to be reduced should any one source be controlled.[652] We also note that compared to 1.23 Mm^{-1} impact from all Oklahoma point source SO_2 emissions combined, the individual facility-level impact from Monticello and Big Brown were modeled to be 1.275 Mm^{-1} and 1.169 Mm^{-1}, respectively based on 2018 CENRAP projected emissions.[653] Therefore, controlling one facility in Texas could achieve more visibility benefit on the 20% worst days than controlling all SO_2 emissions from point sources in Oklahoma. Texas sources do not have a minimal impact, compared to the Oklahoma sources regulated in the first planning period and other sources outside of Oklahoma.

In reviewing Oklahoma's analysis of which sources to regulate and the level of control to require of the units, we looked at whether the reductions from the Oklahoma sources were reasonable for this, the first planning period. We note that Oklahoma gained emission reductions from BART sources and those regulated under other CAA programs, and demonstrated that this addressed visibility impacts from the largest emission sources in the state. We further reiterate that RPGs are interim goals that represent incremental visibility improvement over time toward the goal of natural background conditions. We calculate[654], that for the planning period ending in 2018, our FIP evaluated and addressed controls for 41% of Oklahoma's total 2002 SO_2 budget of 170,021 tons and 66% of Oklahoma's point source emissions.[655] Considering the high control levels resulting from the installation of scrubbers on the six EGU units in our FIP, we consider this level of control adequate for reasonable progress for the first planning period.

Given the large contributions of visibility impairing emissions from sources outside of Oklahoma, particularly from Texas EGUs, Oklahoma stated that it would be unreasonable to require severe or over-control of Oklahoma sources to compensate and that to meet the URP it would have to consider emission reduction measures available for those sources in Texas that contribute the most to visibility impairment at Wichita Mountains. We agreed with this analysis, and the fact that Oklahoma addressed the visibility impairment from its largest sources in the first planning period.

Note that, as described in other sections of this document, as the controls envisioned during this planning period are adopted, the percentage impact from those facilities not controlled in Oklahoma will become larger (on a percentage basis) and will be analyzed in future planning periods. In other words, some of the facilities in Oklahoma that were not controlled in the first planning period will become the largest impacting sources in the next planning period and should be analyzed for additional reasonable controls. This methodology allows a consistent procedure to identify facilities for additional control analysis in this and future planning periods and ensures continuing progress towards the goal of natural visibility conditions.

In summary, we agree with Oklahoma's reasonable progress analysis for sources within Oklahoma and its assessment that the Wichita Mountains would not meet reasonable progress and the URP without significant reductions from Texas sources. For these reasons stated above, and others that

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[652] OK TSD at 26.
[653] FIP TSD table A.4-1a
[654] See the file, "OK FIP percent EGU control.xlsx," in our docket.
[655] Note that the actual reduction will be slightly lower than 41% because of the Oklahoma SIP revision which changes the controls for two facilities slightly from the EPA Oklahoma SO_2 FIP.

EPA explored more fully in the TSD for this FIP proposal, we believe that Oklahoma has adequately controlled its own sources for reasonable progress to the extent necessary for this planning period. The SO_2 reductions made by Oklahoma in the first planning period are substantial and the reasoning underpinning that decision is valid. Reductions from Texas facilities are needed in order for Oklahoma to make reasonable progress in the Wichita Mountains. We also note that there were many sources in Texas that we did not require to be additionally controlled in the first planning period. Thus, we disagree that we are applying a different standard to Texas sources than we are sources in other states.

Our resetting the reasonable progress goal is lawful and legally necessary because we are disapproving Oklahoma's RPG for the Wichita Mountains. Because Oklahoma's analysis in its original SIP submittal did not take into consideration the emissions reductions from certain BART facilities needed to satisfy the BART requirements under Section 51.308(e), the RPG Oklahoma established in its RH SIP was flawed. We remedied this deficiency through setting SO_2 BART emission limits for six facilities in a final action dated December 28, 2011. In addition, because we disapproved Texas' LTS evaluation, we were under a statutory obligation to evaluate Texas sources and propose a FIP for those facilities where we determined that reasonable emission controls could be installed for improved visibility benefit. Because the reasonable progress goals Oklahoma established for the Wichita Mountains do not include appropriate consideration of reductions at Texas sources, we were required by the Regional Haze Rule to disapprove Oklahoma's reasonable progress goals. We recalculate new reasonable progress goals for 2018 for the Wichita Mountains based on the results of our technical analysis that additional controls at Texas sources were reasonable to meet the reasonable progress/long-term strategy requirement for reasonable progress and accounting for the visibility benefit of the required controls anticipated to be in place by 2018. We discuss our disapproval of the Texas Regional Haze SIP in more depth elsewhere in this document. We discuss comments concerning our calculation of the RPG in the section of this document where we respond to comments concerning modeling issues.

18. International Emissions

Comment: [Luminant (0061) p. 42] Luminant provided background on the May 2006 Alpine Geophysics control strategy analysis, *CENRAP Regional Haze Control Strategy Analysis Plan 1*.

Luminant noted that in February 2006, CENRAP contracted Alpine Geophysics, LLC ("Alpine") to assist in developing and evaluating potential emission control strategies. Alpine was specifically charged with developing a quantitative procedure to identify and prioritize potential regional haze control strategies to be tested by CENRAP modelers. Alpine used a three-step process: (1) assembling available information useful in quantifying the reductions in fine particulate aerosol concentrations needed to satisfy CENRAP's preliminary regional haze visibility projections; (2) developing Areas of Influence (AOIs) upwind of each Class I area within which common "visibility precursor-Class I receptor" impacts could be aggregated into similar groupings; and (3) synthesizing the first two steps together with information in the estimated 2018 CENRAP emissions inventory and the cost-effectiveness of various controls, to deduce a prioritized set of regional haze control strategies containing elements of both regional emissions reductions and targeted reductions within the AOIs closest to those six CENRAP

Class I areas for which positive visibility increments were estimated. As part of the analysis, Alpine also developed a four-factor reasonable progress analysis for the states' consideration.

Luminant stated that Alpine concluded that "as a result of the implementation of the list of additional point and area source controls in the each primary AOI," Texas's Class I areas "will be unable to achieve a level of emissions reduction necessary to bring these areas under the glide slope by 2018 using the identified control strategy definitions." (2006 Alpine Report at 43)

Response: The EPA acknowledges the background information provided by the commenter. We take no position with respect to the commenter's synopsis.

Comment: [Luminant (0061) p. 42, 100; CCP (0075) p. 2, 13-14; NRG (0078) p. 6; AECT (0074) p. 8-9; Xcel Energy (0064) p. 14-21; Alpine (0078) p. 22] Multiple commenters stated that EPA acknowledged, but arbitrarily and capriciously failed to account for international sources of emissions that Texas cannot control and which render EPA's proposal ineffective in improving visibility to meet the URP and 2064 goal. The commenters objected to EPA's proposal that would require over-control of Texas sources to compensate for international emissions.

Luminant noted that the 2006 Alpine Report developed for CENRAP concluded, "regardless of the emissions reduction achieved by CENRAP with the available source category and technology applications, there still is an emissions component which is directly out of their control." (2006 Alpine Report at 44)

Multiple commenters noted that, as recognized by EPA, CENRAP's Particulate Matter Source Apportionment Technology (PSAT) modeling analysis indicates that emissions from Mexico and other countries south of the U.S. contribute 52% of the visibility impairment at Big Bend and 25% of the visibility impairment at the Guadalupe Mountains.[25] (Texas SIP ES-2; 2009 Texas SIP Narrative at 10-9; 79 Fed. Reg. 74,843) In comparison, ***all*** Texas EGUs ***together*** contributed only 4.5% at Big Bend[26] and 4.1% at Guadalupe Mountains. (FIP TSD at A-29 to A-30.) Luminant noted, accordingly, Texas found, the "national goal of visibility at these Class I areas cannot be met without substantial reductions in emissions from outside the United States." (2009 Texas SIP Narrative at 10-10.)

Several commenters noted that EPA concludes that "emissions and transport from Mexico and other international sources will limit the rate of progress achievable" by Texas and concludes that efforts to meet the goal of natural visibility by 2064 "would require further emissions reductions not only within Texas, but also large emission reductions from international sources." 79 Fed. Reg. 74,843 (emphasis added).

Xcel Energy stated that if TCEQ cannot meet the glide path without "large emission reductions from international sources," it is unreasonable for EPA to require additional controls from Texas without making any effort to seek emissions reductions from international sources. EPA is proposing to impose on American companies and American ratepayers the burdens of compliance with the FIP while allowing other countries to avoid any responsibility for their contributions to visibility impairment in Class I areas.

Xcel Energy stated that, while EPA "agree[d] with the TCEQ that a rate of improvement necessary to attain natural visibility conditions by 2064 is *not reasonable,"* EPA did not "believe that the rate of improvement the [TCEQ] has selected is reasonable" and disagreed with TCEQ's "analysis of emission measures needed to meet the URP." 79 Fed. Reg. at 74,843 (emphasis added). In other words, EPA agreed that Texas reasonably concluded that it could not meet its "glide path" for this planning period. Nonetheless, EPA disapproved of TCEQ's analysis for failing to adequately consider additional controls to further increase its rate of improvement. Yet EPA fails to account for the substantial contributions from international sources in making this determination. And because Texas cannot be required to over-control in-state sources to make up for international contributions, EPA's failure to adequately consider international sources in its disapproval of Texas' RPG analysis is patently unreasonable.

Xcel Energy stated that over-control of in-state sources due to international contribution is exactly what EPA proposes to require from Texas. EPA has stated that "[t]he glide path is not a presumptive target, and States may establish a RPG that provides for greater, lesser, or equivalent visibility improvement as that described by the glide path." RPG Guidance, at 1-3.

NRG and AECT stated that Texas sources' relative contributions are expected to shrink in the future at the same time that the international contribution rises. Even as Texas SO_2 emissions decline in the next few years, EPA has projected that SO_2 emissions from Mexico will increase by 26% from 2012 to 2030.[27] (2015 Alpine Report submitted with comment 0078 at 28-31). NRG and AECT noted that, even if the contributions of the SO_2 emissions from the Texas EGUs to visibility impairment at the Class I areas were eliminated, visibility improvements in those areas are not likely due to the significant contribution of emissions from sources in Mexico and other countries south of the United States to visibility impairment at such areas. Thus, it is unreasonable for EPA to ignore the impact of emissions from international sources and require additional SO_2 emissions controls for the identified Texas EGUs (such as Limestone Units 1 and 2) to achieve reasonable progress.

Footnotes:
[25] "Technical Support Document for the Texas Regional Haze State Implementation Plan" (November, 2014), Table 15
[26] Id., Figures 6 and 8
[27] "Developing Mexico National Emissions Inventory Projections for the Future Years of 2008, 2012, and 2030" (Martinus E. Wolf, et. al.)

Response: We agree with the commenters that international emissions significantly impact visibility conditions at Big Bend and Guadalupe Mountains. However, as we discussed in the preamble to the RHR, "the States should not consider the presence of emissions from foreign sources as a reason not to strive to ensure reasonable progress in reducing any visibility impairment caused by sources located within their jurisdiction."[656] While the goal of the regional haze program is to restore natural visibility conditions at Class I areas by 2064, the rule requires only that reasonable progress be made towards the goal during each planning period,

[656] 64 FR 35755 (July 1, 1999)

and in cases where it is not reasonable to meet the rate of progress needed to attain the goal in 2064, that the State demonstrate that it is not reasonable and that the selected rate of progress is reasonable for that planning period. We recognize that it may not be possible to attain the goal by 2064, or at all, because of impacts from new or persistent international emissions sources or impacts from sources where reasonable controls are not available. However, states are still required to demonstrate that they are establishing a reasonable rate of progress that includes implementation of reasonable measures within the state to address visibility impairment in an effort to make progress towards the natural visibility goal during each planning period.

The CAA has the goal of natural conditions, but does not have any date or requirement for plans to demonstrate achievement of that goal, only reasonable progress towards it. The EPA rule reiterates the CAA goal, and provides for the use of an analytical framework that compares the rate of progress that will be achieved by a SIP to the rate of progress that if continued would result in natural conditions in 2064. The EPA rule also reiterates the CAA requirement for reasonable progress in reaching natural conditions, but it does not establish a requirement that natural conditions be reached in 2064. We have approved a number of SIPs for the first planning period that have projected that continued progress at the rate expected to be achieved during that first period would not result in natural conditions until a date after 2064.

We disagree that our action requires "over control" of Texas sources. Our action requires the control of particular Texas sources that due to their own emissions were impacting the visibility at Texas and/or other state Class I areas. Our determination of reasonable controls is based on consideration of the four–factors and the visibility benefit of controls in reducing the visibility impairment from Texas sources for this first planning period. Comments concerning EPA's efforts to address international emissions are addressed in a separate response to comment in this section.

Nothing in the Regional Haze Rule or our FIP is calculated to hold Texas accountable for emissions from Mexico. We agree those international emissions should be addressed to achieve natural visibility, but our agreement on this point does not in any way relieve Texas of the obligation to make reasonable progress, including through controls on its own sources, and particularly through the emissions addressed with controls through our FIP. As we and the commenters note, "emissions and transport from Mexico and other international sources will limit the rate of progress achievable" by Texas and efforts to meet the goal of natural visibility by 2064 "would require further emissions reductions not only within Texas, but also large emission reductions from international sources." We agreed with Texas that it is not possible to meet the rate of progress to attain natural visibility conditions by 2064, and that it was reasonable to adopt a RPG that provides for a slower rate of improvement in visibility, in part due to the significant impact from international emissions. However, Texas is required to demonstrate based on the four-factors that the rate of progress adopted by the State is reasonable, and as we stated further emission reductions within Texas are needed to make progress towards the goal of natural visibility. As we discuss in depth elsewhere, Texas's four-factor analysis was flawed. The size of the impact from international emissions in no way relieves Texas of the requirements of the RHR to consider the four factors and evaluate controls for addressing visibility impairment due to Texas sources and making reasonable progress towards the goal of natural visibility conditions. In our action, we are requiring controls based on our evaluation of the four-factors and consideration of visibility benefits for those individual sources with the largest visibility impacts at Texas' Class I areas and/or Wichita Mountains. We are not, as the commenter suggests, requiring "over control" or requiring unreasonable controls in order to somehow compensate for the impact from international sources.

Estimated international emissions from all sources are included in our modeling and the modeling performed by CENRAP. The CENRAP source apportionment results provide estimates of the contributions for Texas sources, sources in other States, and those international sources outside of the jurisdiction of Texas and nearby states.[657] This information was utilized in Texas' and our consideration of whether or not it was reasonable to attain the URP, and in consideration of the amount of visibility impairment that could potentially be addressed by each contributing region. The CENRAP 2018 projections estimated that approximately 9% and 8% of the total visibility impairment at Guadalupe Mountains and Big Bend, respectively, were due to emissions from Texas point sources. Our additional analysis and modeling in support of this action shows that a significant portion of that visibility impairment can be addressed by controlling a small number of facilities through the use of cost-effective controls. For Big Bend, the required controls address 1.88% of the total visibility impairment and 23.4% of impact from all Texas point sources (based on 2018 CENRAP projected emission levels). Controls on Coleto Creek alone addresses approximately 6% of the total Texas point source impact. For Guadalupe Mountains, the required controls address 2.22% of total visibility impairment and 25.74% of impact from all Texas point sources (based on 2018 CENRAP projected emission levels). Controls on Tolk alone addresses nearly 8% of the total Texas point source impact. We also note that the required controls address 5.8% of total visibility impairment and 41.4% of the impact from all Texas point sources (based on 2018 CENRAP projected emission levels) at Wichita Mountains. Each of the required controls result in significant visibility benefit at one or more Class I areas.

The RHR addresses situations where increases in emissions from other countries prevent Class I areas from achieving the established reasonable progress goals. The five-year progress report requires states to assess the adequacy of their regional haze SIP.[658] If the state determines at that time "that the implementation plan is or may be inadequate to ensure reasonable progress due to emissions from sources in another country, the State shall provide notification, along with available information, to the Administrator."[659] However, any anticipated increases in emissions of international sources do not render it unnecessary for the state to implement reasonable controls to address the visibility impairment due to their own sources.

Comment: [Luminant (0061) p. 100; CCP (0075) p. 2, 13-14; NRG (0078) p. 6; AECT (0074) p. 8-9; Xcel Energy (0064) p. 14-21; AECOM (0061 and 0075) p. 5-1] Several commenters argued that EPA has not upheld its duty to seek emissions reductions from international sources.

AECOM stated that international emissions play a significant role in visibility conditions for the Texas Class I areas. As a result, TCEQ has requested assistance from EPA in addressing

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[657] See Figures 6, 7, 8 and 9 of the TX TSD for CENRAP source apportionments for all sources and point sources.
[658] 40 CFR 52.308(h)
[659] 40 CFR 51.308(h)(3)

international emissions.[86] Luminant noted that in 2009, “Texas request[ed] in its SIP that [EPA] initiate and pursue federal efforts to reduce impacts from international transport," (79 FR 74844) consistent with EPA’s regulations. 40 CFR 51.308(h)(3). EPA acknowledges the substantial impact of international sources and Texas’s request but does not account for them in its review and proposed disapproval, nor does EPA act on Texas’s request from 2009. (79 FR 74842-44) Luminant asserted that EPA’s failure to consider this information in its analysis and account for these international emissions in reviewing Texas’s reasonable progress goals and long-term strategy and in proposing its own goals is arbitrary and capricious.

Multiple commenters noted the EPA has explained in its regional haze regulations that “the projected emissions from international sources will in some cases affect the ability of States to meet reasonable progress goals.” Thus, EPA specifically instructed that “EPA does not expect States to restrict emissions from domestic sources to offset the impacts of international transport of pollution.” (64 FR 35714, 35736, July 1, 1999; and Additional Regional Haze Questions 19, Sept. 27, 2006) Instead, EPA recognizes that it has a duty to help control emissions from international sources. As the Agency noted in the 1999 regional haze rulemaking, “EPA will work with the governments of Canada and Mexico to seek cooperative solutions on transboundary pollution problems.” (64 FR 35714, 35736).

Xcel Energy stated that EPA identified a process by which EPA would manage international contributions: (1) a State would submit a "technical demonstration" showing that "international emissions sources are responsible for a substantial increase in emissions affecting visibility conditions in any Class I area;" (2) EPA would determine if it agreed with the finding; and (3) "If EPA agrees with the State's finding, EPA will take appropriate action to address the international emissions through available mechanisms." (64 FR 35747) Texas met all of those requirements. Texas submitted modeling to EPA showing that Mexico's emissions were a significant contributor to visibility impairment in Big Bend and Guadalupe Mountains. *See* Texas SIP, at Section 10.6. EPA agrees that Mexico emissions are significant. *See* 79 Fed. Reg. at 74,843 ("large emission reductions from international sources" would be required to meet natural visibility goals). However, EPA has done nothing to meet its obligations to control emissions from Mexico or other international sources. Thus, EPA, and not Texas, must re-evaluate what it can do to help Texas meet its URP for Class I areas affected by international sources.

<u>Footnote</u>:
[86] http://www.tceq.state.tx.us/assets/public/implementation/air/sip/haze/2SIP_ado_rev.pdf at ES-2.

Response: Our response to comments concerning how we considered international emissions can be found above. Consistent with our earlier record statements, we agree that international emissions, particularly emissions from Mexico, impact visibility conditions at Big Bend and Guadalupe Mountains. Moreover, we acknowledge that Texas requests in its SIP that we initiate and pursue federal efforts to reduce impacts from international transport. There are efforts underway related to health issues along the United States- Mexico border. Given that emissions contributing to health effects and those contributing to visibility impairment are generally the same, the border studies and continuing emissions inventory development are tools to help identify solutions for visibility impairment. The Border 2020 program aims to, among other things, reduce air pollution to help meet national ambient air quality standards and reduce emission through the use of energy efficiency and/or alternative/renewable energy projects. We expect that recent commitments from Mexico to reduce carbon dioxide and black carbon emissions will have ancillary benefits to improve visibility at Class I areas in the future.

Comment: [Luminant (0061) p. 100; AECOM (0061 and 0075) p. 5-1] Luminant stated that the EPA has repeatedly approved state reasonable progress goals that take into account international emissions and do not require domestic sources to further reduce their emissions to compensate for emissions over which the state has no control—including New Mexico's reasonable progress analysis for the exact same monitor at Guadalupe Mountains. [657] AECOM also noted that other state agencies have evaluated international contributions to regional haze and determined its relevance to setting RPGs and URPs.[87]

Luminant asserted that EPA's failure to consider international emissions data is arbitrary and capricious and violates EPA regional consistency regulations. International transport is a very real and key factor to be considered, not just in evaluating whether the URP can be achieved, but in setting the reasonable progress goal. Indeed, EPA concedes that "emissions and transport from Mexico and other international sources ***will limit the rate of progress*** achievable on the 20% worst days . . . ."[658] And in fact, visibility impairment from Mexico is not just limited to point sources but includes agricultural burning along the Texas-Mexico border.[659] Yet, nowhere in EPA's analysis does it account for these emissions. Luminant stated that EPA's use of a so-called "natural conditions" or "clean" background for its Texas individual source modeling wrongfully assumes that Texas can eliminate the impact of international emissions. In that way, too, EPA's failure to account for international sources of visibility impairment is arbitrary and capricious.

Footnotes:
[87] http://www.ecy.wa.gov/programs/air/globalwarm_RegHaze/RH_SIP/Ch_9.pdf.

[657] See, e.g., 77 Fed. Reg. at 70,701 (New Mexico); 77 Fed. Reg. at 30,256 (Idaho); 77 Fed. Reg. 3681, 3687 (Jan. 22, 2012) (Minnesota); 77 Fed. Reg. 76,174, 76,204 (Dec. 26, 2012) (Washington).
[658] 79 Fed. Reg. at 74,843 (emphasis added).
[659] See, e.g., TCEQ, Today's Texas Air Quality Forecast (last modified Apr. 3, 2015), https://www.tceq.texas.gov/airquality/monops/forecast_today.html (forecasting "[s]moke from agricultural burning in Mexico and Central America" on March 25 and 26, 2015).

Response: We respond to Luminant's comment alleging inconsistency in the consistency section of this document. We respond to Luminant's comment concerning the use of "natural conditions" or "clean" background for individual source modeling in the modeling section of this document. Our response to comments concerning how we considered international emissions can be found elsewhere in this section of this document.

Comment: EPA ignores Mexico's contribution to visibility impairment and makes it impossible for Texas to meet the goal of achieving natural visibility conditions.
[Xcel Energy (0064) p. 14-21]

Xcel Energy stated that it is not possible for Texas to achieve the URP because of the overwhelming contribution from Mexican sources to visibility impairment in the Class I areas.

Mexico's impacts dwarf the contribution of any and all point sources in Texas. In fact, Xcel Energy's analysis (described below) shows that if every point source in Texas were shut down, it would have only a marginal impact on visibility in the Guadalupe Mountains. It is simply impossible for Texas to meet the URP and the 2064 visibility goal.

Xcel Energy conducted modeling to determine the impact of removing all Texas and U.S. elevated point sources on Guadalupe Mountains. Following the procedures used by ENVIRON, emissions processing was performed using the Sparse Matrix Operator Kernel Emissions (SMOKE) processing system. For the purpose of this analysis, the point source emissions inventories were updated so that no Texas or other United States elevated point sources would be included in the CAMx modeling input. The SMOKE processing output data was further processed in accordance with ENVIRON's procedures to create the final CAMx emissions input files.

Xcel Energy stated that CAMx was run with the updated emissions input files containing no Texas or other United States elevated point sources. The CAMx output files were post-processed using the same scripts and utility programs used by ENVIRON. These intermediate results were further processed using the EPA's Modeled Attainment Test Software. The final Modeled Attainment Test Software output data were then analyzed using the glide path and source contribution workbooks provided by the EPA. Xcel Energy used EPA's process systems and emission input files so EPA can easily replicate this modeling. However, if EPA has any difficulty conducting or confirming this modeling, Xcel Energy would be happy to share its modeling files with EPA.

Figure 1 provided by Xcel Energy in comment 0064 (reproduced below) shows the glide path for the Guadalupe Mountains, the most impacted Class I area for the Tolk Generating Station. The uncontrolled haze index value of 16.36 dv is the modeled value determined in the 2018 baseline scenario processed by ENVIRON for EPA. TCEQ did not propose additional reasonable progress controls in its SIP, citing the growth and control projections already incorporated into the 2018 baseline emissions data; therefore, the TCEQ SIP value is equivalent to the uncontrolled 2018 baseline scenario value. The EPA FIP value of 16.21 dv corresponds to the modeled haze index obtained from ENVIRON's high control efficiency modeling scenario. The exclusion of all of Texas and other United States elevated point sources resulted in a modeled haze index value of 14.88 dv, meaning that Mexican sources and natural contributions are projected to account for 92%, or all but 1.48 deciviews, of visibility impairment in the Guadalupe Mountains.

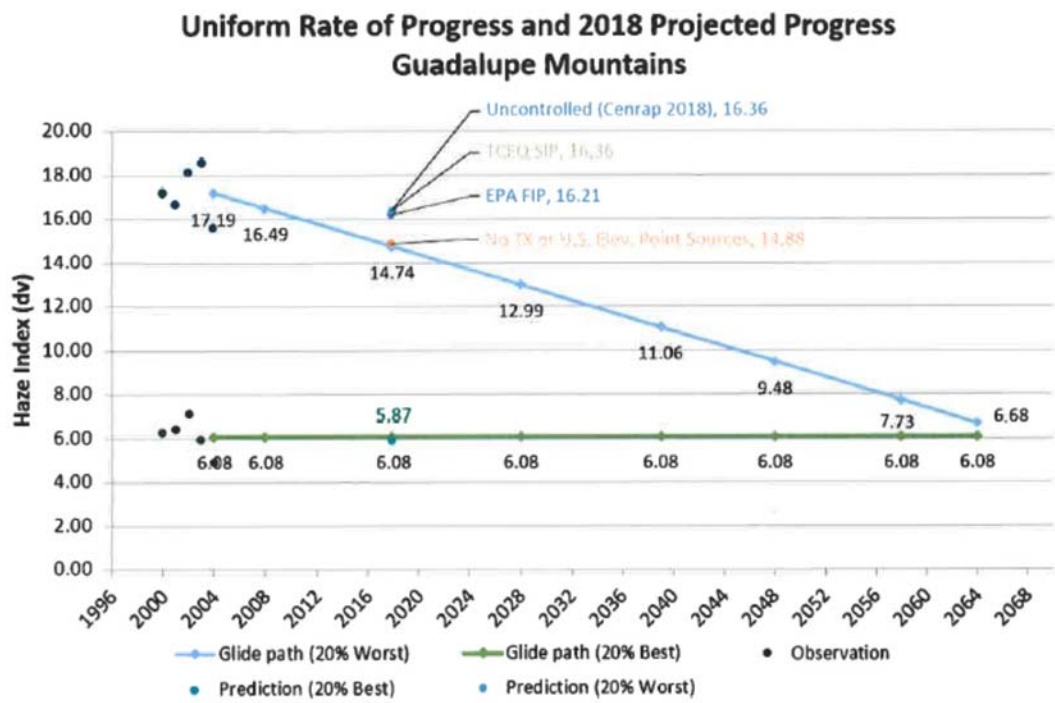


Figure 1. Uniform Rate of Progress and 2018 Projected Progress at the Guadalupe Mountains.[6]

Xcel Energy stated that the EPA acknowledges that meeting the URP and the 2064 target date is not possible. However, EPA makes no pretense of addressing Mexico's massive contribution and, instead, seeks to impose billions of dollars of costs on the electric customers served by Texas sources for inconsequential visibility benefits. Texas cannot be required to over-control in-state sources to make up for EPA's failure to address the far greater international contributions to visibility impairment in Texas' Class I areas.

Response: As we discuss more fully in a separate response to comment above, we agree with the commenters that international emissions significantly impact visibility conditions at Big Bend and Guadalupe Mountains. However, as we discussed in the preamble to the Regional Haze Rule, “the States should not consider the presence of emissions from foreign sources as a reason not to strive to ensure reasonable progress in reducing any visibility impairment caused by sources located within their jurisdiction.”[660] We disagree that our action requires “over control” of Texas sources. Our action requires the control of particular Texas sources that due to their own emissions were impacting the visibility at Texas and/or other state Class I areas.

As detailed below, the commenter overstates the size of the visibility impacts from Mexico relative to Texas. Even if Mexico’s impacts were as large as put forth by the commenter, that point would in no way relieve Texas of its obligation to analyze its sources and implement reasonable controls for addressing Texas’ portion of the visibility impairment at its Class I areas in this planning period. As we stated in our proposal, efforts to meet the goal of natural visibility

[660] 64 FR 35755 (July 1, 1999)

by 2064 "would require further emissions reductions not only *within Texas*, but also large emission reductions from international sources" (emphasis added).[661]

Furthermore, we find it necessary to note that Xcel's analysis incorrectly attributes 92% of visibility impairment at Guadalupe Mountains to "Mexico sources and natural contributions." Xcel's analysis examines the effect of removing Texas and U.S elevated point sources, but fails to account for impacts from mobile and area sources within Texas and other states, and fails to differentiate Mexican sources from other international sources. The analysis also fails to consider that deciviews are a logarithmic function of extinction, resulting in the underestimation of the percent contribution from Texas and U.S. point sources. Xcel's modeling estimates that elimination of all U.S. and TX elevated point sources would result in a reduction of 1.48 dv, from 16.36 dv to 14.88 dv. This is a reduction in extinction of 7.06 Mm^{-1}, or a 13.76% reduction in total extinction from 51.3459 Mm^{-1} (16.36 dv) to 44.2823 Mm^{-1} (14.88 dv).

CENRAP source apportionment for 2018 relied on by Texas and us in our analysis provides estimates of the contribution from various source regions and source types. These results are summarized below. We note that "BC" (boundary conditions) captures impacts from all sources outside of the modeling domain.

CENRAP 2018 PSAT results for Guadalupe Mountains, all pollutants (extinction, Mm^{-1})

Category	US (excluding Texas)	Texas	Gulf of Mexico	Canada	Mexico	BC
Elevated Point	4.497		0.004	0.297	3.210	
Low-Level Point	0.229		0.004	0.154	0.080	
Natural	3.516	4.509	0.000	0.047	1.600	
On-Road Mobile	0.285	0.145	0.000	0.000	0.002	
Non-Road Mobile	0.435	0.232	0.001	0.060	0.492	
Area	3.406	6.659	0.043	0.157	2.461	
EGU Point		1.809				
Non-EGU Point		2.030				
Boundary Condition	0.000	0.000	0.000	0.000	0.000	4.343
Total	*12.367*	*15.386*	*0.052*	*0.715*	*7.846*	*4.343*

The CENRAP PSAT results are consistent with Xcel's modeling showing that the total contribution from all U.S. and Texas point sources (elevated and low level) are approximately 8.56 Mm^{-1} compared to 7.06 Mm-1 estimated by Xcel for elevated point sources only. The impacts from all Texas point sources (3.84 Mm-1) are larger than the estimated impacts from

[661] 79 FR 74843

point sources in Mexico (the large portion of Mexico within the modeling domain) and are comparable to the level of impacts from all sources outside of the modeling domain captured by the boundary conditions. Overall impacts from all sources in Texas are larger than all sources in Mexico and boundary conditions combined. As we discuss in our proposal and elsewhere in our response to comments, we and Texas agreed that it was reasonable to focus on impacts from point sources for this planning period. The impact from Texas point sources is significant, and as our analysis shows, a significant portion of this impairment can be addressed by controlling a small number of sources. Controls on just four units at Tolk and Big Brown are estimated to reduce visibility impairment at the Guadalupe Mountains (estimated by CENRAP 2018 modeling) by approximately 0.49 Mm-1, or a 12.7% additional reduction in the total impact due to Texas point sources. All required controls combined are estimated to reduce visibility impairment at the Guadalupe Mountains by an additional 0.836 Mm^{-1}, a 21.8% additional reduction in impairment from Texas point sources beyond estimated visibility conditions projected by the CENRAP 2018 modeling.

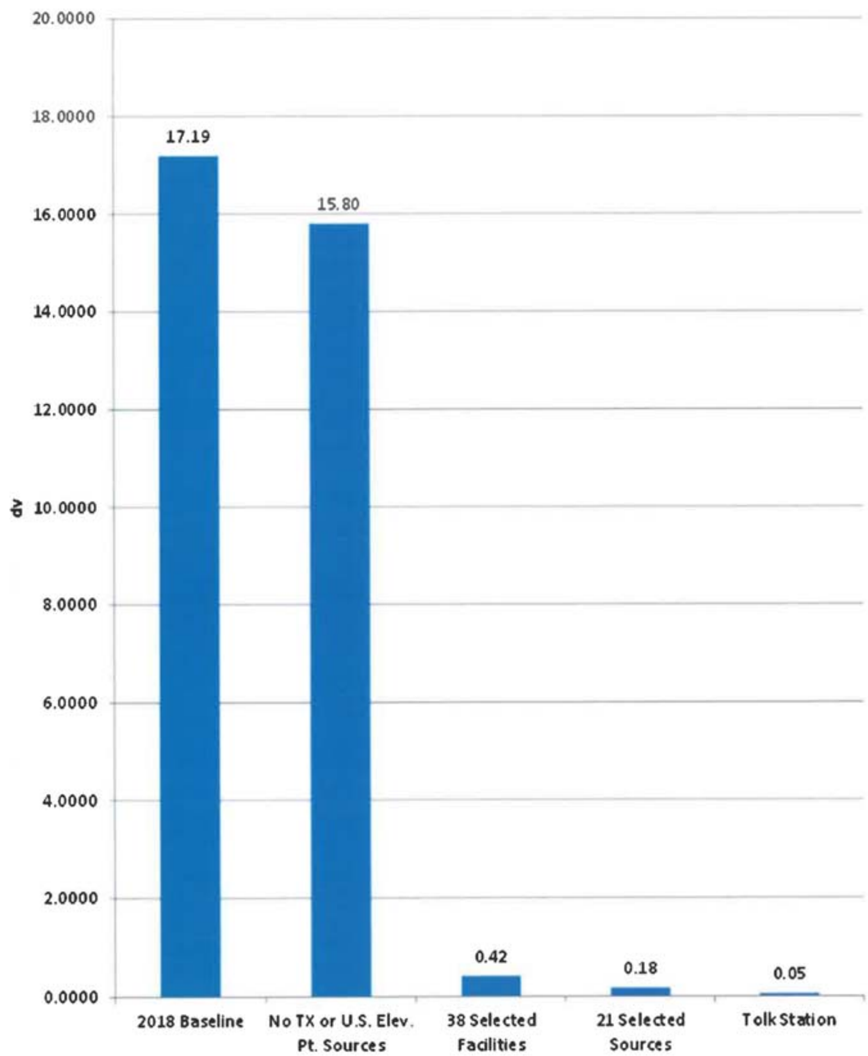
We address comments concerning our efforts to address visibility impairment from international emissions in a separate response to comment above.

Comment: [Xcel Energy (0064) p. 14-21] Xcel Energy stated that even if all sources in the state of Texas were to entirely cease operation, there still would be significant impairment at the Big Bend and Guadalupe Mountains National Parks that would prevent EPA from meeting the natural visibility goals prescribed by the Clean Air Act and the RHR. Xcel Energy stated that the EPA has inaccurately and arbitrarily dismissed this in its evaluation. In fact, Figures 2 and 3 in the Proposal do not accurately represent the effect of the emissions from Mexico because EPA arbitrarily cut off the top contributors, without showing the full level of their contribution to visibility impairment. 79 Fed. Reg. at 74,878-79. By not showing the visibility impairment to scale, EPA's figures appear to indicate a greater impact from specific facilities in Texas, while depicting a lesser impact from other sources. When the impacts are accurately portrayed, it clearly shows how small a contribution Texas facilities make to visibility impairment.

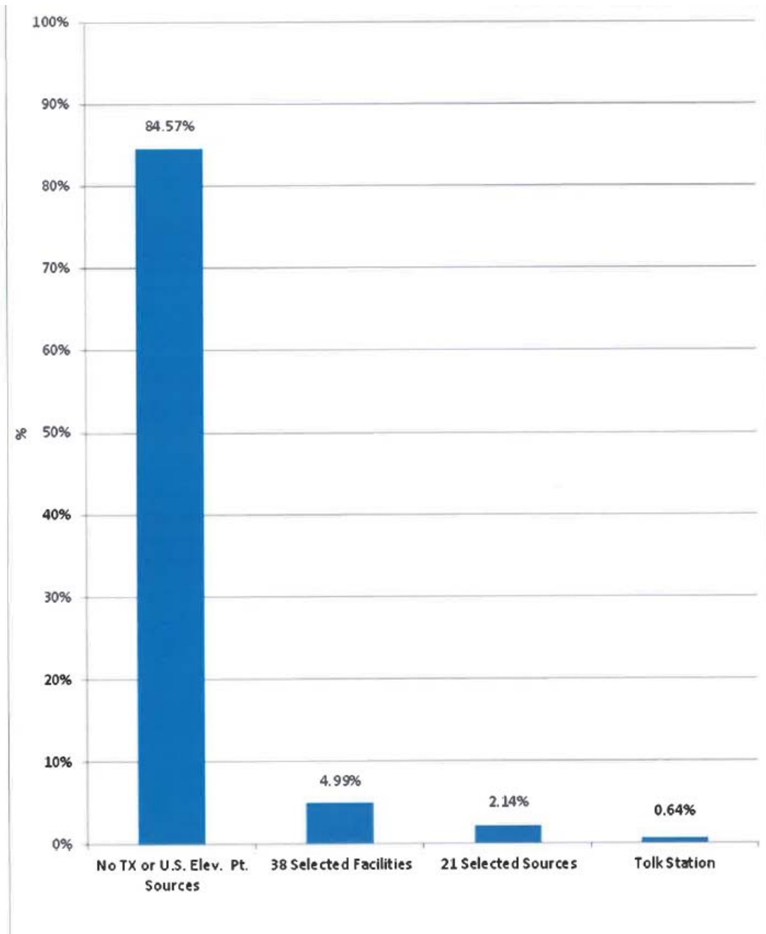
Xcel Energy provided (Xcel Energy Figure 2) which shows the average source contribution to the 2018 deciview haze index at the Guadalupe Mountains. The unaltered 2018 baseline scenario resulted in a haze index of 17.19 dv while the exclusion of Texas and other United States elevated point sources resulted in a value of 15.80 dv. The 38 selected facilities refer to the facilities chosen by EPA for a haze index contribution analysis based on 2009 annual emissions and the distances to the nearest Class I areas (Q/D analysis). The 21 selected sources refer to the emissions sources chosen by EPA to be considered for proposed controls under the FIP and these source collectively contribute only 0.18 dv to the visibility impairment at Guadalupe.

(Xcel Energy Figure 3) displays the percent contribution to total 2018 light extinction at the Guadalupe Mountains. These percentage contribution values were calculated based on the collective contribution to light extinction by each source group as compared to the 2018 baseline total extinction value. Here, again, the visibility effects of the EPA selected 21 sources are miniscule in light of the contribution of international sources and natural contributions.

Source Contribution to 2018 Deciview Haze Index at Guadalupe Mountains, W20 Group (Figure 2 provided by Xcel Energy (comment 0064))



Total Percent Contribution to 2018 Total Light Extinction at Guadalupe Mountains, W20 Group (Figure 3 provided by Xcel Energy (comment 0064))



Response: We address comments concerning how we considered international emissions in a separate response above. We agree that impacts from international sources are significant and it is not reasonable to achieve the URP and meet natural conditions in 2064. However, as was stated in the preamble to the RHR, "the States should not consider the presence of emissions from foreign sources as a reason not to strive to ensure reasonable progress in reducing any visibility impairment caused by sources located within their jurisdiction."[662]

We disagree with Xcel that Figures 2 and 3 in our proposal do not accurately represent the effect of the emissions from Mexico because we "arbitrarily cut off the top contributors, without showing the full level of their contribution to visibility impairment". Figures 1, 2 and 3 in the proposal aim to highlight and compare the magnitude of impacts from the individual facilities in Texas we evaluated for controls to impacts from other point sources in Texas and areas outside of the state. The range of the chart was selected to allow the reader to observe the relative differences between each facility's impact and compare that to impacts from nearby states and regions. We provide additional discussion of these figures in the FIP TSD and note that the Mexico contribution from point sources exceeds the range of the chart. We also provide the

[662] 64 FR 35755 (July 1, 1999)

percent contribution and the extinction due from Mexico point sources on the charts, so the reader can accurately compare the impacts from each contributor shown.

Xcel suggests that because impacts from sources other than Texas and U.S. point sources are a large portion of the total visibility impairment, no reductions from Texas point sources are reasonable. As we discuss in our proposal and elsewhere in our response to comments, Texas and we agreed that it was reasonable to focus the reasonable progress analysis on point source emissions of SO_2 and NO_X, as the sources of these pollutants are the main anthropogenic pollutants that affect visibility at Class I areas in Texas. Based on CENRAP 2018 source apportionment results, Texas point sources are responsible for approximately 8.6% of the total extinction at Guadalupe Mountains (approximately ¼ of the total impairment from all Texas sources), compared to 7.4% from Mexico point sources and 10.6% from U.S. point sources (excluding Texas). The largest contribution from all point sources combined in an individual state is 1.16% from New Mexico point sources. The impact from Texas point sources is significant and as our analysis shows, a significant portion of this impairment can be addressed by controlling a small number of sources. Xcel's chart states that 0.64% of the total visibility impairment is due to emissions from Tolk[663]. This represents nearly 8% of the total visibility impairment from all of Texas point sources that can be addressed by controlling only one facility. We note this is more than half of the contribution that would be addressed if New Mexico or any other individual state controlled all point sources within its jurisdiction. In considering the four-factors, including consideration of visibility benefit with cost, we found that controls on Tolk were cost-effective and resulted in a significant reduction in visibility impairment at Guadalupe Mountains. This is not inconsistent with the realization that significant impacts from international emissions and other sources exist and should also be addressed. We address comments concerning EPA's efforts to address visibility impairment from international emissions in a separate response to comment above.

Comment: [AECOM (0061 and 0075) p. 5-1; CCP (0075) p. 13-14] AECOM stated that back trajectories for 2011-2013 show that approximately 77% of the 20% worst day trajectories at GUMO passed through Mexico. For BIBE, this percentage increases dramatically to about 96%. These contributions were obtained using ArcGIS.

AECOM stated that Mexican point sources, particularly the coal-fired power plant facilities of Carbon, are only about 230 km away from BIBE, while the nearest Texas facility with a proposed new emission limit is about 500 km away. Emissions from these large power plants are noteworthy - SO_2 emissions from the draft EPA 2011 modeling platform cites 162,329 SO_2 tons for Carbon II alone in 2008, which is an increase from 1997 (129,341 tons at Carbon II).[88] In addition to international point sources, smoke plumes from agricultural fires in Central America have been shown to travel northward into the U.S. further contributing to hazy conditions. Agricultural burning helps return nutrients to the soil prior to the growing season. This burning season usually occurs from March through May in Mexico.[89] AECOM provided a satellite image showing the widespread nature of agricultural burning. (See Figure 5-1 in comment 0061/0075.) It is evident from this figure that the trajectory of the international

[663] We note that Xcels's figure 2 above is not a good representation of the relative visibility impacts because deciviews are a logarithmic function of extinction.

emissions passes right over eastern Texas on their way to WIMO. Therefore, observed haze at WIMO with a trajectory from eastern Texas could also have originated south of the border, with substantial international haze contributions.

CCP stated that modeling shows that the sources that cause haze in Big Bend and Guadalupe Mountains are rarely in the area where most of the emission sources targeted by EPA are located. Modeling shows that during one of the worst droughts on record in 2011, some of the worst haze days in Big Bend corresponded to "Fire - Mexico/Central America" flagged events. Looking at trajectories from particular sources, Mexico's Carbon I and II facilities (only 165 km away from Big Bend) heavily influenced Big Bend haze conditions, and SO_2 emissions have actually increased from 1999 from these plants.

AECOM and CCP stated that source apportionment modeling presented in the EPA FIP TSD quantifies international contributions to the Texas Class I areas. Mexican point sources were determined to contribute about 16.8% to BIBE's 20% worst days with a total contribution from all emission sectors of over 25%.[91] For Mexican point sources alone, this contribution is nearly four times greater than all of the Texas EGU point source contributions, which were estimated to be only 4.5% of the 20% worst haze days.[92] AECOM provided figures indicating these source apportionment results for both BIBE and GUMO. (See Figures 5-2 and 5-3 in comment 0061/0075.) Previous research such as the National Park Service 1999 study found that Mexico contributes as much as 70% of the haze for the 20% worst days at BIBE.[93]

AECOM stated that impacts from international sources are even greater when boundary conditions are analyzed. As part of the modeling performed by EPA for the base case of the future year 2018, the source apportionment results of all 38 facilities in Texas modeled separately by EPA, as well as contributions through the modeling boundary, were available. We reviewed the modeling information for individual contributions to selected particulate matter (PM) species over the entire 36 and 12-km computational domains. To assess the most important species for purposes of this rulemaking, we extracted information for the contributions to sulfate from the computational boundary conditions. The boundary conditions represent hourly or monthly concentrations that are set by a global chemical transport model and then transported through the boundaries of the CAMx computational domain by the same meteorology used in the regional CAMx simulation. This analysis examined the monthly and daily modeled contributions over the entire computational domain, as well as contributions at the specific Class I area receptors.

AECOM stated that the monthly average sulfate concentrations were analyzed to identify any periods throughout the year in which the contributions from sources beyond the model boundaries are most evident. The largest contributions mostly originate in the southern boundary (i.e., from Mexico or from countries further south). It also shows that the contributions from the southern boundary are episodic with the likelihood of observing higher concentrations during the winter and spring. AECOM Figure 5-4 in comment 0061/0075 displays monthly sulfate contributions for April.

AECOM explained, in general, the combined contributions from all boundaries to sulfate near the three Class I areas of interest for this rulemaking range from 0.125 μg/m3 to 0.38 $\mu g/m^3$

during the winter, from 0.125 μg/m^3 to 0.5 μg/m^3 during the spring and are less than 0.125 μg/m^3 during the summer. It is evident that localized impacts, defined by large concentration gradients, are present in Mexico and extend to southern Texas, particularly BIBE. It is clear from the concentration gradient information that the international emissions south of the border are responsible for this impact.

AECOM stated that a more detailed examination was conducted of episodic events during the spring and summer. AECOM Figure 5-5 in comment 0061/0075 provides daily sulfate average concentrations for a 3-day period (April 18 to April 20) as an illustration of one of the periods when active transport from the boundary impacts the southern United States, especially states near Mexico. We noted from the modeling results that the contribution from emissions beyond the CAMx boundary were comparable to those shown in the previous figure for a much larger period that started at the end of February and continued until mid-May.

AECOM stated that the source apportionment information also provides a means to compare the relative contribution of the boundary emissions relative to any given emission source tagged by the CAMx modeling conducted by EPA. AECOM Figure 5-6 in comment 0061/0075 provides a time series of impacts that compares the sulfate daily average CAMx-predicted concentrations that the WIMO, BIBE, and GUMO Class I areas in Texas experienced from both the boundary emissions and a selected Texas power plant source (Big Brown). Coleto Creek would have a smaller impact as it has less emissions. The time series clearly indicate that at these three Class I areas, the contributions to sulfate from the boundary emissions are always far more significant than the contributions from Big Brown. For instance, at WIMO, the annual average concentration from the boundaries is 0.21 μg/m^3, while the contribution from Big Brown is an order of magnitude lower, only 0.02 μg/m^3. It is especially interesting to note that boundary conditions appear to have a greater impact at WIMO than BIBE and GUMO through the modeling year.

AECOM explained that, in general, it is obvious that the effect of controlling emissions at a plant like Big Brown would be dwarfed by the massive impact of the international emissions. This component of haze must be accounted for in regional haze SIPs in the development of RPGs and/or natural conditions because these emissions from agricultural burns, power plants, or wildfires from international sources are beyond the jurisdiction of state agencies.

Footnotes:
[88]http://vista.cira.colostate.edu/improve/studies/BRAVO/reports/FinalReport/BRAVO/A5_Kuhns2003EmissInv.pdf at 4-5.
[89] http://www.nasa.gov/mission_pages/fires/main/world/20130503-mexico.html.
[90] http://www.nasa.gov/vision/earth/environment/central_am_fires_prt.htm, http://alg.umbc.edu/usaq/archives/2013_05.html.
[91] EPA FIP Technical Support Document at A-30.
[92] EPA FIP Technical Support Document at A-30.
[93] http://www.epa.gov/visibility/pdfs/introvis.pdf.

Response: We address comments concerning back trajectory analysis in a separate response to comment.

We agree with AECOM that impacts from international emissions can be significant, including impacts from fires in southern Mexico, and Central America. We also agree those international emissions need to be addressed to achieve natural visibility, but our agreement on this point does not in any way relieve Texas of the obligation to make reasonable progress, including through controls on its own sources, and particularly through the emissions addressed with controls through our FIP.

We disagree with AECOM that impacts from Coleto Creek would be smaller than impacts from Big Brown because it has less emissions. However, AECOM fails to consider the location of the source and the meteorology/transport conditions. Coleto Creek is closer to Big Bend and our source apportionment modeling shows that the one unit at Coleto Creek has a larger impact on the 20% worst days at Big Bend than the impact from two units at Big Brown.[664]

AECOM suggests that because impacts from international sources are a large portion of the total visibility impairment, no reductions from Texas point sources are reasonable. As we discuss in our proposal and elsewhere in our response to comments, Texas and we agreed that it was reasonable to focus on impacts from point sources for this planning period. The impact from Texas point sources is significant, and as our analysis shows, a significant portion of this impairment can be addressed by controlling a small number of sources. We discuss the relative significance of impacts from Texas point sources at Guadalupe Mountains in response to other comments above. For Big Bend, Texas EGUs contribute 4.5% of the total visibility impairment. The required controls in this action address 1.88% of the total visibility impairment, 41.8% of the impact from all Texas EGUs, and 23.4% of impact from all Texas point sources (based on 2018 CENRAP projected emission levels). Controls on Coleto Creek alone address approximately 6% of the total Texas point source impact. Controls on two units at Big Brown address another approximately 6% of the total Texas point source impact.

Furthermore, AECOM apparently fails to appreciate that the comparison it cites should be properly understood to be between the visibility impact from one facility *to the visibility impact from all sources around the world that lie outside of the modeling domain*, including long range transport from fires, windblown dust, and significant anthropogenic emissions. AECOM states that annual average visibility impairment from Big Brown is approximately 10% of the annual average contribution from those sources captured by the boundary conditions. This is a significant fraction of the total visibility impairment that can be addressed through the installation of controls *on only two emission units*. We also note that visibility impairment on the 20% worst days at each Class I area from Big Brown is larger; as can be seen by the data submitted by AECOM, on some days, the visibility impairment due to Big Brown's emissions approach or exceed that from all emissions sources captured by the boundary conditions. For Wichita Mountains, controls on just Big Brown addresses almost 12% of the total visibility impairment due to Texas point sources and 1.63% of the total visibility impairment from all sources. In summary, the visibility impairment from the individual sources analyzed is significant and controls on these sources provide for meaningful visibility improvement at one or more Class I areas towards the goal of natural visibility conditions. This is not inconsistent with the understanding that significant impacts from international emissions and other sources exist and should also be addressed.

[664] See Figure A.3-3 of the FIP TSD.

Lastly, we agree with CCP that the sources it cites, Carbon I and Carbon II, are responsible for significant levels of pollution. Carbon I, is a 1,200 MW power plant and Carbon II is a 1,400 MW coal-fired power plant. These two power plants, less than 1.5 miles apart, are less than 20 miles from the U.S.-Mexico border. Together, these power plants comprise one of the largest uncontrolled sources of SO_2 and NO_X in North America.[665] It has been demonstrated for some time that they are significant contributors to visibility impairment at Big Bend.[666] However, addressing international emissions can be complex. For instance, Texas has recently issued water discharge and mining permits to a coal mine in Maverick County, near the Texas border town of Eagle Pass, to allow the Mexican company Dos Republicas to begin mining coal that will reportedly be sent to these facilities.[667] Prior to our delegation of the National Discharge Elimination System (NPDES) permitting authority to Texas, we issued a NPDES permit for the operation of this mine, and in the process issued an Environmental Impact Statement (EIS).[668] In our EIS, we stated that ". . . EPA does not have the authority to prohibit export of U.S. resources which will cause the country environmental harm . . . EPA believes that the U.S. policy should be to take actions which will generate the investment capital needed to directly solve the Carbon I/II problem"[669] Subsequent to that, we attempted to work with the government of Mexico specifically on the problem of installing controls on these sources through a technical work group composed of EPA and SEMARNAP (now SEMARNAT, the Mexican Environment and Natural Resources Secretariat) staff. Unfortunately, these discussions did not result in any control of Carbon I and II. However, EPA is committed to explore opportunities for further discussions with Mexico concerning this subject.

Comment: Mexican Emissions Will Impact Results More Than Predicted
[Alpine (0078) p. 22]

In a 2015 report attached to NRG's comment (0078), EPA agreed with the TCEQ and based on the CENRAP PSAT modeling, that emissions and transport from Mexico and other international sources will limit the rate of progress achievable on the 20% worst days and that efforts to meet the goal of natural visibility by 2064 would require further emissions reductions not only within Texas, but also large emission reductions from international sources.

Alpine provided a table with summaries of more recent modeling studies utilized by EPA to estimate the emissions from Mexico. (Table 7 of Alpine comment 0078, not reproduced here.) According to Alpine, this table demonstrates Mexican point source emissions of SO_2 have shown an increase since 2008 and are projected to increase even more through 2030. (http://www.epa.gov/ttnchie1/conference/ei18/session2/wolf.pdf) This increase has created a

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665 Commission for Environmental Cooperation of North America, "North American Power Plant Air Emissions," http://www.cec.org/storage/56/4876_powerplant_airemission_en.pdf. TCEQ may keep this in consideration in future studies on the impacts of sources from Mexico on Class I areas or otherwise.
666 Big Bend Regional Aerosol and Visibility Observational Study (BRAVO), Final Report, September 2004.
667 http://www.epbusinessjournal.com/2015/11/dos-republicas-coal-partnership-coal-mine-expanded-water-discharge-permit-application-to-be-heard-november-16th/.
668 Authorization to Discharge Under the National Pollutant Discharge Elimination System. Permit No. TX0109011.
669 Final Environmental Impact Statement on Dos Republicas Resource Company, Inc.'s Proposed Eagle Pass Mine in Maverick County, Texas, December 30, 1994. Page C-51.

higher magnitude of transported visibility impairing emissions to the Class I areas as compared to the CENRAP modeling estimates.

Additionally, Alpine stated that with demonstrated reductions in SO_2 from Texas emission sources, this international component most likely will increase the Mexican percentage of contribution to visibility impairment at both Big Bend and Guadalupe Mountains and should be considered when establishing rate-of-progress determinations.

Alpine stated that, based on these most current emission estimates and projects in use by EPA, the impact of Mexican source emission projections should be considered, and with greater weight, during additional regional haze modeling to better attribute non-domestic visibility impairment at the Big Bend and Guadalupe Mountains Class I areas. Should these current Mexican emissions and their increased regionally significant effect on sulfate concentrations have been used by EPA in their modeling, the influence of domestically generated emissions and relative impact of incremental controls within the State of Texas could be substantially less than what EPA predicts.

Response: We agree that increases in emissions from Mexico, either actual increases or increases due to updated emissions inventories, would decrease the relative impact from Texas sources. However, the absolute impact remains the same and as we have demonstrated in our analysis, reasonable controls can address a significant portion of the visibility impairment at the Wichita Mountains (as well as the two Texas Class I areas) due to Texas sources, and in particular the impact due to Texas point sources. Alpine suggests that if visibility conditions were to worsen at a Class I area due to an increase in international emissions, controls on Texas sources would become less reasonable. This is not correct and it runs counter to the goal of the regional haze program. If it held weight, it would allow a State to avoid addressing its share of the visibility impairment simply because outside forces are also affecting the amount of progress that can be made. This is precisely why it is important to consider not only the percentage of visibility impairment, but also the absolute reduction in extinction and the visibility benefits of controls compared to "clean" background when evaluating the reasonableness of individual controls or a control strategy. We discuss these concepts in more detail elsewhere in this document.

The Regional Haze Rule addresses situations where increases in emissions from other countries prevent Class I areas from achieving the established reasonable progress goals. The five-year progress report requires states to assess the adequacy of their regional haze SIP.[670] If the state determines at that time "that the implementation plan is or may be inadequate to ensure reasonable progress due to emissions from sources in another country, the State shall provide notification, along with available information, to the Administrator."[671] However, anticipated increases in emissions of international sources do not relieve the state from implementing reasonable controls to address the visibility impairment due to their own sources.

[670] 40 CFR 52.308(h)
[671] 40 CFR 51.308(h)(3)

Comment: EPA Should Further Strengthen the Reasonable Progress Goals for Big Bend and Guadalupe Mountains. [Earthjustice (0067) p.50]

Earthjustice et al., stated that reasonable progress goals must "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." 40 C.F.R. § 51.308(d)(1). In establishing a reasonable progress goal, EPA must:

> (1) Consider 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," 40 C.F.R. § 51.308(d)(1)(i)(A); and
>
> (2) "Analyze and determine the rate of progress needed to attain natural visibility conditions by the year 2064. To calculate this rate of progress, the State must compare baseline visibility conditions to natural visibility conditions in the mandatory Federal Class I area and determine the uniform rate of visibility improvement (measured in deciviews) that would need to be maintained during each implementation period in order to attain natural visibility conditions by 2064. In establishing the reasonable progress goal, the State must consider the uniform rate of improvement in visibility and the emission reduction measures needed to achieve it for the period covered by the implementation plan." 40 C.F.R. § 51.308(d)(1)(i)(B).

Earthjustice et al., stated that in establishing RPGs for Texas and Oklahoma Class I areas, EPA concluded that progress goals that provide for natural visibility by 2064 are unreasonable because "emissions and transport from Mexico and other international sources will limit the rate of progress achievable on the 20% worst days and that efforts to meet the goal of natural visibility by 2064 would require further emissions reductions within Texas and from international sources." 79 Fed. Reg. at 74,843. EPA proposed progress goals that will not achieve natural visibility conditions at all Texas and Oklahoma Class I areas for 82 to 173 years, well past the 2064 goal. *Id. at* 74,887. Those progress goals are unreasonable, at a minimum, in light of the agency's recognition of available, cost-effective measures at additional facilities, which would achieve a greater rate of progress toward the 2064 natural visibility goal at Wichita Mountains, Big Bend, and Guadalupe Mountains.

Earthjustice et al., stated that where an implementation plan "establishes a reasonable progress goal that provides for a slower rate of improvement in visibility than the rate that would be needed to attain natural conditions by 2064, the State must demonstrate, *based on the factors in paragraph (d)(1)(i)(A)* of this section, that the rate of progress for the implementation plan to attain natural conditions by 2064 is not reasonable; and that the progress goal adopted by the State is reasonable." 40 C.F.R. § 51.308(d)(1)(ii) (emphasis added). The data upon which Texas and EPA relied in determining the impact of Mexico emissions is more than 15 years old.[61] To the extent that EPA factors international emissions in establishing RPGs for Texas, EPA should update its calculations for international emissions so that it is supported by technical demonstrations and is based on "available monitoring information and appropriate data analysis techniques." *Id.* § 51.308(d)(2)(iii); *see also* 64 Fed. Reg. at 35,746.

Moreover, although some of the haze pollution in Texas and Oklahoma Class I areas may be attributable to international sources, the presence of such emissions cannot be used thwart the development of appropriate RPGs nor excuse forgoing reasonable, available controls on in-state sources. Put differently, the fact that some portion of impairment is attributable to international sources does not automatically make EPA's alternative reasonable progress goal reasonable. *See* 40 C.F.R. § 51.308(d)(1)(i)-(ii).

Indeed, EPA has made clear that states cannot use emissions from foreign sources "as a basis to ignore controls on in-state sources where such controls are clearly reasonable."[62] Where emissions from international sources may affect a state's ability to meet RPGs, EPA has suggested that a three-prong approach is appropriate: (1) the state first needs to address sources within its control; (2) the state should then request reductions from contributing states; and (3) the state should then ask EPA to address international emissions.[63] To the extent that EPA has not undertaken each of these actions with respect to Texas, it should do so.

Earthjustice et al., concluded, given that recent and reliable data demonstrate that there are additional, cost-effective measures in Texas that will achieve greater progress toward natural visibility in Texas and Oklahoma Class I areas, EPA cannot relieve itself of the obligation to address those sources by relying on decades-old data regarding emissions from Mexico.[64] Thus, EPA should revise the reasonable progress goals for Big Bend and Guadalupe Mountains to reflect the installation and operation of the additional controls listed above at Welsh, Parish, and other Texas sources.

<u>Footnotes</u>:

[61] *See* App'x B to CENRAP Modeling TSD, TX166-011-08 (describing file names and data sources for emissions inventory).

[62] EPA, Approval and Promulgation of Implementation Plans; North Dakota, Regional Haze Implementation Plan; Federal Implementation Plan for Interstate Transport of Pollution Affecting Visibility and Regional Haze, 77 Fed. Reg. 20,894, 20,913 (Apr. 2, 2012); *see also* 64 Fed. Reg. at 35,755 (July 1, 1999) (noting that while "EPA will not hold States responsible for developing strategies to 'compensate' for the effects of emissions from foreign sources, . . . [s]tates should not consider the presence of emissions from foreign sources as a reason not to strive to ensure reasonable progress in reducing any visibility impairment caused by sources located within their jurisdiction"). 63 U.S. EPA Region 8, Comments on August 21, 2009 Draft Regional Haze SIP (FLM Consultation Version), Enclosure 1 at 5 (comments on North Dakota Regional Haze SIP).

[64] In any event, EPA has a duty to address international pollution transport concerns. 64 Fed. Reg. 35,755. If EPA agrees with Texas's finding regarding interstate pollution impacts, then EPA should take appropriate action to address the international emissions through available mechanisms. Id. In particular, EPA should actively encourage Mexico to reduce emissions impairing visibility in Texas, Oklahoma, and elsewhere. EPA is well within its rights to formally request reductions from Mexico where appropriate.

[63] U.S. EPA Region 8, Comments on August 21, 2009 Draft Regional Haze SIP (FLM Consultation Version), Enclosure 1 at 5 (comments on North Dakota Regional Haze SIP).

Response: We agree with Earthjustice that the presence of international emissions in no way relieves Texas of the requirements of the Regional Haze Rule to consider the four factors and evaluate controls for addressing visibility impairment due to Texas sources and making reasonable progress towards the goal of natural visibility conditions. We disagree that the progress goals we proposed are unreasonable because cost-effective measures at additional facilities would provide for additional visibility benefit. As we discuss elsewhere in addressing specific comments concerning additional controls, based on our evaluation of the four factors and consideration of visibility within the cost factor of the four factor reasonable progress analysis, we determined that additional controls at Parish, Welsh and other sources were not required for reasonable progress for the first planning period.

We utilized the emission inventories developed by CENRAP and used by Texas in our analysis, including the emissions inventory for Mexico. We agree that there is uncertainty in these emission inventories and that ongoing efforts to improve these inventories should be incorporated into future regional haze planning evaluations. As we discuss above, the Regional Haze Rule addresses situations where increases in international emissions prevent Class I areas from achieving reasonable progress towards natural visibility conditions.

We address comments concerning how we considered international emissions in a separate response above.

19. Grid Reliability

Comment: [TCEQ/PUCT (0056) p. 22] The TCEQ recommended that the EPA withdraw the proposed FIP; however, if the EPA does finalize the FIP, the EPA should include an electric reliability safety valve provision in the final rule.

The TCEQ maintained that its 2009 Regional Haze SIP is approvable as submitted and the EPA should withdraw the proposed FIP. However, if the EPA does finalize the FIP then the final rule should include a reliability safety valve provision. The EPA has not considered the potential electric reliability implications of the proposed rule. A reliability safety valve provision in the rule could be a provision that allows the EPA to grant an extension to the compliance dates in situations where electric reliability is at risk, after consultation with the appropriate Independent System Operator /Regional Transmission Organization.

[TCEQ/PUCT (0056) p. 20, and Appendix 1: ERCOT report] The TCEQ stated that the EPA has not evaluated any potential impacts of the proposed FIP to reliability and prices of electricity in Texas, as further discussed below. In 2014, the Electric Reliability Council of Texas (ERCOT conducted a study of the impacts that environmental regulations have in the ERCOT Region. The report, entitled "Impacts of Environmental Regulations in the ERCOT Region," was finalized on December 16, 2014, and is included as Appendix 1 to the TCEQ's comments (summarized below). While the report included a number of environmental regulations, such as the MATS rule, Clean Power Plan, and CSAPR, ERCOT also included the EPA's proposed Regional Haze FIP for Texas in its analysis. The TCEQ incorporates the ERCOT report into the agency's comments and encourages the EPA to consider the findings of the ERCOT report.

ERCOT is the independent system operator (ISO) for the ERCOT Interconnection, which encompasses approximately 90% of electric load in Texas. ERCOT is the independent organization established by the Texas Legislature to be responsible for the reliable planning and operation of the electric grid for the ERCOT Interconnection. Under the North American Electric Reliability Corporation (NERC) reliability construct, ERCOT is designated as the Reliability Coordinator, the Balancing Authority, and as a Transmission Operator for the

ERCOT region. ERCOT is also registered for several other functions, including the Planning Authority function.

ERCOT noted that there are several proposed or recently finalized EPA regulations that could have an impact on grid reliability in ERCOT. These rules include the Mercury and Air Toxics Standards (MATS), CSAPR, the Regional Haze program, the Cooling Water Intake Structures rule, the Steam Electric Effluent Limitation Guidelines (ELG) rule, the Coal Combustion Residuals (CCR) Disposal rule, and the Clean Power Plan. The ERCOT study assesses the individual and cumulative impact of these regulations on generation resources in the ERCOT region, and potential implications for grid reliability.

Resource owners in ERCOT will need to take actions to comply with these regulations in the coming years, or else retire or mothball the units. Tables provided by ERCOT (Tables ES-1 and Table ES-2 of comment 0056-A3 [not reproduced here]) show the potential compliance requirements for coal and natural gas units, respectively, under these regulations.

According to the ERCOT report, coal units are the most affected by environmental regulations. Without considering the Clean Power Plan, 3,000 MW to 8,500 MW of coal-fired capacity in ERCOT can be considered to have a moderate to high risk of retirement – due primarily to the costs of EPA's proposed requirements for the Regional Haze program. The results of this analysis also suggest potential impacts from CSAPR in the short-term. By comparison, the other regulations are not expected to have a significant system-wide impact, but could affect the economics of a small number of units. The implementation and regulatory timeline of the Clean Power Plan will impact decisions resource owners make about whether to retrofit or retire impacted units. Additionally, the Clean Power Plan itself may cause unit retirements, due to the need to meet stringent CO_2 emissions limits on a state-wide basis. ERCOT's modeling analysis suggests that the Clean Power Plan, in combination with the other regulations, will result in the retirement of up to 8,700 MW of coal-fired capacity.

The results of the ERCOT study indicate that the Regional Haze requirements and the Clean Power Plan will have significant impacts on the planning and operation of the ERCOT grid. Both are likely to result in the retirement of coal-fired capacity in the ERCOT region. Currently, resource owners are required to notify ERCOT no less than 90 days prior to the date that the unit is retired or mothballed. Given the competitiveness of the ERCOT market and the current uncertainty surrounding environmental regulations, it is unlikely that generators would notify ERCOT of potential retirements or unit suspensions before the minimum notification deadline. If ERCOT does not receive early notification of these retirements, and if multiple unit retirements occur within a short timeframe, there could be periods of reduced system-wide resource adequacy and localized transmission reliability issues due to the loss of generation resources in and around major urban centers. Additionally, loss of the reliability services provided by retiring units will strain ERCOT's ability to integrate new intermittent renewable generation resources.

The Clean Power Plan will also result in increased wholesale and consumer energy costs in the ERCOT region. Though the other regulations considered in this study will pose costs to owners of generation resources, they are less likely to significantly impact costs for consumers.

ERCOT undertook two parallel efforts for this study. First, in the summer of 2014, ERCOT distributed a survey to fossil fuel-fired generators on the impacts of relevant environmental regulations. The responses indicate the current compliance status of fossil fuel-fired resources in the ERCOT region. Second, ERCOT conducted a modeling analysis of the impacts of CSAPR, the Regional Haze program, and the Clean Power Plan on generation resources and energy costs in the ERCOT region. The ERCOT report:

- Provides an overview of the environmental regulations evaluated in this study and describes prior ERCOT analyses related to the potential impacts of environmental regulations (Section 1);
- Discusses the requirements and associated costs of environmental regulations for generation resources (Section 2);
- Presents the results of the generator survey which asked about planned retirements or curtailments due to environmental regulations, currently installed control technologies, and compliance strategies (Section 3 and Appendix A);
- Describes the methodology and results of ERCOT's modeling analysis performed using the Energy Exemplar's PLEXOS Integrated Energy Model for different regulatory scenarios (Section 4);
- Discusses the impacts of these regulations for grid reliability in the ERCOT region (Section 5); and
- Presents a cost analysis of the relevant environmental regulations (Section 6)

The results of the ERCOT study indicate that the Regional Haze program and the Clean Power Plan will both lead to the retirement of coal-fired capacity in ERCOT. EPA's proposed Regional Haze FIP is likely to result in the retirement of coal units due to the costs associated with upgrading and retrofitting scrubbers. ERCOT anticipates that 3,000 MW to 8,500 MW of coal-fired capacity in ERCOT face a moderate to high risk of retirement due to these requirements. If implemented as proposed, the Clean Power Plan will also result in coal unit retirements, due to the need to meet stringent CO2 emissions limits on a state-wide basis. ERCOT's analysis suggests that the Clean Power Plan, in combination with other environmental regulations, will result in the retirement of up to 8,700 MW of coal-fired capacity. By comparison, the other regulations are not expected to have a significant system-wide impact, but could affect the economics of a small number of units.

The retirement of existing capacity in ERCOT could result in localized transmission reliability issues due to the loss of fossil fuel-fired generation resources in and around major urban centers, and will strain ERCOT's ability to integrate new intermittent renewable generation resources. If the expected retirement of coal resources were to occur over a short period of time, reserve margins in the ERCOT region could reduce considerably, leading to increased risk of rotating outages as a last resort to maintain operating balance between customer demand and available generation. The need to maintain operational reliability (i.e., sufficient ramping capability) could require the curtailment of renewable generation resources.

[GCLC (0063) p. 15-16] According to GCLC, EPA believes that energy concerns will not be significant, because once again, by relying on BART Guidelines, EPA has only taken a narrow view of the energy penalties of controls at each individual unit. However, viewed on a larger scale (i.e. statewide) the energy impacts of complying with the Proposed FIP may be significant, particularly in the ERCOT region. EPA has failed to consider these broader impacts of its proposal.

ERCOT is predicting that by 2020, ERCOT will have a reserve margin of 12.4%.[68] By 2024, this reserve margin will shrink to 7.3%, far below the 13.75% target margin for the region and the margin that the NERC demands. The Proposed FIP will impact 10,131 MW of installed Texas capacity either through forced scrubber upgrades or scrubber retrofits.[69] If the ERCOT units targeted with scrubber retrofits are forced to retire, this would take 2,972 MW off of the ERCOT grid, reducing the reserve margin to 8.3% in 2020 and 3.3% in 2024, which places the grid in substantial jeopardy when it comes to preserving reliability.

Importantly, GCLC noted that ERCOT's estimates regarding predicted capacity and demand do not include the impacts of environmental rules. Therefore the predicted impacts of the Clean Power Plan, the 316(b) Rule, the MATS rule and others are not reflected in this shortfall calculation. Therefore, the predicted reserve margin will be even lower than stated above.

GCLC asserted that EPA's Proposed FIP could have a very significant effect on energy/electricity availability in the state, which is a clear and convincing reason that EPA should not continue with its Proposed FIP or impose the source-specific limitations it contemplates. This was something that was not accounted for by EPA in its cost analysis, nor in its analysis of energy impacts.

Footnotes:
[68] ERCOT, Report on the Capacity, Demand, and Reserves in the ERCOT Region, 2015-2024, 9 (Dec. 1, 2014). Available at: http://www.ercot.com/content/gridinfo/resource/2014/adequacy/cdr/CapacityDemandandReserveReportDec2014.pdf.
[69] See U.S. Energy Information Administration, Form EIA-860 Annual Electric Generator Report, 2012 Data, available at http://www.eia.doe.gov/cneaf/electricity/page/eia860.html.

Response: First, we note that controls achieving the level of control that we are requiring are highly cost-effective, are in wide use in the industry, and thus should not require a source to shut down to comply. In response to the TCEQ's comments, however, we contracted with Synapse Energy Economics, Inc., a nationally recognized firm with particular expertise in the subject area. (Synapse).[672] Synapse assessed the information in the ERCOT report and we reproduce its findings below:

1. ERCOT's perspective of market operations is short-sighted. ERCOT raises concerns that reliability could be impacted if numerous coal units choose to retire simultaneously with little notice to either ERCOT or other market participants. Unlike other competitive market regions, ERCOT's rules do not require meaningful notice. ERCOT's charge as a reliability coordinator may obligate it to implement rules requiring reasonable notice for economic retirements.

[672] Synapse's report, "ERCOT_Report_Review_Memo_20150908.pdf" is in our docket to this rulemaking action.

2. ERCOT's assumptions about new gas turbine capacity are not realistic. While the FIP, along with other environmental regulations ERCOT included in its study, will strain the economic viability of coal plants and likely lead to less coal capacity, ERCOT has not considered new resources that will be available to help address potential reliability challenges. Specifically, ERCOT does not include approximately 4,500 MW of additional gas-fired capacity coming online in Texas in the upcoming years. This represents 7.5 percent of current gas capacity, and would double the modeled baseline gas capacity additions through 2029.
3. The set of regulatory scenarios modeled is both incomplete and (now) outdated. Despite an overall thorough analysis ERCOT excluded a critical scenario that would have modeled the impact of the Regional Haze Program FIP by itself. This limits inferences we can make about impacts. Additionally, since ERCOT finalized its study, EPA finalized the Clean Power Plan. The final rule includes substantive changes that are likely to affect all of the CO_2 limit and price-inclusive scenario modeling results.
4. Electric Generating Unit owners' compliance "burdens" with the regional haze FIP may be over-stated. Of the 15 coal-fired units subject to regional haze compliance requirements, eight require upgrades to their existing scrubbers rather than new scrubbers. ERCOT assumed that all of the scrubbers would be priced at the cost of a new retrofit, thereby substantially increasing the cost of the regulation.

We reviewed and accept Synapse's findings and adopt its conclusion that ERCOT's report contained significant flaws. In sum, ERCOT's report cannot support a determination that there is likely to be any significant, adverse effect on the supply, distribution, or use of energy. During our comment period, we received no, non-speculative information to validate claims that sources would retire rather than install demonstrably cost-effective controls. Commenters who have alleged grid reliability concerns in response to our proposed controls have not provided adequate documentation for their assertions.

20. Determination of Nationwide Scope and Effect

Comment: [Earthjustice at al. (0067) p. 34] Earthjustice agreed that any petitions for review of the rule must be filed in the D.C. Circuit Court of Appeals. Even if EPA were not clarifying its interpretation of the existing haze rule in this action, EPA's rule takes action on two SIPs, the review of which would normally occur in two separate circuits. For this reason alone, review of the rule must occur in the D.C. Circuit.

Response: We appreciate the commenters' support, but note that we must make a determination of nationwide scope or effect and publish that finding before judicial review of a local or regionally applicable rule must occur in the D.C. Circuit. We have taken both steps here.

Comment: [TCEQ/PUCT (0056) p. 19] The TCEQ disagreed with the EPA's assertion that this action is a rulemaking of nationwide scope and effect. Any appeal of the EPA's final action on Texas' regional haze plan and FIP should be filed in the 5th Circuit Court of Appeals.

The TCEQ Stated that the EPA argues that the proposed FIP and SIP disapproval actions for Texas and Oklahoma have nationwide scope and effect and therefore, under CAA, §307(b)(1), appeal must be to the D.C. Circuit. First, the TCEQ notes that the EPA has in fact taken the opposite position in several final actions on regional haze plans in Oklahoma, New Mexico and Arizona.[17]

The TCEQ stated that these EPA actions do not have nationwide scope and effect; they are not nationally applicable, but apply only to two States. The EPA has provided no legal basis - beyond a one sentence assertion- to support that its actions interpreting the RHR as they apply to Texas and Oklahoma are of "nationwide scope and effect." This interpretation of the RHR as it applies to Texas and Oklahoma Regional Haze SIPs is unsupported by the EPA's proposed action. The action here specifically deals with plans adopted by Texas and Oklahoma to meet the CAA and regional haze regulations as they apply in their respective jurisdictions. Each regional haze plan submitted by the various States is unique, addressing visibility impairment at Class I areas in those States and in surrounding States. The EPA's proposed partial disapproval of Texas' plan and proposed imposition of a FIP does not rely solely on an interpretation of their rules but rather on a review of the Texas plan's comportment with those rules. The EPA has proposed determinations that Texas did not develop its natural visibility conditions and RPG correctly.
The EPA then goes on to draft RPG controls for 15 Texas units and redo the natural visibility estimates. This proposal is *Texas-centric;* it is not nationally applied.

The TCEQ Stated that the EPA then attempts to plug the obvious hole in its position by pointing to congressional report language that allows the Administrator to determine its action has nationwide scope and effect if the rulemaking extends to two judicial districts. This is not found in the CAA. In fact, §307(b)(1) specifically States that "any implementation plan" or "any other final action of the Administrator under this chapter .... which is locally or regionally applicable may be filed only in the United States Court of Appeals for the appropriate circuit." The fact that Oklahoma is in the Tenth Circuit and Texas is in the Fifth Circuit is immaterial to potential petitions for review. The TCEQ's comments and any future actions it may or may not take in court will be based on the EPAs action on Texas' SIP and any FIP the EPA has imposed on Texas, not Oklahoma. As Stated previously, venue for regional haze plans in several neighboring States, including Oklahoma, is already established in their respective circuits.

Footnote
[17] See for example: 79 FR 12944, 12954 March 7, 2014; 77 FR 70693, 70705, Nov. 27, 2012; 78 FR 46142, 46174 July 13, 2013; 79 FR 52420, 52479, Sept. 3, 2014.

Response: We disagree with this comment. The commenter is conflating two distinct portions of the CAA's judicial review provision. Under CAA Section 307(b)(1), "[a] petition for review of . . . nationally applicable regulations promulgated, or final agency action taken, by the Administrator . . . may be filed only in the United States Court of Appeals for the District of Columbia." Contrary to the commenter's assertions, the EPA did not assert at proposal, nor do we assert now, that our FIP for Texas and Oklahoma is a "nationally applicable" regulation. CAA Section 307(b)(1) next provides that "[a] petition for review of the Administrator's action in approving or promulgating any implementation plan under section 7410 . . . or any other final action of the Administrator . . . which is locally or regionally applicable may be filed only in the

United States Court of Appeals for the appropriate circuit." The commenter cites this sentence, but ignores the following sentence, which States "[n]otwithstanding the preceding sentence a petition for review of any action referred to in such sentence may be filed only in the United States Court of Appeals for the District of Columbia if such action is based on a determination of nationwide scope or effect and if in taking such action the Administrator finds and publishes that such action is based on such determination."

In other words, a final agency action that is locally or regionally applicable, such as a FIP, is appealable only in the D.C. Circuit if two conditions are met: (1) the action is based on a determination of nationwide scope or effect, and (2) EPA finds and publishes its determination. Both conditions are met here. First, we proposed to find and have confirmed its finding in this final rule that the Agency's action on the Texas and Oklahoma regional haze SIPs, which includes the promulgation of a partial FIP for each State, is based on a determination of nationwide scope and effect. Second, we have published that finding in the Federal Register.

While the CAA does not provide any guidance regarding the phrase "nationwide scope and effect," the legislative history indicates that a determination of nationwide scope and effect is appropriate if a local or regional action encompasses two or more judicial circuits, as is the case with Texas and Oklahoma in this action. The commenter makes no effort to explain why this legislative history should not be taken into account. Instead, the commenter cites to three other EPA actions on regional haze SIPs where the Agency did not make a determination of nationwide scope and effect. However, the commenter fails to mention that all of these actions involved a single State and thus did not implicate multiple judicial circuits. We have routinely made determinations of nationwide scope and effect when more than one circuit is involved. Last year, for instance, we made a determination of nationwide scope and effect in a SIP approval action that involved the States of Florida and North Carolina, which reside in separate judicial circuits. See 79 FR 29362. We have made many other such determinations over the years and similarly do so for this matter. Again, and as stated on our final action, the scope and effect of this rulemaking extend to Texas and Oklahoma, which are located in two judicial circuits.

We also determined that this action has nationwide scope and effect because at the core of this rulemaking is our interpretation of the requirements of Sections 110(a)(2)D)(i)(II) and 169A(b)(2) of the CAA and multiple complex provisions of the Regional Haze Rule. Many commenters disagreed with our interpretation of these provisions, with some providing alternative interpretations that would substantially change the Regional Haze Rule, which is implemented on a nationwide basis. Congress intended for such issues of national importance to be decided by the D.C. Circuit. Therefore, it does not matter that the final rule's requirements are largely Texas-centric, which reveals only that the final rule is locally or regionally applicable. It says nothing of whether the final rule has nationwide scope and effect.

Comment: Any judicial challenge to a final rule must be heard in the U.S. Court of Appeals for the Fifth Circuit. [CCP (0075) p. 15]

CCP noted that the EPA States that the Texas and Oklahoma FIPs and interpretations therein are of "nationwide scope and effect." See 79 Fed. Reg. 74,888. This is inconsistent with the Congressional mandate in the CAA that rules with only local or regional effect should be heard in the appropriate appellate court and not in the D.C. Circuit.

CCP stated that other FIP challenges were heard in other circuit courts of appeals for the appropriate region and not in the D.C. Circuit. See Wyoming v. EPA, No. 14-9529 (10th Cir.) (reviewing Wyoming SIP Disapproval/FIP); North Dakota v. EPA, 730 F. 3d 750 (8th Cir. 2013) (reviewing North Dakota SIP Disapproval/FIP); Oklahoma v. EPA, 723 F.3d 1201, 1213 n.7 (10th Cir. 2013) (reviewing Oklahoma SIP Disapproval/FIP). EPA fails to identify any issue of sufficient "nationwide scope and effect" to require review in the D.C. Circuit.

Response: We disagree with this comment. Section 307(b)(1) reflects Congress's intent that some local and regional actions should be reviewed in the D.C. Circuit only. The actions cited to by the commenter all involved a single State in a single judicial circuit. In contrast, this final rule involves two States in two separate judicial circuits. Moreover, we explained in detail why the interpretations at the core of this rulemaking are nationally significant.

Comment: EPA appears to be attempting to dictate which appellate court should have jurisdiction over any appeal of the final FIP. [Xcel Energy (0064) p. 25]

Xcel Energy stated that the EPA inappropriately suggests that the Proposal is unique in its "nationwide scope and effect," which would site jurisdiction over any appeals of the Proposal in the U.S. Court of Appeals for the D.C. Circuit ("D.C. Circuit"). *See* 79 Fed. Reg. at 74,888. This is a blatant and improper attempt to override Congress' mandate in the CAA that rules with only local or regional effect should be heard in the United States Court of Appeals for the appropriate circuit and not in the D.C. Circuit. 42 U.S.C. § 7607(b)(l). EPA's final Regional Haze FIP for Texas will determine what additional controls to impose on specific Texas sources to achieve reasonable progress toward natural visibility goals for Class I areas located in Texas and Oklahoma. It is an action of inherently local or regional effect that must be reviewed in the U.S. Court of Appeals for the Fifth Circuit.

Xcel Energy Stated that the EPA has proposed interpretations in this Proposal that might have applicability to other State regional haze FIPs. However, that does not make the Proposal of "nationwide scope and effect." EPA also has proposed interpretations in other State regional haze FIPs that might have applicability to Texas, but EPA has never claimed that those FIPs were of nationwide scope and effect. In fact, most recently, on April 8, EPA proposed a regional haze FIP for Arkansas. 80 Fed. Reg. 18,944 (Apr. 8, 2015). Nowhere in the proposed Arkansas FIP does EPA suggest that its interpretations therein are of nationwide scope and effect. Instead, the proposed Arkansas FIP and other prior regional haze FIPs have been treated as having "only local or regional effect." Indeed, other FIP challenges have already been heard in other circuit courts of appeals for the appropriate region and not in the D.C. Circuit. *See Wyoming* v. *EPA,* No. 14-9529 (l0th Cir.) (reviewing Wyoming SIP Disapproval/PIP); *North Dakota* v. *EPA,* 730 F.3d 750 (8th Cir. 2013) (reviewing North Dakota SIP Disapproval/PIP); *Oklahoma* v. *EPA,* 723 F.3d 1201, 1213 n.7 (10th Cir. 2013) (reviewing Oklahoma SIP

Disapproval/FIP). The final FIP for Texas should clearly State that any appeals of the FIP should be heard in the U.S. Court of Appeals for the Fifth Circuit.

Response: We disagree with this comment. Section 307(b)(1) reflects Congress's intent that some local and regional actions should be reviewed in the D.C. Circuit only. The actions cited to by the commenter all involved a single State in a single judicial circuit. In contrast, this final rule involves two States in two separate judicial circuits. It does not just involve the Fifth Circuit, as the commenter suggests. Moreover, we explained in detail why the interpretations at the core of this rulemaking are nationally significant.

Comment: EPA's action is reviewable in the 5th Circuit. [NRG (0078) p. 14]

NRG noted that the EPA has proposed to determine that its action is only reviewable in the D.C. Circuit, on the basis that:

> [T]his rule is based on a determination of nationwide scope and effect. The rule discusses our interpretation of multiple provisions of the Regional Haze Rule and explains how those provisions operate in the visibility-transport context. Our interpretation of our regulations is applicable to all States, not just Texas and Oklahoma. 79 Fed. Reg. at 74,888.

NRG disagreed that this action is reviewable in the D.C. Circuit. The Clean Air Act provides that a petition for review of "a locally or regionally applicable" EPA action "may be filed only in the United States Court of Appeals for the appropriate circuit" unless it "is based on a determination of nationwide scope or effect." 42 U.S.C. § 7607(b)(l). Further, if EPA's proposed finding on judicial review were correct, no State implementation plan challenge would ever lie outside the D.C. Circuit, despite the statute's role for other Circuits and the substantial history of past decisions on State plans that have been determined in the various Circuits.

The proposal is locally or regionally applicable. NRG Stated that the "locally or regionally applicable" nature of EPA's action is made clear by the fact that the proposal would only impose new emission controls on a small number of facilities in Texas. A further indication that the action is "locally or regionally applicable" is that it only regulates three out of over 100 areas subject to the statutory provisions on regional haze *See, e.g.,* htto://www.epa.gov/ttn/oaroq/tl/fr notices/classimp.gif (last accessed April 2, 2015). Also notably, the proposed rule was signed by EPA's Region 6 Regional Administrator Curry, based in Dallas, not by Administrator McCarthy in Washington, D.C.

NRG noted that courts outside the D.C. Circuit have frequently exercised jurisdiction over challenges to EPA regional haze rules that address specific States. For example:

- In October 2014, the 10th Circuit rejected on the merits a challenge by environmental groups to EPA's approval of a three-State emissions trading program to satisfy regional haze rule requirements. *WildEarth Guardians v. EPA,* 770 F.3d 919 (10th Cir. 2014).

- In July 2014, the 9th Circuit rejected on the merits a challenge by environmental groups to EPA's approval of BART determinations for sources in Nevada. *WildEarth Guardians v. EPA,* 759 F.3d 1064 (9th Cir. 2014)
- In September 2013, the 8th Circuit issued an opinion on the merits on BART and reasonable progress plan issues for North Dakota. *North Dakota v. EPA,* 730 F.3d 750 (8th Cir. 2013).

NRG Stated that the EPA's litigation position subsequent to the current proposal further illustrates the distinction between this action, reviewable in the 5th Circuit, and other regional haze actions for which judicial review may lie in the D.C. Circuit. On January 30, 2015, EPA filed a brief with the 8th Circuit concerning a challenge to the Minnesota regional haze plan. EPA's rationale as presented to the court was that the Minnesota lawsuit was a collateral attack on the substance of a prior nationwide EPA rule finding that EPA-promulgated emissions trading programs were superior to BART for regional haze purposes, as EPA had merely approved Minnesota's reliance on the EPA emissions trading program. January 30, 2015 brief of EPA, *National Parks Conservation Association v. EPA,* Nos. 12·2910, 12- 3481 (8th Cir.).

By contrast to the Minnesota lawsuit, NRG's objections to EPA's current proposal do not contradict EPA's underlying regional haze rules. These objections are fact-specific to how EPA's regulations should be applied to Texas sources. Thus, the current proposal is exemplary of the type of "locally or regionally applicable" action for which judicial review lies in the 5th Circuit.

<u>The proposal does not rely on a determination of nationwide scope and effect</u>. NRG also disagreed that the proposal relies on "a determination of nationwide scope and effect." Rather, the proposal concerns the application of national regulations to fact-specific circumstances at a small number of emissions sources and protected areas.

Response: We disagree with this comment. Section 307(b)(1) reflects Congress's intent that some local and regional actions should be reviewed in the D.C. Circuit only. The actions cited to by the commenter all involved a single State in a single judicial circuit. For example, not only did we act separately on each of the four State plans at issue in *WildEarth Guardians v. EPA,* 770 F.3d 919 (10th Cir. 2014), but each State was in the Tenth Circuit. In contrast, this final rule involves two States in two separate judicial circuits. It does not just involve the Fifth Circuit, as the commenter suggests. Moreover, we explained in detail why the interpretations at the core of this rulemaking are nationally significant.

We also note that the Regional Administrator is delegated with the authority to sign proposed FIPs. Only the Administrator can sign this final rule.

Comment: EPA's Regional Haze FIP is not a rule of "nationwide scope and effect." [GCLC (0063) p. 19-20]

According to GCLC, EPA declares in the preamble of the Proposed FIP that "this is a rulemaking of nationwide scope or effect such that any petitions for review must be filed in the U.S. Court of Appeals for the District of Columbia Circuit." [77] EPA's position is both factually and legally incorrect.

GCLC stated that the Proposed FIP addresses only two States' SIP submissions - Texas and Oklahoma. Grouping these two States in a single SIP submission does not make a rule one of "nationwide scope of effect." Further, in actual application, the only legal obligations imposed by the Proposed FIP is limited to Texas and Texas generators; there are no substantive burdens imposed on Oklahoma or its generations sources, so practically, the rule is limited solely to Texas. EPA attempts to claim that "[its] interpretation of [its] regulations is applicable to all States, not just Texas and Oklahoma."[78] By this logic, any SIP rulemaking would be of nationwide scope, because all SIP approvals and disapprovals require interpretation. This is clearly contradictory to the purpose of Section 307(b)(1) [79] and if proven true, would effectively read the judicial review provisions out of the CAA.

Footnotes:
[77] Proposed FIP, 79 Fed. Reg. at 74888.
[78] Proposed FIP, 79 Fed. Reg. at 74888.
[79] 42 USC §7607(b)(1).

Response: We disagree with this comment. Section 307(b)(1) reflects Congress's intent that some local and regional actions should be reviewed in the D.C. Circuit only. This final rule involves two States in two separate judicial circuits and, as we have explained in detail, includes statutory and regulatory interpretations that are nationally significant. The commenter is incorrect that under our logic, any SIP rulemaking would be of nationwide scope and effect. For judicial review to lie in the D.C. Circuit, we must make an affirmative determination and publish that finding. As many commenters have pointed out, we typically do not make such findings in SIP rulemakings unless more than one judicial circuit is involved and interpretations of national importance are at issue.

Comment: If EPA adopts its Proposal, judicial review of it will be proper in the Fifth Circuit Court of Appeals [AECT (0074) p. 10]

AECT disagreed with EPA's assertion that any petitions for review must be filed in the U.S. Court of Appeals for the D.C. Circuit because EPA's adoption of the Proposal would have "nationwide scope or effect". EPA's assertion that its adoption would have "nationwide scope or effect" is based on its claims that (i) the Proposal discusses EPA's interpretations of provisions in its Regional Haze rules and such interpretations would be applicable to all States, and (ii) its adoption would have "scope or effect beyond a single judicial circuit".[31] AECT does not see how either of those bases would support EPA's assertion that its adoption would have "nationwide scope or effect."

AECT noted that EPA's interpretation of its Regional Haze rules in its Proposal cannot be applicable to all States since EPA has already made determinations on the Regional Haze SIPs under those rules for all States except for the two States that are covered by its Proposal.[32] Notwithstanding that, it cannot be true that an EPA action regarding one State's SIP has "nationwide scope or effect" merely because that action involved EPA interpreting its rules that the State's SIP is addressing and such interpretations might be used in its evaluations of other States' SIPs that address those rules. If that was true, AECT cannot conceive of an EPA action regarding a SIP that would not have "nationwide scope or effect," and, thus, would be subject to judicial review in the applicable circuit court of appeals.

AECT Stated, in addition, if EPA was to adopt its Proposal, that action would not have "scope or effect beyond a single judicial circuit". That action would only impose legal requirements on EGUs in Texas. Accordingly, any legal challenge to that action would only relate to its impacts on EGUs in Texas. Since Texas is only covered by a single judicial circuit-- the Fifth Circuit -- EPA's action would not have "scope or effect beyond a single judicial circuit", and thus, would not have "nationwide scope or effect".

<u>Footnotes:</u>
[31] 79 Fed. Reg. at 74888
[32] 79 Fed. Reg. at 74820 (stating that EPA has "acted on all of the States' regional haze SIPs for the first planning period except for the Texas regional haze SIP and certain portions of the Oklahoma regional haze SIP")

Response: We disagree with this comment. Section 307(b)(1) reflects Congress's intent that some local and regional actions should be reviewed in the D.C. Circuit only. Contrary to the commenter's claim, this final rule involves two States in two separate judicial circuits. We have partially approved and partially disapproved Texas' regional haze SIP and have promulgated a FIP. We have also partially approved and partially disapproved Oklahoma's regional haze SIP and promulgated a partial FIP. While the commenter is correct that the FIP imposes emission limits on Texas sources but not Oklahoma sources, this does not mean that we have not taken action on both States' SIPs. More importantly, our rationale for requiring SO_2 reductions at Texas EGUs is inextricably linked to our evaluation of the Oklahoma SIP.

Moreover, the EPA explained in detail why the interpretations at the core of this rulemaking are nationally significant. The commenter is incorrect that under our logic, any SIP rulemaking would be of nationwide scope and effect. For judicial review to lie in the D.C. Circuit, the EPA must make an affirmative determination and publish that finding. As many commenters have pointed out, the EPA typically does not make such findings in SIP rulemakings unless more than one judicial circuit is involved and interpretations of national importance are at issue.

In summary, the commenter is incorrect that judicial review is appropriate in the Fifth Circuit. The EPA has finalized and published its determination that judicial review can only be had in the D.C. Circuit.

21. Reasonable Progress Determination for the Texas Class I Areas

Comment: Texas' reasonable progress analysis meets all statutory and regulatory requirements, and EPA must approve it. Texas' Reasonable Progress Goals for Big Bend and Guadalupe Mountains meet all statutory and regulatory requirements. [Luminant (0061) p. 59]

Luminant stated that Texas established reasonable progress goals for 2018 for the two Class I areas in the state—Big Bend and Guadalupe Mountains—that fully meet all statutory and regulatory requirements, and, as such, EPA must approve them. For Big Bend and Guadalupe

Mountains, Texas established goals for 2018, expressed in deciviews, that provide for an improvement in visibility for the most impaired days and ensure no degradation in visibility for the least impaired days over the period of the implementation plan (2008-2018). After considering the four statutory factors, Texas determined that the uniform rate of progress was not reasonably achievable by 2018, and thus Texas established interim goals for 2018 of 16.6 deciviews for Big Bend and a goal of 16.3 deciviews for Guadalupe Mountains, based on CENRAP modeling.[422] Of particular relevance to Texas' determination was CENRAP's modeling that showed that the uniform rate of progress could not be achieved due to emissions from outside the United States, which Texas could not control.[423] CENRAP's analysis showed that 52% of impairment at Big Bend and 25% of impairment at Guadalupe Mountains was due to emissions from Mexico and further south.[424]

According to Luminant, in its proposal here, EPA agrees with Texas that the RPGs established by Texas provide for "improvement in visibility for the most impaired days over the period of the SIP and ensure no degradation in visibility for the least impaired days over the same period."[425] And EPA further agrees with Texas that RPGs based on the uniform rate of progress are not achievable.[426] EPA further agrees that international sources of emissions are the reason.[427] EPA's only point of departure from Texas' reasonable progress analysis is that the 2018 RPGs should be lowered by a miniscule (and undetectable) amount—from 16.6 to 16.57 deciviews for Big Bend and from 16.3 to 16.26 deciviews for Guadalupe Mountains.[428]

Luminant stated, in other words, the basis upon which EPA would second-guess Texas' reasonable progress analysis—and for which it would impose billions of dollars in emission control measures on a handful of select Texas sources—is stated in the hundredths of a deciview: 0.03 deciview improvement at Big Bend and 0.04 deciview improvement at Guadalupe Mountains. And in terms of achieving the national goal of natural visibility conditions, EPA's proposal would have no meaningful benefit, under even EPA's calculations. EPA projects that its RPGs would achieve natural visibility at Big Bend in the year 2198 (compared to 2206 with no further controls); at Guadalupe Mountains in the year 2163 (compared to 2169 with no controls); and at Wichita Mountains in the year 2095 (compared to 2101 with no controls).429

Luminant asserted that the EPA has no authority to disapprove Texas' reasonable progress analysis on this basis. Texas has not failed to consider any of the statutory factors, nor has EPA identified any other requirement of the statute that Texas' SIP revision does not meet. Moreover, as a matter of common sense, this difference is so negligible that it cannot support or justify EPA's proposed disapproval or the costs EPA would impose through the FIP. In fact, the additional "benefits" EPA projects are literally eliminated in the rounding. Under EPA's own rounding convention, which rounds deciviews to the nearest tenth of a deciview for purpose of reasonable progress goals,[430] the RPGs that Texas established are exactly the same as the RPGs that EPA now concludes are reasonable. EPA's disregard of its own rounding convention here is unexplained and arbitrary and capricious.

Luminant stated that EPA's proposal to micro-engineer the outcome of Texas' reasonable progress analysis is contrary to the statute and regulations and wholly unreasonable. EPA's proposal rests on the incorrect assumption that EPA has the authority to review the substantive outcome of a state's RPGs—***down to the hundredth of a deciview***. But the statute and regulations impose only an analytical requirement for states, which Texas has fully met. The CAA and EPA's regulations do not establish required emission limitations or visibility improvements, but instead impose only an "analytical" requirement to consider the four statutory factors.[431] Thus, as long as the state performs the required analysis (as Texas did here), EPA must respect the state's choices and approve its reasonable progress goals—even where EPA would have come to a different conclusion than the state in considering the factors.[432] And even though EPA believes that more reductions from Texas sources are "feasible,"[433] such a standard was specifically rejected by Congress in enacting the regional haze program and is not a lawful basis for EPA's disapproval.[434] EPA's proposal thus applied the wrong legal standard by which to judge Texas' SIP revision.

Further, Luminant stated that there was no error in Texas' analysis. Texas' analysis followed the regulations and EPA's own guidance in considering potential additional controls and assessing the four statutory factors. And, as discussed in Section X and elsewhere in our comments, Texas followed the same approach as other states, whose SIPs EPA approved without reservation.[435] EPA finds no error in the data considered by Texas, nor does EPA contend that Texas failed to conduct the four-factor analysis. Indeed, Texas relied on CENRAP modeling and control strategy analysis with which EPA concurs.[436] Additionally, Texas estimated and considered the visibility improvements at multiple Class I areas (including the three at issue here) from the potential controls it analyzed, noting that at each area the improvement was less than 0.5 deciviews and thus imperceptible.[437] Based on this information—which is basically the same information as EPA develops on its own and claims requires a different outcome—Texas appropriately concluded that the additional controls were not reasonable.[438]

Footnotes:
[422] 2009 Texas SIP Narrative at 10-3.
[423] Id. at 10-10.
[424] Id.
[425] 79 Fed. Reg. at 74,834.
[426] Id. at 74,887 ("We propose to find that it is not reasonable to provide for rates of progress at the Wichita Mountains, Big Bend, or Guadalupe Mountains that would attain natural visibility conditions by 2064 (i.e., the URP).").
[427] Id. at 74,843.
[428] Id. at 74,887.
[429] See TX116-007-_33_Vis_modeling_summary ("2018 RPG calcs").
[430] BART Alternative TSD at 24 n.24 ("Calculating visibility changes to the nearest tenth of a deciview (rather than the nearest hundredth) is consistent with the practice for implementing the reasonable progress goals under the Regional Haze rule.") (citing EPA Guidance for Tracking Progress).
[431] 40 C.F.R. § 51.308(d)(1)(i).
[432] North Dakota, 730 F.3d at 768 ("[T]he CAA requires only that a state establish reasonable progress, not the most reasonable progress."); 79 Fed. Reg. at 5205 (approving Wyoming's decision not to impose additional controls on oil and gas source category because EPA concluded that the costs "were not so low that EPA could find it necessarily unreasonable for the State to not have adopted them").
[433] Technical Support Document for the Oklahoma Regional Haze State Implementation Plan and Federal Implementation Plan (OK TSD) 29 ("Oklahoma TSD") (Nov. 2014).
[434] In the conference committee that reconciled the House and Senate versions of the 1977 Clean Air Act amendments, the term "maximum feasible progress" was specifically changed to "reasonable progress" in the final legislation. See 1 Legislative History of the Clean Air Act Amendments 1977 Pub. L. No. 95-95 155 (1977) ("The term 'maximum feasible progress' is changed to read 'reasonable progress' whenever it appears in the section.").
[435] For example, EPA approved, without question, Washington's decision that the URP was not reasonably achievable and that additional controls were not necessary during the first planning period, based on the same

rationale Texas used in its SIP. 77 Fed. Reg. 76,174 (Dec. 26, 2012). As EPA explained: "Additional controls on point sources or other source categories at this time is not likely to result in substantial visibility improvement in the first planning period due to the significant contribution from emissions from natural fire, the Pacific offshore, Canada, and outside the modeling domain." Id. at 76,204.

[436] TX SIP TSD at 55 ("The CENRAP states' modeling, described in Section 8 of the Texas Regional Haze SIP, was developed consistent with our guidance."); CENRAP Modeling TSD at 30 ("EPA concurred with the selection of CAMx for the CENRAP regional haze modeling as it has been extensively used within the region and has been proven to be an acceptable model.").

[437] 2009 Texas SIP Narrative at 10-6, tbl.10-6.

[438] Id. at 10-7 ("At a total estimated cost exceeding $300 million and no perceptible visibility benefit, Texas has determined that it is not reasonable to implement additional controls at this time.").

Response: We disagree with this comment on all issues raised. Contrary to Luminant's belief, and as discussed elsewhere, our review of SIPs is not limited to a ministerial type of automatic approval of a state's decisions. We must consider not only whether Texas considered the appropriate factors but acted reasonably in doing so. In undertaking such a review, we do not "usurp" the state's authority but ensure that such authority is reasonably exercised. As stated in more detail elsewhere, Texas did not fully satisfy the requirements under Section 51.308(d)(1) related to the evaluation of the four reasonable progress factors and establishment of the RPGs. In particular, as we discussed in detail in our proposal and final, we disagree with the set of potential controls identified by Texas and how it analyzed and weighed the four reasonable progress factors under Section 51.308(d)(1)(i)(A). As stated previously, we disagreed with the goals set by Texas and how the state analyzed and weighed the four reasonable progress factors. As we stated in our proposal and within our responses to comments and final action, Texas did not satisfy several of the requirements at Section 51.308(d)(1) with regard to setting RPGs, most notably the requirement to reasonably consider the four statutory reasonable progress factors and the requirement to adequately consider the emission reduction measures needed to meet the URP. As we state in our proposal and are finalizing today:[673]

> Because it only estimated the visibility benefit of all the controls together, the TCEQ was not able to assess the potential benefit of controlling individual sources with significant, and potentially cost-effective, visibility benefits. Also, we believe that individual benefits were masked by the inclusion of those controls with little visibility benefit that only served to increase the total cost figures.

We are finalizing our determination that Texas' analysis was deficient and not approvable because the large control set they selected was not appropriately refined, targeted or focused on those sources having significant and potentially cost-effective visibility benefits. Consistent with our proposal, we conclude that control set was over-inclusive. It included controls on sources that would increase total cost figures with little visibility benefit.

We, Texas and CENRAP all acknowledge that emissions from Mexico contribute to visibility impairment at Texas' Class I Areas. We are not requiring Texas to over-control its sources in order to make up the difference. We reject Luminant's conclusion that because these Class I Areas are partially impacted by emissions from Mexico that no efforts from Texas to further

[673] 79 FR 74838.

improve their visibility impacts by controlling Texas' share of the problem are warranted. A reasoned four-factor analysis was still required.

Luminant claims that we agreed with Texas that the RPGs established by Texas provide for "improvement in visibility for the most impaired days over the period of the SIP and ensure no degradation in visibility for the least impaired days over the same period." However Luminant's partial reproduction of our proposal misrepresents what we said. The full quote is reproduced below: (footnote 674)

> Although Texas' RPGs do provide for ***some*** improvement in visibility for the most impaired days over the period of the SIP and ensure no degradation in visibility for the least impaired days over the same period, ***we believe the overall RPG goals that Texas established for its own Class I areas of Big Bend and Guadalupe Mountains do not provide for reasonable progress based on the four reasonable progress factors that a state is required to consider in selecting a RPG under (d)(1)(i)(A).*** **[*emphasis added*].**

Luminant holds up our conclusion that the rates of progress at the Wichita Mountains, Big Bend, or Guadalupe Mountains that would attain natural visibility conditions by 2064 are not reasonable as if that conclusion is somehow indicative of the approvability of Texas' regional haze SIP. It is not. Our proposed acknowledgement of that fact has no bearing on our proposed controls. Again, Luminant seems to believe that because perfect progress cannot be made, no progress should be made. We reject this misplaced conclusion. Texas must meet the RP statutory requirements in establishing their RPGs, and where we determine that these requirements have not been satisfied, we have the authority to disapprove the State's RPGs and indeed must disapprove it as not meeting the Federal requirements. Our disapproval is based on the fact that Texas did not properly evaluate the four statutory factors in establishing its RPGs. As further explained elsewhere in today's action, Congress directed in section 110 of the CAA that states would take the lead in developing implementation plans, but balanced that decision by requiring us to review the plans to determine whether a SIP meets the requirements of the CAA. We must consider not only whether the State considered the appropriate factors in development of its RPGs, but also whether the State acted reasonably in doing so. For the reasons explained in this document and the preamble to this final rule, Texas failed to do so.

Luminant states we found no error in the data considered by Texas, nor we contend that Texas failed to conduct the four-factor analysis. As we state in our proposal and in numerous responses herein, we in fact found many errors in Texas' regional haze SIP. Luminant erroneously extends our finding that CENRAP's modeling was acceptable to all aspects of the Texas Regional Haze SIP. Also as we indicate many times in our response to comments, merely addressing our regional haze requirements in some form or fashion does not equate with doing so properly or reasonably.

We address Luminant's allegations of inconsistencies with our other actions in the consistency section of this document. We disagree with comments that we applied the wrong legal standard in evaluating the state's reasonable progress determinations because the state was not free to do

[674] 79 FR 74834

make such determinations that were inconsistent with the CAA. Thus, while states have discretion in establishing reasonable progress goals it must be reasonably exercised. Texas' approach to reasonable progress was flawed and we properly rejected it. Please see our responses in other more detailed comments regarding our authority to review SIPs and regarding our authority to disapprove TX's reasonable progress goals, and consistency that includes and explanation of Wyoming and Washington. We address comments concerning visibility benefits of controls and the commenter's assertion that the benefits round to zero in a separate response to comment where we address comments on cost versus visibility benefit.

Comment: [Associations (0059) p. 9-10] The Associations stated that Texas fully complied with all statutory and regulatory requirements in developing its own reasonable progress goals for the Big Bend and Guadalupe Mountain Class I areas. Specifically, Texas appropriately considered the four statutory factors in 42 U.S.C. § 7479(g)(1) and established reasonable progress goals after determining that the uniform rate of progress was not reasonably achievable by 2018. EPA does not dispute that Texas' evaluation complied with the statutory and regulatory requirements. EPA agrees that Texas' reasonable progress goals provide for "improvement in visibility for the most impaired days during the period of the SIP and ensure no degradation in visibility for the least impaired days over the same period" in accordance with 40 C.F.R. § 51.3108(d)(1). 79 Fed. Reg. at 74,834. EPA also agrees with Texas that the reasonable progress goals based on the uniform rate of progress are not achievable due to international emissions. *Id. at* 74,843, 87. Thus, because Texas has complied with these criteria, EPA has a mandatory duty to approve the SIP pursuant to 42 U.S.C. § 7410(k)(3). *See National Ass'n of Home Builders*, 551 U.S. 644 (EPA has no discretion when statutory language says the agency "shall approve" a State program if statutory criteria are met). Nevertheless, EPA arbitrarily proposes to second-guess Texas' 2018 reasonable progress goals by replacing them with goals that would improve projected visibility at the Big Bend and Guadalupe Mountain Class I areas by an imperceptible few hundredths of a deciview, but require enormous expenditures by a handful of stationary sources.

The Associations stated that EPA's proposal is contrary to the cooperative federalism principles on which the regional haze program is based. Under those principles, EPA must respect the State's choices and approve its reasonable progress goals as long as the State performed the required analysis. EPA does not claim that Texas failed to perform the required analysis. Instead, it faults "how [Texas] analyzed and weighed the four reasonable progress factors." EPA, *Texas Technical Support Document* 18. But, under the Clean Air Act, EPA must approve a State's reasonable progress goals, even if EPA would have weighed the statutory factors differently and reached a different result. *See, North Dakota*, 730 F.3d at 768 ("[T]he CAA requires only that a state establish reasonable progress, not the most reasonable progress."); *see also Alaska Department of Environmental Conservation v. EPA*, 540 U.S. 461, 490 (2004) (recognizing that, when EPA reviews the reasonableness of state best available control technology determinations, it must act with deference and cannot "second guess state decisions"). Thus, it is unlawful and contrary to Congress' intent for EPA to disapprove of Texas' reasonable progress goals simply because EPA, after second-guessing Texas' analysis, concluded that additional reductions from a handful of additional sources are feasible. *See also* Section II, *infra*.

Response: We disagree with the Associations that "EPA does not dispute that Texas' evaluation complied with the statutory and regulatory requirements." As we discuss in our responses to more detailed comments herein, we disagree with the Associations that Texas fully complied with all applicable requirements in developing its reasonable progress goals for Big Bend and Guadalupe Mountains. As we note in our response to Luminant above, the Associations' selection of discrete statements concerning the impact of international emissions, and Texas' reasonable progress goals providing for "improvement in visibility for the most impaired days during the period of the SIP and ensure no degradation in visibility for the least impaired days over the same period," are taken out of context or misrepresent the actual text in our proposal. Thus, Texas has not in fact complied with the applicable criteria and its regional haze SIP must be disapproved. We further reject the Associations' characterization of our review as "second guessing" Texas' reasonable progress goals. Our review was conducted according to the authority granted to us by Congress, and as reflected in our Regional Haze Rule. We did no second guessing, but rather conducted a thorough review and properly rejected Texas' flawed analyses.

We do not agree that our proposed disapproval of the Texas RPG's is contrary to the CAA, the RHR, or relevant case law. As detailed in our responses elsewhere, Congress crafted the CAA to provide for states to take the lead in developing implementation plans, but balanced that decision by requiring us to review the plans to determine whether a SIP meets the requirements of the CAA. Our review of SIPs is not limited to a ministerial type of automatic approval of a state's decisions. We must consider not only whether the State considered the appropriate factors but acted reasonably in doing so. In undertaking such a review, we do not "usurp" the state's authority but ensure that such authority is reasonably exercised. As discussed elsewhere in state and federal roles under the Regional Haze program, the court in *North Dakota* held that the CAA and the States operate under a framework of "cooperative federalism." Under this framework, the court stated that the CAA left the individual states to make pollution restriction for particular emitters within that state. "But, if a state fails to submit a SIP, submits an incomplete SIP, or submits a SIP that does not meet the statutory requirements, we are obligated to implement our own FIP to correct the deficiency in the SIP, unless the State can correct the deficiency itself and we can approve that correction within two years. 42 U.S.C. 7410(c). This is commonly referred to as cooperative federalism, and both Section 169A and Section 110 operate under this framework." Thus, the CAA provides us with a critical oversight role in ensuring that SIPs meet the CAA's requirements. As discussed elsewhere, the states' analyses and reasonable progress determinations were flawed.

Comment: [AEP (0055) p. 2] AEP stated that Texas and Oklahoma submitted provisions that satisfied the requirements of the Clean Air Act, the regional haze regulations and the EPA's guidance for tracking reasonable progress. The requirements and guidance provide a process and framework that directs states to develop a plan that demonstrates reasonable progress toward the national goal. As noted in these requirements, EPA's role is to defer to the states in the plan development and goal setting.

Response: We disagree with the comment. Please see our response to Luminant above concerning our SIP review authority as well as our responses to other, more detailed comments.

Comment: Texas' reasonable progress analysis and associated SIP submission complies with all CAA requirements and must be approved. [GCLC (0063) p. 5]

GCLC stated that Texas' reasonable progress analysis complies with all statutory and regulatory requirements. EPA's proposal to disapprove Texas' SIP submission regarding reasonable progress is arbitrary, capricious, and not supported by the facts or law. As EPA itself has admitted, EPA's "individual source" and "visibility benefit" approach for Texas is "without ... prior precedent." [18] Rather than deferring to Texas' reasoned judgment and its extensively supported SIP, EPA has inappropriately decided to deny Texas' reasonable progress analysis based on "how [Texas] analyzed and weighed the four reasonable progress factors," [19] and more specifically, how Texas considered potential visibility benefits of the considered control strategies. [20]

Footnotes:
[18] Declaration of Sam Coleman, Nat'! Parks Conservation Ass'n v. McCarthy, No. 11-01548, at 5 (D. D.C. 2014).
[19] TX TSD at 18. (emphasis added).
[20] Proposed FIP, 79 Fed. Reg. at 74838.

Response: We disagree with GCLC that Texas' reasonable progress analysis complies with all statutory and regulatory requirements, as is detailed in our proposal, final action and in numerous responses to comments contained herein. Similarly, please see our responses to visibility benefit, Texas' four-factor reasonable progress analysis, and Texas' control strategy for more detailed responses. We have addressed our review authority in more specificity elsewhere. Lastly, as explained elsewhere, with regards to Sam Coleman's declaration - while we did say that there was no prior precedent, this was in regards to the particular type of modeling undertaken. Sam Coleman's statement is related to the additional modeling we determined was appropriate due to the large distances involved and the large number of sources being analyzed. The cited portion of this Declaration is thus taken out of context and does not represent the premise for which it was cited.

Comment: EPA's Disapproval of Texas' Reasonable Progress Control Analysis Is Proper. [Earthjustice (0067) p.21]

Earthjustice et al., stated that the cornerstone of the regional haze program is the requirement that haze plans must make reasonable progress toward restoring natural visibility conditions at national parks, wilderness areas, and other Class I areas. 42 U.S.C. § 7491(a)(1), (b)(2); 40 C.F.R. § 51.308(d)(1)(i)(B); *see also Util. Air Regulatory Group*, 471 F.3d at 1340 (agreeing with EPA that reasonable progress is the ultimate measure of whether a haze plan complies with "the regulatory scheme as a whole"); *Ctr. for Energy & Econ. Dev. v. EPA*, 398 F.3d 653, 660 (D.C. Cir. 2005) (the haze program's primary goal is to achieve reasonable progress toward eliminating human-caused visibility impairment). A state is required to adopt "enforceable emissions limitations, compliance schedules, and other measures as necessary to achieve the reasonable progress goals established by States having mandatory Class I Federal areas." 40 C.F.R. §51.308(d)(3). Moreover, because Texas causes or contributes to impairment in other states' mandatory Class I areas, Texas "must demonstrate that it has included in its implementation plan all measures necessary to obtain its share of the emission reductions needed to meet the progress goal for the area." *Id.* § 51.308(d)(3)(ii).

In comments made at public hearings on the proposed rule, Texas and industry argued that Texas is being treated differently than other states because EPA is imposing a novel requirement to assess reasonable progress on a source-by-source basis. But EPA is using the same basic framework for reviewing Texas' SIP that is established by the Clean Air Act: whether the plan meets all applicable legal requirements. 42 U.S.C. § 7410(c), (k), (l). EPA's statutory responsibility is to review each haze plan to ensure that it is "reasonably moored" to the Clean Air Act and that the plan is based on a reasoned analysis. *See Oklahoma v. EPA*, 723 F.3d at 1206-12; *North Dakota v. EPA*, 730 F.3d at 761 (quoting from Alaska Dep't of Envtl. Conservation v. EPA, 540 U.S. 461, 485 (2004)). This is precisely the approach that EPA has taken in its review of the Texas plan

Earthjustice et al., stated that Texas and industry are inventing a straw man by claiming that EPA is, for the first time, requiring that reasonable progress be analyzed on a source-by-source basis. EPA has said no such thing. Indeed, EPA has not performed or required source-by-source analysis of the vast majority of Texas' 1600+ point sources, let alone all of its individual area or mobile source contributors. Instead, EPA has said that the analysis that Texas undertook failed to comply with the statutory and regulatory requirements. EPA's conclusion that Texas' analysis of the aggregate costs and benefits of reasonable progress controls was not approvable is not the same thing as concluding that Texas was required to analyze each reasonable progress source individually.

Earthjustice et al., stated that the EPA is properly proposing to disapprove Texas' reasonable progress control analysis for at least two reasons. First, the aggregate visibility benefits of the controls Texas considered are significant enough that it was unreasonable for Texas to dismiss the controls out of hand. [30] Second, by considering costs only in the aggregate, and failing to take a more fine-grained look at the costs of controls, Texas unreasonably rejected controls that met the state's own cost-effectiveness threshold of $2,700 per ton.

Footnote 30: As discussed previously, visibility is not a fifth factor in reasonable progress analyses. Accordingly visibility benefits may not be used to screen out reasonable progress controls. We consider Texas' evaluation of the "significance" of visibility benefits afforded by its evaluated controls, and its weighing of costs versus benefits, only because this is the framework of evaluation used by EPA.

Response: We take no position on the background statements or certain characterizations of our action that are made by Earthjustice. For specific responses regarding comments on our disapproval of reasonable progress goals, single source analysis, our review of Texas' Cost-effectiveness methodology, and visibility benefit analysis, please see our responses to more detailed comments concerning those issues.

Comment: EPA does not provide any lawful basis for disapproving the RPGs for Big Bend and Guadalupe or the Texas LTS. [UARG (0065) p. 15-21]

UARG stated that the hallmark of the CAA's regional haze program is state primacy in all substantive decision-making, including in particular the evaluation of reasonable progress and the establishment of RPGs. Indeed, EPA's "Guidance for Setting Reasonable Progress Goals Under the Regional Haze Program" (June 1, 2007), Doc. ID No. EPA-R06-OAR-2014-0754-0012, TX166-012-10 ("Reasonable Progress Guidance"), provides that the regional haze rule "gives States wide latitude" to determine which measures to require pursuant to the Act's reasonable progress provisions and provides that states "have considerable flexibility" in deciding how to take the reasonable progress factors into consideration, *id.* at 4-2; *see also id.* at 5-1 ("In determining reasonable progress, CAA §169A(g)(1) requires States to take into consideration a number of factors. However, *you [i.e., states] have flexibility in how to take into consideration these statutory factors and any other factors that you have determined to be relevant.*") (emphasis added); s*ee also Am. Corn Growers Ass'n v. EPA*, 291 F.3d 1, 5-9 (D.C. Cir. 2002) (per curiam) (emphasizing state primacy). EPA nevertheless proposes to disregard the deference that is due to Texas' reasonable progress analysis, its RPG determinations, and its LTS. EPA proposes to disapprove Texas' RPGs for Big Bend and Guadalupe because "the state has not demonstrated that its RPGs provide for reasonable progress towards meeting the national visibility goal" on the grounds that, EPA contends, Texas failed "most notably … to reasonably consider the four statutory reasonable progress factors and the requirement to adequately justify RPGs that are less stringent than the URP." 79 Fed. Reg. at 74,822. In connection with its proposed disapproval of these RPGs, EPA also proposes disapproval of key elements of Texas' LTS. Apart from EPA's rationale for disapproving Texas' SIP related to Wichita Mountains, addressed above in Section III of these comments, EPA states it is disapproving the Texas LTS because, in its view, Texas did not adequately consider the emissions limitations and schedules for compliance needed for reasonable progress in Big Bend and Guadalupe. *Id*.

UARG stated that Texas' RPGs and the state's rationale for its determinations fully comport with the CAA, the regional haze rule, and EPA's guidance. Indeed, EPA's statements in the proposed rule illustrate that Texas did everything that was required of it under the regional haze rule. *Id.* At 74,834 ("Based on the emission reductions from these measures, CENRAP modeled the projected visibility conditions anticipated at each Class I area in 2018 and the TCEQ used these results to establish its RPGs. The TCEQ states it developed its RPGs after considering the regulatory factors required under Section 51.308(d)(1)(i)(A) …."); *id.* at 74,835 ("TCEQ developed a list of potential controls and costs associated with those controls to inform their four-factor analysis. It used the control strategy analysis developed by CENRAP as the starting point for its analysis."). EPA's discussion of Texas' evaluation of the reasonable progress factors also demonstrates that the state conducted a lawful and appropriate reasonable progress analysis. *Id. at* 74,837-38. Texas evaluated the costs of compliance and, in doing so, set cost thresholds that it determined reasonably differentiated between reasonable and unreasonable levels of expense. *Id. at* 74,837. It considered time necessary for compliance and remaining useful life of affected sources and found that these factors were likely not determinative. *Id*. It qualitatively assessed energy and non-air-quality environmental impacts, concluding that this factor generally weighed against additional controls, but did not rest its decision on its assessment of that factor. *Id*. Further, Texas identified the suite of emission controls that could be deployed at various Texas sources and conducted modeling to evaluate the degree of visibility improvement that could be achieved at affected Class I areas. 79 Fed. Reg. at 74,837. Reasonably – and certainly within the broad bounds of state discretion in this area – Texas determined that the costs of additional controls were not warranted in part due to the minimal degree of visibility improvement that those controls could achieve. *Id*. All of these determinations comport with the CAA, the regional haze rule, and EPA's Reasonable Progress Guidance.

UARG noted that the EPA rests its proposed disapproval on its *disagreement* with Texas' determinations and on EPA's *policy preferences* for different choices. For instance, EPA states the Agency "believe[s] the overall RPG goals [sic] that Texas established for its own Class I areas of Big Bend and Guadalupe Mountains do not provide for reasonable progress based on the four reasonable progress factors that a state is required to consider." *Id. at* 74,834. Similarly, EPA states that it "disagree[s] with the set of potential controls identified by the TCEQ and how it analyzed and weighed the four reasonable progress factors in a number of key areas." *Id*. At 74,838. These sort of "belie[fs]" and "disagree[ments]" are not lawful grounds for disapproving a regional haze SIP.

UARG contended that the allegations of more specific purported flaws that EPA identifies do not withstand scrutiny. For example, EPA states that, "[i]n general, the cost of compliance was the key factor considered by the TCEQ," suggesting that Texas gave improper weight to this factor. *Id.* at 74,837. The rest of EPA's discussion, however, shows that Texas gave appropriate weight to each factor and, as noted above, that the state also considered the degree of visibility improvement that would result from additional reasonable progress measures. *Id. at* 74,838 ("The TCEQ's assessment of reasonable progress rested primarily on its calculation of the total cost of the controls it analyzed versus the visibility benefits at the ten Class I areas it analyzed.").

UARG noted that the EPA also states that "because the TCEQ did not evaluate controls on a source-by-source basis, source-specific factors related to the evaluation of the reasonable progress four-factor analysis could not be considered," and for that reason, EPA proposes to determine that Texas' analysis is "insufficient." *Id. at* 74,838, 74,841. States are not, however, required to conduct reasonable progress assessments on a source-by-source basis. This is confirmed by EPA itself in the Reasonable Progress Guidance, which states that the cost factor can be evaluated "for individual sources *or source categories*." Reasonable Progress Guidance at 5-1 (emphasis added). State discretion to conduct a reasonable progress assessment without analyzing controls on a source-by-source basis has been confirmed by the U.S. Court of Appeals for the Tenth Circuit. *WildEarth Guardians v. EPA*, 770 F.3d 919, 944 (10th Cir. 2014) ("Neither the Clean Air Act nor the Regional Haze Rule requires source-specific analysis in the determination of reasonable progress."). EPA fails to acknowledge this established law and cites no support for its conclusion.

UARG stated that after conducting its own source-by-source analysis, all that EPA is able to reach is a vague, open-ended conclusion:

> These results also *suggest* that controlling a small number of sources will result in visibility benefits at both Class I areas, and that rather than evaluating controls at all

> facilities identified by Texas combined, a subset of those facilities (and some additional facilities not identified) *may be reasonable*. 79 Fed. Reg. at 74,839 (emphases added).

Despite the fact that this sentence appears to be incomplete, what *is* clear from it is that the most EPA can even assert is that different regulatory determinations than the ones that Texas made in its SIP *might* have been "reasonable" policy choices. Plainly, that is no basis for disapproving a SIP.

UARG stated that the EPA also suggests that it must disapprove Texas' SIP because EPA "believe[s] that in performing its control analysis, the TCEQ should have given greater consideration to the flexibility in the CAIR trading program and the resulting uncertainty in the projected emissions." *Id. at* 74,840. To explain its point, EPA highlights the difference in Texas' Integrated Planning Model-based estimates of emission reductions due to CAIR at Big Brown Unit 1 versus Big Brown Unit 1's actual emissions in 2012. *Id.* EPA cannot fault Texas for being unable to predict the future. The modeling that Texas relied on was the best information available at the time it submitted the SIP, which it did long before 2012, and EPA cannot validly judge a SIP unapprovable on the basis of information that became available for EPA's review only after the SIP was submitted and *only because EPA has missed its statutory deadline* for action on the submitted Texas SIP by nearly five years.

UARG noted that the EPA also takes issue with the cost threshold Texas used to exclude certain controls from consideration. Texas chose $2,700 per ton, while EPA prefers $4,000 per ton to $5,000 per ton. *Id. at* 74,838. This preference is not a reason for disapproving Texas' SIP. Indeed, the only purported justification that EPA can muster – that reliance on the $2,700-per-ton cost threshold EPA used in CAIR is inappropriate because "[a] state should look beyond BART for additional reductions when developing its long-term strategy to achieve reasonable progress at its Class I areas" – conflicts with EPA's own guidance indicating that BART may reasonably be concluded to satisfy reasonable progress requirements in the first planning period. *Id.*; Reasonable Progress Guidance at 4-2 to 4-3. EPA cites – and can cite – no basis in the CAA or in the regional haze rule for disapproving Texas' cost threshold.[4]

Furthermore, EPA states that it proposes to disapprove Texas' URP analysis because "we do not *believe* that the rate of improvement the TECQ [sic] has selected is reasonable, because we *disagree* with its four-factor analysis and the analysis of emission measures needed to meet the URP." 79 Fed. Reg. at 74,843. This is not a lawful basis for a SIP disapproval. Texas has complied with the regional haze rule's requirements with respect to a URP analysis, and, for the reasons stated above, EPA has not provided a valid justification for disapproving Texas' reasonable progress analysis.

UARG stated that the EPA proposes to disapprove Texas' calculation of the URP as a result of its proposal to disapprove the state's calculation of natural visibility conditions at Big Bend and Guadalupe. *Id. at* 74,822. The primary reason for this proposed disapproval is Texas' assumption that fine soil and coarse mass concentrations, and their resulting light extinction effects, is entirely attributable to natural sources. *Id. at* 74,831. Texas provided a reasoned justification for its decision in this regard, explaining that "to the extent its assumption that 100% of coarse mass and fine soil is natural is an overestimate, it expects that its low organic carbon estimate will more than compensate for any errors in this assumption at this time." *Id*. Despite the reasonableness of this finding, Texas, at the FLMs' request, performed a supplemental analysis assuming that only 80 percent of this particulate matter was from natural sources. *Id*. In the final analysis, the FLMs recognized that EPA's regulations at "40 CFR 51.308 give the State [the] right" "to recalculate natural conditions for Big Bend [National Park] and Guadalupe Mountains [National Park]" and agreed that "the basic approach used [by Texas] to adjust natural conditions is reasonable, provided that the Proposed SIP address the uncertainty of the assumption that all of the coarse mass and fine soil fraction on the worst 20 percent days is natural."5 Texas' final SIP submission provides the basis for the assumption, as the FLMs requested.6 In contrast, EPA, without any meaningful analysis, would impose use of default values for this particulate matter provided for in the IMPROVE equation and proposes disapproval of the Texas SIP on that basis. *Id. at* 74,832. EPA provides no basis for rejecting Texas' reasoned explanation. Particularly in light of the FLM comments and Texas' rationale for using 100 percent, EPA has a duty to fully explain and to provide an adequate rationale for selecting the default values over Texas' determination. EPA failed to discharge that duty, and its proposed action is improper for that reason as well.

Footnotes:
[4]Moreover, although the point is not directly relevant to this proceeding, EPA's statement in the preamble to the proposed rule that "the URP does not establish a 'safe harbor' for the state in setting its progress goals," 79 Fed. Reg. at 74,834, is wrong and should be corrected by EPA. The language in the preamble to the 1999 regional haze rule that EPA quotes confirms that there is, in fact, such a safe harbor. EPA there made clear that if a state determines that the progress the URP would require is reasonable, then "the State *should* identify this amount of progress as its reasonable progress goal for the first long-term strategy." 64 Fed. Reg. 35,714, 35,732 (July 1, 1999) (emphasis added). *Only if* the state instead "determines that additional progress is reasonable" should the state adopt a more accelerated or ambitious RPG than the URP. *Id*. As this preamble language makes clear, the state has no obligation to undertake additional analysis if it determines the URP is reasonable for its Class I area. The decision whether to undertake such additional analysis is a matter reserved for the state's exercise of discretion.
[5] U.S. Fish & Wildlife Serv. & Nat'l Park Serv., Comments on Texas Proposed Regional Haze Rule State Implementation Plan at 2, 3 (Jan. 11, 2008), Doc. ID No. EPA-R06-OAR-2014-0754- 0002, TX166-002-03.
[6] *See generally* TCEQ, Revisions To The State Implementation Plan (SIP) Concerning Regional Haze at Appendix. 5.2 (adopted Feb. 25, 2009), Doc. ID No. EPA-R06-OAR-2014-0754-0002, TX166-002-05 ("2009 Texas SIP").

Response: We disagree with this comment on all issues raised. We take no position on UARG's presentation of background information. As explained in greater detail elsewhere, we disagree that states have "primacy" or that they are owed "deference" to the point that it would supplant our authority to review the Texas Regional Haze SIP for conformance with federal requirements. States have flexibility under the Regional Haze Rule to approach our requirements in different ways, but they must still satisfy those requirements, and our role is to determine that they have done so. We disagree that Texas reasonably established its reasonable progress goals. We further disagree that our proposed disapproval was based on "beliefs" and "disagreements," but in fact is founded on our own analysis that showed that a small number of Texas sources significantly impacted the visibility at the Wichita Mountains, Big Bend, and the Guadalupe Mountains; and that cost-effective controls are available to reduce those impacts. As stated elsewhere, while states have discretion in establishing reasonable progress goals such discretion must be reasonably exercised. We found that Texas analysis was flawed. As we stated in our proposal, final and elsewhere in our responses to comments herein, we believe that Texas' four-factor analysis for reasonable progress was flawed on several grounds and did meet federal requirements.

We disagree with UARG that our cost analysis indicates that Texas gave improper weight to cost as a factor. We conducted our control cost analysis (which included a control efficiency analysis) because we concluded that what Texas provided in its SIP was inadequate. We also disagree that Texas properly considered visibility, principally because it obscured the visibility impacts of individual sources (for which it partially conducted control efficiency and cost analysis). See our other responses to comments concerning source category versus individual source analysis for more information.

We disagree with UARG that after conducting our control cost analysis, our conclusion was open-ended or vague. First, what UARG attributes to our analysis is not described via an incomplete sentence and is actually our discussion of the CENRAP PSAT modeling and our initial facility level modeling of sources identified through the Q/d analysis. Our point was that in considering the results of the CENRAP PSAT analysis, and that was confirmed by our initial modeling analysis, this should have suggested to Texas that controlling a smaller subset of sources may be reasonable. The CENRAP PSAT modeling specifically highlighted the importance of impacts from EGUs, particularly EGUs in the northeast portion of the states. Our initial modeling confirmed this and further showed that on an individual basis, a small group of sources were responsible for a large share of the visibility impacts from Texas point sources. Instead of basing its analysis from that technical point, Texas proceeded with its own flawed analysis. It was necessary for us to conduct additional modeling and analysis to determine if, in fact cost-effective controls were available at these sources and whether such controls resulted in significant visibility benefit improvement. Our own analysis was anything but open-ended or vague, as we devoted two Technical Support Documents to it: our Cost TSD and our FIP TSD. We refer UARG to those technical documents that are included in the docket to this action.

UARG takes issue with a statement in our proposal that the TCEQ should have given greater consideration to the flexibility in the CAIR and the resulting uncertainty in the projected emissions. Again, UARG misreads the text—we are not asking Texas to "predict the future." As we explain in detail in the preceding two paragraphs, the TCEQ based its emission reductions on IPM predictive modeling. In so doing, it assumed Big Brown's 2018 emission reduction of approximately 1/3 (due to switching to a lower sulfur coal) would be an appropriate baseline for use in a scrubber retrofit. We merely pointed out that were Big Brown to in fact install a SO_2 scrubber, it could continue to burn its higher sulfur coal, thus greatly improving the scrubber's Cost-effective ness ($/ton). We stated that the TCEQ's Cost-effective ness for Monticello was similarly impacted. We summarized this situation by concluding that the TCEQ *could* [emphasis added] have recognized that regional haze controls would likely not be in addition to the anticipated reductions due to CAIR (the lower sulfur coal), but in place of them (retaining the higher sulfur coal and installing a scrubber). Our use of "could" makes it clear this was not a pivoting issue in our analysis of the Texas Regional Haze SIP. Texas' failure to properly consider the visibility improvement and cost-effectiveness for scrubbers on Big Brown (and other sources) was far more consequential.

We discuss UARG's allegation that we rejected Texas's $2,700/ton threshold in favor of a $4,000 to $5,000 threshold in the section of this document where we respond to allegations of inconsistency.

UARG claims that our disapproval of Texas' URP analysis is not legal. As we explain in our proposal:

> However, for the reasons we have discussed above, although we agree with the TCEQ that a rate of improvement necessary to attain natural visibility conditions by 2064 is not reasonable, we do not believe that the rate of improvement the TECQ has selected is reasonable, because we disagree with its four-factor analysis and the analysis of emission measures needed to meet the URP. Therefore we propose to disapprove the TCEQ's RPGs for Big Bend and the Guadalupe Mountains under Section 51.308(d)(1)(ii). In so doing, we rely on the specific directive in Section 51.308(d)(1)(iii): ''In determining whether the State's goal for visibility improvement provides for reasonable progress towards natural visibility conditions, the Administrator will evaluate the demonstrations developed by the State pursuant to paragraphs (d)(1)(i) and (d)(1)(ii) of this section.''

UARG provides no explanation other than its belief that Texas complied with the applicable requirements and that that we did not provide a valid justification. As stated above, we disagree. UARG also objects to our disapproval of Texas' URP analysis because we noted that the URP is anchored by the natural conditions value in 2064, and because we proposed to disapprove Texas' natural conditions estimate, we had to disapprove its URP calculations. UARG objects to our proposed disapproval of Texas' natural conditions calculations and so believes Texas' URP analysis should be approved. We disagree with UARG's assertion that we should have approved Texas' natural conditions calculations and refer UARG to our responses to other more detailed comments on that issue. As stated elsewhere in our response to comments, we also note other reasons for disapproving Texas' URP analysis.

Please see our responses regarding our authority to review SIPs, our disapproval of Texas' reasonable progress goals, our disapproval of Texas' URP, and our disapproval of Texas' long-term strategy and consultation for more specific information.

Comment: TCEQ's four-factor analysis was reasonable and within its broad discretion, and is supported by recent monitoring data showing RPGs will be met without additional controls. [CCP (0075) p. 5-7]

CCP noted that the CAA and EPA regulations allow States to establish alternative RPGs to move from "baseline" visibility conditions to the end goal of "natural conditions" by 2064. As detailed in the SIP proposal and TCEQ's comments on the Proposed Rule incorporated here by reference, TCEQ concluded that it would be unreasonable to meet the glidepath to meet the URP during the 2008-2018 planning period (the first planning period for regional haze programs) and that the substantial reductions in haze pollutants that it anticipated via other regulatory programs would be sufficient for this planning period. Therefore, Texas and Oklahoma established more reasonable RPGs. In the Proposed Rule, EPA agrees that it is not reasonable to achieve the URPs for Wichita Mountains, Big Bend and Guadalupe Mountains. Yet EPA proposes to disapprove of the State-established RPGs in favor of EPA-calculated RPGs that are purportedly based on additional controls at Texas sources.

CCP stated that the EPA's regulations specify that "[f]or each mandatory Class I Federal area located within the State, the State must establish goals (expressed in deciviews) that provide for reasonable progress towards achieving natural visibility conditions." 40 C.F.R. § 51.308(d)(1) (emphasis added). In other words, deciview goals should be set on an area-by-area basis, not on an individual, source-specific basis. The United States Court of Appeals for the Tenth Circuit recently confirmed that source-specific analysis is not required. See WildEarth Guardians v. EPA, 770 F.3d 919, 944 (10th Cir. 2014) ("Neither the Clean Air Act nor the Regional Haze Rule requires source-specific analysis in the determination of reasonable progress."). Moreover, EPA's guidance supports TCEQ's approach. See "Guidance for Setting Reasonable Progress Goals under the Regional Haze Program" at 5-1 (June 1, 2007) (explaining that each state has the discretion to interpret the costs of compliance factor "to encompass the cost of compliance for . . . source categories . . ."). That guidance also allows states to use EPA's BART guidelines which provide states "flexibility in how they calculate costs" of compliance" and allow states to "choose to apply the costs of compliance factor collectively for all of the sources in a source category." See 70 Fed. Reg. 39,104, 29,127 (July 6, 2005). Other EPA guidance states that "reasonable progress is not required to be demonstrated on a source-by source basis." See "EPA's "Additional Regional Haze Questions" (Sept. 27, 2006 Revision). Accordingly, TCEQ set RPGs based on a reasonable estimate of the visibility improvement needed to be reasonably achieved in the Class I Federal area during the applicable planning period 2008-2018.

CCP stated that CAA Section 169A(g) requires the consideration of four-factors when setting RPGs: (1) the cost of compliance, (2) the time for compliance, (3) the energy and non-air quality impacts of compliance, and (4) the remaining useful life of any potentially affected sources. 42 U.S.C. §7491(g). In conducting the analysis, TCEQ properly focused its control strategy on point source emissions of SO_2 and NO_x, as TCEQ determined that these are the main anthropogenic pollutants that affect visibility at Class I areas in Texas and neighboring states. TCEQ noted that it is already going beyond federal requirements by reducing NO_x emissions from mobile sources through the Texas Emissions Reduction Program, reinforcing the appropriateness of focusing its control strategy on point sources. TCEQ then determined RPGs reflecting visibility improvements from emissions reductions associated with the CAA, the Texas Clean Air Act, Texas' ozone SIP revisions and rules, and agreements between EPA and oil refineries for SO_2 emissions reductions.

CCP stated that the TCEQ conducted a thorough analysis of the potential additional controls that could be applied to help achieve even greater visibility at Class I areas affected by Texas sources. See SIP Section 10 and Appendices 10-1, 10-2. In considering additional controls, TCEQ worked with the Central Regional Air Planning Association ("CENRAP"). TCEQ used the control strategy analysis prepared by CENRAP as the starting point for its analysis of additional controls. The CENRAP analysis used the EPA AirControlNET tool to develop cost per ton estimates for relevant pollutants. TCEQ reviewed this information and made changes based on its knowledge of particular facilities—contrary to EPA's criticism that TCEQ did not consider source-specific factors—and agency experience with implementing ozone control strategies. TCEQ also added some individual sources that were not part of the EPA

AirControlNET dataset that CENRAP relied on, in order to ensure that opportunities for cost-effective visibility improvements were not overlooked. TCEQ used the CENRAP analysis to determine an effectiveness ratio providing an estimate of improvement in visibility for every ton of NO_x and SO_2 reduced and was able to develop an order-of-magnitude estimate of the likely visibility improvements resulting from its point source control strategy. EPA's "Cost-effective ness" analysis of controls, by contrast, is simply a statement of EPA's estimated cost per ton of emissions reduced, without consideration of the visibility improvement that is likely to result.

CCP stated that the TCEQ considered aggregate visibility benefits from reductions in all sources and determined that aggregate visibility benefits were not perceptible (1 dv is considered perceptible to the human eye) and therefore not cost-effective. Specifically, TCEQ concluded that substantial additional controls at an estimated annualized cost of $300 million were not warranted for the .16 dv benefit predicted by TCEQ at Big Bend, .22 dv benefit at Guadalupe Mountains, and .36 dv benefit at Wichita Mountains. Reductions from a single source, e.g. Coleto Creek Unit 1, could not therefore have a meaningful visibility benefit. Importantly, visibility improvement is not one of the four statutory factors that a state is required to consider when setting RPGs, and it should be given no more weight than TCEQ gave it here—as one consideration in the cost of compliance determination. EPA instead considers visibility improvement as the main factor in its analysis, to the exclusion of the four statutory factors. This is inappropriate on the face of the statute, but becomes even more inappropriate when EPA bases its proposed requirement on extra-statutory terms like "reasonable" and "significant" in evaluating the visibility improvement that would result from the additional SO_2 controls.

Response: We address elsewhere all the comments above, including the source specific analyses comments, consideration of visibility, our cost-effectiveness analysis, perceptibility, and the flaws in the Texas' technical analysis. In using the terms "reasonable" and "significant" in evaluating the visibility improvement, please see our explanation in our final action under general comments.

22. Deference

Comment: [Luminant (0061), p. i] Luminant stated that EPA's legal analysis ignores the criteria that Congress included in the statute and relies instead on criteria that Congress did not include. Ignoring its own regulations, EPA offers newly minted "interpretations" that bear no resemblance to the plain language of the regulations themselves. Tellingly, EPA's proposal begins not by offering a plausible reading of its regulations, but by explaining why it thinks this new approach to Texas is beyond the review of a federal court. This is the opposite of reasoned decision-making.

Response: We disagree with this comment. We never stated that our interpretations of our regulations were "beyond the review of a federal court." We merely stated that our interpretations were consistent with the statutory scheme and legislative history and thus entitled to substantial deference.

Comment: EPA's new interpretations of its regional haze regulations are plainly erroneous and inconsistent with the plain meaning of the regulations [Luminant (0061) p. 84]

Luminant stated that EPA's unprecedented proposal for Texas rests on entirely new interpretations of its regional haze regulations that are plainly erroneous and contrary to their plain meaning, as well as inconsistent with prior EPA regional haze guidance interpreting those regulations.[570] EPA's interpretations are thus not a lawful basis for EPA's proposed action,[571] and they are arbitrary and capricious because EPA's prior interpretations were relied on by Texas in the multi-year development of its SIP and have "engendered serious reliance interests that must be taken into account."[572] EPA's new "interpretations" certainly are not entitled to judicial deference as EPA asserts.[573]

Luminant noted, specifically, EPA rests its proposal to disapprove Texas' submission on at least three new interpretations of 40 C.F.R. §§ 51.308(d)(3) that are contrary to the plain text of the rules and EPA's prior practice under those rules. The ***first*** is that the phrase "progress goal" in 40 C.F.R. § 51.308(d)(3)(ii) does not mean a reasonable progress goal established by a state but instead means a reasonable progress goal that is "approved or approvable" by EPA.[574] EPA relies on this erroneous interpretation to propose disapproval of Texas' long-term strategy, which fully comports with the reasonable progress goal established by Oklahoma for the Wichita Mountains, but which EPA claims does not comport with EPA's new proposed reasonable progress goal for that area. The ***second*** is that 40 C.F.R. § 51.308(d)(3)(ii) and (iii) require a state to analyze the four-factors in 42 U.S.C. § 7491(g)(1) and § 51.308(d)(1)(i) for "both their own Class I areas and downwind Class I areas."[575] The ***third*** is that a state may not meet the requirement in 40 C.F.R. § 51.308(d)(3)(iii) to "document the technical basis" for its long-term strategy by relying on technical analyses developed by a regional planning organization ("RPO") and approved by all participating states unless the RPO itself has conducted a four-factor analysis of the factors in § 51.308(d)(1)(i).[576]

Luminant asserted that all three of these interpretations are plainly erroneous and inconsistent with EPA's own regulations and thus cannot form the basis for lawful action on Texas' and Oklahoma's regional haze SIPs. EPA is wrong that its interpretation of the regulations is entitled to deference based on the decision in *Auer v. Robbins*, under which courts defer to agency interpretations of their regulations if certain conditions are met.[577] *Auer* deference is entirely unwarranted here. First, even under *Auer*, no deference is owed an "interpretation" that conflicts with the plain language of the regulations.[578] "[D]eference is warranted only when the language of the regulations is ambiguous."[579] Here, the language of the regulations is clear on its face and plainly permissive of Texas' approach to meeting the reasonable progress and long-term strategy requirements, and the regulations do not contain the requirements that EPA seeks to impose on Texas and Oklahoma here.[580] Second, even to the extent there was some ambiguity in EPA's regional haze regulations, no deference is owed EPA here because its interpretation is contrary to how EPA has consistently interpreted those regulations since they were enacted. The Supreme Court has emphasized that *Auer* deference is inappropriate where an agency's new interpretation of a regulation "would result in … 'unfair surprise,'"[581] particularly where "the agency's [new] interpretation conflicts with a prior interpretation."[582] EPA itself has admitted that its actions here are "without . . . prior precedent," and surely this new approach results in "unfair surprise" to Texas and the Texas sources targeted in EPA's proposal.

Moreover, Luminant stated that EPA's plea for deference—at the outset of its proposal—only confirms that even EPA acknowledges the fragility of its own position. Instead of providing the best reading of its regulations at the rulemaking stage, EPA is providing a strained interpretation of its regulations and seeking to justify that "interpretation" by invoking *Auer*.[583] *Auer's* holding, however, is subject to considerable doubt and is shaky ground upon which to base an entire rulemaking that would require $2 billion dollars of expenditures. Indeed, as explained by the concurring opinions in *Perez v. Mortgage Bankers Ass'n*, *Auer* is bad law and should be overruled. First, *Auer* violates the separation of powers principle, because it permits the same branch of government to both enact a rule and to interpret it.[584] Second, *Auer* deprives the judiciary of the power to "say what the law is," as required under Article III.[585] EPA's proposal here is a vivid illustration of both of these shortcomings in Auer.

According to Luminant, even under *Auer*, EPA's interpretations cannot be applied here. EPA concedes that the new interpretations of its regulations that underpin its unique action here are novel and have never been announced by the agency prior to this proposal.[586] EPA's premise for making these new interpretations— that "some uncertainty exists as to the respective roles and responsibilities of upwind and downwind states in addressing visibility impairment"[587]—is itself incorrect. As discussed above and throughout these comments, the respective roles of the states are clear— they are to consult about potential impairment to each other's Class I areas through regional planning organizations and seek to reach agreement on required emission reductions, as Texas and Oklahoma did here. EPA points to no instance in which "uncertainty" has prevented states from fully consulting under the regional haze program. EPA's attempt to manufacture some "uncertainty" is a transparent effort to justify its new and novel approach under which EPA would undercut the roles and responsibilities of the states and impose its own view of what is "reasonable," in contravention of the plain language of its regulations.

Footnotes:
570 Id. at 74,828–30.
571 Bowles v. Seminole Rock & Sand Co., 325 U.S. 410, 414 (1945) (agency interpretation of its regulation is not controlling where "it is plainly erroneous or inconsistent with the regulation"); see also Auer v. Robbins, 519 U.S. 452, 461 (1997) (same).
572 Perez v. Mortgage Bankers Ass'n, 135 S. Ct. 1199, 1209 (2015) (internal quotations omitted).
573 79 Fed. Reg. at 74,829.
574 Id.
575 Id.
576 Id.
577 Id. at 74,828–29.
578 Christopher v. SmithKline Beecham Corp., 132 S. Ct. 2156, 2166 (2012).
579 Christensen v. Harris Cnty., 529 U.S. 576, 588 (2000).
580 Id. ("The regulation in this case, however, is not ambiguous—it is plainly permissive.").
581 Christopher, 132 S. Ct. at 2167.
582 Id. at 2166.
583 Id.
584 See Perez v. Mortgage Bankers Ass'n, 135 S. Ct. 1199, 1213–14 (Mar. 9, 2015) (Scalia, J., concurring in the judgment); see also Decker v. Nw. Envtl. Def. Ctr., 133 S. Ct. 1326, 1339–42 (2013) (Scalia, J., concurring in part and dissenting in part).
585 See Perez, at 1222–23 (Thomas, J., concurring in the judgment).
586 79 Fed. Reg. at 74,823.
587 Id.

Response: We disagree with this comment. For a discussion of why our clarified interpretations of the quoted regulatory provisions are neither "plainly erroneous" nor "new," see our responses to comments in Section 1.g. In regards to reliance interests, the commenter's assertions do not square with reality. Indeed, Texas' analyses and statements *in its own SIP* demonstrate that Texas knew that the CENRAP analysis was merely a starting point that required supplementation and that the Regional Haze Rule required States to conduct a four-factor analysis for both in-state and downwind Class I areas. Thus, there was no "unfair surprise" as the commenter suggests. Furthermore, we never stated that our actions were "without . . . prior precedent." The full statement, included in a declaration from EPA Deputy Regional Administrator Sam Coleman to the U.S. District Court for the District of Columbia Circuit, reads as follows:

> EPA is undertaking the appropriate modeling. The additional modeling will enable EPA to develop more specific information concerning the visibility impairment caused by individual sources. Due to the large distances involved and the large number of sources being analyzed, EPA is utilizing a different model than the standard models used previously by EPA and States for Regional Haze SIPs. This model is complicated and the results it generates are not directly comparable to the modeling platform used in most other States' Regional Haze submittals. Appropriate review of this model therefore requires thorough technical and policy analysis and interpretation to ensure compliance with the Regional Haze Rule, *without the benefit of prior precedent to streamline the process*.[675]

Thus, the actual quote, read in context, merely states that our review of the visibility model used in the FIP did not have the benefit of prior precedent because it was not used in "most other States' Regional Haze submittals." The commenter takes this quote grossly out of context to support its position. Notably, the commenter again fails to mention that Texas itself used the same visibility model when developing its regional haze SIP due to the large distances between Texas sources and impacted Class I areas. We thoroughly explained the technical reasons why we used this same model in our proposal and again in this final rule. Finally, the commenter's attempt to invoke the dissent from *Mortgage Bankers* as if it were controlling law is without merit. The deferential standard in *Auer v. Robbins* applies to an agency's interpretations of its own regulations until a majority of the Supreme Court holds otherwise.

Comment: Earthjustice et al., stated that EPA's Interpretation of 40 C.F.R. Sections 51.308(d)(1) and (d)(3) is the Only Reasonable Reading of the Regulations, and EPA Need Not Rely on *Auer* Deference to Support its Determination that Neither the Texas Nor Oklahoma SIPs Provided for Reasonable Progress Toward Natural Visibility in Class I Areas. [Earthjustice (0067) p.29, 31]

Earthjustice et al., stated that the Regional Haze Rule requires each state with a Class I area to "establish goals . . . that provide for reasonable progress towards achieving natural visibility conditions" (*i.e.*, reasonable progress goals). 40 C.F.R. § 51.308(d)(1). In establishing control

[675] Declaration of Sam Coleman, Nat'l Parks Conservation Ass'n v. McCarthy, No. 11-01548, at 5 (D.D.C. 2014) (emphasis added).

measures that will achieve those reasonable progress goals, the state must consider the four statutory factors outlined in Section 169A(g)(1) of the CAA—"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. 42 U.S.C. § 7491(g)(1). Additionally, the state "must consult" with any other state which "may reasonably be anticipated to cause or contribute to visibility impairment" at a Class I area within the state, and "develop coordinated emission management strategies." 40 C.F.R. § 51.308(d)(1)(iv), (3)(i). Each state must then "document the technical basis, including modeling, monitoring and emissions information" to "demonstrate that it has included in its implementation plan all measures necessary to obtain its share of the emission reductions needed to meet the progress goal for" the affected Class I area. *Id.* § 51.308(d)(3)(ii)-(iii).

In disapproving the Texas and Oklahoma Regional Haze SIPs, EPA suggests that these provisions do not explicitly address situations like this case:

> where the control measures in an upwind state's long-term strategy are sufficient to obtain its share of reductions needed to meet a RPG included in a downwind state's SIP, but the goal itself is flawed precisely because the upwind state never proposed sufficient control measures to ensure reasonable progress in the first place. To prevent such situations, we interpret the term "progress goal" in Section 51.308(d)(3)(ii) as an *approved or approvable* progress goal.[37]

Earthjustice et al., stated that, according to EPA's interpretation, where states fail to consult and properly assess whether any additional upwind state emission reductions are necessary to achieve a *reasonable* progress goal at a downwind state Class I area, as Texas and Oklahoma failed to do here, EPA must disapprove both SIPs.

While EPA invokes *Auer* deference in its proposed rule, EPA's regulatory interpretation does not implicate the public participation concerns frequently associated with the rule of deference articulated in *Auer v. Robbins*, 519 U.S. 452 (1997). In sharp contrast to the regulatory interpretation offered in an amicus brief in *Auer*, or the policy guidance at issue in similar cases, EPA has proposed to clarify the transport and consultation requirements of the Regional Haze Rule and the Clean Air Act through an open and transparent notice and comment process, invited public participation, and explained its reasoning. As a result, EPA need not rely on *Auer* deference to support its interpretation of the existing haze regulations.[38] There is an additional reason that EPA need not invoke *Auer* deference here. EPA's interpretation of the Clean Air Act and the Regional Haze Rule is not only the fairest and most natural reading of those provisions, but is the only interpretation that is consistent with the regulation as a whole, the Clean Air Act, and EPA's obligation to ensure that each state SIP is consistent with all applicable requirements of the Act. *See Decker v. Nw. Envtl. Def. Ctr.*, 133 S. Ct. 1326, 1339-40 (2013) (Scalia, J., dissenting) (where an "agency's interpretation of the rule is also the fairest one," rather than an "unnatural reading," deference is unnecessary to uphold decision). Additionally, EPA's decision reflects a reasonable interpretation of the statute under *Chevron v. Natural Res. Def. Council,* 467 U.S. 837 (1984).

Footnotes:

[37] 79 Fed. Reg. at 74,829 (emphasis in original).

[38] *See, e.g., Perez v. Mortgage Bankers Ass'n*, 135 S. Ct. 1199 (2015) (Scalia, J., concurring) (criticizing Auer deference because it encourages agencies to "write substantive rules more broadly and vaguely, leaving plenty of gaps to be filled in later, using interpretive rules unchecked by notice and comment"); *see also Appalachian Power Co. v. EPA*, 208 F.3d 1015, 1020 (D.C. Cir. 2000) (criticizing agency use of guidance documents in the form of interpretive rules and policy statements, recognizing the potential problem that "[l]aw is made, without notice and comment, without public participation, and without publication in the Federal Register or the Code of Federal Regulations.").

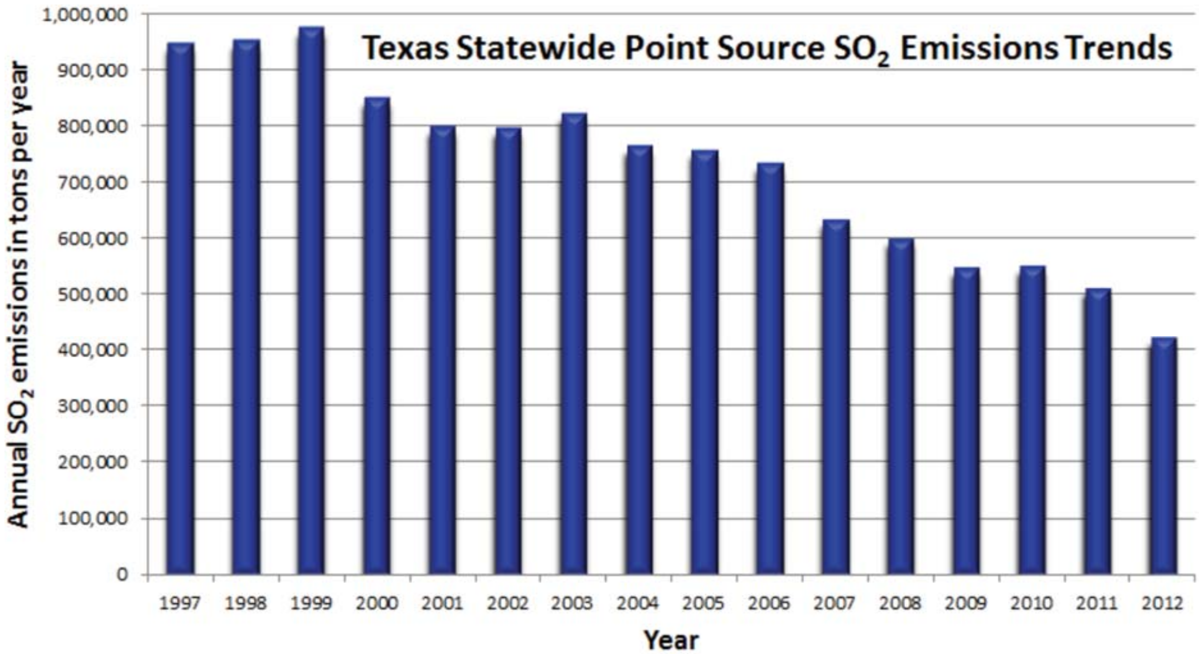
Response: We generally agree with this comment, but take no position as to specific statements.

23. Reasonable Progress Goal Progress

Comment: TCEQ's four-factor analysis was reasonable and within its broad discretion, and is supported by recent monitoring data showing RPGs will be met without additional controls. [CCP (0075) p. 5-7]

CCP stated that actual emissions data supports the reasonableness of TCEQ's RPG determinations. EPA acknowledges that States "may take credit in your long-term strategy for emission reductions achieved after 2002." EPA RPG Guidance at 4-1. Indeed, even in the Proposed Rule EPA notes that "more recent IMPROVE monitored data" showing "more progress than anticipated by the CENRAP modeling has occurred." 79 Fed. Reg. 74,843. This monitoring data, based on actual emissions, shows that SO_2 emissions have decreased by nearly 50% from the baseline period through 2012. See Figure 1 provided by CCP. In fact, the most recent five-year (2009-2013) averages of visibility monitoring data are 15.3 dv at Guadalupe Mountains, 16.3 dv at Big Bend, and 21.2 dv at Wichita Mountains, each of which is lower than EPA's proposed 2018 reasonable progress goals. See 79 Fed. Reg. 74,870. Thus, the three Class I areas Big Bend, Guadalupe Mountains, and Wichita Mountains will meet the RPGs that EPA proposes without further emission controls totaling more than $2 billion. Yet EPA wholly ignores these actual conditions in developing its RPGs and in concluding that its RPGs are more reasonable.

Texas SO_2 Emission Trends (Figure 1 provided by CCP)



CCP stated that a central tenet of EPA's FIP is that TCEQ's SIP is insufficient to meet RPGs to meet the glide path toward natural visibility conditions by 2064. But EPA's Proposed Rule also does nothing to accelerate the final goal of natural visibility levels. EPA's FIP purports to reach natural visibility levels at Guadalupe Mountains only after 141 years and, at Big Bend, only after 173 years. This is not a significant improvement over Texas' date for obtaining natural conditions, and demonstrates the absurdity of EPA's position.

CCP stated that, because TCEQ carefully considered the first of the factors, cost of compliance, and determined that cost was so excessive relative to benefit, it determined that detailed analysis of the other three factors was unnecessary even though it would have further supported a determination that additional controls was unreasonable.

Response: We address consideration of recent monitoring data, natural visibility conditions and URP, and Texas's four-factor analysis elsewhere in this document.

Comment: Multiple commenters noted that emission reduction impacts from other regulations have improved visibility.

[EEI (0076) p. 2] EEI stated, as part of the ongoing transition to cleaner sources of generation, the electric power sector generally - and Oklahoma and Texas generators in particular - have cut emissions significantly in recent years and will continue to do so under many EPA regulations, even without the regional haze FIP proposed by EPA here.

AECOM (0075) explained that many Texas programs have been in place in the state over the years to achieve lower SO_2 emissions and visibility improvements. These programs will work in conjunction with the Regional Haze Rule to continue the documented reduction in SO_2 emissions and other contributing factors to visibility impairment, and in reducing the need for additional future controls on EGUs. A list of programs is provided in AECOM (0075).

AECOM (0075) stated that actual SO_2 emissions from Texas have been significantly reduced since the regional haze rule baseline period (2000-2004). As noted by the TCEQ,[32] statewide SO_2 emissions had decreased by nearly 50% from the baseline period through 2012, as shown in AECOM (0061/0075) Figure 2-1). The Texas 5-year regional haze progress report[33] issued in 2014 indicates a projection of further reductions of haze-forming SO_2 and NO_x emissions from point sources through 2018 (Figure 2-2 of AECOM 0061/0075). Therefore, it is expected that visibility improvements observed through 2013, as discussed below for WIMO, GUMO, and BIBE, will continue through the 2018 interim goal year.

[Alpine (0078) p. 22] Alpine concurred with EPA's findings that this observed improvement from the baseline conditions is the result of reduction in the impacts from SO_2 emissions and a reduction in the impacts from coarse material but disagreed that it is related to meteorological conditions more than emission changes. Alpine provided Figure 13 showing SO_2 emissions in Texas from 1999 through 2011 and noted that a reduction of 50% in SO_2 emission has occurred across all anthropogenic categories State-wide. A significant portion of this reduction is attributed to electric utility coal fuel combustion (38%), as well as from industrial fuel combustion and processes (70%). And according to TCEQ's point source emission inventory, these values continue to decrease beyond 2011 levels for all point sources reporting to the State.[7]

Texas SO_2 and NO_x Emissions Trends
(AECOM Figures 2-1 and 2-2)

Figure 2-1: Texas SO_2 Emission Trends[34]

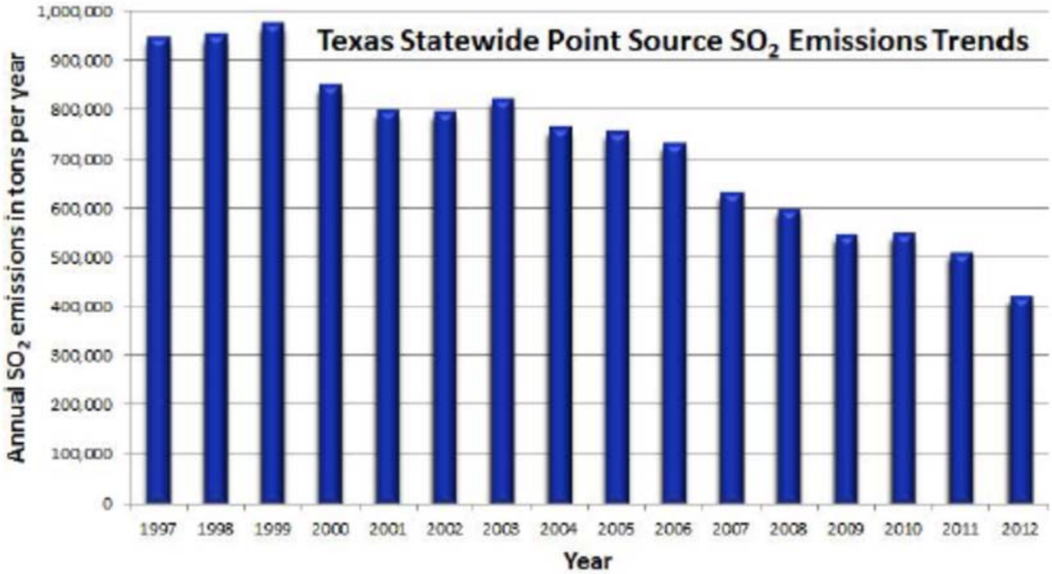
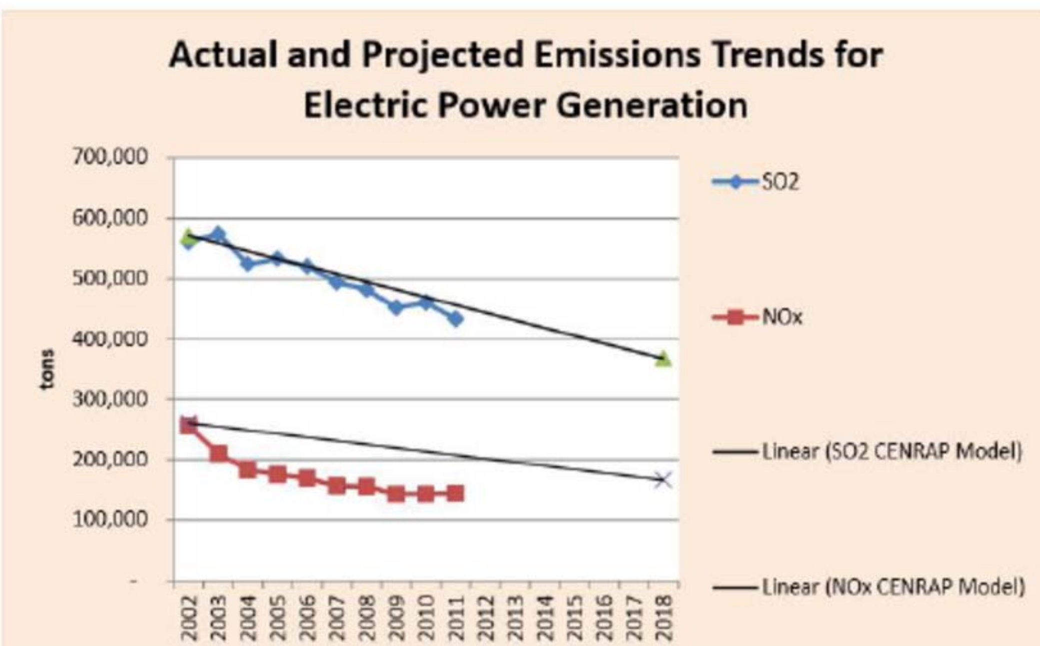
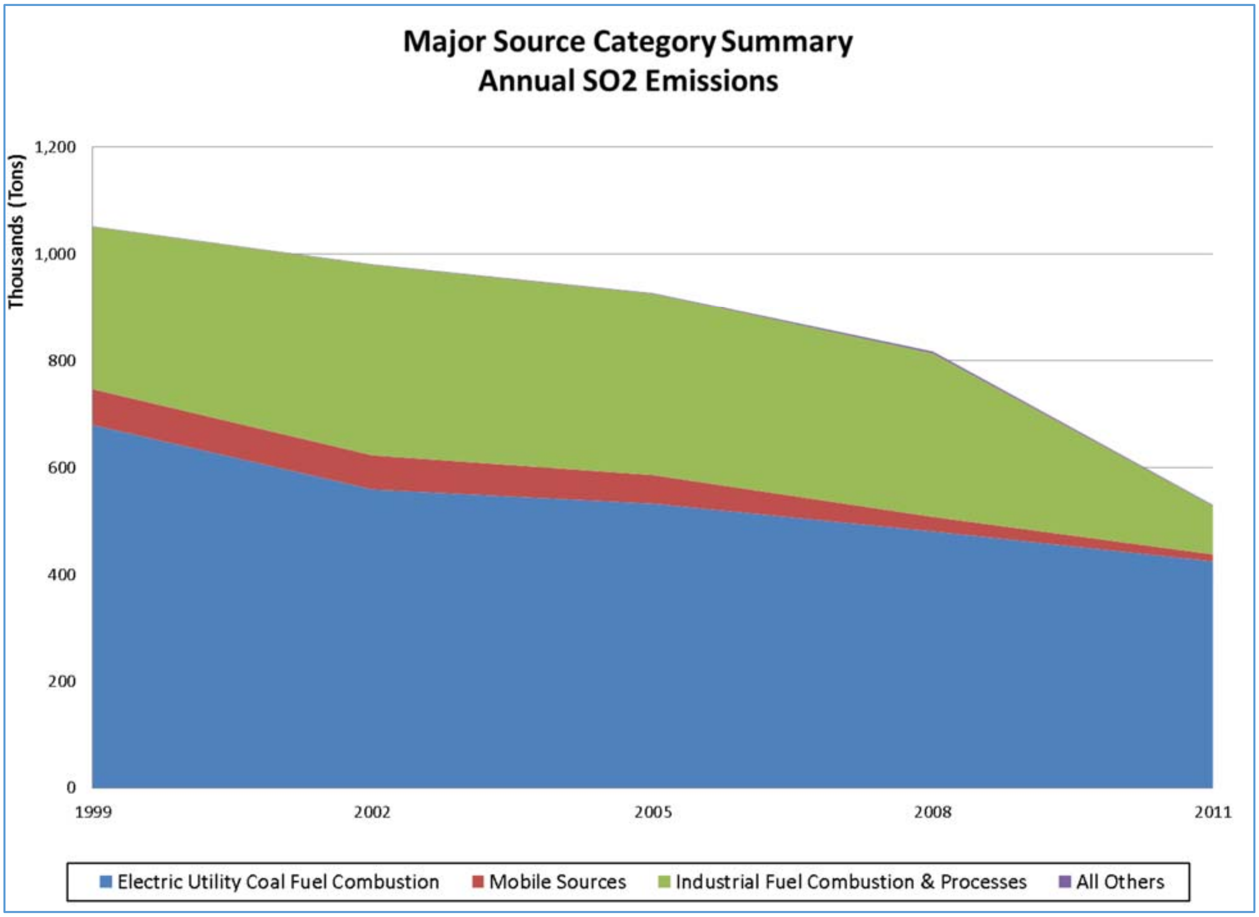


Figure 2-2: Projected Texas SO_2 and NOx EGU Emissions Trend through 2018[36]



Annual SO_2 **Emission Trends - Texas. (Alpine Figure 13 (0078))**



Source: http://www.midwestozonegroup.com/files/AQTrendsSummary_Texas_3.ppt

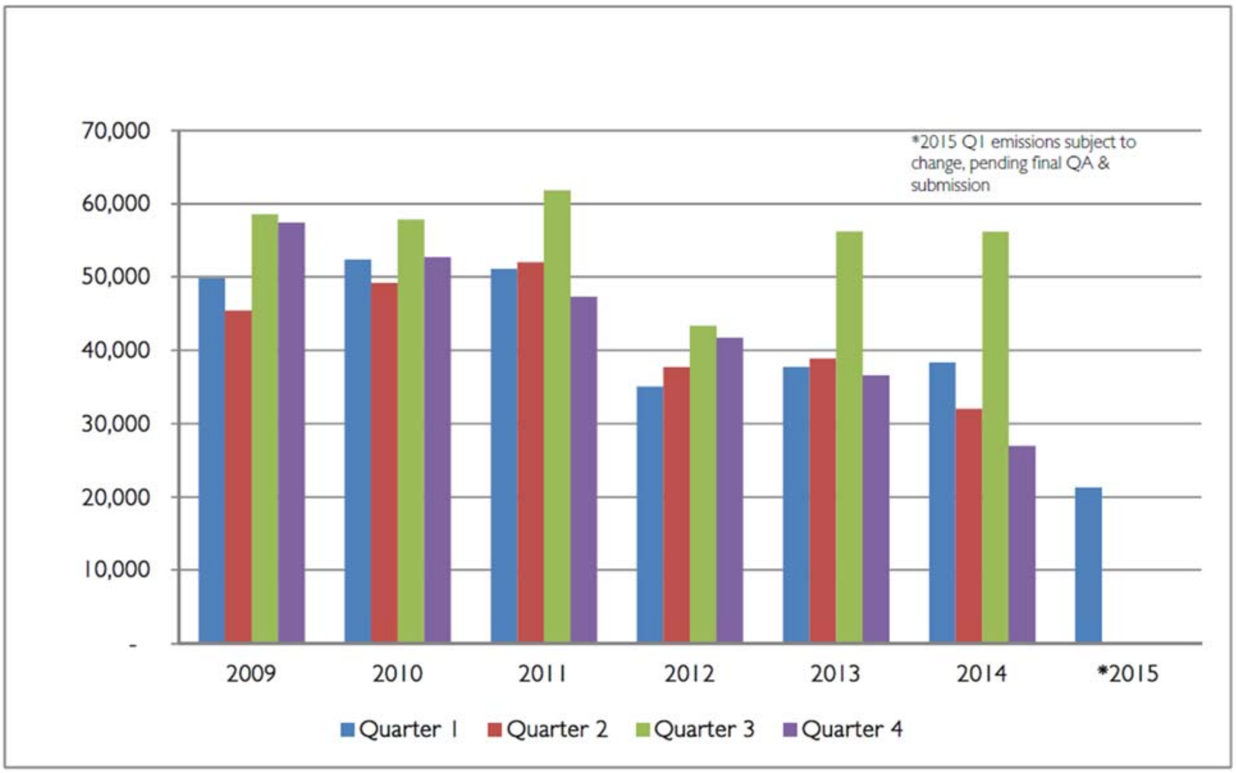
[Luminant (0061) p. 96] Luminant stated that the progress under Texas's SIP is demonstrated and undisputed. All record evidence indicates that the visibility improvement for these three areas will persist and continue through 2018. In its five-year regional haze progress report, Texas demonstrated that emissions of both SO_2 and NO_x from Texas generating units are declining and will continue to decline under existing programs.[631] As Texas explained in its progress report: "Emissions of NO_x decreased 44% from 255,556 tons in 2002 to 143,782 tons in 2011. Sulfur dioxide emissions decreased 23% from 560,860 tpy to 433,782 tpy during the same period. Emissions have trended downward better than or as predicted in the CENRAP modeling projections."[632] And with current programs in place that will continue through 2018, including CSAPR and MATS, there is no possibility that emissions will increase, and current visibility conditions degrade, between now and 2018.

According to Luminant, SO_2 emissions from Luminant's units that EPA would subject to new requirements have steadily trended downward over the first planning period, further underscoring the effectiveness of the measures relied on in Texas's SIP and the unreasonableness of EPA's assumptions and proposed FIP. From 2009 to 2014, SO_2 emissions from Luminant's Big Brown, Martin Lake, Monticello, and Sandow Unit 4 were reduced by 27%.

(Table 11 and Figure 9 provided by Luminant (0061)) shows the quarterly and annual SO_2 emissions for these units from 2009 to 2014, as well as the first quarter of 2015.[633]

Quarterly and Annual SO_2 Emissions from Luminant Units Proposed by EPA for Further Controls (Table 11 and Figure 9 provided by Luminant (0061))

	2009	2010	2011	2012	2013	2014	*2015
Quarter 1	49,798	52,315	51,042	35,046	37,716	38,334	21,331
Quarter 2	45,429	49,136	51,967	37,669	38,880	32,041	
Quarter 3	58,599	57,868	61,863	43,308	56,242	56,203	
Quarter 4	57,423	52,674	47,291	41,710	36,544	26,987	
Annual Totals	211,249	211,994	212,164	157,733	169,382	153,565	21,331



Luminant noted that first quarter 2015 SO_2 emissions are sharply lower—approximately 57% lower than the first quarter of 2009 and about 44% lower than the first quarter of 2014. Again, the data unequivocally show that SO_2 emissions are trending down, and thus there is no basis for EPA's proposal. These data also underscore the arbitrary nature of EPA's approach of adjusting ENVIRON's modeling based on three years of "actual" emissions from 2009 to 2013.[634] As explained by Sargent and Lundy in its report prepared in support of Luminant's comments, EPA's selective use of data significantly understates the cost-effectiveness (that is, understates the cost per ton of SO_2 removed) and overstates the estimated benefits that EPA relies on for its proposal.[635] A more representative 3-year period would be the most recent 3 years for which full data is available—2012-2014.[636]

Footnotes:
[7] https://www.tceq.texas.gov/airquality/point-source-ei/psei.html

[32] http://www.tceq.state.tx.us/airquality/airsuccess/air-success-inventory.
[33] https://www.tceq.texas.gov/assets/public/implementation/air/sip/haze/13012SIP_ado.pdf.
[34] http://www.tceq.state.tx.us/airquality/airsuccess/air-success-inventory.
[35] https://www.tceq.texas.gov/assets/public/implementation/air/sip/haze/13012SIP_ado.pdf at 4-10.

[631]See TCEQ, 2014 Five-Year Reasonable Progress Report 4-10, fig.4-2 (Feb. 26, 2014), available at https://www.tceq.texas.gov/assets/public/implementation/air/sip/haze/13012SIP_ado.pdf ("Texas Five-Year Progress Report").
[632] Id. at 4-10.
[633] The 2015 data is still being reviewed and is subject to change pending quality assurance and submission to TCEQ.
[634] See FIP TSD at A-59.
[635] S&L Report at 11, 13, 21, 23.
[636] Id. at 21.

Response: We acknowledge that actual SO_2 and NO_X emissions from Texas point sources have decreased since the baseline period for the first planning period (2000-2004). As noted in our proposed rulemaking, we also acknowledge that there is an observed reduction in the impacts from SO_2 emissions and a reduction in the impacts from coarse material at Big Bend, Guadalupe Mountains, and Wichita Mountains.[676] Some commenters also point to Texas' five-year regional haze progress report as showing that SO_2 and NO_X emission from Texas EGUs are expected to continue to decline through 2018, along with a continued trend in visibility improvement at the three Class I areas. With regard to the assertion that Texas' five-year regional haze progress report projects SO_2 and NO_X emissions from point sources to continue to decline through 2018 (with corresponding visibility improvement trends at the three Class I areas), Texas' five-year regional haze progress report is pending evaluation as a SIP revision, and we intend to take action on it in a future rulemaking. We note that the portion of the Texas' five-year regional haze progress report referred to by the commenters[677] compares actual annual emissions from 2002 through 2011 against a linear change between 2002 actual emissions and the 2018 CENRAP modeled emissions and concludes that emissions from 2002 to 2011 have trended downward better than or as predicted in the CENRAP modeling projections. However, we noted in our proposal that the CENRAP projected visibility impacts in 2018 from Texas point sources, and EGUs in particular, are significant. As noted in our proposed rulemaking, based on information provided by the TCEQ in materials other than the progress report, we do not expect large additional emission reductions of SO_2 in Texas between 2013 and 2018 under Federal programs and the SIP as submitted.[678] We have not seen evidence in support of something different. Furthermore, emissions from some of the Texas EGUs that we are requiring controls

[676] 79 FR at 74843 and 74870.
[677] 2014 Texas Five-Year Reasonable Progress Report, p 4-10, figure 4-2.
[678] Texas comments on Draft IPM modeling conducted by EPA for potential national rule making platform provided on June 26, 2014. In this docket materials as "TCEQ comment letter to EPA on draft modeling platform dated June 24, 2014. '2018 EMP signed.pdf.

for and that impact visibility at the three Class I areas the most, are still above the emission level projected in the 2018 CENRAP modeling. We are not aware of any upcoming controls or changes in operation to suggest that future actual emissions at these specific sources will decrease to those predicted levels. [679] We also note that our analysis uses recent emissions data to identify those sources with the greatest potential to impact visibility and in assessing the potential visibility benefits from controls. In addition, we considered recent emission reductions by adjusting the 2018 modeled emission inventory to account for reductions at sources when controls had been installed and relied on post-control actuals to support modeled emission rates.[680]

We disagree with comments contending that emissions of both SO_2 and NO_X from Texas generating units will continue to decline through 2018 under existing programs. As noted in our proposed rulemaking, based on information provided by the TCEQ, we do not expect large additional emission reductions of SO_2 in Texas between 2013 and 2018 under federal programs and the SIP as submitted.[681] We have not seen evidence in support of something different. As we explained in the FIP TSD[682]:

> …based on recent comments from the TCEQ, it was also unclear if any further SO_2 or NOx reductions would occur due to these rules even if all litigation was resolved. The TCEQ has provided extensive comments on recent emission inventory indicating that further significant reductions in SO_2 were not expected due to CSAPR or MATS.[683] We thought it was reasonable to continue to rely upon the initial CENRAP 2018 modeling inventory initially and update the information that we were more certain about as discussed above. We utilized 2009-2013 CEM data for EGUs in evaluation and selection of updated emission levels to model.[684] Comparison of recent CEM data with CAIR projections indicated that the Texas EGUs were on track to meet the CAIR requirements without further substantial reductions. For the ENVIRON modeling we did not increase emissions for existing sources based on recent actuals but we did lower emissions for some sources when controls had been installed and relied on post-control actuals to support modeled emission rates. TCEQ in recent ozone attainment modeling has also used recent CEM data to represent expected emissions levels from Texas EGUs for future year of 2018 in recent Houston and DFW area modeling.

With regard to the commenters' contention that the downward trend in emissions from Texas point sources, especially Luminant's facilities, underscores the effectiveness of Texas' RH SIP, we note that the annual and quarterly SO_2 emissions data for Luminant's facilities for 2009-2015

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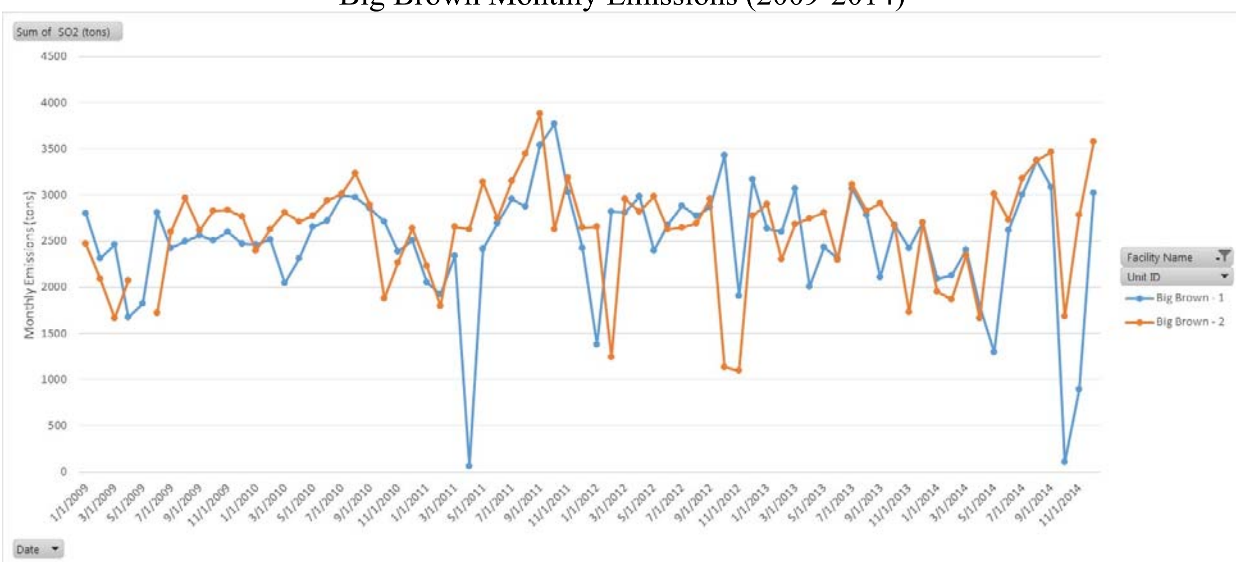
[679] 79 FR 74842 and 74843.
[680] Table 2 of ENVIRON 2018 Memorandum, Sept 16, 2013. Available in the docket for this action as TX166-010-09 Memo_TXHAZE_2018CAMx 16Sept13
[681] 79 FR 74870.
[682] FIP TSD at A-16
[683] TCEQ comment letter to EPA on draft modeling platform dated June 24, 2014. '2018 EMP signed.pdf'
[684] Emission rates/data used in modeling are included in the report and electronic file "Summary_emissions_for_39_selected_072913_ENV.xlsx" and CEM data included in file "TX Sources of Interest Emissions 2007-2012_msf_annual estimates.xls

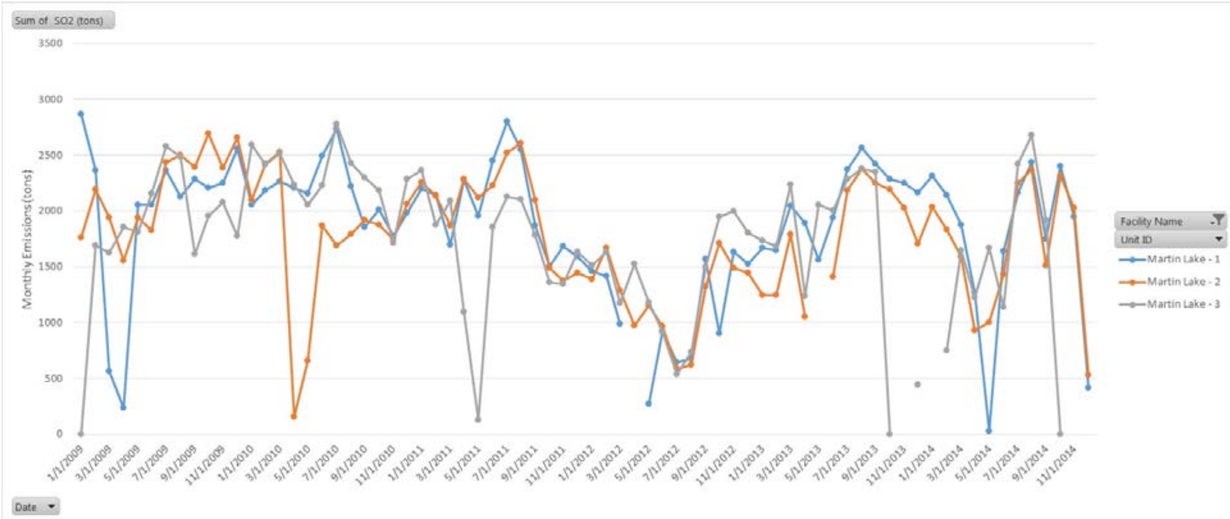
provided by the commenter demonstrates that although there has been an overall downward trend in annual SO_2 emissions during this time period, there has not been a downward trend in SO_2 emissions during Quarter 3 for the six year period for which full data is available. Except for the years 2011 and 2012, when total SO_2 emissions for Quarter 3 were either sizably higher or lower compared to the other years during the 2009-2014 time period, emissions for Quarter 3 remained relatively unchanged during this six year period. This is significant because Quarter 3 corresponds to the summer months and many of the 20% worst days, which is what the RPGs are based on, typically occur during the summer months. Emissions reductions during the fall and/or winter months reduce annual emissions, but will not lead to improved visibility during the 20% worst days. As shown in the figures below, the majority of the decline in annual SO_2 emissions is driven by seasonal operation of Monticello units 1 and 2.[685] We also note, as discussed above, NOx emissions for many of these units were updated in our modeling to better reflect the recent actual emissions.

Big Brown Monthly Emissions (2009-2014)

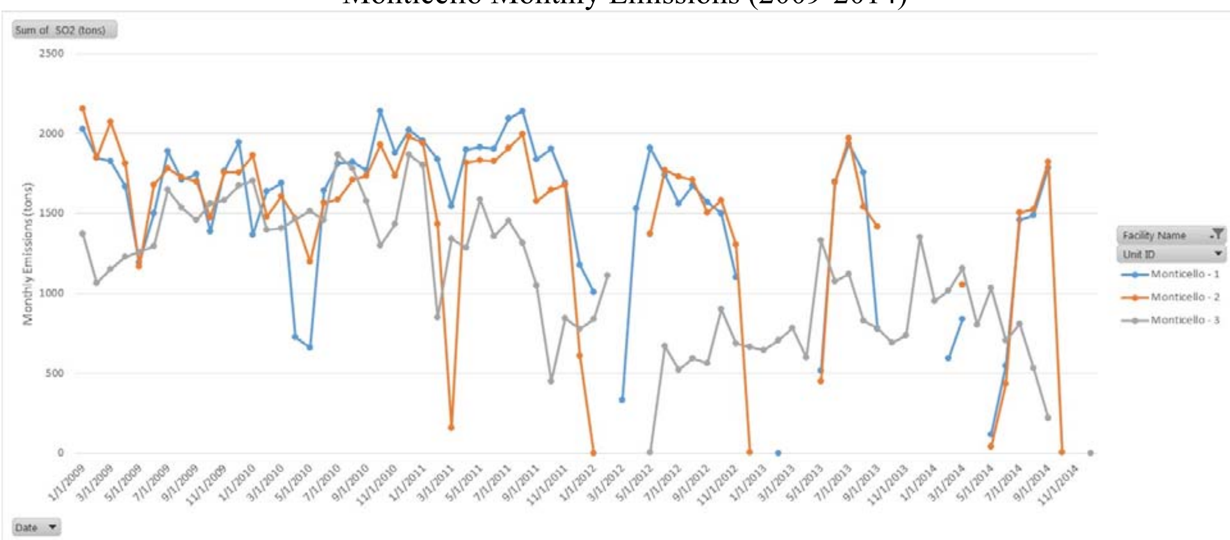


Martin Lake Monthly Emissions (2009-2014)

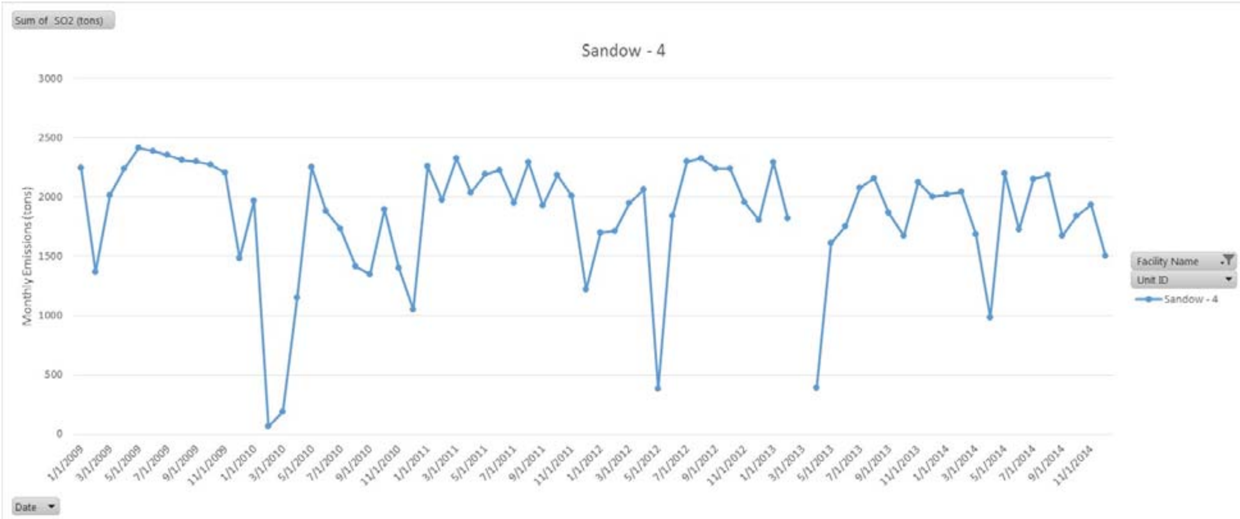
[685] See Luminant CAMD emissions.xlsx in the docket for this action



Monticello Monthly Emissions (2009-2014)



Sandow 4 Monthly Emissions (2009-2014)



We also remind the commenters that even with the controls we are requiring for Texas EGUs under our FIP, additional reductions would be needed for visibility conditions to meet or exceed every URP goal in 2018 as calculated by us in our proposal. For example, current conditions at Wichita Mountains (based on 2009-2013) is 21.2 dv, therefore additional reductions are needed for the area to meet the URP goal of 20.01 dv in 2018. We have estimated that even with the controls we are requiring (including those with an installation date beyond 2018), it is estimated to take 82 years to reach natural visibility conditions at Wichita Mountains, 173 years at Big Bend, and 141 years at Guadalupe Mountains, all falling short of the national goal of achieving natural visibility conditions by 2064.[686] We disagree with the commenter that our FIP "does nothing to accelerate the final goal of natural visibility levels" and "is not a significant improvement over Texas' date for obtaining natural conditions." We estimate that the required controls are a significant acceleration of the final goal, reducing the number of years to meet natural visibility by 25 to 30 years at Big Bend and Guadalupe Mountains. This is significant progress towards the goal during this first planning period when compared to the estimates in the Texas SIP. As we note in our proposal:

> If the State determines that the amount of progress identified through the [URP] analysis is reasonable based upon the statutory factors, the State should identify this amount of progress as its reasonable progress goal for the first long-term strategy, unless it determines that additional progress beyond this amount is also reasonable. If the State determines that additional progress is reasonable *based on the statutory factors,* the State should adopt that amount of progress as its goal for the first long-term strategy [emphasis added].[687]

This determination must be based on the statutory factors. As we discuss in our proposal,[688] Texas's reasonable progress four factor analysis was highly flawed, and thus could not serve as a legitimate basis for rejecting additional progress including progress beyond the URP.

[686] 79 FR 74887
[687] 64 FR 35732 (July 1, 1999).
[688] See discussion beginning on 79 FR 74838.

Furthermore, we disagree that the actual observed reduction in SO_2 and NO_X emissions from Texas point sources and any projected future reduction through 2018 makes our proposed FIP unreasonable and unwarranted. As discussed in our proposal, in our final rule, and elsewhere in this document, we have determined that the Texas and Oklahoma RH SIPs do not fully meet the requirements of the RH rule. Oklahoma did not explicitly ask Texas for additional reductions from Texas sources impacting Wichita Mountains. Texas performed a technically flawed analysis for both establishing its Class I areas' RPGs and for determining under LTS its fair share of emissions reductions for Wichita Mountains. We therefore were required to conduct our own analysis under sections 51.308(d)(1) and (3). We conducted our own analysis in accordance with the RH rule and the CAA and therefore, we believe our FIP is reasonable and necessary to fully satisfy the regional haze requirements for Texas and Oklahoma. We identified those sources with the greatest visibility impacts and determined based on consideration of the four factors that for some of these sources controls were reasonable and provided for meaningful visibility improvements towards the goal of natural visibility conditions for this first planning period. In evaluating these specific sources, we considered recent emissions data.

We disagree with Luminant's contention that our use of three years of actual emissions from 2009 to 2013 is an arbitrary approach that understates the cost per ton of SO_2 removed and overstates the estimated benefits. We respond to that comment in the cost section of this document.

Comment: Luminant provided background information on current visibility conditions in the three relevant Class I areas and on the IMPROVE visibility monitoring network. [Luminant (0061) p. 53]

Luminant noted that visibility conditions at Class I areas are monitored by a network of visibility monitors coordinated and funded by EPA, other federal agencies, and multi-state air quality organizations as part of the IMPROVE program. IMPROVE monitoring data are the backbone of the regional haze program. The monitoring data from these sites is "used to establish baseline conditions (for the 2000-2004 period) for each Class I area and to track progress toward goals established in future SIPs."[384] IMPROVE monitoring data is also used to validate modeling results. As EPA has explained: "Model performance at IMPROVE monitors is of highest importance, because these monitors are sited to be representative of the visibility conditions impacting each Class I Area."[385]

Luminant noted that the IMPROVE network started in 1986 at two Class I areas and expanded to 30 sites in 1988.[386] Among the new sites added in 1988 were the Big Bend (BIBE1) and Guadalupe Mountains (GUMO1) monitors.[387] After EPA's issuance of its regional haze regulations in 1999, the network was upgraded and expanded to 110 sites nationally to cover all of the 156 mandatory Class I areas.[388]

Luminant stated that the three Class I areas of interest in EPA's proposal here are each served by a separate IMPROVE monitor—Big Bend's monitor is designated BIBE1; Guadalupe Mountains' monitor is designated GUMO1; and Wichita Mountains' is designated WIMO1.[389] However, some IMPROVE monitors in the network serve more than one Class I area. The 110 current monitoring locations were selected to provide representative visibility monitoring at all 156 mandatory Federal Class I areas, except the Bering Sea Wilderness (which is too remote for monitor deployment).[390] As we explained:

> Because of the broad spatial distributions of regional haze, and in order to use monitoring resources efficiently, EPA determined, in conjunction with State and Federal land managers, that some neighboring mandatory Federal Class I areas could be represented by a single monitoring site . . . The EPA consulted with the States in order to design a network that was as representative of all mandatory Federal Class I areas as possible.[391]

Luminant noted that when the IMPROVE network was expanded after the 1999 regulations were issued, the IMPROVE Steering Committee developed the plan for future network configuration.[392] As part of this planning process, the Committee concluded that "from a technical perspective, monitoring sites that are relatively near to each other in remote areas can be expected to collect similar data that might be considered redundant . . . Since regional haze impacts are by definition those that are distributed over a broad geographic region, a representative monitoring site does not necessarily need to be located very near to the [Class I area] being represented."[393]

Luminant noted that, accordingly, the IMPROVE Steering Committee developed a "two-stage process . . . for selecting new monitoring sites."[394] As relevant here, using this process, the Committee concluded that the monitor for Guadalupe Mountains (GUMO1) would also serve as the monitor for Carlsbad Caverns National Park, which is located in New Mexico and contiguous with Guadalupe Mountains.[395]

Footnotes:
[384] EPA, Guidance for Tracking Progress Under the Regional Haze Rule 1-4 (Sept. 2003) ("EPA Guidance for Tracking Progress"). See also 64 Fed. Reg. at 35,728 (discussing use of IMPROVE data under Regional Haze Rule).
[385] CENRAP Modeling TSD at 34.
[386] EPA Guidance for Tracking Progress at 1-12.
[387] See IMPROVE, Spatial and Seasonal Patterns and Temporal Variability of Haze and Its Constituents in the United States: Report III, at 1-6 (May 2000) ("IMPROVE 2000 Report"), available at http://vista.cira.colostate.edu/improve/publications/reports/2000/2000.htm.
[388] EPA Guidance for Tracking Progress at 1-3.
[389] See Vista, IMPROVE/Protocol Network in Year 2002, http://vista.cira.colostate.edu/improve/Overview/IMPROVENetworkExp.htm (last visited Mar. 22, 2015) (listing of monitor locations).
[390] EPA Guidance for Tracking Progress at 1-3, 1-12.
[391] Id. at 1-13 to 1-14.
[392] IMPROVE 2000 Report at 1-7.
[393] Id. at 1-7, 1-9.
[394] Id. at 1-10.
[395] Id.

Response: We acknowledge the historical information provided by the commenter. We take no position with respect to the commenter's synopsis.

Comment: Multiple commenters stated that EPA's proposal is unnecessary and outside of its authority because EPA's 2018 visibility goals for Big Bend, Guadalupe Mountains, and Wichita Mountains have already been achieved based on IMPROVE monitoring network data without any further emission reductions or controls on Texas sources.

Luminant, EEI, AECOM and AECT provided the data below showing actual monitored visibility compared to the goal that EPA claims must be achieved by 2018.

Monitored Visibility Compared to EPA's Proposed Goals
(deciviews, 20% worst days)
(Table provided by Luminant (0061), EEI (0076), and AECOM (0061/0075))

Class I Area	Actual Observed Conditions from IMPROVE Monitors (2009-13) (5-year average) in deciviews	EPA's Proposed RPG (2018) in deciviews
Big Bend	16.3	16.57
Guadalupe Mountains	15.3	16.26
Wichita Mountains	21.2	21.33

Source: 79 FR 74843, 74870 and 74887, tbl.43.

[Luminant (0061) p. iv] Luminant stated that the Texas regional haze SIP has been in place since 2009, and it is working. Texas emissions have decreased, and visibility has improved—beyond what even EPA would require in this proposal. While EPA relies on computer modeling, actual real-world data clearly and irrefutably demonstrate the effectiveness of the Texas plan. These improvements are the result of on-going emission reductions that will continue under Texas rules and national programs like the Cross-State Air Pollution Rule (CSAPR) and the Mercury and Air Toxics Standard (MATS)—all without the additional $2 billion that EPA would require. Luminant stated that the EPA ignores these data from its own monitors and even refuses to account for CSAPR and MATS limitations in the modeling it uses to justify its proposal. But the reality remains the same—Texas's plan is working and visibility is improving. EPA should withdraw its FIP and approve the Texas SIP.

[Luminant (0061), p. 2, 55] Luminant stated that the EPA concedes that data from IMPROVE monitors is "of highest importance,"[9] yet EPA fails to account for the more recent, real-world data from these monitors in its flawed modeling and proposed FIPs. Because the reasonable progress goals have already been achieved, EPA has no authority to require further controls from Texas sources.

[EEI (0076) p. 8-9] EEI concluded that the existing regulatory programs put into place by Texas in its SIP are accomplishing in practice what EPA seeks to achieve with the imposition of more stringent control equipment on a regulatory timeline that will not deliver any benefits within the first planning period.

[AECOM (0061/0075) p. 1-5] AECOM stated that actual visibility monitoring data indicates faster progress toward the RPG and URP goals than EPA is assuming. Current monitoring data from the IMPROVE[25] network using the most recent 5-year average show that the three Class I areas of interest already meet both the RPGs proposed by the States and the more stringent RPGs proposed by EPA without any further emission controls. These current data also show that WIMO is projected to meet the EPA approved URP for Oklahoma, and GUMO is projected to meet the EPA-proposed URP by 2018, without the emission controls that EPA is proposing. EPA notes that "more recent IMPROVE monitored data" at the three Class I areas "indicate more progress than anticipated by the CENRAP modeling has occurred."[27] EPA attributes this improvement to "meteorological conditions, reduction in the impact of SO_2 emissions, and a reduction in the impacts from coarse material."[28] Yet, EPA does not take this information into account in its proposed URP and RPGs for the Class I areas and emission reductions for the 14 Texas sources.

[CCP (0075) p. 2] CCP expressed concern that actual visibility monitoring data shows that the three Class I areas already meet the TCEQ- and EPA-proposed RPGs without any further emission controls. CCP stated that significant reductions in SO_2 emissions from Texas sources since the baseline period (2000- 2004) have resulted in actual visibility improvements not considered by EPA in proposing its RPGs and the required emission controls.

[AECT (0074) p. 6] AECT noted that the most recent five-year (2009-2013) averages of EPA's IMPROVE visibility monitoring data show that EPA has not provided adequate support that any of the additional SO_2 emissions controls for the identified Texas EGUs is needed to meet EPA's proposed 2018 reasonable progress goals for any of the three Class I areas.[18] Further, visibility monitoring data for 2018 should be even lower than it was in that five-year period since EPA's IPM modeling predicts that visibility-impairing emissions in Texas will progressively decline through 2018. Accordingly, AECT believes that EPA has not supported its proposal to require additional SO_2 emissions controls for any of the identified Texas EGUs.

Luminant (0054-3) stated that the EPA's proposal is based in large part on visibility goals for the Wichita Mountains National Wildlife Refuge in Oklahoma and making sure that Texas sources do not interfere with meeting those goals. The commenter stated that current data from EPA monitors for the Wichita Mountains confirms that visibility conditions in that refuge have improved steadily over the last 10 years, which EPA attributes to reductions in SO_2 emissions from Texas. In fact, current visibility monitoring data shows that the Wichita Mountains already meet the 2018 goal that EPA has determined is reasonable. This progress is well ahead of the 2018 schedule, current regulatory programs will ensure this progress is maintained without the additional cost that EPA's proposal would entail.

[UARG (0065) p. 30] As part of their argument that the proposed FIP is arbitrary, capricious, and an abuse of discretion because it would have no perceptible effect on visibility conditions in any Class I area, UARG noted that the proposed rule acknowledges that even in the absence of the controls EPA now proposes, recent monitoring data at Wichita Mountains "indicate that more progress than anticipated by the CENRAP modeling has occurred." *Id. at* 74,870. EPA notes that for 2009–2013 average conditions for the 20 percent worst days, Wichita Mountains experienced 21.2-deciview visibility conditions, which is *better than* the 21.5-deciview average that CENRAP projected *for 2018*. *Id*. EPA further notes that "[m]ore recent emission inventory data show reductions in emissions in most states beyond what was projected in the 2018 modeling, including large reductions in emissions from the Eastern United States [and] [e]missions from non-EGU Texas point sources." *Id*. Given these facts admitted by EPA, the Agency has failed to explain why the stringent emission reduction requirements in its proposed rule are needed.

[TCEQ/PUCT (0056) p. 4] The TCEQ stated that the EPA's proposed partial SIP disapproval and partial FIP undervalue the effectiveness of the long-term strategy embodied in the Texas 2009 RH SIP. Without presenting evidence, the EPA dismisses the progress made as being due to "meteorological conditions, reduction in the impacts from SO_2 emissions, and a reduction in the impacts from coarse materials" (79 FR 74843). The EPA makes the meteorological assertion in spite of the fact that 2011 was one of the hottest and driest years in Texas history and there were unprecedented wildfires that year. The current visibility conditions in Big Bend, Guadalupe Mountains, and Wichita Mountains are already better than the respective state-established and the EPA-proposed RPG for these three Class I areas.

Footnotes:
[9] EPA, CENRAP Modeling TSD: Review of Modeling and Emission Inventory Development for the Regional Haze Implementation Plan for the State of Texas 34 (Nov. 2014) ("CENRAP Modeling TSD").

AECOM Footnotes:
[25] Interagency Monitoring of Protected Visual Environments (IMPROVE) is a network of speciated particulate monitors that obtain 24-hour average particulate concentrations. These concentrations are then converted into an equivalent visibility metric (extinction) through the "IMPROVE equation" that is documented at http://vista.cira.colostate.edu/improve/Publications/GrayLit/019_RevisedIMPROVEeq/RevisedIMPROVEAlgorithm3.doc.
[27] 79 Fed. Reg. 74,818; 74,843; 74,870 (Dec. 16, 2014).
[28] 79 Fed. Reg. 74,843; 74,870.

ACET Footnotes:
[18] Although EPA's Proposal suggests that weather (i.e., temperature and precipitation) may have caused the five-year average of IMPROVE monitoring data to be abnormally low and, thus, be below EPA's proposed 2018 reasonable progress goals for the three Class I areas and be projected to meet their Uniform Rate of Progress for 2018 for those areas, AECT believes that weather did not cause the IMPROVE monitoring data to be abnormally low. Available information on temperatures and precipitation suggests that other than 2011and 2012, none of the years were unusually cool or wet, or otherwise conducive to abnormally low levels of haze. In fact, some of the IMPROVE monitoring data is associated with one or more exceptional events that actually caused abnormally high levels of haze. For example, an unusually intense series of wildfires in Mexico appear to be responsible for the abnormally high levels of haze observed at Big Bend in 2011, and a dust storm appears to be responsible for the abnormally high levels of haze observed at the Guadalupe Mountains in 2012.]

Response: We disagree with the commenters' contention that we ignore recent data from IMPROVE monitors that shows actual observed visibility conditions at Big Bend, Guadalupe Mountains, and Wichita Mountains are better than the numerical RPGs we proposed in our FIP proposal. In our proposal, we acknowledge that the more recent data from IMPROVE monitors at the three Class I areas indicate that more progress than anticipated by the 2018 CENRAP modeling has occurred and that we believe this observed improvement is the result of meteorological conditions, reduction in the impact from fires, and reduction in the impacts from SO_2 emissions and coarse matter.[689] However, we also determined that TCEQ's analyses do not fully satisfy the requirements under section 51.308(d)(1) and (3). We discuss our evaluation of recent meteorological conditions and visibility conditions in a separate response to comment where we address modeling issues and back trajectory analysis.

We disagree with the comment that we should withdraw our FIP and approve the Texas regional haze SIP because the Texas SIP is working and that this is evidenced by the decrease in Texas emissions and the improvement in visibility beyond what we are requiring in our FIP. We do not believe that the decrease in emissions from Texas sources and the fact that recent data from IMPROVE monitors at the three Class I areas indicates visibility conditions are better than the numeric RPGs we proposed, warrants full approval of the Texas RH SIP and withdrawal of our FIP. Commenters making this contention have an incorrect understanding of the regional haze requirements. We identified those sources that have the greatest visibility impacts at the Class I areas of interest and through our analyses of the four factors, we found that cost-effective controls that result in meaningful visibility improvement are available at some of these sources. We also note that emissions at some of these sources that impact visibility are still above the emission levels projected in the 2018 CENRAP modeling. The determination of whether an RPG and the emission limitations and other control measures upon which it is based constitute reasonable progress is made by conducting certain analyses and meeting the requirements under section 51.308(d)(1). Additionally, section 51.308(d)(3)(i) requires that Texas consult with other states if its emissions are reasonably anticipated to contribute to visibility impairment at that state's Class I area(s).

As discussed in more detail in our proposal and in our final action, Texas did not fully satisfy the requirements under section 51.308(d)(1)(i) and (ii) in determining whether additional controls for Texas sources are reasonable and in establishing its RPGs. Therefore, we proposed to disapprove those portions of the Texas regional haze SIP. Specifically, we disagreed with the set of potential controls identified by the TCEQ and how it analyzed and weighed the four reasonable progress factors in a number of key areas.[690] In addition, we proposed to find that Texas did not adequately address the requirement in section 51.308(d)(3)(i) to consult with Oklahoma in order to develop coordinated emission management strategies to address its impacts on the Wichita Mountains.[691] Please see our proposal, our responses to other comments in this document, and the TSDs for a detailed discussion of this. The decrease in emissions from Texas sources along with recent data from IMPROVE monitors indicating that visibility conditions are better than the levels anticipated in the CENRAP projections for 2018 and better than the RPGs we proposed (which were based on adjusting the CENRAP 2018 projection to account for the visibility benefit anticipated from controls required in this FIP), do not change our finding that Texas did not fully satisfy the regional haze requirements under section 51.308(d)(1). The required controls will result in a significant visibility improvement towards the goal of natural visibility conditions for this planning period. Through our own analysis of the four reasonable progress factors, we found that controlling a small number of Texas sources will result in

689 79 FR 74843 and 74870
690 79 FR 74838
691 79 FR 74856

significant visibility benefits at the affected Class I areas, and that rather than evaluating controls at all facilities identified by Texas combined, a subset of those facilities (and some additional facilities not identified by Texas) is reasonable. In addition, we found that TCEQ did not consider in its analysis the reasonableness of control upgrades or increased utilization of existing controls. Through our own analysis, we found that there are a number of Texas sources with older SO_2 scrubbers that can upgraded and would result in cost-effective visibility benefits. We continue to hold that the emission limitations we are establishing for sources in Texas constitute reasonable progress and that we arrived at these emission limitations in accordance with the CAA and the regional haze regulations.

We estimated the revised numerical RPGs for the 20% worst days in 2018 for Texas and Oklahoma Class I areas to reflect the additional anticipated visibility benefit from the controls on Texas sources in our FIP that will be in place by 2018.[692] We also assessed the additional benefit from required controls that will not be in place by 2018 but did not include that benefit in the proposed RPGs. While we recognize that recent IMPROVE monitoring data appear to indicate that the three affected Class I areas are meeting the RPGs selected by the states as well as the more stringent RPGs we have established in our FIP, we disagree that this means that we should approve the Texas Regional Haze SIP. The SO_2 emission limitations we are requiring in our FIP for specific Texas sources are not required under the Texas RH SIP and result in significant additional visibility benefit by achieving large reductions in pollutants at these sources. These emission limitations along with the "on the book" reductions are what we have determined will constitute reasonable progress at the affected Class I areas based on our analyses under section 51.308(d)(1). The RPGs we calculated in our proposal are intended to reflect the additional visibility benefit that would result based on the emission limitations that would be in place by 2018 estimated by adjusting the CENRAP 2018 projected visibility conditions at the Class I areas. We explained in our proposal why we cannot assume that the SO_2 scrubber retrofits we are requiring for certain sources will be installed and operational within this planning period, which ends in 2018.[693] We did not conduct photochemical modeling to quantify the revised RPGs, but instead we adjusted the 2018 RPGs established by Texas and Oklahoma that were based on the 2018 CENRAP modeling. As a result, the RPGs we quantified are not as refined as they would be had we conducted additional photochemical modeling to estimate them and are still based on the CENRAP 2018 projections. The estimated RPGs serve to demonstrate the additional visibility benefit anticipated by the required controls anticipated to be in place in 2018 as compared to the RPGs established by Texas in the TX RH SIP. This helps explain why Texas and Oklahoma Class I areas appear to already be meeting the revised RPGs we proposed. However, we do not believe our method for calculating the revised RPGs presents a serious issue because the RPGs themselves are not directly enforceable under the RH rule.[694] The RPGs are an analytical tool the state and we use to evaluate whether the measures in the implementation plan are sufficient to achieve reasonable progress.[695] Instead, what is enforceable under the RH rule are the emission limitations and other control measures that apply to specific sources, and upon which the RPGs are based. Since the emission limitations we are requiring in our FIP for specific Texas sources (which is what our revised RPGs are based upon) are not included in the

[692] 79 FR 74886
[693] 79 FR 74874 and 74886
[694] 40 CFR 51.308(d)(1)(v)
[695] See 51.308(d)(1)(v).

Texas RH SIP and are not currently being achieved, we disagree that visibility at the Class I areas has already improved beyond what we would require in our FIP and that our FIP is therefore unjustified and unwarranted. The emission reductions required in this action will result in significant visibility improvements at the Class I areas beyond what is currently being achieved or observed.

With regard to comments that linear regression of the 2009-2013 observations from IMPROVE monitors indicates the Wichita Mountains and Guadalupe Mountains are achieving a rate of improvement greater than the URP for 2018, we discussed in our proposal that based on information provided by the TCEQ we do not expect large additional emission reductions of SO_2 in Texas between 2013 and 2018 under federal programs and the SIP as submitted.[696] We have not seen evidence in support of something different. Therefore, it is highly questionable whether the rate of visibility improvement observed up until 2013 at the Class I areas will continue through 2018 and whether the Class I areas will actually meet the URP for 2018. Furthermore, as explained in more detail elsewhere in this document, meteorological conditions over the past few years have deviated from the typical conditions and transport patterns. This helps explain one factor why Texas and Oklahoma Class I areas appear to already be meeting the revised RPGs we proposed and why we do not anticipate the rate of visibility improvement will continue.

We disagree that the controls we are requiring in our FIP are projected to result in negligible visibility benefit, without a perceptible effect on visibility conditions in any Class I areas compared to the SIPs submitted by Texas and Oklahoma. We address elsewhere in this document comments contending that our FIP provides negligible or no perceptible visibility benefit.

With regard to the comment that we refused to account for CSAPR and MATS limitations in our modeling analysis, as we discuss in depth in the FIP TSD and elsewhere in this response to comments document, we have no reason to believe that significant additional reductions will occur due to these programs. The TCEQ has provided extensive comments on recent emission inventory indicating that further significant reductions in SO_2 were not expected due to CSAPR or MATS.[697] In fact, Texas has used recent actual emissions in estimating emissions from EGUs for future years (including 2018) in ozone attainment demonstration SIPs in DFW and HGB.[698] We note that, as discussed in the FIP TSD, information available also indicates that SO_2 credits under the CSAPR program are much cheaper than originally projected and that Texas was

[696] 79 FR 74870

[697] TCEQ comment letter to EPA on draft modeling platform dated June 24, 2014. '2018 EMP signed.pdf'

[698] HGB 1997 8-Hour Ozone standard attainment demonstration approved by EPA in 2013, see TSD materials for 2010 "Appendix B Emission Modeling for the HGB Attainment Demonstration SIP Revision for the 1997 Eight-Hour Ozone Standard" on page B-78, "09017SIP_ado_Appendix_B.pdf".; DFW 1997 8-Hour Ozone standard attainment demonstration submitted to EPA, see TSD Appendix B: Emission Modeling for the DFW Attainment Demonstration SIP Revision for the 1997 Eight-Hour Ozone Standard, Page B-39, "AppB_EI_ado.pdf"; DFW 2008 8-Hour Ozone standard attainment demonstration proposed for adoption Dec. 10, 2014 and posted October 2014, see TSD materials "Appendix B Emissions Modeling for the Dallas-Fort Worth Attainment Demonstration State Implementation Plan Revision for the 2008 Eight-Hour Ozone Standard" Starting Page 40.,DFWAD_SIP_Appendix B.pdf

originally projected to be a purchaser of credits rather than implementing significant controls. Furthermore, none of the facilities required to install controls by this action have provided any information on anticipated reductions at their facilities due to compliance with these programs. We also note that we did consider recent actual emissions in our analysis and adjusted the 2018 emission inventory utilized by ENVIRON to account for reductions at sources when controls had been installed and relied on post-control actuals to support modeled emission rates.[699] Finally, as discussed elsewhere, there is uncertainty in CSAPR budgets due to the recent CSAPR remand.

With regard to the comment that we dismissed the progress being made at the three Class I areas as being due to meteorological conditions, reduction in the impacts from SO_2 emissions, and a reduction in the impacts from coarse materials without presenting evidence and in spite of the fact that 2011 was one of the hottest and driest years in Texas history with unprecedented wildfires and additional information provided by commenters on recent conditions and visibility, we discuss our evaluation of recent meteorological conditions and visibility conditions in a separate response to comment where we address modeling issues and back trajectory analysis. As explained in more detail in that section, meteorological conditions over the past few years (2011-2013) have deviated from the typical conditions and transport patterns.
Considering the above, we disagree that our FIP is unnecessary, arbitrary, capricious, and outside our authority and we are finalizing our partial disapproval of the Texas and Oklahoma regional haze SIPs and finalizing our Texas RP and LTS FIP and the Oklahoma RPG FIP.

Comment: EPA has no authority to disapprove Texas's SIP because all three Class I areas will meet EPA's RPGs and URPs by 2018 without further reductions

[CCP (0075) p. 12-13] CCP stated that Texas's conclusion that additional controls are not needed to meet the State's RPGs is further supported by the attached materials (AECOM attachments to 0075) that show that the States' established RPGs have already been attained. Current conditions based on more recent actual monitoring data account for the substantial reduction in SO_2 emissions. Table 3 provided by CCP in comment 0075 shows the URPs and RPGs proposed by the States and EPA and the negligible difference between the State-proposed RPGs and the proposed RPGs. Most importantly, the exhibit shows that TCEQ estimates of the impact of current controls on emissions are reasonable and that no additional controls are needed to meet both the TCEQ and EPA-proposed RPGs. Texas's insignificance determination should be afforded deference by EPA. Conversely, EPA's proposal to require $2 billion in additional controls when RPGs are already being met is unreasonable. EPA acknowledges the improvement in current conditions but arbitrarily determined not to take this information into account in establishing its revised goals and emission reductions for the 14 Texas sources.

URPs and RPGs Established by the States and Proposed by EPA and Current Conditions (Table 3 provided by CCP in comment 0075)

[699] Table 2 of ENVIRON 2018 Memorandum, Sept 16, 2013. Available in the docket for this action as TX166-010-09 Memo_TXHAZE_2018CAMx 16Sept13

Class I Area	State Established URP (2018) (20% worst days)	Current Conditions	State Established RPG (2018) (20% worst days)	EPA Proposed URP (2018) (20% worst days)	EPA Proposed RPG (2018) (20% worst days)	Difference Between State RPG and EPA Proposed RPG
Big Bend	15.6	16.3	16.60	14.93	16.57	0.03
Guadalupe Mountains	16.0	15.3	16.30	14.73	16.26	0.04
Wichita Mountains	20.01	21.2	21.47	20.01 (approved)	21.33	0.14

[Luminant (0061) p. 92] Luminant stated that EPA has no authority to disapprove Texas's regional haze SIP or to issue its proposed FIP because current visibility monitoring at the three Class I areas demonstrates that all three areas already meet EPA's reasonable progress goals for 2018 and will even meet the uniform rate of progress (URP) by 2018, without the additional controls that EPA would impose. Under EPA's regional haze regulations, Texas must only demonstrate the reasonableness of its rate of progress where that rate "provides for a slower rate of improvement in visibility than the rate that would be needed to attain natural conditions by 2064 [i.e., meet the URP] . . . ."[620] Here, Texas' SIP revision is achieving a rate of improvement ***faster*** than the URP, and, indeed, visibility conditions in the three Class I areas ***already*** meet EPA's own reasonable progress goals ***for 2018***.

[AECOM (0061/0075) p. 2-1] AECOM noted that the EPA asserts in its proposal that the projected rate of progress at the three Class I areas under discussion (WIMO, GUMO, and BIBE) will fall short of the 2018 URP goals based upon various modeling projections.[29] For example, in its FIP Technical Support Document, EPA relies on modeling it commissioned from ENVIRON that predicts the following 2018 base case visibility conditions at the three areas with current controls and regulatory requirements in place: WIMO (21.61 dv); BIBE (16.80 dv); and GUMO (16.36 dv).[30] All of these modeled values are above the EPA-proposed URPs and RPGs discussed above. In contrast, in the case of Caney Creek Wilderness Area in Arkansas, EPA finds that "[b]ased on the 2018 CENRAP projections, Missouri and Arkansas established RPGs for their Class I areas that provide for a slightly greater rate of improvement in visibility than needed to attain the URP, and determined that the projected emission reductions included in the model were adequate, and that it was not reasonable to request additional controls from Texas at this time. We find these consultations acceptable."[31]

[AECOM (0065/0075), p. 2-1] AECOM (0061/0075) stated that recent monitoring data, however, contradict EPA's modeling results and show WIMO, BIBE, and GUMO <u>already meet</u> the 2018 EPA-proposed RPGs, and WIMO and GUMO are even projected to meet the URPs as discussed below. When accounting for natural events and adjustments to natural conditions, BIBE will be shown to meet the RPG and URP. Thus, there is no basis or need for EPA's proposed additional emissions reductions from targeted Texas sources.

To assess EPA's proposal, AECOM stated that it is critical to review actual haze data reported by the Interagency Monitoring of Protected Visual Environments (IMPROVE) monitors from WIMO, GUMO, and BIBE through the latest available year of data[36] (2013) to determine the actual rate of progress toward the URPs and RPG goals for 2018 that EPA is proposing. As EPA has explained, "Model performance at IMPROVE monitors is of highest importance, because these monitors are sited to be representative of the visibility conditions impacting each Class I Area."[37] AECOM and Luminant noted, given EPA's substantial delay in its action on Texas' SIP (which was submitted to EPA in 2009), there has been a significant amount of actual data collected at the IMPROVE monitors that demonstrate Texas's long-term strategy is working and will achieve the URPs and RPGs for these three Class I areas. Luminant stated, in other words, these areas are ***years ahead*** of the rate of progress that EPA itself has said is reasonable.

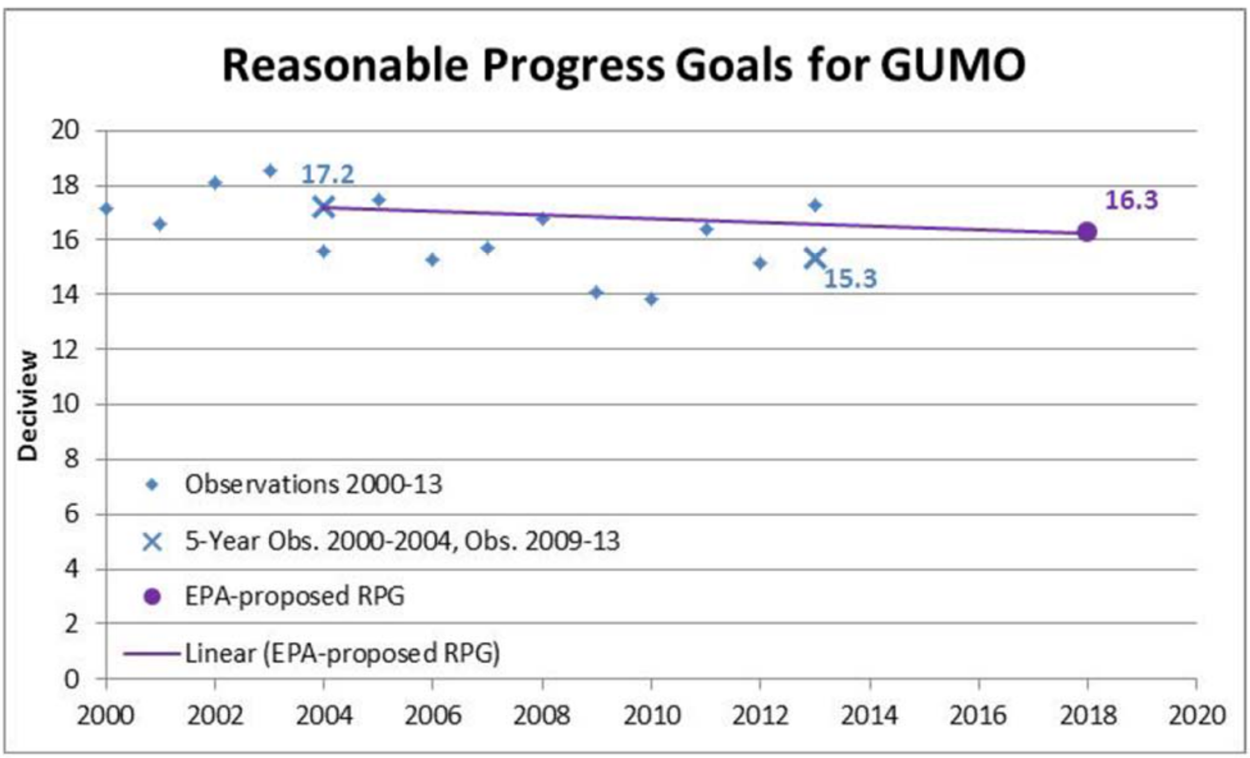
AECOM noted, to calculate current visibility conditions, EPA's regulations provide, "The period for calculating current visibility conditions is the most recent five year period preceding the required date of the implementation plan submittal for which data are available." AECOM 0061/0075 Table 2-1[40,41,42] shows the most recent 5-year average data of the 20% worst visibility days from 2009-2013 for the three Class I areas in comparison to the EPA proposed RPGs for 2018. For these Class I areas, the recent 5-year average observations already show haze measurements below the EPA-proposed 2018 RPGs. In other words, since the time Texas submitted its SIP to EPA (2009), visibility in these areas has already improved more than EPA's proposed target for 2018, without the additional reductions that EPA's proposed FIP would impose.

According to AECOM and Luminant, Luminant Figures 5 through 7 and AECOM Figures 2-3 through 2-5 further illustrate this monitored data, as compared to EPA's RPGs for each Class I area. These figures show recent monitored observations in deciviews from EPA's IMPROVE monitoring network (blue diamonds); the most recent five-year average of these observations (blue cross); and EPA's RPG for 2018 (purple circle). As these figures show, all three areas are already below their EPA-proposed RPGs, based on the most recent five-year data, which EPA's regulations provide as the basis for assessing reasonable progress.[624]

Actual IMPROVE Observations at WIMO Compared to EPA Proposed RPG

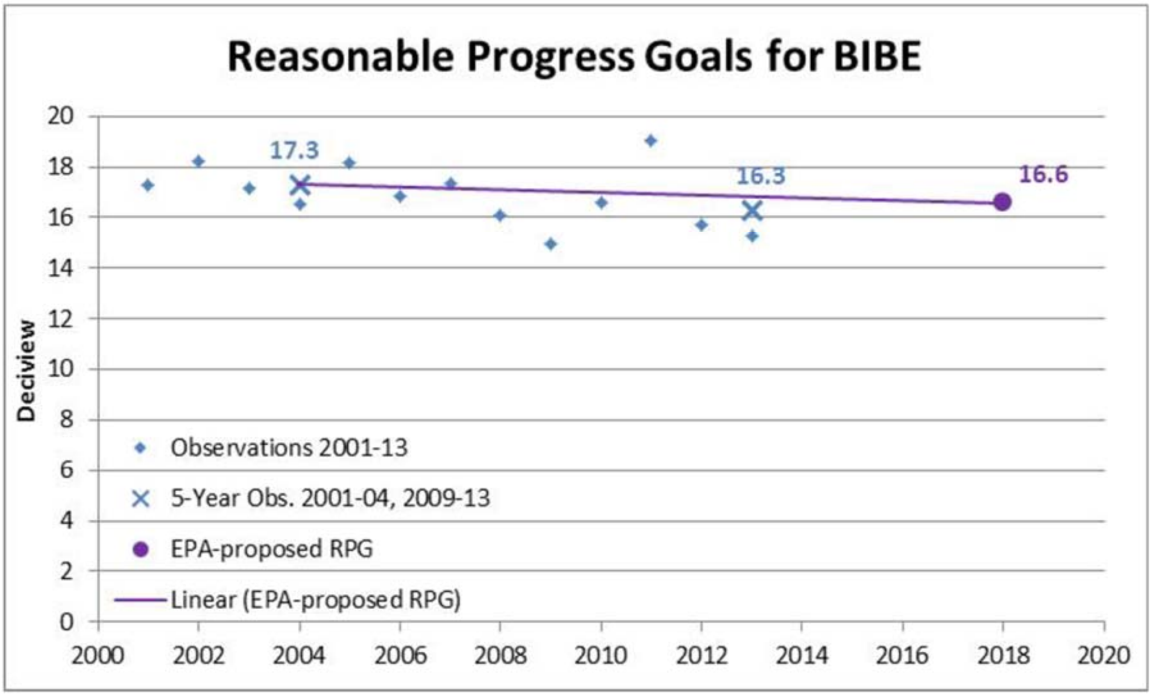
(Luminant (0061) Figure 5, AECOM (0061/0075) Figure 2-3)

Actual IMPROVE Observations at GUMO Compared to EPA Proposed RPG
(Luminant (0061) Figure 6, AECOM (0061/0075) Figure 2-4)



Actual IMPROVE Observations at BIBE Compared to EPA Proposed RPG

(Luminant (0061) Figure 7, AECOM (0061/0075) Figure 2-5)

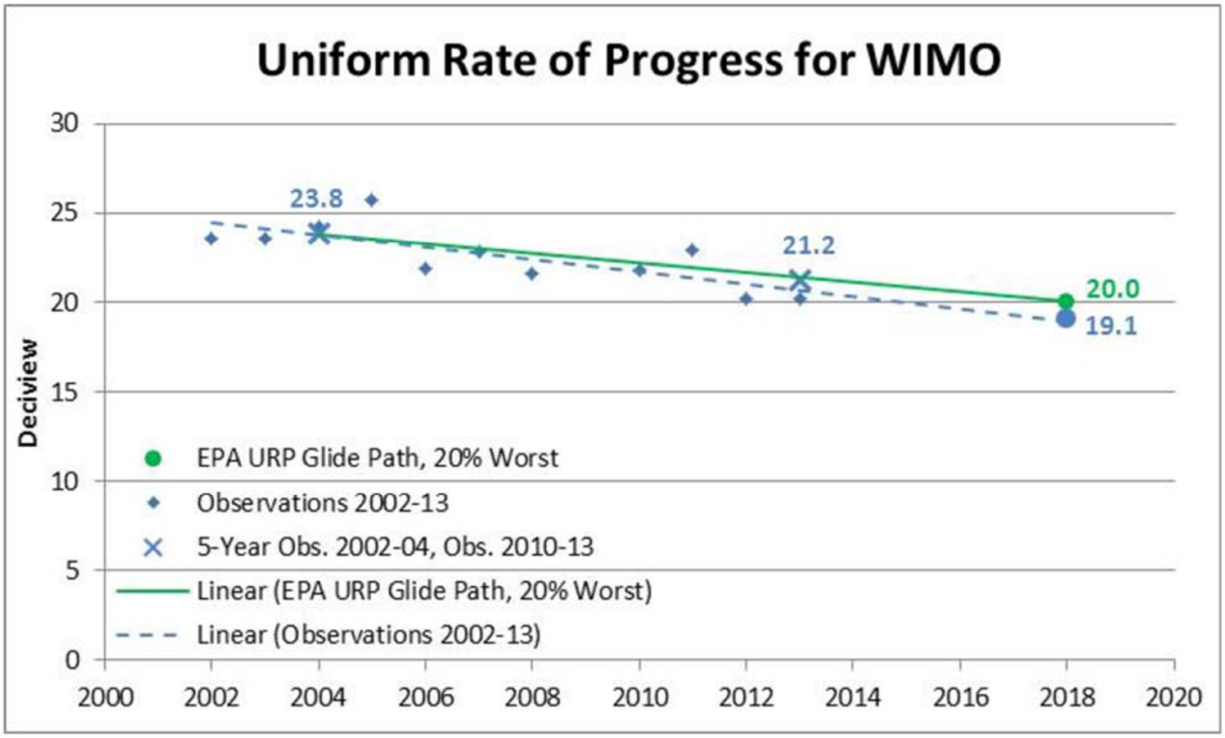


Luminant stated this substantial progress has been made, EPA concedes, based on "reduction in the impacts from SO_2 emissions."[625] And EPA further concedes that these conditions will continue, and not worsen, through 2018 based on emission reductions currently in place.[626] There is thus no reason or legal basis for requiring any further controls in the first planning period. Not only have all three areas already met EPA's RPG, all three areas are projected to meet their URP in 2018 based on the existing emission limitations, compliance schedules, and other measures that Texas included in its SIP in 2009—without the additional SO_2 controls proposed in EPA's FIP and that EPA claims Texas and Oklahoma should have considered.

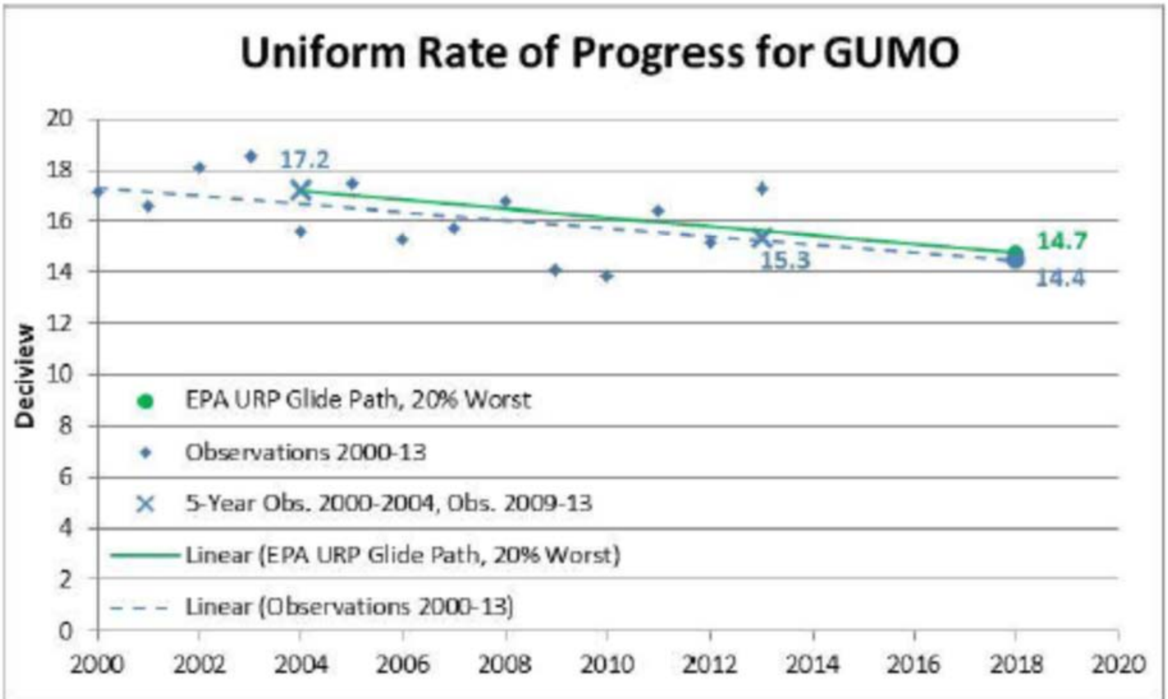
Luminant Figure 8 and AECOM Figure 2-6 shows the URP glide path for Wichita Mountains (already approved by EPA[627]) as compared to recent IMPROVE monitoring data. With current emission limitations in place, Wichita Mountains will meet the URP in 2018, and thus Luminant concluded that there is no basis for disapproval of the Texas SIP or EPA's proposed FIP.

AECOM Figures 2-6 through 2-8 show the same IMPROVE data as compared to EPA's approved URP for WIMO and its proposed URPs for BIBE and GUMO. With respect to the URP and its associated glide path, WIMO and GUMO indicate they are currently measuring conditions below the uniform glide path (green line). EPA recognizes this progress is greater than anticipated by the CENRAP modeling performed in support of the regional haze SIP.[43] BIBE does not indicate it is currently measuring below the uniform glide path; however, BIBE's default natural conditions do not wholly represent the real impact of natural causes of hazy conditions. Further, given the projected emission trends shown in AECOM Figure 2-2, a linear regression[44] of the annual IMPROVE observations (dashed blue line) can be used to show the actual and projected rate of improvement for the 20% worst visibility conditions. Projecting this observation-based regression to 2018, the data clearly show that both WIMO and GUMO are on track to meet the 2018 URP, while BIBE is within 0.5 deciview of making this target even without the further refinements to natural conditions.

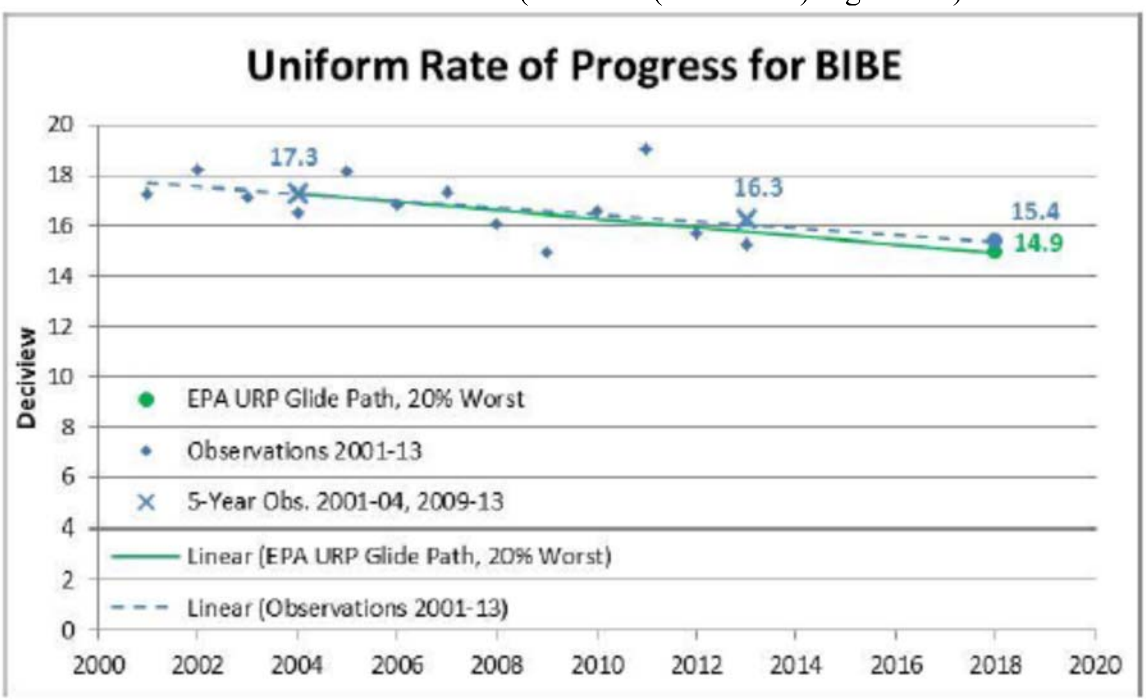
EPA Approved URP Glide Path for WIMO to 2018 and a Linear Regression Based on IMPROVE Observations
(Luminant (0061) Figure 8, AECOM (0061/0075) Figure 2-6)



EPA Proposed URP Glide Path for GUMO to 2018 and a Linear Regression Based on IMPROVE Observations (AECOM (0061/0075) Figure 2-7)



EPA Proposed URP Glide Path for BIBE to 2018 and a Linear Regression Based on IMPROVE Observations (AECOM (0061/0075) Figure 2-8)



AECOM stated that the BIBE linear regression shows a reduction in haze by 2018 to below EPA's proposed RPG, but the regression's projected 2018 end point misses the URP. This appears to be the result of outlier observations in 2011 and not related to SO_2 emissions from

Texas point sources. A close examination of the BIBE observations in 2011 indicates that the area was heavily influenced by natural conditions from windblown dust and wildfires. Texas experienced one of its worst single-year droughts on record where, during May 2011 through April 2012, the BIBE and GUMO Class I areas were designated as the most severe drought category of "exceptional drought."[45] Because 2011 observations at BIBE were largely influenced by natural conditions, especially the highest visibility measurements of the year, and were left unaccounted for based on the default methodology of calculating natural conditions estimates, an outlier analysis of the 2011 annual average IMPROVE observation to recalculate the linear regression is warranted.

Luminant stated that recent IMPROVE data demonstrate the same result for Guadalupe Mountains and, with some adjustment for outliers,[628] the same result for Big Bend—even compared to EPA's proposed more stringent URPs that use default values for coarse mass and soil (which is not a reasonable assumption by EPA).[629] Using the natural conditions as calculated by Texas, or even the refined approach calculated by AECOM, the result is even more apparent—both Texas Class I areas are on track to meet the URP under the SIP proposed by Texas.[630]

[NRG (0078) p. 3] NRG stated that EPA's own monitoring data show that haze levels in the Class I areas of concern are at or below even EPA's proposed lower 2064 glide path. NRG stated that, as explained in the attached report by Alpine Geophysics (0078), in a comparison of the air quality monitoring data at the Class I areas in question to the Uniform Rate of Progress calculated by EPA in the current proposal, almost all of the observed data are below the Uniform Rate of Progress. To the extent that the observed monitoring data slightly exceed the Uniform Rate of Progress for a particular year, the exceedance is associated with exceptional events that are not representative of typical air quality. These same observational data are also below EPA's projections for 2018 visibility impairment. NRG stated that these data show that further controls are not needed to protect visibility in the Class I areas at issue in this action.

NRG stated that, to the extent that the observed monitoring data slightly exceed the Uniform Rate of Progress for a particular year, the exceedance is associated with exceptional events that are not representative of typical air quality. For example, an unusually intense series of wildfires in Mexico appear to be responsible for the relatively high levels of haze observed at Big Bend in 2011, and a dust storm appears to be responsible for the haze observed at the Guadalupe Mountains in 2012. Alpine Report at 8, 11-22.

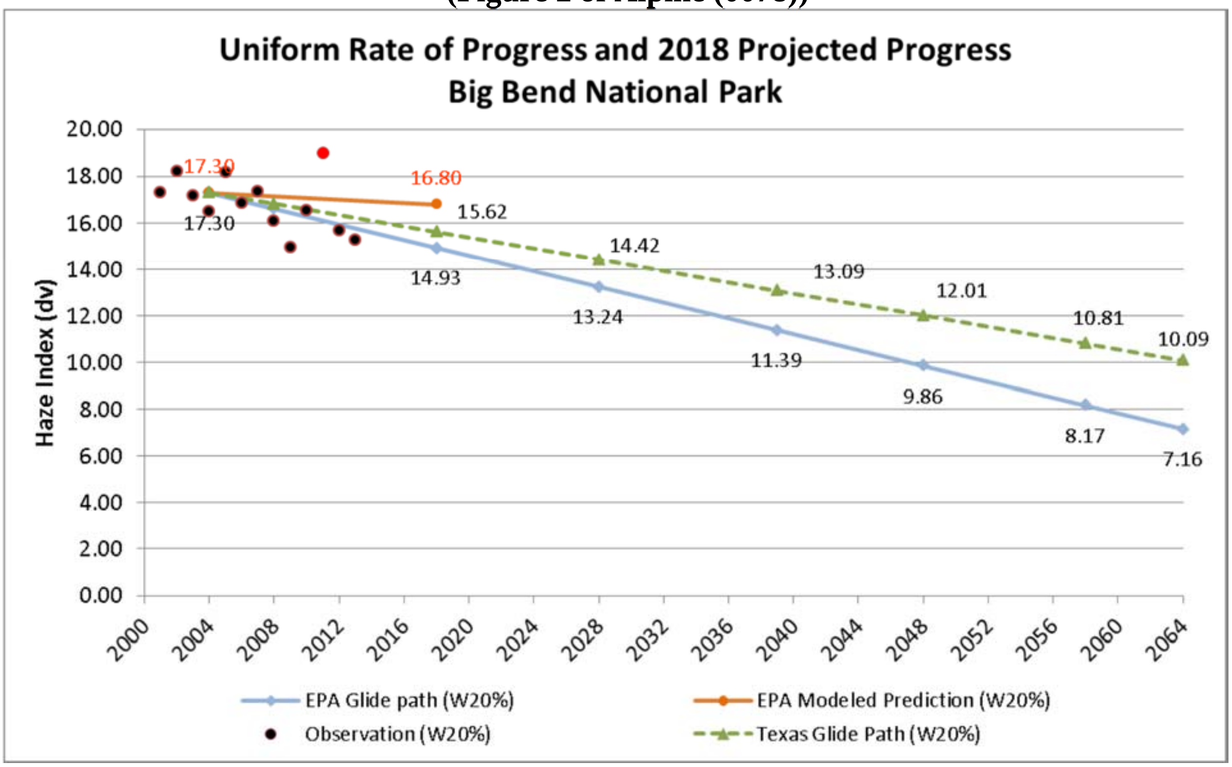
[Alpine (0078) p.5, 7] Alpine stated that the EPA's proposal appears to ignore actual data showing that the Big Bend, Guadalupe Mountains, and Wichita Mountains Class I areas are on a glide slope to attaining natural visibility conditions by 2064.

Alpine stated, using both the most recent five-year (2009-2013) average conditions for the 20% worst days and individual annual conditions for these same days, monitoring data indicates that Big Bend and Wichita Mountains are currently observed to be below the EPA calculated uniform rate of progress line and Guadalupe Mountains has recently maintained observations below EPA modeling predictions. This further demonstrates that Texas is showing reasonable progress towards meeting the national visibility goals at these Class I areas.

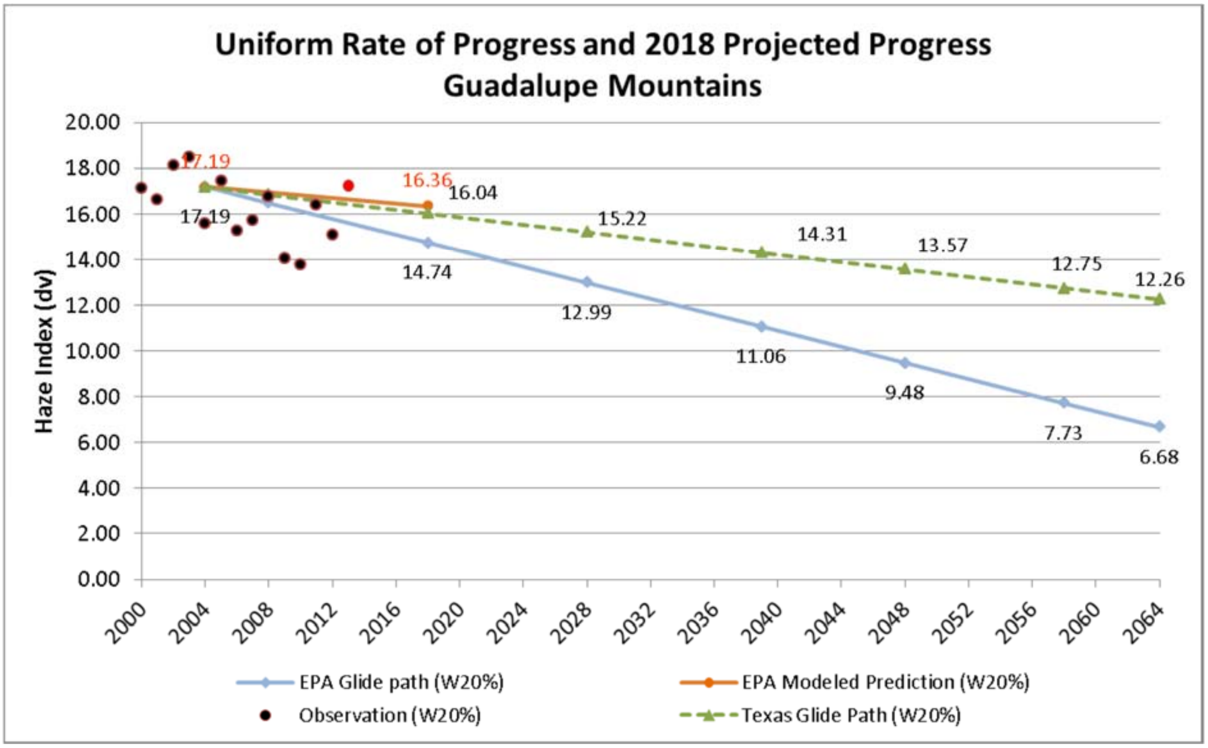
It is further recognized that during the two recent highest years' of haze index observations (2011 for Big Bend, Wichita Mountains and Guadalupe Mountains and 2013 for Guadalupe Mountains), these monitors also had significantly high 'exceptional' event influences represented with a high wildfire year reported in the southern U.S. and northern Mexico domains in 2011 and episodic high dust storms reported during poor visibility days near Guadalupe Mountains in 2013, both contributing to the increased haze index observations, likely more than meteorology.

Alpine provided Figures 2 through 4 in Alpine comment 0078, showing these impacted W20% observation calculations are highlighted as red dots in 2011 and 2013.

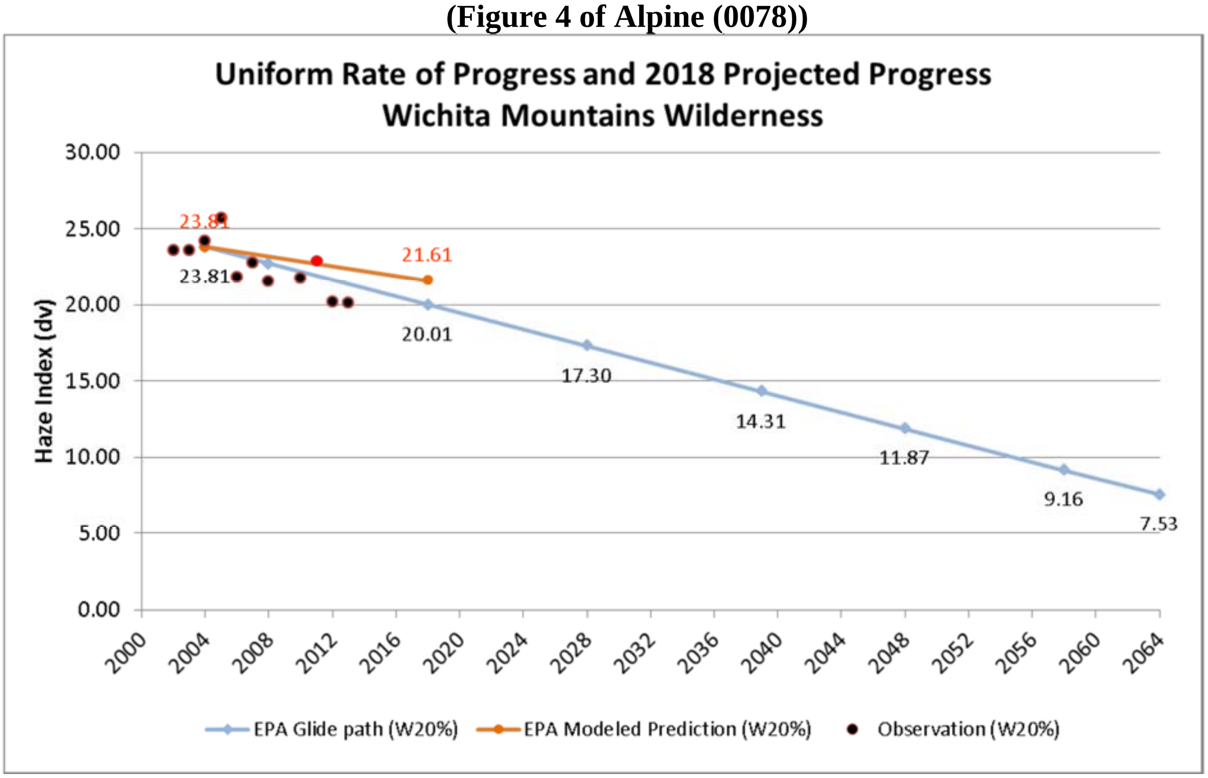
Observed and predicted W20% haze index values for Big Bend National Park.
(Figure 2 of Alpine (0078))



Observed and predicted W20% haze index values for Guadalupe Mountains.
(Figure 3 of Alpine (0078))



Observed and predicted W20% haze index values for Wichita Mountains Wilderness area. (Figure 4 of Alpine (0078))



Shown in Table 1 and Figures 2 through 4 of comment 0078, recent observations (black dots in Figures 1, 2, and 3) from these Class I areas indicate significant progress during the W20% days has been made and at levels significantly more pronounced than EPA's modeling predicts (orange slope in Figures 1, 2, and 3).

Alpine noted, by EPA's own admission,

> (w)e believe that this observed improvement from the baseline conditions is the result of meteorological conditions, reduction in the impacts from SO_2 emissions, and a reduction in the impacts from coarse material. More recent emission inventory data shows reductions in emissions in most states beyond what was projected in the 2018 modeling, including large reductions in emissions from the Eastern United States. Emissions from non-EGU Texas point sources are lower than have been projected in the modeling. (79 FR 74843).
>
> (w)e also note the more recent IMPROVE monitored data at the Big Bend and Guadalupe Mountains indicate that more progress than anticipated by the CENRAP modeling has occurred. (79 FR 74843)

Annual glide path and observed haze index (dv) at Big Bend (BIBE), Guadalupe Mountains (GUMO), and Wichita Mountains Wilderness (WIMO) Class I areas for worst 20% visibility days. Highlighted values indicate exceptional event influence. (Table 1 of Alpine (0078))

		Haze Index (deciview) - 20% Worst Visibility Days									
Class I Area		**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
BIBE	Glide Path	17.30	17.13	16.96	16.79	16.62	16.46	16.29	16.12	15.95	15.78
	Observed	16.51	18.17	16.87	17.35	16.10	14.95	16.47	19.02	15.70	15.29
GUMO	Glide Path	17.19	17.01	16.84	16.66	16.49	16.31	16.14	15.96	15.79	15.61
	Observed	15.57	17.46	15.27	15.72	16.75	14.07	13.70	16.39	15.12	17.25
WIMO	Glide Path	23.81	23.54	23.27	23.00	22.72	22.45	22.18	21.91	21.64	21.37
	Observed	24.23	25.68	21.83	22.80	21.55	#N/A	21.69	22.91	20.17	20.14

Furthermore, for Guadalupe Mountains and Wichita Mountains, observed condition trends for the worst 20% visibility days fall below the EPA calculated uniform rate of progress line through 2013, not just the predicted and modeled visibility values.

It is recognized that Big Bend National Park, which while demonstrating an observational trend lower than EPA's CAMx predicted values, exhibits a trend higher than EPA's calculated uniform rate of progress line for the Class I area. This measured condition trend is considerably impacted by the 2011 W20% haze index value and can be linked to significant smoke events resulting from the record wildfire season in 2011 in the southwestern US and Mexico. (http://www.ncdc.noaa.gov/sotc/fire/2011/13).

Alpine stated that when reviewing the observed visibility at Big Bend National Park and plotting the W20% days, it is noted that many of these days have statistically high standard deviations compared to other recent years of observations. Alpine provided a figure showing B20% and W20% days for Big Bend National Park in 2011. (Figure 5 of Alpine comment 0078, not reproduced here). A closer review of the dates of these uncharacteristic observations tie many of the W20% days to wildfire impact events during the 2011 calendar year.

Alpine explained that fires across the southern U.S. resulted in 2011 having the third most active wildfire season since 2000 with respect to acres burned and sixth least active in terms of number of fires, indicating a historically greater number of acres burned per fire than the twelve year average. Texas had the most acres burned of any state during the year, with over 3.7 million acres burned across the state during 2011, 43 percent of the national total and a State record in acres burned since the Texas Forest Service started keeping records in 1985. During the three month period of Mar-May in 2011, 20,100 fires burned over 3.2 million acres across the U.S., mostly across Texas, Arizona, and New Mexico. The acres burned were record high for the 3-month period, surpassing the spring of 2008 when 1.5 million acres burned nationwide.

To demonstrate the impact that these events have on the observed conditions at each monitor, Alpine presented Table 2 of Alpine comment 0078 with the individual days selected at Big Bend in 2011 used to represent the W20% for the year. Highlighted dates and visibility observations indicate those days found to be impacted by wildfire events using satellite imagery and interpretation. It should be noted that this type of review is also applicable to the Guadalupe Mountains and Wichita Mountains Wilderness Class I areas.

W20% days at Big Bend National Park in 2011. Highlighted values indicate days with exceptional event influence. (Table 2 of Alpine (0078))

Date	Visibility (dv)	Date	Visibility (dv)
20-Feb-11	18.63	12-May-11	17.05
16-Mar-11	16.05	27-May-11	18.02
19-Mar-11	17.60	30-May-11	22.84
28-Mar-11	17.25	8-Jun-11	23.86
3-Apr-11	17.25	11-Jun-11	16.45
6-Apr-11	17.47	14-Jun-11	25.07
12-Apr-11	26.59	17-Jun-11	18.18
15-Apr-11	18.21	20-Jun-11	16.21
21-Apr-11	23.26	18-Oct-11	21.48
27-Apr-11	15.66	2-Nov-11	23.31
30-Apr-11	15.66	5-Nov-11	15.66
6-May-11	18.81	2-Dec-11	15.85

Alpine reviewed Satellite Smoke Text Product from the Satellite Services Division of the NOAA National Environmental Satellite, Data, and Information Service (NESDIS) for each of the W20% days at Big Bend National Park with fire impacted periods. Alpine provided a table describing the smoke events (Table 3 of comment 0078, not reproduced here). Alpine also provided satellite imagery of the domain collected from the NASA earth observatory website, corroborating the textual descriptions of most of the smoke events, in Figures 6, 7, and 8 of comment 0078 (not reproduced here).

Alpine stated that when these wildfire impact days are removed from the W20% calculation, it can be seen in Alpine Figure 9 that the observational trend line would fall well below the EPA uniform rate of progress line.

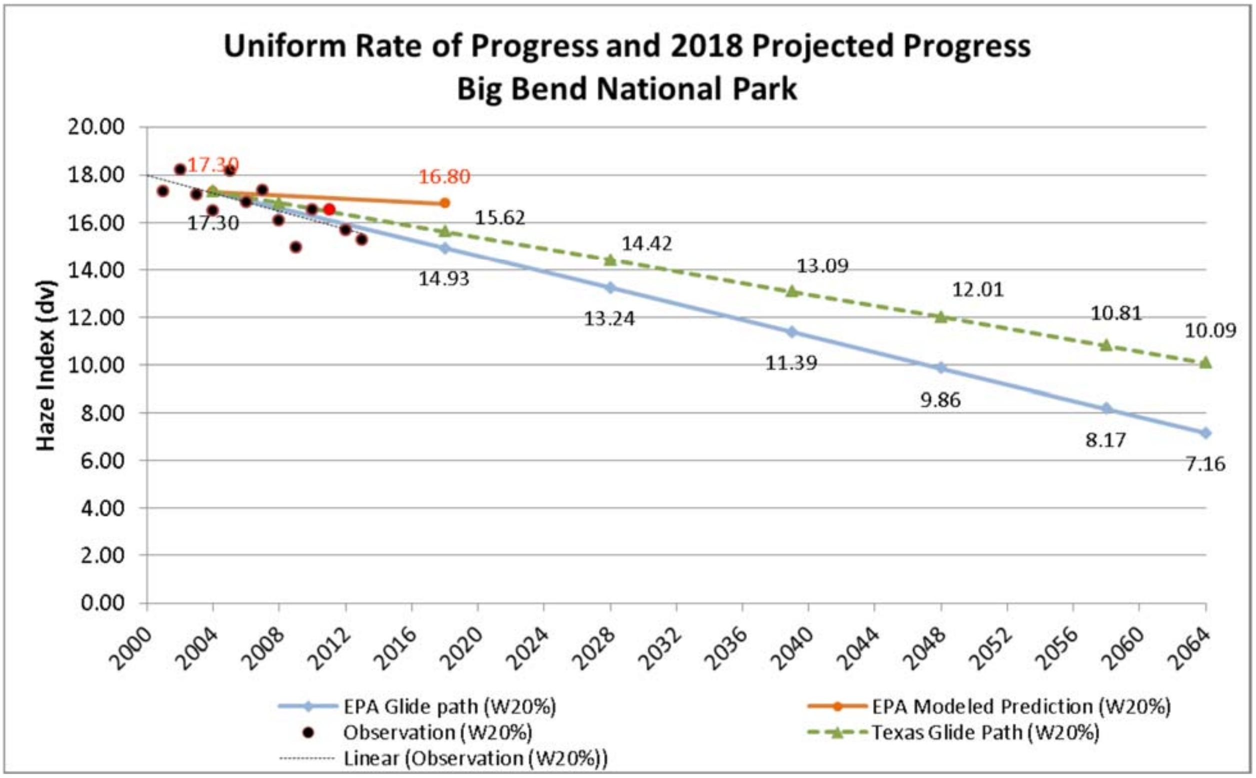
Alpine stated that in 2013 as documented in other years, dust event impacts have been tied to daily observations Class I areas in Texas.[4] When removing dust impacted days from the W20% calculations, there are visibility trend improvement results comparable to years when wildfire impacts are removed, as shown in Alpine Table 4 and Figures 9 and 12 of comment 0078).

Alpine provided a figure showing the B20% and W20% days for Guadalupe Mountains in 2013 (Figure 10 of Alpine comment 0078, not reproduced here).

Alpine reviewed Satellite Smoke Text Product for each of the W20% days at Guadalupe Mountain for dust impacted periods identified in Alpine Table 4. Further satellite imagery of the domain was also collected from the NASA earth observatory website, corroborating the textual descriptions of most of the dust events. Alpine provided example images (Figure 11 of Alpine comment 0078, not reproduced here).

When these wildfire and dust event impacted days are removed from the W20% calculation and new W20% calculations are incorporated, the observational trend line falls below both the EPA and Texas calculated rate of progress lines for each of the Class I areas. The significantly active wildfire year in 2011 and dust events in 2013 could justify removal of daily readings most impacted by smoke and dust at each of the Class I areas and as demonstrated would show an even greater attainment of the uniform rate of progress line.

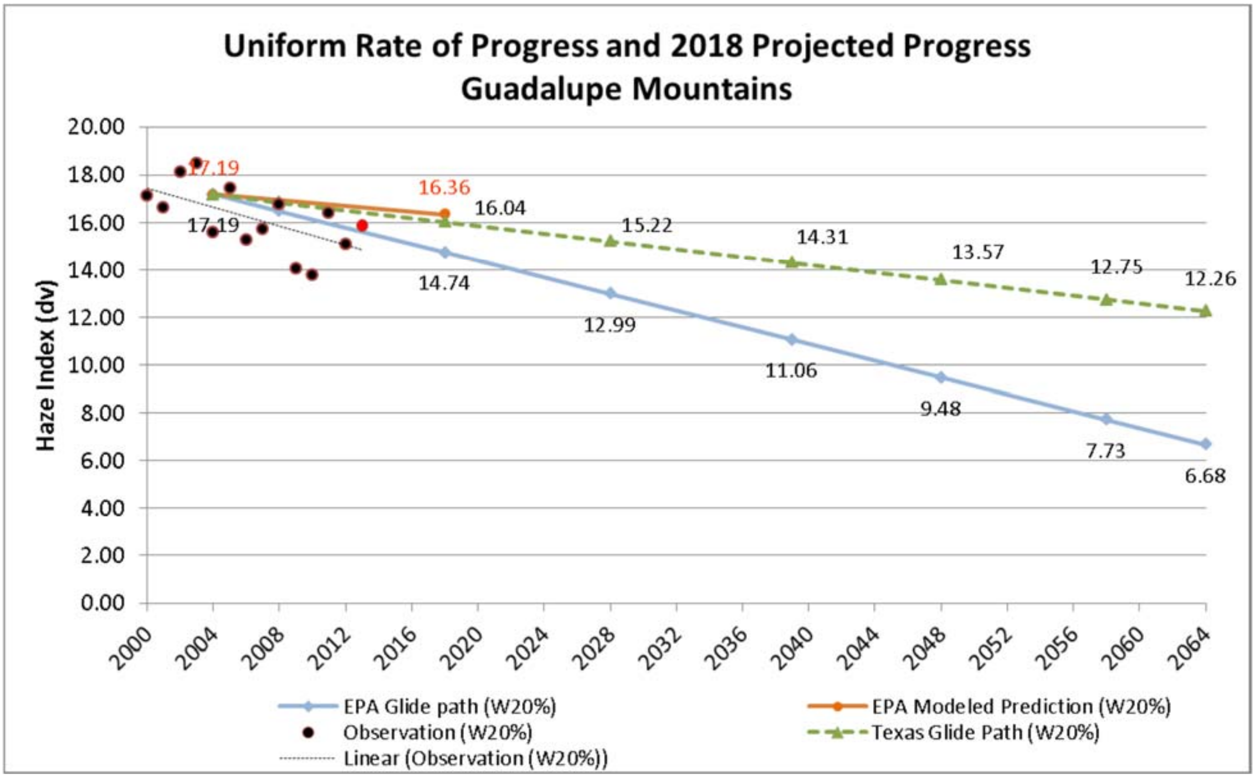
Wildfire impact adjusted W20% haze index values for Big Bend National Park. (Figure 9 of Alpine (0078))



W20% days at Guadalupe Mountains in 2013. Highlighted values indicate days with exceptional event influence. (Table 4 of Alpine (0078))

Date	Visibility (dv)	Date	Visibility (dv)
9-Feb-13	26.93	12-Jun-13	15.53
24-Feb-13	19.55	18-Jun-13	14.75
5-Mar-13	16.40	24-Jun-13	15.04
17-Mar-13	16.07	27-Jun-13	14.74
20-Mar-13	18.02	6-Jul-13	17.05
23-Mar-13	22.13	9-Jul-13	14.70
10-Apr-13	17.73	15-Jul-13	20.52
25-Apr-13	15.18	20-Aug-13	16.93
1-May-13	15.48	1-Sep-13	14.52
6-Jun-13	21.59	7-Sep-13	14.99
9-Jun-13	14.48		

Dust impact adjusted W20% haze index values for Guadalupe Mountains. (Figure 12 of Alpine (0078))



Footnotes:
4https://www.tceq.texas.gov/assets/public/implementation/air/sip/bart/haze_sip-dust_storms.pdf

Luminant Footnotes:
620 40 C.F.R. § 51.308(d)(1)(ii). EPA's has elsewhere taken the position that states must affirmatively demonstrate to EPA the reasonableness of their goal even if the URP will be achieved. 77 Fed. Reg. 14,604, 14,622 (Mar. 12, 2012). This interpretation, however, is based solely on EPA's view of prefatory language in the preamble to the regional haze rule. Id. The regulation, which provides EPA's definitive interpretation of the statute, plainly says otherwise and controls over EPA's statements in a preamble.
624 40 C.F.R. § 51.308(f)(1).
625 79 Fed. Reg. at 74,843, 74,870.
626 FIP TSD at A-45 ("Overall this information supports looking at recent actual emissions to represent future emission levels in 2018.").
627 76 Fed Reg. 81,728 (Dec. 28, 2011).
628 A full discussion and basis for excluding abnormal 2011 data from the Big Bend calculation is provided in AECOM's report submitted as part of these comments.
629 See AECOM Report at 2-9.
630 See id. at 3-1 to 3-11.

AECOM Footnotes:
29 EPA, Technical Support Document for the Oklahoma and Texas Regional Haze Federal Implementation Plans (FIP TSD), Nov. 2014.
30 FIP TSD, at A-20-A-26. ENVIRON's modeling, however, did not account for current emission limits under the Cross State Air Pollution Rule, which became effective in 2015, but instead relied on prior emission limits under the Clean Air Interstate Rule, which is no longer in effect.
31 79 Fed. Reg. 78,456.
36 http://views.cira.colostate.edu/fed/DataWizard/Default.aspx.
37 CENRAP Modeling TSD at 34.
38 40 C.F.R. § 58.308(f)(1).

[39] Note: All values are reported in deciviews.
[40] 79 Fed. Reg. 74,843.
[41] 79 Fed. Reg. 74,870.
[42] 79 Fed. Reg. 74,887.
[43] 79 Fed. Reg. 74,843; 74,870.
[44] A linear regression is a statistical method that calculates the best-fitting line for a set of observed data.
[45] National Public Radio (NPR), cited 2014: Dried Out: Confronting the Texas Drought. Web site: http://stateimpact.npr.org/texas/drought/.

Response: These comments are predicated on the assumption that: (1) if a Class I area meets its URP, or (2) if subsequent monitoring shows a Class I area meets its RPG, it is automatically relieved of any obligation to address the reasonable progress and long-term strategy requirements in Sections 51.308(d)(1) and (d)(3). As we discuss below, this assumption is false.

Luminant states that we have no authority to disapprove Texas's regional haze SIP or to issue our proposed FIP because current visibility monitoring at the three Class I areas demonstrates that all three areas already meet our reasonable progress goals for 2018 and will even meet the uniform rate of progress (URP) by 2018, without the additional controls our FIP would impose. Luminant expresses its belief that under our regional haze regulations, Texas must only demonstrate the reasonableness of its rate of progress where that rate "provides for a slower rate of improvement in visibility than the rate that would be needed to attain natural conditions by 2064 [i.e., meet the URP] . . . ." Luminant acknowledges that we have previously refuted this belief in our final action on the Arkansas SIP (77 FR 14622) but claims that our regulations in section 51.308(d)(1)(ii) take precedence. We disagree there is any inconsistency between our position on this issue in our Arkansas action and our regulations. As we state in the cited final action:

> While EPA agrees that the RHR requires states to consider the uniform rate of improvement in visibility when formulating RPGs, we disagree that a state's consideration of the URP and establishment of RPGs that provide for a slightly greater rate of improvement in visibility than would be needed to attain the URP is all that is needed to satisfy the RPG requirements in the RHR. EPA also disagrees that the RHR only requires additional analysis when a state establishes RPGs that provide for a slower rate of improvement than the URP. As explained in our proposed rulemaking on the Arkansas RH SIP, in establishing its RPGs, the State is required by CAA § 169A(g)(1) and 40 CFR 51.308(d)(1)(i)(A) to ''[c]onsider 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, and include a demonstration showing how these factors were taken into consideration in selecting the goal.''
>
> The RHR states the following with regard to RPG requirements:
>
>> Today's final rule requires the States to determine the rate of progress for remedying existing impairment that is reasonable,

> taking into consideration the statutory factors, and informed by input from all stakeholders.[700]

> An analysis of the four statutory factors is precisely the ''further analysis'' EPA refers to in its proposed rulemaking on the Arkansas RH SIP.[701] As explained above, both the RHR and the CAA require states to undertake this analysis in establishing its RPGs. Therefore, EPA disagrees that our proposed rulemaking on the Arkansas RH SIP is arbitrary and capricious because it relies on factors, which Congress has not intended it to consider. CAA section 169A(g)(1) clearly requires states to consider these four factors in establishing their RPGs. Accordingly, EPA's proposed disapproval of Arkansas's RPGs is consistent with the RH regulations and the Act. Because the CAA section 169A(g)(1) and 40 CFR 51.308(d)(1)(i)(A) require that states consider the four statutory factors in establishing their RPGs, a requirement which Arkansas has not satisfied, our proposed disapproval of Arkansas's RPGs recognizes the purpose of the RPGs in improving visibility impairment and is in keeping with the statutory requirements.

With regard to Luminant's claim that "Texas must only demonstrate the reasonableness of its rate of progress where that rate "provides for a slower rate of improvement in visibility than the rate that would be needed to attain natural conditions by 2064 [i.e., meet the URP]," we note that the complete citation to section 51.308(d)(1)(ii) is the following:

> For the period of the implementation plan, if the State establishes a reasonable progress goal that provides for a slower rate of improvement in visibility than the rate that would be needed to attain natural conditions by 2064, the State must demonstrate, based on the factors in paragraph (d)(1)(i)(A) of this section, that the rate of progress for the implementation plan to attain natural conditions by 2064 is not reasonable; and that the goal adopted by the State is reasonable. The State must provide to the public for review as part of its implementation plan an assessment of the number of years it would take to attain natural conditions if visibility improvement continues at the rate of progress selected by the State as reasonable.

Section 51.308(d)(1)(ii) confers an additional obligation on states for Class I Areas that are not meeting their URP. Luminant seems to believe that only states that are above the URP must comply with section 51.308(d)(1)(i)(A). However, section 51.308(d)(1)(i)(A) itself does not make such a distinction:

> (i) *In establishing a reasonable progress goal for any mandatory Class I Federal area within the State*, the State must:
>
> (A) Consider 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, and include a

[700] 64 FR 35731

[701] 76 FR 64195.

demonstration showing how these factors were taken into consideration in selecting the goal [emphasis added].

Clearly, a state's obligation to satisfy section 51.308(d)(1)(i)(A) applies in all cases, without regard to its position on the URP. We see nothing in Luminant's claim that would cause us to reconsider our position on these issues. Thus, we disagree with comments contending that given the recent monitoring data from IMPROVE monitors, we have no authority to disapprove Texas' regional haze SIP or to issue our FIP. Therefore, even when recent data from IMPROVE monitors indicates that visibility conditions in the Class I area are better than the established RPGs and/or that the area may be projected to meet the URP by 2018, Texas is not excused from addressing the requirements under sections 51.308(d)(1) and 51.308(d)(3)(i) in evaluating controls for additional sources and in establishing RPGs for its Class I areas.

The revised RPGs we are establishing in our FIP for Texas and Oklahoma Class I areas are based on the additional improvement over the projected CENRAP 2018 visibility conditions projected from the emission limitations on specific Texas sources as determined through our analyses under section 51.308(d)(1). These emission limitations that apply to specific sources and not the RPGs themselves are what is enforceable under the regional haze regulations. Therefore, we disagree that the Texas RH SIP satisfies the reasonable progress requirements. We address elsewhere in this document comments contending that there is a negligible difference between the RPGs proposed by Texas and Oklahoma and those established by us in our FIP.

Luminant further contends that Texas and Oklahoma Class I areas are also projected to meet the URPs for 2018 without the need for additional controls under our FIP. As an initial matter, we question the contention that the Guadalupe Mountains and Wichita Mountains will meet the URP by 2018 based on linear regression of the 2009-2013 annual observations from IMPROVE monitors even without the additional controls that we propose in our FIP. We also question the contention that Big Bend will meet the URP by 2018 when natural events and adjustments to natural conditions are accounted for. We note that the URP for 2018 as calculated by us in our proposal is 14.93 dv for Big Bend and 14.73 dv for Guadalupe Mountains, while the current visibility conditions (2009-2013 average) are 16.30 dv at Big Bend and 15.3 dv at Guadalupe Mountains. Although there has been greater visibility improvement up until 2013 than projected in the 2018 CENRAP modeling, we noted in our proposal that based on information provided by the TCEQ, we do not expect large additional emission reductions of SO_2 in Texas between 2013 and 2018 under existing federal programs and the SIP as submitted.[702] Therefore, it is questionable whether the currently observed rate of visibility improvement at the Class I areas will continue through 2018 and whether the Class I areas will actually meet the URP goal in 2018. Additional emission reductions are needed in order to further reduce visibility impairment at these Class I areas. Furthermore, as explained in more detail elsewhere in this document, our analysis of recent meteorological data and visibility conditions reveal that meteorological conditions over the past few years have deviated from the typical conditions and transport patterns. This helps explain one factor why Texas and Oklahoma Class I areas appear to already be meeting the revised RPGs we proposed and why we do not anticipate this rate of visibility improvement will continue.

[702] 79 FR 74870

Nevertheless, we note that even when a Class I area is projected to meet the URP for 2018, this is not sufficient reason to approve a state's RPGs when the state has not fully satisfied all the requirements under section 51.308(d)(1) in establishing its RPGs and under section 51.308(d)(3)(i) to address its impact on other states' Class I areas. The preamble to the Regional Haze Rule[703] states that the URP does not establish a "safe harbor" for the state in setting its progress goals:

> If the State determines that the amount of progress identified through the [URP] analysis is reasonable based upon the statutory factors, the State should identify this amount of progress as its reasonable progress goal for the first long-term strategy, unless it determines that additional progress beyond this amount is also reasonable. If the State determines that additional progress is reasonable based on the statutory factors, the State should adopt that amount of progress as its goal for the first long-term strategy.

For instance, even though Arkansas established RPGs for its Class I areas that provide for a slightly greater rate of improvement in visibility than needed to attain the URP, we disapproved Arkansas' RPGs because the State did not satisfy the requirements under section 51.308(d)(1)(i) and because some of the State's BART determinations did not meet the requirements of the CAA and the RH rule.[704] We proposed a FIP for Arkansas to address this deficiency that includes controls to meet the BART requirements and additional controls on two units at one facility under the reasonable progress requirements that will result in additional significant visibility benefits. Similarly, we found that Texas did not fully satisfy the requirements under section 51.308(d)(1) and 51.308(d)(3)(i) in determining if controls on additional Texas sources would provide for reasonable progress for the affected Class I areas. Therefore, we are disapproving Texas' reasonable progress analysis and its RPGs.

We disagree with Luminant's comment alleging that we conceded in the TSD for our proposed FIP that conditions will continue, and not worsen, through 2018 based on emission reductions currently in place. The actual statement we made in our TSD was: "Overall this information supports looking at recent actual emissions to represent future emission levels in 2018" (FIP TSD at A-45)." That statement is specific to considering recent actual emissions at the EGUs we analyzed for controls to represent future anticipated emissions at these specific units. In other words, emission reductions are not anticipated at these specific units between now and 2018 and so recent actual emissions can be expected to represent the emission levels in 2018 for these units.

With regard to the comment that exceptional event influences in the form of high wildfires in 2011 in the southern U.S. and northern Mexico and episodic high dust storms near Guadalupe Mountains in 2013 contributed more so than meteorology to the increased haze index observations in 2011 for Big Bend, Wichita Mountains, and Guadalupe Mountains and in 2013 for Guadalupe Mountains, we recognize that there is year to year variability in monitored

[703] 64 FR 35732
[704] 76 FR 64186

visibility conditions and therefore focus on a 5-yr average in assessing current or baseline visibility conditions.

We disagree with Luminant and AECOM who contend the reason why Big Bend is projected to miss the URP in 2018 is because the default natural conditions do not wholly represent the real impact of natural causes of hazy conditions. As Alpine notes in its comments, Texas experienced one of its worst single-year droughts on record from May 2011 through April 2012 and the area was heavily affected by windblown dust and wildfires in the southwestern US and Mexico. We also agree with Alpine that if the influence of fire and dust were removed from the monitoring data for Big Bend, the Guadalupe Mountains, and the Wichita Mountains, these Class I areas would certainly be monitoring lower. However, as we discuss above, we disagree with what Alpine seems to be implying that this relieves Texas of its responsibility to properly analyze the four statutory factors under section 51.308(d)(1)(i)(A). If after analyzing these four factors additional progress can be made, then the state's RPGs should incorporate that progress.

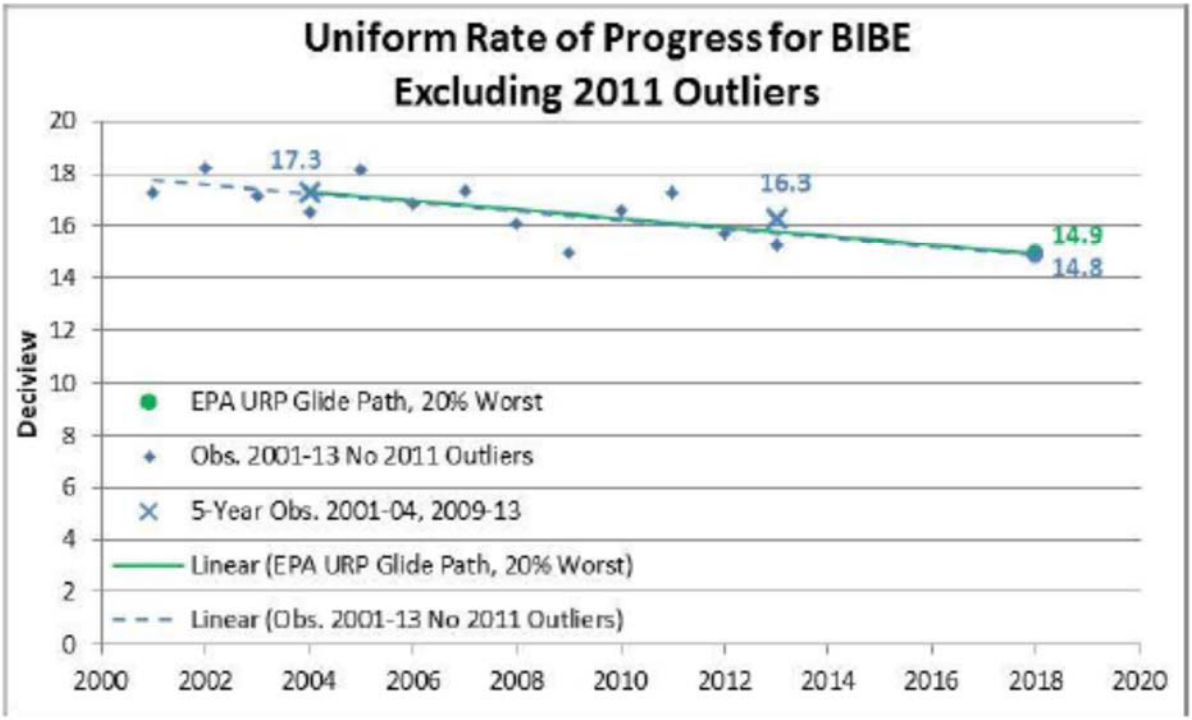
We also disagree that an outlier analysis of the 2011 annual average IMPROVE observation for Big Bend to recalculate the linear regression is warranted because 2011 observations at Big Bend were heavily influenced by natural conditions and this was unaccounted for based on the default methodology of calculating natural conditions estimates.

We respond to comments concerning natural visibility conditions, and emission reductions from CSAPR elsewhere in this document.

Comment: Methods for determining outliers in regional haze datasets
[AECOM (0061/0075) p. 2-8]

AECOM explained that methods for determining outliers in regional haze datasets were explored in an EPA report by Science Applications International Corporation (SAIC).[46] The findings, included in EPA guidance, define an outlier as a data point greater than two standard deviations of the mean. The guidance states "the impact from a small number of days tends to average out when the visibility is examined on a deciview scale over a 5-year period."[47] However, on an annual basis, we find the impacts of outliers to be significant due to the magnitude of the 2011 annual average in comparison to annual averages in recent years. Six outliers were identified using a two standard deviation outlier cutoff for the 20% worst day measurements in deciviews. These outliers correspond to the top 6 haziest days in 2011 which measured coarse matter, organic mass, and soil contributing greater than 55% to the total aerosol extinction. With these outliers removed and the 2011 20% worst haze days' average recomputed, the resulting regression shows that BIBE would indeed meet the 2018 URP interim goal (14.8 vs. a goal of 14.9 deciviews) as illustrated in AECOM 0061/0075 Figure 2-9.

EPA Proposed URP Glide Path for BIBE to 2018 and a Linear Regression Based on IMPROVE Observations Excluding 2011 Outliers
(AECOM (0061/0075) Figure 2-9)



AECOM stated that excluding these outliers is further supported by EPA's regulatory treatment of "exceptional events." EPA has supported the exclusion of certain air quality measurements if it is known and proven to be associated with "exceptional events" when the measurements in excess of one or more NAAQS are affected by natural and/or uncontrollable events.[48] Exceptional events are not accounted for in regional haze data; however, they have been proposed as a tool for regional haze natural conditions estimates.[49] As such, these events are important to consider as they relate to the outlier analysis. TCEQ submitted exceptional event demonstration packages to EPA for seven days in 2011 regarding $PM_{2.5}$ and PM_{10} measurements impacted by high wind (i.e., windblown dust) and wildfire events.[50] In addition to exceptional events, many states add qualifier flags to air quality data when they believe it is influenced by an event similar to an exceptional event. TCEQ applied the "Fire - Mexico/Central America" qualifier flag to six additional days in 2011 of which two corresponded to the 2011 BIBE outlier days.[51] The outlier on April 12, 2011, the worst visibility day since 2007, was within three days of a day with a fire-related qualifier flag (April 15, 2011). April 12th corresponded to a time when widespread wildfires were burning in west Texas and Mexico.[52] Furthermore, all six 2011 outliers were identified as naturally-caused days in the refined natural conditions analysis provided by AECOM.

AECOM stated that, under EPA guidance, the monitoring data from IMPROVE sites is "used to establish baseline conditions (for the 2000-2004 period) for each Class I area *and to track progress toward goals established in future SIPs*."[53] In the case of WIMO, BIBE, and GUMO, these data show that all three areas already meet the RPGs proposed by EPA and are on track to meet the URPs. With SO_2 emissions predicted to decline even further, there is thus no basis for requiring further emission reductions beyond those already in place in order to meet the 2018 goals.

Footnotes:
[47] http://www.epa.gov/ttn/caaa/t1/memoranda/rh_tpurhr_gd.pdf at 3-14.
[48] http://www.law.cornell.edu/cfr/text/40/50.14.
[49] http://www.wrapair2.org/pdf/WRAP_NaturalConditionsReview_20130625.pdf at 14.
[50] http://www.tceq.state.tx.us/airquality/monops/pm_flags.html.
[51] https://ofmext.epa.gov/AQDMRS/aqdmrs.html.
[52] http://www.theatlantic.com/photo/2011/04/texas-wildfires/100050, http://alg.umbc.edu/usaq/images/HMSFIRE_4_12_2011.jpg.
[53] http://www.epa.gov/ttn/caaa/t1/memoranda/rh_tpurhr_gd.pdf at 1-4.

Response: We disagree with AECOM that we should exclude data of the 20% worst day measurements for the top 6 haziest days in 2011, which the commenter says are outliers caused by high wind (i.e., windblown dust) and wildfire events. The guidance the commenter refers to is our "Guidance for Tracking Progress Under the Regional Haze Rule," which is clear in that, "[e]ach annual estimate of best and worst days should be based on all valid measured aerosol concentrations during the calendar year. This includes high concentrations associated with regional forest fires or other unusual events."[705]

Our guidance also provides that "…events which result in apparent outliers in the data and do have an impact on the regional visibility (e.g., forest fires) should be included in subsequent trends analysis. The data should be flagged and explained, if possible, but should remain in the data set."[706] Further, our guidance also points out that "…the impact from a small number of days tends to average out when the visibility is examined on a deciview scale over a 5-year period. It is important to include these extreme concentrations in the estimates for 5-year baseline and current visibility conditions because the impact from these events may be part of natural background and is thus reflected in the estimate for the target visibility levels."[707] We remind AECOM that in assessing current visibility conditions at Class I areas, we look at the average of the most recent 5-year period of IMPROVE monitor data, not at each individual year. As a result, any extreme concentrations on a given year are expected to average out when examining the average of the most recent 5-year period. Therefore, we disagree that apparent outlier data for 2011 should be excluded from the dataset and that excluding these apparent outliers is supported by EPA's regulatory treatment of "exceptional events" in assessing compliance with the National Ambient Air Quality Standards (NAAQS).

We address elsewhere in this document comments contending that there is no basis for the additional emissions reductions under our FIP because the Class I areas already meet the 2018 RPGs and because linear regression of the most recent IMPROVE monitor data indicates the Class I areas are on track to meet the URPs. As we discuss in depth elsewhere in this document, we disagree with the comment's assertion that SO_2 emissions are predicted to decline further.

Comment: [Luminant (0061) p. 98] According to Luminant, the so-called "uncertainty" of Texas EGU emission trends that EPA relies on as the basis for its disapproval does not exist and is an arbitrary basis for EPA's proposal.[637] EPA asserts, as the basis for its disapproval, that

[705] EPA Guidance for Tracking Progress Under the Regional Haze Rule, September 2003 (at 3-14).
[706] Id.
[707] Id.

"[w]e believe that in performing its control analysis, the TCEQ should have given greater consideration to the flexibility in the CAIR trading program and the resulting uncertainty in the projected emissions."[638] EPA's "belief," however, is completely unfounded. The undisputed evidence in the record is that EGU "[e]missions have trended downward better than or as predicted in the CENRAP modeling projections."[639] Moreover, as Texas reported in its progress report, actual EGU emissions of SO_2 and NO_x are ***below*** CAIR allowance allocations.[640] And, more fundamentally, there is always some "inherent amount of uncertainty in the assumed emissions" used in modeling for regional haze, as EPA itself has recognized.[641] Yet, as EPA has also recognized, such "inherent uncertainty" "is ***not*** grounds for disapproving [a] SIP" that relies on such modeling.[642]

Luminant stated that EPA has before it all of this information about current and expected visibility conditions, yet chooses to ignore it, relying instead on "uncertainty" that has indisputably been resolved by the passage of time and the availability of real-world data. This claimed continued "uncertainty" surrounding CAIR is a phantom of EPA's creation. As of January 1, 2015, CSAPR (EPA's replacement for CAIR) is in place with more stringent emission budgets and, effective beginning January 1, 2017, stringent limitations on out-of-state trading that CAIR did not impose. EPA's paltry explanation of why it does not credit or account for CSAPR reductions in its analysis—that CSAPR SO_2 allocations are "not much different than the CAIR Cap for Texas"—is wholly unsupported.[643] EPA also unreasonably and arbitrarily discounts and does not consider NO_x reductions from CSAPR and SO_2 reductions from the Mercury and Air Toxics Standards (MATS)—all of which will continue the downward trend in Texas EGU emissions. EPA has compounded its error by failing to take into account the additional emission reductions from Oklahoma BART sources that EPA and Oklahoma are requiring so that those sources are BART-compliant like Texas sources. These measures will lead to further large emission reductions and improvement in visibility at the Wichita Mountains that EPA fails to consider.

Luminant noted that the simple fact is that these three Class I areas are improving faster than the URP and EPA's RPGs and are thus on track to attain these goals in 2018 under the SIP revision as proposed by Texas. EPA must therefore approve the SIP revision, and it certainly has no authority or reasoned basis to impose any further reductions on Texas sources in a FIP. EPA's statutory authority stops at the point that emission reductions are no longer necessary to make progress toward achieving the national goal.[644] That point has been reached, as the data clearly show. And, as the Supreme Court has recently held, EPA certainly has no statutory authority to require Texas's SIP to impose emission reductions on Texas sources so that visibility at Oklahoma's Wichita Mountains can improve at a faster rate than the URP or more than EPA has determined is reasonable.[645]

Footnotes:
[637] 79 Fed. Reg. at 74,837.
[638] Id. at 74,840.
[639] Texas Five-Year Progress Report at 4-10.
[640] Id. at 2-11 to 2-12.
[641] 77 Fed. Reg. at 40,155.
[642] Id. (emphasis added) (approving Nebraska regional haze SIP despite uncertainty in the assumed emissions and discrepancies between the modeling and Nebraska SIP limits).
[643] FIP TSD at A-45.

[644] 42 U.S.C. § 7491(b)(2) (authorizing EPA to issue regulations to require states to adopt SIP emission limitations "as may be necessary to make reasonable progress toward meeting the national goal" (emphasis added)).
[645] *See EPA v. EME Homer City Generation*, 134 S. Ct. 1584, 1609-10 (2014) ("EPA cannot require a State to reduce its output of pollution by more than is necessary to achieve attainment in every downwind State or at odds with the one-percent threshold the Agency has set."); *see also* 42 U.S.C. § 7410(a)(2)(D)(i)(II) (requiring only that a SIP contain "adequate provisions . . . prohibiting . . . any source or other type of emissions activity within the State from emitting any air pollutant in amounts which will— . . . interfere with measures required to be included in the applicable implementation plan for any other State under part C of this subchapter . . . to protect visibility" (emphasis added)).

[UARG (0065) p. 18-19] As part of their argument that the EPA does not provide any lawful basis for disapproving the RPGs for Big Bend and the Guadalupe Mountains or the Texas LTS, UARG stated that the EPA suggests that it must disapprove Texas's SIP because EPA "believe[s] that in performing its control analysis, the TCEQ should have given greater consideration to the flexibility in the CAIR trading program and the resulting uncertainty in the projected emissions." *Id. at* 74,840. To explain its point, EPA highlights the difference in Texas's Integrated Planning Model-based estimates of emission reductions due to CAIR at Big Brown Unit 1 versus Big Brown Unit 1's actual emissions in 2012. *Id*. EPA cannot fault Texas for being unable to predict the future. The modeling that Texas relied on was the best information available at the time it submitted the SIP, which it did long before 2012, and EPA cannot validly judge a SIP unapprovable on the basis of information that became available for EPA's review only after the SIP was submitted and *only because EPA has missed its statutory deadline* for action on the submitted Texas SIP by nearly five years.

Response: With regard to the comment that our explanation of why we did not account for CSAPR reductions in our analysis is unsupported and that we unreasonably and arbitrarily did not consider NO_X reductions from CSAPR and SO_2 reductions from MATS, our FIP TSD[708] discusses in great detail that based on Texas' recent comments[709] and other information, further significant reductions in SO_2 were not expected due to CSAPR or MATS, even if all related litigation is resolved. We note that the CENRAP and our modeling includes estimated reductions from CAIR, and we considered recent emission reductions by adjusting the 2018 modeled emission inventory to account for reductions at sources when controls had been installed and relied on post-control actuals to support modeled emission rates, including NOx reductions at some of the EGU sources evaluated in our reasonable progress/LTS analysis.[710] Overall, this information supports looking at recent actual emissions to represent future emission levels in 2018 for the specific EGUs evaluated in our reasonable progress/LST analysis.[711] Contrary to the commenter's assertion, the evidence in the record does not suggest that emissions from the sources we evaluated will be reduced in the near future, reducing their visibility impacts on the Class I areas of interest. Furthermore, as discussed elsewhere, due to the recent CSAPR remand there is ongoing uncertainty in the emission budgets. Comments that we failed to take

[708] FIP TSD at A-45
[709] Texas comments on Draft IPM modeling conducted by EPA for potential national rule making platform provided on June 26, 2014. In this docket materials as "TCEQ comment letter to EPA on draft modeling platform dated June 24, 2014. '2018 EMP signed.pdf.
[710] Table 2 of ENVIRON 2018 Memorandum, Sept 16, 2013. Available in the docket for this action as TX166-010-09 Memo_TXHAZE_2018CAMx 16Sept13
[711] See FIP TSD, p. A-16, A-45 (found in the docket for this rulemaking).

into account the additional emission reductions from Oklahoma BART sources are addressed elsewhere.

As part of its arguments that emissions in Texas have trended downward, Luminant states, "Texas reported in its progress report, actual EGU emissions of SO_2 and NO_x are ***below*** CAIR allowance allocations." The commenter is incorrect. The data presented by TCEQ in the Texas 5-yr progress report SIP show facility allocations through the Title IV SO_2 Trading Program and a total statewide allowance allocation of 580,000 tpy of SO_2. Compliance with CAIR was established using these same allocations but at increasing ratios. The Title IV SO_2 allowances allocated for 2010-2014 were to be retired for compliance with CAIR at a ratio of two allowances per ton of emissions. SO_2 allowances allocated for 2015, and thereafter, were to be retired for compliance at a ratio of 2.86 allowances per ton of emissions. The commenter compares the Title IV SO_2 program allowances to facility emissions but does not consider the required allowance ratio to demonstrate compliance with CAIR or the amount of allowances some facilities have purchased in order to demonstrate CAIR compliance. We note that the mere fact that Texas EGUs have purchased sufficient allowances to be below the CAIR cap is only evidence that these EGUS are in compliance with CAIR. Examining the cumulative statewide emissions of SO_2 for Texas EGUs presented in the Texas 5-yr progress report SIP shows emissions exceed both the CAIR budgets of 320,946 tons SO_2 per year for Phase I and 224, 662 tons of SO_2 per year for Phase II.

We disagree with Luminant that the uncertainty in the projected emissions from the CAIR trading program we pointed to in our proposal does not exist and is an arbitrary basis for our FIP. Even Texas itself agreed with the uncertainty in visibility projections due to CAIR in its Regional Haze SIP. As we discussed in our proposal, the TCEQ stated that it requested that key EGUs in Texas review and comment on the predictions of the IPM model but no EGU made an enforceable commitment to any particular pollution control strategy, preferring to retain the flexibility offered by the CAIR program.[712] Furthermore, TCEQ stated that because emission allowances can be purchased by EGUs, visibility improvement may be less or more that that predicted by the CENRAP's modeling. Despite the recent downward trend in SO_2 and NO_X emissions from Texas EGUs, the flexibility to purchase emission allowances from out of state in the future still remains along with the uncertainty in actual reductions from sources near the affected Class I areas. Furthermore, we note that we are unaware, nor did any of the facilities provide information on planned installation or upgrades of controls in the near future that would result in emission reductions at these EGUs.

With regard to the comment that an inherent amount of uncertainty in the assumed emissions is not grounds for disapproving a SIP that relies on modeling of such emissions, we disagree that uncertainty in the projected emissions from CAIR is the basis for our disapproval of the Texas RH SIP. Although we did note in our proposal that TCEQ should have given greater consideration to the flexibility in the CAIR trading program and the resulting uncertainty in the projected emissions, this did not form the sole basis of our partial disapproval of the Texas RH SIP. As discussed in our proposal, the flaws in Texas' analyses under section 51.308(d)(1) and in its consultations under section 51.308(d)(3)(i) formed the grounds for our disapproval of Texas' reasonable progress analysis and RPGs for the Big Bend and Guadalupe Mountains and

[712] 79 FR 74838

LTS for Wichita Mountains. Luminant does not present the quote concerning uncertainty in the proper context. In stating that "We believe that in performing its control analysis, the TCEQ should have given greater consideration to the flexibility in the CAIR trading program and the resulting uncertainty in the projected emissions," we were addressing the fact that TCEQ's cost analysis was flawed because the consideration of the tons reduced were calculated from a starting point of the projected CAIR emissions rather than considering a baseline of actual emissions. We provided an example of this in the Texas TSD (TX TSD at 22):

> The TCEQ's cost-effectiveness calculation for post-combustion controls on Big Brown Unit 1 was based on reducing that projected 2018 SO_2 emission level of 23,142 tpy by 90%, resulting in a reduction of 20,828 tpy. This results in a cost of $32,766,310/yr, or a cost-effectiveness calculation of $1,573/ton. However, the installation of a scrubber would allow Big Brown flexibility in fuel choice thus allowing the unit to continue to burn the higher average sulfur fuel it currently burns, instead of moving to the low sulfur coal predicted by IPM.
>
> Big Brown Unit 1's SO_2 emissions in 2012 were 32,100 tons. The issue of scrubber efficiency aside, a reduction of 90% from these actual emission levels would result in an SO_2 reduction in the range of 29,000 to 31,000 tpy. While the numerator ($) in the cost-effectiveness metric of $/ton will increase slightly beyond what was estimated by Alpine Geophysics due to an increased sulfur loading to the scrubber, the denominator (tons) would increase by roughly 50%, thus improving (lowering) the overall cost-effectiveness of controlling Big Brown Unit 1 significantly. Estimates for scrubbers at units at Monticello are similarly impacted by the cost-methodology used by Texas in estimating cost-effectiveness on a cost-per-ton basis.

This flaw resulted in an overestimate in the cost-effectiveness of controls as calculated by the TCEQ in terms of $/ton. Therefore, contrary to Luminant's assertion that we are faulting Texas for being unable to predict the future, we are actually faulting Texas' cost analysis for failing to consider available emission data for these units at the time the cost-analysis was performed, and failing to consider that "implementation of reasonable controls under the Regional Haze Rule would likely not be in addition to anticipated reductions due to CAIR predicted by IPM, but would replace or complement any controls predicted by IPM."

We address elsewhere in this document why recent improvement in visibility conditions at the three Class I areas are not sufficient grounds for our approval of the Texas RH SIP.

We disagree that we have no authority or reasoned basis to impose any further reductions on Texas sources in our FIP. The commenter references the CAA at 42 U.S.C. § 7491(b)(2) in support of the statement that our authority stops at the point that emission reductions are no longer necessary to make progress toward achieving the national goal. 42 U.S.C. § 7491(b)(2) of the CAA directs EPA to promulgate regional haze regulations that ". . . require each applicable implementation plan for a State in which any area listed by the Administrator under subsection (a)(2) of this section is located (or for a State the emissions from which may reasonably be anticipated to cause or contribute to any impairment of visibility in any such area) to contain such emission limits, schedules of compliance and other measures as may be necessary to make reasonable progress toward meeting the national goal specified in subsection (a) of this section…" We continue to believe that our partial disapproval of the Texas Regional Haze SIP and our disapproval of Oklahoma's RPGs and consultations under section 51.308(d)(1) are in accordance with the CAA and our regional haze regulations. We remind Luminant that the CAA at 42 U.S.C. §7941(g)(1) provides that "… in determining reasonable progress there shall be taken into consideration 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." Further, our regional haze regulations at section 51.308(d)(1)(iii) contain the clear directive that "In determining whether the State's goal for visibility improvement provides for reasonable progress towards natural visibility conditions, the Administrator will evaluate the demonstrations developed by the State pursuant to paragraphs (d)(1)(i) and (d)(1)(ii) of this section." As discussed extensively in our proposal, we found that Texas' analyses do not fully satisfy the requirements under section 51.308(d)(1)(i) and (ii) and (3), and we therefore determined that Texas' goals for visibility improvement do not constitute reasonable progress towards natural visibility conditions. This is not changed by the fact that recent data indicates that under the Texas Regional Haze SIP the Class I areas are currently meeting the RPGs we are establishing or the fact that linear regression (which assumes continuing emission reductions) of the most recent IMPROVE monitor data indicates they are projected to meet the URP for 2018. The fundamental issue is that the analyses Texas conducted that led it to determine that additional controls are not reasonable in the first planning period for its two Class I areas and the Wichita Mountains area in Oklahoma and which it used in determining its RPGs for Big Bend and Guadalupe Mountains do not fully meet the requirements of the CAA and our regional haze regulations. Therefore, the Texas RH SIP does not demonstrate that additional emissions reductions are not necessary to achieve reasonable progress as defined under the CAA and our regional haze regulations. We also discuss elsewhere in this document that the emission limitations and other control measures the RPGs are based on, rather than the numerical value of the RPGs, are what is enforceable under the regional haze regulations. The RPGs are an analytical tool we use to evaluate whether measures in the implementation plan are sufficient to achieve reasonable progress. Therefore, to satisfy the regional haze requirements it is not sufficient to meet the RPGs without also complying with the emission limitations the RPGs are based on.

The comment that under *EPA v. EME Homer City Generation,* EPA has no statutory authority to require emission reductions on Texas sources so that visibility at Oklahoma's Wichita Mountains can improve at a faster rate than the URP or more than the RPGs is based on a fundamental misunderstanding of the structure of the Regional Haze Rule. The language referenced by Luminant in *EME Homer City* applies to the specific requirements in CAA section 110(a)(2)(D)(i) regarding the attainment and maintenance of national ambient air quality standards (NAAQS). These air quality standards are specified by EPA at levels requisite to protect the public health and welfare. Once EPA establishes a new NAAQS (or revises an existing standard), EPA identifies those areas where the concentration of the regulated pollutant exceeds the NAAQS. States with a nonattainment area are required to submit a plan that will, among other things, bring the area into attainment with the applicable NAAQS.[713] In addition, SIPs must ensure that "contain adequate provisions . . . prohibiting . . . any source or other type

[713] CAA Section 172(c)(1).

of emissions activity within the State from emitting any air pollutant in amounts which will . . . contribute significantly to nonattainment in, or interfere with maintenance by, any other State with respect to any . . . [NAAQS]." *EME Homer City* addresses this specific requirement related to upwind States' contribution to downwind nonattainment of the NAAQS.

The role of RPGs (and the URP) in the visibility program is fundamentally different from that of the NAAQS. Neither the RGPs nor the URP are enforceable standards such as the NAAQS. In finalizing the Regional Haze Rule, we declined to set presumptive visibility targets but rather concluded that States (or EPA in the context of a FIP) should have the flexibility in determining reasonable progress goals based on consideration of the statutory factors.[714] As we explained in response to concerns that States would be subject to sanctions for failure to meet the RPGs:

> …the reasonable progress goal is a *goal* and not a mandatory standard which must be achieved by a particular date as is the case with the NAAQS….the [RPG] itself is not enforceable.[715]

We further explain that if the State fails to meet its RPGs, the State could either revise the strategies in its SIP or revise its RPGs, but in either case the State's decision should be based on appropriate analyses of the factors identified in 308(d)(1)(A) and (B). The RPGs set by a State are accordingly based on the anticipated changes in emissions over the planning period of the SIP, both from measures adopted specifically to address haze and from other requirements of the CAA during the planning period. The RPGs, unlike the NAAQS, are not independent, enforceable standards. The URP is yet another step further away from a standard such as the NAAQS. The URP is an analytical requirement "to ensure that States consider the possibility of setting an ambitious reasonable progress goal." We do not agree that the requirements in our FIP will result in improvements in visibility at a faster rate than the URP, but regardless of whether or not this is the case, there is nothing in the Regional Haze Rule that suggests that a State's obligations to ensure reasonable progress can be met simply by meeting the URP.[716]

We discuss in the preceding paragraph and elsewhere in this document that the determination of what constitutes reasonable progress is not based only on the numerical value of the RPG or whether the state is on track to meet the URP. The determination of what constitutes reasonable progress is based on the analyses conducted under section 51.308(d)(1) and under section 51.308(d)(3)(i) when a state impacts Class I areas in other states. We continue to hold that the emission limitations we established based on our analyses under section 51.308(d)(1) constitute reasonable progress for Texas and Oklahoma Class I areas. Therefore, we disagree that our FIP imposes emission reductions on Texas sources so that visibility at Oklahoma's Wichita Mountains can improve at a faster rate than the URP or more than what we have determined would provide reasonable progress.

Comment: Two commenters supported EPA's proposal to not establish any additional requirements on sources within Oklahoma.

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[714] 64 FR at 36731.
[715] 64 FR at 35733.(emphasis in the original)
[716] *See* 77 FR 14604, at 14629.

[OG&E (0057) p. 3] OG&E stated that analysis by the Oklahoma Department of Environmental Quality (ODEQ) shows that contributions to visibility impairment in the Wichita Mountains come not only from in-state emission sources, but also sources upwind in Texas and the eastern United States. (79 FR 74821) With regard to addressing contributions from in-state sources, OG&E agreed with EPA's determination that no further reductions are required from emission sources in Oklahoma in the planning period ending in 2018. (79 FR 74823) Regardless of the outcome of the Proposal concerning the implementation of the FIP for Texas, OG&E stated that the EPA should maintain this determination regarding Oklahoma in the final rule.

OG&E stated that in the proposal EPA noted improvements in visibility in the Wichita Mountains as measured by the visibility monitoring system operated by the U.S. Fish and Wildlife Service in the Wichita Mountains. Specifically, EPA noted that for the most recent 5-year period for which data is available (2009-2013), average conditions for the 20% worst days is 21.2 dv, below the 21.47 dv RPG developed by ODEQ for 2018.[10] (79 FR 74870) Indeed, annual summary data from the IMPROVE program website shows that 2012 and 2013 visibility is very near the ODEQ URP goal for 2018 of 20.01 dv and better than ODEQ developed for the 2018 RPG. Visibility in 2012 was measured at an annual average of 20.17 dv and 2013 (the most recent year for which finalized data is available) was measured at 20.15 dv.

OG&E stated that these data favor the EPA's determination that no additional emission reductions for sources in Oklahoma are warranted in the planning period ending in 2018 and beyond, especially when combined with the significant emissions reduction measures currently being implemented.

[EEI (0076) p. 2, 10, 11] EEI noted that EPA proposes to partially disapprove Oklahoma's 2010 SIP regarding the RPG for the Wichita Mountains and replace that part of their plan with the proposed FIP that relies upon the reductions in Texas to satisfy the 2018 milestone for the Wichita Mountains. EPA states in the proposal that the 2018 targets for the Wichita Mountains could not be achieved without emissions reductions from sources in Texas. See 79 Fed. Reg. 74,823. EPA's proposal appropriately "does not establish any additional requirements on sources within Oklahoma." (79 FR 74818)

EEI supported EPA's proposal to not seek further reductions from Oklahoma facilities given the recently finalized, litigated and currently in place FIP in Oklahoma being implemented by Oklahoma utilities. EPA must include the reductions that will occur as a result of this Oklahoma FIP and compliance with other air quality rules when determining whether additional reductions are required to achieve the goals of the regional haze program in both Texas and Oklahoma.

EEI stated that the EPA's analysis does not take into account all emission reductions from Oklahoma sources. Oklahoma sources are currently implementing the final 2012 SIP and FIP provisions for the state's regional haze obligations and are in the process of retiring, converting or installing expensive control equipment on affected units through 2019. EPA cannot ignore these reductions when assessing whether additional reductions are necessary to achieve the goals of the regional haze program. Given the current Oklahoma SIP and FIP in place for regional haze and the fact that IMPROVE data show the Wichita Mountains are already attaining the

2018 milestones, additional reductions are not required. Further, the Agency cannot ignore the additional emissions reductions that are occurring within the state as a result of compliance with other air quality rules, including the Mercury and Air Toxics Standards (MATS), which will result in the conversion to natural gas or retirement of 60% of Oklahoma's coal-fired generation.

Response: We appreciate the commenters' support of our determination that no further emissions reductions from Oklahoma sources are necessary in the first planning period.

We address elsewhere in this document where we address comments on modeling issues and calculation of the RPGs, the comments contending that we must address in our FIP the additional emissions reductions from sources in Oklahoma as a result of compliance with the Oklahoma FIP we previously promulgated. We address comments concerning anticipated emission reductions as a result of compliance with other air quality rules, including MATS elsewhere in this document.

Comment: Recent IMPROVE Monitoring Data Do Not Support Texas and Industry's Argument that the Proposed FIP is Unnecessary. [Earthjustice (0067) p.40]

Earthjustice et al., noted that, in their comments at public hearings on the proposed rule, Texas and industry groups argued that the FIP is unnecessary because the affected Class I areas are already on track to meet the RPGs that EPA is proposing. To the extent Texas and industry are arguing that the current visibility conditions meet the RPGs EPA is proposing, that is largely a result of the fact that EPA has not updated the majority of the 2018 projections that CENRAP and Texas relied on. Goals based on the controls EPA has proposed and also on more updated projections would likely be lower than the RPGs EPA is proposing. The recent improvement is due to a variety of factors, which EPA discusses in the proposed rule, 79 Fed. Reg. at 74,843, most of which are not enforceable limitations or are beyond the state's control and, therefore, may be temporary.

According to Earthjustice et al., at best, this argument merely counsels in favor of EPA lowering the RPGs. It does not show that the proposed controls themselves are unnecessary or unreasonable. Further, the argument by Texas and industry reflects a misunderstanding of how RPGs are set. RPGs are set to reflect controls that are reasonable; controls are not required in order to meet pre-set RPGs. Congress defined reasonable progress as the amount of progress that could be made after consideration of four factors. 42 U.S.C. § 7491(g)(1). After the four-factor analysis defines reasonable progress, each haze SIP must include the enforceable measures necessary to make reasonable progress. *Id.* § 7491(b)(2). The RPG for 2018 is calculated as the baseline visibility condition minus the amount of reasonable progress (which is established based on consideration of the four statutory factors).

Thus, Earthjustice et al., stated that RPGs are not comparable to the NAAQS. Under the NAAQS, once the goal is set, if the goal is attained, no additional controls are necessary. Under the haze program, the ultimate goal is set by the statute: elimination of all "man-made" haze. 42 U.S.C. § 7491(a)(1). Reasonable progress goals represent interim goals along the path toward achieving the statutory goal of eliminating all anthropogenic haze. Even if it were true that the

Class I areas already have achieved the RPGs that EPA has set, which is not the case, that would mean merely that EPA should revise the RPGs to reflect the visibility conditions that will be achieved once the proposed controls are in place. That is because the reasonable progress goals are not the equivalent of the NAAQS that, once reached, satisfies a state's legal obligations. Instead, the reasonable progress goals are merely steps along the way to achieving the statutory goal of eliminating all man-made haze.

Moreover, under the haze provisions, Earthjustice et al., stated that the amount of reasonable progress to be made is determined by reference to the uniform rate of progress and the emission reductions achievable via a four-factor analysis. *See* 40 C.F.R. § 51.308(d)(1)(i)-(ii). RPGs simply identify the visibility conditions that should result once the controls selected by the four-factor analysis are implemented, provided that the state has analyzed the reductions necessary to achieve the URP, and, if the goals are less stringent than the URP, the state has shown that it is not reasonable to achieve the URP and its alternative goals are reasonable. *See id.* Texas's argument omits the critical role that the four-factor analysis plays in defining reasonable progress goals. Thus, even if visibility has improved faster than was previously projected, that does not in any way call into question EPA's analysis showing that consideration of the four factors results in the conclusion that the proposed controls are reasonable, and the reasonable progress goals must reflect implementation of those reasonable controls.

Response: We appreciate the commenter's support of our FIP.

Comment: [Commenter 0053-1] The TCEQ stated that it shares the common goal of clear vistas at the nation's national parks and wilderness areas. The TCEQ's 2009 regional haze SIP revision moves us toward that goal in accordance with the federal Clean Air Act. It's important to focus on the goal of visibility at federal Class I areas rather than any other goals that the EPA or others may have in regards to this federal rule.

The TCEQ stated that Texas determined that current emissions reductions will be adequate for the first control period of 2008 through 2018. This SIP revision was thoroughly vetted through consultations with neighboring states, with the presence and input of the EPA, and it meets all requirements of the federal Clean Air Act and EPA's regional haze rule for this 10-year period. During the planning, proposal, and review stages between 1999 and mid-2013 the EPA never stated that the methodology used by TCEQ was not approvable.

According to TCEQ, three primary issues illustrate some of the reasons why EPA should not finalize the proposed federal implementation plan, which imposes significant costs with no perceptible benefit. First, the EPA is unjustified in proposing additional controls since the three Class I areas have already achieved better visibility than the goals EPA proposes to set for 2018.

The TCEQ stated that the most recent actual monitoring data on visibility improvement shows that the Wichita Mountains, Guadalupe Mountains, and Big Bend Class I areas already have better visibility than the reasonable progress goals EPA's proposing to set for 2018. This alone makes EPA disapproval of the Texas SIP inappropriate. Using the EPA's own conventions for visibility, the benefits of EPA's proposed FIP by 2018 are zero at Big Bend and Guadalupe Mountains and an imperceptible one-tenth of a deciview at Wichita Mountains.

Second, the TCEQ noted that the EPA inappropriately claims that Texas did not evaluate the reasonable further progress goals four factor analysis correctly. The regional haze rule and the EPA's guidance give the states flexibility in how to analyze additional controls using the statutory factors, and TCEQ's analysis was consistent with EPA guidance and the CENRAP analysis. Consistent with EPA's regional haze rule, Texas is not required to conduct the four factor analysis for areas not in Texas such as Wichita Mountains.

Third, the TCEQ stated that the period covered by the Texas SIP submittal runs through 2018, the end of the first required planning period. Some of the controls EPA proposes would not go into effect until 2020 and are, therefore, inappropriate for consideration and irrelevant to the approvability of Texas's regional haze SIP submittal.

Given these facts, the TCEQ concluded that the EPA should approve the Texas plan and withdraw the proposed FIP, because the Texas 2009 regional haze SIP revision meets the requirements of the federal Clean Air Act and EPA's regional haze rules.

Response: We disagree with the TCEQ that its 2009 Regional Haze SIP revision moves the affected Class I areas toward that goal in accordance with the CAA. We discussed in our proposal and elsewhere in this document why the TCEQ's 2009 Regional Haze SIP does not fully satisfy the regional haze regulations and statutory requirements. The TCEQ implies that we and other parties are focusing on goals other than visibility at federal Class I areas in promulgating our FIP. However, it is not clear to what other goals the TCEQ refers. The purpose of our FIP is to correct the inadequacies in the Texas and Oklahoma Regional Haze SIPs and ensure that these states have plans in place that fully meet the CAA requirements and regional haze regulations.

We address the comment asserting that we must disapprove Texas' RPGs despite the agreement among states that participated in the consultation process that no additional emission reductions were needed from Texas sources, in the section in this document addressing consultation comments. Also, as the TCEQ notes, we did participate in some of Texas' consultations, and provided input at certain stages in the planning and development of the SIP. This included comments to the TCEQ, in which we were highly critical of its approach to satisfying key aspects of the Regional Haze Rule, including some of the core inadequacies that led to our FIP. These comments went largely unheeded. Regardless, we remind the TCEQ that there is no requirement in the CAA that we must review, evaluate, and comment on a State's proposed SIP revision. Our job under the CAA is to review a SIP submittal and determine if it meets the CAA and rules, regardless of whether we commented or not on a State's proposed SIP during its State rulemaking process.

We address elsewhere in this document comments contending that our FIP provides no perceptible visibility benefit and that it is not justified and inappropriate because the three Class I areas have already achieved better visibility than the RPGs EPA proposes to set for 2018. While we acknowledge that the RH rule and the our guidance give the states a certain amount of flexibility in how to analyze additional controls using the four statutory factors, given the circumstances of this case, we disagree with the set of potential controls identified by the TCEQ and how it analyzed and weighed the four reasonable progress factors in a number of key areas. This is discussed in detail in our proposal and elsewhere in this document.[717]

We disagree with the TCEQ that Texas was not required to consider and evaluate its own sources to address its visibility impacts in Class I areas outside the state. In our proposal, we provided the following explanation regarding this issue:

> Finally, each state 'must document the technical basis, including modeling, monitoring and emissions information, on which the State is relying to determine its apportionment of emission reduction obligations necessary for achieving *reasonable progress* in each mandatory Class I Federal area it affects.' To reiterate, Section 169A(g)(1) of the CAA requires states to determine 'reasonable progress' by considering the four statutory factors. Therefore, this provision requires states to consider both their own Class I areas and downwind Class I areas when they develop the technical basis underlying their four-factor analyses. This documentation is necessary so that the interstate consultation process can proceed on an informed basis and so that downwind states can properly assess whether any additional upwind emission reductions are necessary to achieve reasonable progress at their Class I areas. The regulations further provide that, 'States may meet this requirement by relying on technical analyses developed by the regional planning organization and approved by all State participants.' Thus, states have the option of meeting this requirement by relying on four-factor analyses and associated technical documentation prepared by a regional planning organization on behalf of its member states, to the extent that such analyses and documentation were conducted. In situations where a regional planning organization's analyses are limited, incomplete or do not adequately assess the four factors, however, then states must fill in any remaining gaps to meet this requirement.[718]

Therefore, Texas is required to consider both its own Class I areas and downwind Class I areas when it develops the technical basis underlying the four-factor analyses. Texas did not meet this requirement.

We address issues concerning the installation of controls beyond the first planning period in another the section of this document.

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[717] 79 FR 74838
[718] 79 FR 74829