APPENDIX M

Public Comments Received

[EXTERNAL] EPA comments on Oklahoma's Proposed Regional Haze SIP for the 2nd Planning Period
Feldman, Michael <Feldman.Michael@epa.gov>
Fri 7/1/2022 9:40 AM
To:

- DEQ AQD SIP Comments <aqdsipcomments@deq.ok.gov>;
- Melanie Foster <melanie.foster@deq.ok.gov>

Cc:

- Medina, Dayana <Medina.Dayana@epa.gov>;
- Goudeau, Charlotte <Goudeau.Charlotte@epa.gov>;
- Donaldson, Guy <Donaldson.Guy@epa.gov>

1 attachments (237 KB)
EPA Comment lttr_OK RH SIP.pdf;
Thank you for the opportunity to review the proposed Oklahoma Regional Haze SIP for the second planning period. We have reviewed the proposed SIP revision and are providing our comments and recommendations for your consideration.

Please let us know if you have any questions.

Thank you,

Michael Feldman, PhD
Chief, SO2 and Regional Haze Section
State Planning Implementation Branch
U.S. EPA Region 6, 6-ARSH
Phone: 214-665-9793
feldman.michael@epa.gov

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1201 ELM STREET, SUITE 500
DALLAS, TEXAS 75270

July 1, 2022

Ms. Melanie Foster
Oklahoma Department of Environmental Quality
Air Quality Division
P.O. Box 1677
Oklahoma City, Oklahoma 73101-1677
melanie.foster@deq.ok.gov

RE: Proposed Regional Haze State Implementation Plan for the Second Planning Period

Dear Ms. Foster:

Thank you for the opportunity to review the proposed Oklahoma Regional Haze State Implementation Plan (SIP) Revision for the second planning period. We appreciate Oklahoma's continued work to address the regional haze requirements. We have reviewed the proposed SIP revision and are providing our comments and recommendations for your consideration.

If you have any questions or comments regarding this letter, please contact me at (214) 665-9793 or Dayana Medina of my staff at (214) 665-7241.

Sincerely,

Michael Feldman, Ph.D.
Section Chief
SO2 and Regional Haze Section (ARSH)

Enclosure

cc: AQDSIPComments@deq.ok.gov

EPA Comments on Oklahoma RH SIP Public Comment Draft
July 1, 2022

Pollutants and Source Categories Evaluated

1. The Regional Haze Rule requires states to consider evaluating major and minor stationary sources, mobile sources, and area sources in developing its long-term strategy. 40 CFR 51.308(f)(2)(i). Section 4 of the SIP narrative states that "NOx emissions are not dominated by one source category, but instead are heavily contributed to by the point, nonpoint, and on-road sectors." (See page 20 of SIP narrative). Section 4 also notes that that the proportion of NOx emissions attributable to nonpoint sources increased slightly from 2014 to 2017. Given the large proportion of Oklahoma's NOx emissions attributable to oil and gas nonpoint sources, we encourage ODEQ to reconsider whether it would be appropriate and reasonable to evaluate potential NOx control strategies for nonpoint sources in a four-factor analysis. The four-factor analyses can be for individual sources or large groups of sources or sectors, where appropriate.

Source Selection Analysis

2. The AOI study that ODEQ relied on in the source selection analysis used 2016 as the baseline emissions year but based on feedback from EPA, the SIP narrative explains that "DEQ did remove some sources and their corresponding emissions, such as the Big Brown Power Plant, from the source selection calculations." (See page 31 of the SIP narrative). A review of Appendix D reveals that in addition to the removal of sources in Texas that have permanently shut down, sources in Oklahoma whose emissions appear to have been removed from the source selection calculations include OG&E Muskogee Generating Station, OG&E Sooner Generating Station, PSO Northeastern Power Station. We note that entirely removing all SO2 and NOx emissions for these Oklahoma facilities is not an appropriate approach given that while recent implementation of controls at these facilities have resulted in large emissions reductions, these facilities still emit some SO2 and/or NOx emissions. Therefore, ODEQ should revise the individual source contribution calculations for these facilities by using actual emissions from a recent year (such as 2020 or 2021) to more accurately reflect current emissions and potential visibility impacts from these facilities following implementation of controls. We offer comments on ODEQ's decision to forego a four-factor analysis on BART sources elsewhere in this document.

   Based on our review of Appendix D, it appears that ODEQ's removal of emissions for these facilities from the source-selection calculations did not result in any additional Oklahoma sources being selected for four-factor analysis. If so, we encourage ODEQ to discuss this in section 6.2.1. of the SIP narrative.

3. ODEQ used both a Q/d threshold of 5 or greater and an individual source contribution threshold of 0.5% or greater for selecting sources to evaluate in a four-factor analysis. Based on our review of Appendix D, it appears that Elmore City Gas Plant was not selected for four-factor analysis even though it has a Q/d- NOx of 5 and an individual source contribution (%EWRT*Q/d- NO3) of 0.5%. Please provide explanation in the SIP narrative on why this facility was not selected for four-factor analysis for NOx.

4. Section 6.2.1. of the SIP narrative states that the NOx and SO2 sources selected for four-factor analysis represent 12% of NOx emission and 55% of SO2 emissions from all point sources in Oklahoma from the 2016 inventory. EPA's July 8, 2021 "Clarifications Regarding Regional Haze State Implementation Plans for the Second Implementation Period" Memorandum explains that "A state that relies on a visibility (or proxy for visibility impact) threshold to select sources for four-factor analysis should set the threshold at a level that captures a meaningful portion of the state's total contribution to visibility impairment to Class I areas." (See 2021 Clarifications Memo at 3). The SIP narrative should provide additional discussion and justification for the thresholds selected by ODEQ for identifying sources for further evaluation. The SIP narrative states that "The 0.5% threshold identified twelve total sources, which is a reasonable number of sources that warranted further analysis in the form of a four-factor analysis and on which to focus limited available resources." See SIP narrative at 32. The SIP narrative should explain why twelve sources is a reasonable number of sources beyond merely noting that the State has limited available resources. Consistent with the memo, the SIP revision should explain how the percentage of emissions captured through ODEQ's source selection methodology represents a meaningful portion of the state's total contribution to visibility impairment at the Wichita Mountains.

5. ODEQ's approach of automatically foregoing a four-factor analysis for the Oklahoma BART sources identified in the source selection analysis is not consistent with our regulations and guidance. 40 C.F.R. 51.308(e)(5) specifically notes that "[a]fter a State has met the requirements for BART… BART-eligible sources will be subject to the requirements of paragraphs (d) and (f) of this section, as applicable, in the same manner as other sources." EPA's August 2019 "Guidance on Regional Haze State Implementation Plans for the Second Implementation Period" elaborates that "[S]tates may not categorically exclude all BART-eligible sources, or all sources that installed BART controls, as candidates for selection for analysis of control measures." See August 2019 Guidance at 25. EPA's 2021 Clarifications Memo further clarifies that "A state relying on an "effective control" to avoid performing a four-factor analysis for a source should demonstrate why, for that source specifically, a four-factor analysis would not result in new controls and would, therefore, be a futile exercise." (See 2021 Clarifications Memo at 5). Consistent with the rule, guidance and clarifications memo, ODEQ should provide further explanation in the SIP to justify the decision not to evaluate these BART sources in the four-factor analysis based on source-specific factors that would provide justification for no further evaluation consistent with our guidance. Alternatively, without such justification, the BART sources that were automatically eliminated from further analysis should be evaluated in a full four-factor analysis to

determine if further controls are necessary and whether existing measures at those sources are necessary for reasonable progress.

This feedback applies to the OG&E Muskogee Generating Station and all NOx BART sources. Only Units 4 and 5 of the OG&E Muskogee Station are subject to BART, while Unit 6 (a coal-fired unit with no existing SO2 controls and only overfire air for NOx control) is not subject to BART and thus was not evaluated or controlled under regional haze in the first planing period. Additionally, NOx BART sources that were automatically eliminated from further analysis were all required to install combustion controls (low-NOx Burners or low-NOx Burners with Overfire Air) rather than post-combustion controls, and some appear to continue to have considerable NOx emissions. Therefore, further analysis of potential controls for these sources or detailed discussion on why it is reasonable to assume for these units that a full four-factor analysis would likely result in the conclusion that any further controls are not necessary should be included in the SIP. As discussed below, Arkansas and Missouri specifically identified the Muskogee Generating Station as reasonably anticipated to impair visibility at one or more of their Class I areas. We also note that OG&E Muskogee Generating Station is located closer to Arkansas' Class I areas and Missouri's Class I area than to Oklahoma's own Class I area. OG&E Muskogee is located 178.11 km from Caney Creek; 187.37 km Upper Buffalo; 231.48 km from Hercules Glades; and 330.27 km from Wichita Mountains. Therefore, the Q/d values of this source with respect to Caney Creek, Upper Buffalo, and Hercules Glades are greater than the Q/d value with respect to Wichita Mountains (See Appendix C of the proposed SIP).

6. PSO Northeastern Unit 3, which is currently required under BART requirements to comply with an SO2 emission limit of 0.40 lb/MMBtu based on operation of dry sorbent injection (DSI), was also required under the AEP/PSO Regional Haze Agreement (from the first planning period) to develop a monitoring program for Unit 3 to determine whether increased SO2 removal efficiencies can be achieved during normal operations using existing DSI. The SIP narrative states that based on the monitoring program and the terms of the AEP/PSO Regional Haze Agreement, PSO concluded that the resulting federally enforceable emission rate for Unit 3 should be 0.37 lb/MMBtu on a 30-day rolling average basis and that ODEQ concurs with the company's determination. The SIP narrative notes that the revised SO2 emission limit for Unit 3 will be incorporated into a future permit modification. We encourage ODEQ to provide additional information as to the planned timing of this permit modification, to the extent possible. We also note that if ODEQ makes the determination that the new 0.37 lb/MMBtu emission limit for Unit 3 is necessary to make reasonable progress, then ODEQ must adopt this emission limit as part of its long-term strategy for the second planning period and include the limit in its SIP. This issue is discussed in greater detail below.

Four-Factor Analyses

7. For each of the selected sources, and for each emission unit evaluated, the four-factor analysis should clearly identify the baseline control scenario, and associated emissions and emissions limits (lb/MMBtu, tons/year, lb/ton, etc., depending on unit type) used in the analysis. Further guidance regarding these issues can be found on pages 29 and 30 of our August 2019 Guidance, respectively. See also 40 C.F.R. 51.308(f)(2)(iii). The State should provide appropriate documentation of all this information, including with citations to regulatory and technical documents. We specifically recommend that the SIP narrative identify existing emission limits and where those limits are located (e.g., in the SIP, in a federal and/or state permit, in a consent decree). In addition, we recommend that the SIP narrative discuss how these limits compare to the baseline emissions used in the four-factor analyses. ODEQ has not provided analysis consistent with these recommendations, but rather agrees with all aspects of the submitted four-factor analyses and the conclusions made by the facilities without providing an independent assessment and discussion of the State's review of these analyses. The State should document their review and decision-making process when determining reasonable control measures. Such documentation should include the State's assessment of the analysis performed under each factor and how it weighed the four statutory factors to allow for stakeholder review and comment. After this review, if ODEQ determines that no additional (i.e., new) measures are necessary to make reasonable progress for a particular source, it must then determine whether the source's existing measures are necessary to make reasonable progress. See section 4 (pages 8 – 12) of the Clarifications Memo for information on determining when a source's existing measures are necessary to make reasonable progress. Generally, a source's existing measures are needed to prevent future emission increases and are thus needed to make reasonable progress. If ODEQ concludes that the existing controls at a selected source are necessary to make reasonable progress, ODEQ must adopt emissions limits based on those controls as part of its long-term strategy for the second planning period and include those limits in its SIP (to the extent they do not already exist in the SIP).

   Alternatively, if ODEQ can demonstrate that the source will continue to implement its existing measures and will not increase its emission rate, it may be reasonable for the State to conclude that the existing controls are not necessary to make reasonable progress. Such a demonstration should be supported by documentation, such as the data and analysis described in the Clarifications Memo. In such case, the emission limits may not need to be adopted into the long-term strategy and SIP. We recommend that ODEQ clearly state its determination for each source and explain whether it is including either existing or new emission limits for each source in the long-term strategy and SIP (or whether emission limits already exist in the SIP). See August 2019 Guidance at 43; Clarifications Memo at 8-9.

8. We recommend that for each selected source, the State consider whether the source can achieve or is already achieving a lower emission rate using its existing measures. If a source is capable of operating or is already operating at a lower emission rate than assumed either

(1) as the basis for not conducting a full four-factor analysis or (2) as the baseline for four-factor analysis, that lower rate should be analyzed as a potential control measure. Similarly, we recommend ODEQ consider whether equipment upgrades might be reasonable. If either more efficient use of existing measures or equipment upgrades are potentially reasonable control options, the State should either conduct a four-factor analysis or explain why it is reasonable to forgo doing so. See Clarifications Memo at 5, 7.

9. Please include line-item cost breakdowns, cost calculations (preferably in Excel spreadsheet format), and all vendor quotes obtained for all the control options evaluated in the four-factor analyses. This is consistent with the Regional Haze Rule, which requires that in establishing its long-term strategy for regional haze, a state must document the technical basis, including modeling, monitoring, cost, engineering, and emissions information, on which the state is relying to determine the emission reduction measures that are necessary to make reasonable progress in each mandatory Class I Federal area it affects. 40 CFR 51.308(f)(2)(iii).

Continental Carbon (evaluated for SO2 only)

10. The four-factor analysis submitted by the company and the summary provided by ODEQ in Section 6.4.1.5 the SIP narrative explain that Continental Carbon entered into a federally enforceable consent decree with EPA on May 7, 2015, requiring the removal of the three thermal oxidizer units at the facility and replacement with two clean gas and energy cogeneration units, each with a selective catalytic reduction (SCR) system for the control of NOx emissions and a dry scrubber for the control of SO2 emissions. Section 6.4.1.5 of the SIP narrative explains that the two clean gas and energy cogeneration units were installed in the fall of 2018 and that the dry scrubbers have been installed but are still being modified to operate effectively. The SIP narrative also explains that project completion will result in a new permitted limit of approximately 708 tpy of SO2 for the units. As discussed elsewhere in this document, ODEQ must make a determination whether the source's existing measures are necessary to make reasonable progress and if ODEQ concludes that the existing measures are necessary to make reasonable progress, ODEQ must adopt emissions limits based on those controls as part of its long-term strategy for the second planning period and include those limits in its SIP (to the extent they do not already exist in the SIP). Alternatively, ODEQ could demonstrate that the existing controls are not necessary to make reasonable progress through a demonstration supported by the data and analysis described in the Clarifications Memo. See August 2019 Guidance at 43; Clarifications Memo at 8-12. Also discussed elsewhere in this document, if either more efficient use of these existing measures or equipment upgrades are potentially reasonable control options and a more stringent emission limit is feasible for the Continental Carbon units, we recommend that the four-factor analysis consider this or alternatively, the State should explain why it is reasonable to forgo doing so. See Clarifications Memo at 5, 7.

DCP Chitwood Gas Plant (evaluated for NO_X only)

11. The use of a 7% interest rate in the cost analysis is not appropriate. For consistency with EPA's Control Cost Manual, the cost analysis should be based on either the bank prime rate or a company-specific interest rate, if available.[1] Since the Regional Haze Rule is intended to evaluate the private cost of controls, the Control Cost Manual directs entities to use the bank prime rate when estimating costs of controls in cases where a company-specific interest rate is not available.[2] If a company-specific interest rate is available and is being used to estimate the cost of controls, documentation supporting that interest rate should be provided with the cost analysis. Section 6.4.2.7 of the SIP narrative states that at the suggestion of EPA, DEQ calculated the cost options at a lower interest rate (3.25%) than the rate used by DCP (7%) for the NOx controls evaluated for the DCP Chitwood Gas Plant. Other than stating that the lowest cost option was reduced to approximately $2,400 per ton of NO*x* removed, there is no additional information or revised cost calculations to reflect the bank prime rate provided in the proposed SIP. We recommend that the cost analysis document and use the bank prime rate at the time of the analysis and that cost calculations and a summary table presenting ODEQ's revised cost-effectiveness ($/ton) numbers (similar to Table 6-4) be included in the final SIP submittal.

    Even when using an unsupported interest rate of 7%, the costs of NOx controls for engines C-1, C-2, C-4, C-6, and C-7 are still within the range of what we have considered reasonable in the past. As we noted in the "Cost Thresholds" section of this document, it is reasonable to expect that cost thresholds in the second planning period should be higher than in the first planning period. We note that by taking these comments into account and adjusting both the interest rate used in the cost analysis and the selected cost thresholds, ODEQ could find these controls to be necessary for reasonable progress and strengthen its long-term strategy by securing additional emissions reductions and visibility benefits.

12. Section 6.4.2.7 of the SIP narrative states that "Although the lower end of these costs [of NOx controls on the DCP Chitwood Gas Plant units] might be considered reasonable under certain circumstances, the four-factor analysis also addressed the amount of uncertainty associated with the control costs, the feasibility of the retrofits, and the potential emission reductions. Based on this information, the company concluded that no control option was determined to be cost-effective. DEQ concurs that this is a reasonable conclusion." (See SIP narrative at page 40). However, the reason why there is uncertainty associated with the cost, feasibility, and potential emission reductions of the retrofit controls evaluated is because the four factor analysis provided by the company "discuss[es] general hypothetical retrofit scenarios for these types of engines, but these scenarios are not based on an engineering

[1] The bank prime rate is based on the federal funds rate, which is set by the Federal Reserve. The current bank prime rate can be found at https://www.federalreserve.gov/releases/h15/ and historical data on the bank prime rate can be found at https://fred.stlouisfed.org/series/PRIME.

[2] See EPA Control Cost Manual at 15-17. The Control Cost Manual can be found at https://www.epa.gov/sites/production/files/2017-12/documents/epaccmcostestimationmethodchapter_7thedition_2017.pdf.

analysis specific to each subject engine." (See Appendix E of the proposed SIP). The four factor analysis submitted by the company states that "These are unique engines and, if any analysis herein suggests that an engine may be amenable to retrofit actions as a function of a 4-factor analysis, then such engine would require a detailed, engineered engine health analysis and engineering and vendor assessment of whether that engine specifically can successfully accommodate a retrofit action. Such detailed engineering assessments would provide more accuracy around technical feasibility and cost and may conclude that a particular retrofit action is, for example, not technically feasible to be successfully implemented, or not economically reasonable." Id. If ODEQ's determination that controls are not necessary is based on consideration of the uncertainty associated with the four factor analysis provided by the company, ODEQ should provide a site-specific analysis and engineering study (or request the company to do so) to more accurately determine the feasibility and cost of retrofit controls at these units and reconsider whether the determination that no controls are necessary is reasonable based on the updated analysis. We offer recommendations regarding ODEQ's cost threshold selection elsewhere in this document.

GRDA Unit 2 (evaluated for SO2 only)

13. The four-factor analysis submitted to ODEQ by the company states that it is based on a forecasted/projected annual capacity factor but the company states that it is not definitive. In a follow up response to ODEQ, the company confirmed that the forecasted capacity factor is based on recent historical operations of the facility from 2016-2020. Please explain what is meant by the statement that the forecasted capacity factor is not definitive and how this factor may impact the four-factor analysis and assessment of potential controls.

14. The assumption of a shortened remaining useful life in the cost analysis for controls evaluated for Unit 2 is based on "operating projections." However, the four-factor analysis states that this projected remaining life for Unit 2 is subject to change and in a follow-up response to ODEQ, the company confirmed that Unit 2 does not have an enforceable shutdown date. As discussed in the August 2019 Guidance, this is not an appropriate approach. The Guidance explains that "In the situation where an enforceable shutdown date does not exist, the remaining useful life of a control under consideration should be full period of useful life of that control as recommended by EPA's Control Cost Manual." See August 2019 Guidance at 34. ODEQ should revise the four-factor analysis accordingly.

Mustang- Binger Gas Plant (evaluated for NO_X only)

15. In Mustang-Binger Gas Plant's follow-up response to ODEQ's request for additional information on the four-factor analysis, the company retracted its original statement that it is not feasible to control the four engines evaluated in the four-factor analysis using air fuel ratio controllers (AFRC). The company also confirmed that three of the four engines (CM-2323, CM-2324, and CM-2325) already operate with AFRC. The company should evaluate

the cost of AFRC for engine CM-2322 in the four-factor analysis to determine if those controls are necessary for reasonable progress.

OG&E Horseshoe Lake (evaluated for NO_X only)

16. For the time necessary for implementation, the four-factor analysis states that the company anticipates that it would take a minimum of four years to install SCR on the evaluated units. In comments EPA provided to ODEQ after review of an early draft SIP, we noted that based on historical data, the installation of SCR at similar units can be typically completed in three years. In OG&E's follow-up response to ODEQ's request for additional information on the four-factor analysis, the company explains that estimates of the time needed for installation of SCR at a "typical" gas-fired plant are not applicable to Horseshoe Lake, which is among the oldest active plants in the country and has a unique physical configuration that limits the available space for SCR installation. (See Appendix E of the proposed SIP). The four-factor analysis should provide additional information on the plant's "unique physical configuration" and explain in more detail how this affects the time necessary for implementation of SCR at the Horseshoe Lake units.

17. The assumption of a shortened remaining useful life (20 years) in the cost analysis for NOx controls evaluated for Units 6, 7, and 8 is not appropriate without an enforceable shutdown date for these units. As discussed in EPA's August 2019 Guidance, "In the situation where an enforceable shutdown date does not exist, the remaining useful life of a control under consideration should be full period of useful life of that control as recommended by EPA's Control Cost Manual." See August 2019 Guidance at 34. Furthermore, in a follow up response to ODEQ, the company states that "OG&E is willing to consider enforceable air permit conditions that require retirements for these units no later than 20 years from the effective date of the SIP." (See Appendix E of the proposed SIP). However, ODEQ does not appear to take this information into account in their review and decision-making process when determining reasonable control measures for this source.

18. The use of a 7% interest rate in the cost analysis is not appropriate. As discussed earlier in this section of this document, the cost analysis should be based on either the bank prime rate or a company-specific interest rate for consistency with the Control Cost Manual. If a company-specific interest rate is available and is being used to estimate the cost of controls, documentation supporting that interest rate should be provided with the cost analysis.

Oxbow Kremlin Calcining Plant (evaluated for SO2 only)

19. The assumption of a 20-year remaining useful life in the cost evaluation of controls is not sufficiently supported with documentation that is site-specific for the Oxbow Kremlin Calcining Plant. As discussed in EPA's August 2019 Guidance, "Annualized compliance costs are typically based on the useful life of the control equipment rather than the life of the

source, unless the source is under an enforceable requirement to cease operation." See August 2019 Guidance at 33. We note that the Oxbow Port Arthur Calcining facility located in Port Arthur, Texas, began operations in 1935 and is currently still operating. According to the four-factor analysis provided to ODEQ by the company, the Oxbow Kremlin Calcining Plant commenced operation in the 1963-1970 time frame. The Oxbow website also states that the three kilns at the Kremlin Calcining Plant were built in the late 1960's and early 1970's.[3] Unless there is additional site-specific information that would limit the life of Kremlin Calcining Plant, such as a federally enforceable requirement to cease operation, the four-factor analysis should be based on the useful life of the control equipment. Based on what we have historically observed and available literature, an assumption of 30 years for the equipment life of scrubbers and DSI is reasonable and consistent with EPA's Control Cost Manual. Revising the four factor analysis to reflect an assumption of 30 years for the equipment life of SO2 controls at this source would result in lower $/ton numbers that ODEQ may find to be cost-effective.

20. The four-factor analysis and the company's follow-up response to ODEQ's request for additional information explain that average hourly SO2 emission rates (measured at each kiln during the January 2015 to December 2019 period) were used as the basis for the O&M cost estimates while annual average SO2 emission rates (during the January 2018 to December 2019 period) were used as the basis for the calculation of tons of SO2 emissions reduced and cost-effectiveness of the control technologies evaluated. The company explains that average hourly SO2 emission rates from the January 2015 to December 2019 period were used as the basis for the O&M cost estimates because they were determined to be representative of typical operating conditions and fluctuations experienced at each kiln. On the other hand, annual average SO2 emission rates form the January 2018 to December 2019 period were used as the basis for the calculation of SO2 tons removed because these more recent emissions data reflect an increase in the sulfur content of the green petroleum coke and are expected to be more representative of future emissions from the facility. Please explain why the O&M cost estimates are not also based on January 2018 to December 2019 emissions data, given that the company believes these more recent emissions data are expected to be representative of future emissions.

Panhandle Eastern Cashion Compressor Station (evaluated for NO_X only)

21. Section 6.4.2.6. of the SIP narrative explains that engine testing data recently provided to ODEQ by the company provides lower and more accurate estimates of the NOx emissions from the facility's engines compared to the conservative estimates of NOx emissions the company had previously reported and upon which ODEQ's source selection analysis was based. The SIP narrative states that had the actual emissions data been used when selecting sources for the four-factor analysis, this facility would have been excluded for small contribution. Please specify if this means that the %EWRT*Q/d of the facility would have

[3] See *https://www.oxbow.com/Services_Value_Added_Services_Calcining.html*.

fallen below ODEQ's selected threshold of 0.5%. The SIP narrative should provide the %EWRT*Q/d for the facility using the actual emissions data provided by the company to support ODEQ's conclusions regarding this facility.

Western Farmers Hugo Power Plant (evaluated for SO2 only)

22. The use of a 7% interest rate in the cost analysis is not appropriate. As discussed earlier in this section of this document, the cost analysis should be based on either the bank prime rate or a company-specific interest rate for consistency with the Control Cost Manual. In the company's follow-up response to ODEQ's request for additional information, the company dismisses EPA's comment that the use of a 7% interest rate is inappropriate and states that using the bank prime rate (3.25%), the cost-effectiveness of dry flue gas desulfurization (DFGD) and wet flue gas desulfurization (WFGD) would be $6,830/ton and $7,091/ton, respectively, and the overall conclusion of no controls necessary for reasonable progress would remain unchanged. We reaffirm that the cost analysis should document and use the bank prime rate at the time of the analysis and calculations used in estimating the cost-effectiveness using the bank prime rate should be provided in the SIP to allow EPA and the public to review and evaluate this information.

23. The cost estimates for DFGD and WFGD were based on cost estimates from the Technical Support Document for EPA's 2011 Oklahoma SO2 BART FIP. The company escalated those cost numbers, which were based on 2009 dollars, to 2019 dollars using CEPCI escalation indices. The EPA's Control Costs Manual does not recommend escalating costs over more than 5 years. Therefore, we recommend that a new cost analysis be conducted for DFGD and WFGD controls that is based on year dollars consistent with the year the analysis is conducted instead of relying on an outdated cost analysis that is escalated over a 10-year period.

<u>Cost Thresholds</u>

24. ODEQ appears to avoid selecting a cost threshold for SO2 controls but points to $5,000/ton as being "widely used as a reasonable threshold in evaluating SO2 compliance costs for Regional Haze" (See page 46 of SIP narrative), and notes that Texas selected a cost threshold of $5,000/ton and Arkansas selected a cost threshold of $5,086/ton for EGU boilers. The SIP narrative states that "Evaluating the thresholds used by neighboring states that affect Oklahoma or are affected by Oklahoma as a guidepost is a reasonable approach when setting a reasonable cost threshold." (See page 46 of SIP narrative). The SIP narrative points to Texas and Arkansas as having used $5,000/ton as a cost threshold in the second planning period but EPA is also currently aware of other states considering up to $10,000/ton as reasonable. We note that the first planning period involved the evaluation of BART controls at sources that were older and mostly uncontrolled. Considering the iterative nature of the regional haze program, it is reasonable to expect that following the installation of controls at

the largest sources during the first planning period, sources with lower emissions and thus potentially less cost-effective controls (i.e., higher $/ton figures) will likely be pulled in for evaluation in the second and subsequent planning periods. It may be a more appropriate approach to select cost thresholds for the second planning that are higher than those from the first planning period. Ultimately, if a state applies a threshold for cost/ton to evaluate control measures, the selected cost threshold should be justified based on a review of the sources selected for evaluation and the available controls for this planning period.

Regarding ODEQ's selection of a NOx control cost threshold in the range of $1,400 to $2,000/ton, which is based on the estimated marginal cost of complying with CSAPR Update ozone season NOx emissions budgets, we note that the transport program under CAA section 110(a)(2)(D)(i)(I) is an entirely separate program from regional haze, serving a different statutory purpose and involving the consideration of factors that may have no relationship to the regional haze program. There were numerous source-specific NOx controls estimated to cost over $2,000/ton that were found to be cost-effective in the first planning period by states and/or EPA. We recommend ODEQ look to examples and precedent within the regional haze program as a starting point for evaluating what may be cost-effective in making reasonable progress on visibility in the second planning period. We further note that the CSAPR Update was, by its own terms, only a partial remedy to the problem of interstate ozone transport for the 2008 ozone NAAQS, intended to obtain near-term emissions reductions by the 2017 ozone season. EPA has never made any finding that the control strategy in the CSAPR Update constituted the only emissions controls for NOx at EGUs that could be found to be cost-effective. Thus, we see no basis for the CSAPR Update to serve as a cost-effectiveness benchmark for Oklahoma's second planning period Regional Haze SIP. ODEQ's selection of a cost threshold of $1,400 to $2,000/ton for NOx controls in the second planning period does not seem appropriate or sufficiently justified. EPA suggests ODEQ consider applying a more robust cost threshold based on the full range of first planning period costs found to be reasonable, in addition to more recent control cost assumptions, including those found in other state plans for the second planning period.

We note that by taking the above comments into account and increasing the control cost thresholds, ODEQ could strengthen its long-term strategy and secure additional emissions reductions and visibility benefits. For instance, increasing the NOx control cost threshold could potentially result in several of the engines at the DCP Chitwood Plant being identified as cost-effective. NOx controls for five of the engines evaluated at the DCP Chitwood Plant were estimated by the company to cost in the range of $3,250 - $5,800.

25. Section 6.8 of the SIP narrative discusses the selection of cost thresholds and notes that "Because the emission units under evaluation are existing rather than new units, ODEQ concluded that Best Available Control Technology (BACT) cost factors would be inappropriate." (See page 36.) Please provide further clarification on this statement, including a discussion of the "cost factors" ODEQ is referring to.

Long-Term Strategy

26. ODEQ must clearly identify the enforceable emission limitations, compliance schedules, and other measures that are being included in the long-term strategy for the second planning period. Section 6.9 of the SIP narrative states that "[In addition to the ongoing air pollution control programs, the Smoke Management Plan, and the construction regulations in OAC 252:100-29], DEQ incorporates into its long-term strategy, the reductions documented in the four-factor analyses discussed in Section 6.4 above. See also Appendices E, F & G. Specifically, requirements and limitations associated with ONEOK's removal of seven engines and commitment to removing the remaining six before the end of Planning Period 2 (i.e., 12/31/2028) at the Maysville Gas Plant as agreed to in Regional Haze Agreement No. 22-085." No other requirements and limitations aside from those for the ONEOK Maysville Gas Plant appear to be included in Oklahoma's long-term strategy. This is inconsistent with section 6.4.2.3. of the SIP narrative, where ODEQ identifies non-selective catalytic reduction (NSCR) as a cost-effective control for engine CM-2322 at the Mustang Gas Binger Plant (at an estimated cost of $24.67/ton NOx removed) and states that the source will be required to install and operate this control technology no later than one year following EPA's approval of this portion of the Oklahoma Regional Haze SIP based on the four-factor analysis.

    When a state determines that a particular control is necessary for reasonable progress based on an evaluation of the four statutory factors, that control must be included in the state's long-term strategy. In this case, given that the four-factor analysis summary presented in the SIP narrative states that ODEQ is requiring the installation of NOx controls on engine CM-2322 based on the four-factor analysis provided by the company, a NOx emission limit consistent with the operation of this control equipment, reporting and recordkeeping requirements, and a compliance schedule must be included in the long-term strategy for the second planning period and must be clearly identified as such in the SIP. This is consistent with 40 CFR 51.308(f)(2), which states that "The long-term strategy must include the enforceable emission limitations, compliance schedules, and other measures that are necessary to make reasonable progress, as determined pursuant to (f)(2)(i) through (iv)."

27. The "Executive Summary" section of the draft SIP states that "Considering the advanced progress toward natural conditions thus far, the time remaining in planning period 2 (2018 – 2028), the results of the four-factor analyses, and financial uncertainty associated with Oklahoma's sources, DEQ selected a long-term strategy that recognizes and relies in large part upon the existing pollution control programs and clean energy technology advances that have resulted in and will continue to result in advanced progress. As older emission units continue to be replaced or retire, emission reductions will likely continue along the recent trends, and meeting a reasonable progress goal will be achievable with this long-term strategy." (See page 5 of SIP narrative). It is not clear how much weight ODEQ placed on the "financial uncertainty associated with Oklahoma's sources" in developing the long-term strategy given that this "financial uncertainty" does not appear to be discussed in detail elsewhere in the SIP. In any case, we do not consider "financial uncertainty associated with

Oklahoma's sources" to be an appropriate justification for ODEQ's conclusion that controls are not necessary for reasonable progress.

Additionally, the statement that "emission reductions will likely continue along the recent trends, and meeting a reasonable progress goal will be achievable with this long-term strategy" suggests a potential misunderstanding of the regional haze requirements and confusion regarding the relationship between RPGs and the long-term strategy. The Clean Air Act, 42 USC section 7491(b)(2), requires that SIPs contain long-term strategies for making reasonable progress towards the national visibility goal. The Regional Haze Rule establishes a framework of periodic, comprehensive SIP revisions to implement this mandate. 40 CFR 51.308(f) requires that each periodic SIP revision contain a strategy for making reasonable progress for the applicable period. The increment of progress that is "reasonable progress" for a given implementation period is determined through the four statutory factors. 40 CFR 51.308(f)(2)(i). EPA has explained that reasonable progress cannot be determined prior to or independently from the analysis of control measures for sources. See 82 FR 3078, 3091/3 (Jan. 10, 2017); Clarifications Memo at 6. ODEQ must therefore determine what is necessary to make reasonable progress in the second implementation period by using the four factors to analyze control measures for sources. While progress made in the first implementation period, ongoing emission trends, and anticipated changes in emissions (including due to shutdowns, on-the-way controls, or other factors) may inform a state's regional haze planning process, these circumstances alone do not satisfy a state's obligation to determine and include in its SIP the measures that are necessary to make reasonable progress. Therefore, any suggestion that a state's goal in a given planning period should be to establish a long-term strategy that achieves the RPG is incorrect and contrary to the Regional Haze Rule requirements. This statement should be removed from the SIP.

Progress Report

28. The Regional Haze Rule provides that the plan revision due on or before July 31, 2021, must include a commitment by the State to meet the requirements of paragraph (g) of this section. See 40 CFR 51.308(f). Consistent with this regulatory requirement, language should be added to Section 5 of the SIP narrative with a commitment to submit the January 31, 2025, progress report. See also August 2019 Guidance, Appendix D at D-5.

29. The Regional Haze Rule requires States to include in the SIP revision an assessment of any significant changes in anthropogenic emission within or outside the State that have occurred since the period addressed in the most recent plan required under paragraph (f) including whether or not these changes in anthropogenic emissions were anticipated in that most recent plan and whether they have limited or impeded progress in reducing pollutant emission and improving visibility. See 40 CFR 51.308(g)(5). The SIP Progress Report portion of the proposed SIP does not appear to address whether the changes in anthropogenic emissions discussed in Section 5.6 of the proposed SIP were anticipated in the most recent plan required under paragraph (f). The final SIP must address all portions of 40 CFR 51.308(g)(5).

State-to-State and FLM Consultation

30. The SIP narrative contains a statement on page 43 that seems to indicate that the legal standard triggering consultation is "significant" contribution to or impairment of visibility. (See "The Arkansas Division of Environmental Quality (ADEQ) identified two facilities in Oklahoma reasonably anticipated to impair visibility significantly at the Caney Creek Wilderness Area: OG&E Muskogee Generating Station and WFEC Hugo Generating Station.") The phrase "reasonably anticipated to impair visibility significantly" is not used in the federal regulation. (See Sec. 6.6, p. 34; 6.6.3, 6.6.4, p. 35). The legal standard is "reasonably anticipated to contribute to visibility impairment" 40 CFR 51.308(f)(2)(ii), which suggests a much lower threshold than "reasonably anticipated to impair visibility significantly." ODEQ should review the state of its consultations to ensure that they consistent with and can be justified under the "reasonably anticipated to contribute to visibility impairment" legal standard of 51.308(f)(2)(ii).

31. The SIP should include all available documentation of Oklahoma's consultations with other states, including copies of all correspondence between Oklahoma and other states. This is consistent with the requirement of 40 CFR 51.308(f)(2)(ii)(C) that "[a]ll substantive interstate consultations must be documented." The proposed SIP currently includes copies of two letters received by Oklahoma from the Missouri and Arkansas with "asks" from these states and copies of letters sent by Oklahoma to Texas, Nebraska, Louisiana, and Arkansas with "asks" from Oklahoma. However, there is no documentation of when/how Oklahoma responded to the letters it received or when/how Nebraska, Louisiana, and Arkansas responded to the "ask" letters sent by Oklahoma. Copies of any response letters sent or received by Oklahoma to these or any other states as part of state-to-state consultation must be included in the SIP. If there was no further written correspondence exchanged after the initial "ask" letters, Section 6 of the SIP narrative or Appendix A should document any follow-up discussions between the states.

32. Section 6 of the SIP narrative should clearly state if there is any disagreement between Oklahoma and another state regarding the outcome of the state-to-state consultation and/or the emission reduction measures necessary to make reasonable progress in a Class I area. In particular, Section 6.5 of the SIP narrative is vague as to whether Oklahoma agrees with Texas regarding the outcome of the consultation. Given the large contribution to visibility impairment at Wichita Mountains from Texas sources, any disagreement between the two states regarding the sources that should be analyzed, or control requirements should be clearly discussed.

33. The identification of the Muskogee Generating Station by both Arkansas and Missouri as reasonably anticipated to impair visibility at one or more of their Class I areas (see Sections 6.6.1 and 6.6.3) lends further support to our concern regarding ODEQ's decision to automatically eliminate the OG&E Muskogee Generating Station from further analysis on

the basis that this is a BART source. As we discussed elsewhere in this document, OG&E Muskogee Unit 6 is a coal-fired unit and is not subject to BART and thus was not evaluated or controlled under regional haze in the first planing period. In light of Oklahoma's consultation with Arkansas and Missouri, ODEQ should evaluate Unit 6 in a full four-factor analysis to determine if SO2 and/or NOx controls are necessary.

34. The Regional Haze Rule at 40 CFR 51.308(i)(4) requires that the plan (or plan revision) provide procedures for continuing consultation between the State and Federal Land Manager on the implementation of the visibility protection program. The proposed SIP revision does not appear to specifically address this requirement. The final SIP submittal must address this requirement at 40 CFR 51.308(i)(4).

Environmental Justice

35. As discussed in the Clarifications Memo, states have discretion to consider environmental justice in determining the measures that are necessary to make reasonable progress and formulating their long-term strategies, as long as such consideration is reasonable and not contrary to the regional haze requirements. *See* Clarifications Memo at 16. We encourage Oklahoma to consider whether there may be equity and environmental justice impacts in the development of its regional haze strategy for the second planning period, including impacts on tribal lands. *Id.* Section 8.2 of the SIP narrative provides a discussion of Oklahoma's consultation with Oklahoma tribes during the SIP development process. We also encourage Oklahoma to describe any outreach to other communities with environmental justice concerns or underserved communities that the State conducted, the opportunities Oklahoma has provided for communities to give feedback on its proposed strategy, and the consideration Oklahoma gave environmental justice and impacts on tribal lands in its technical analyses.

Other Observations

36. The Regional Haze Rule requires that states submit an implementation plan that includes an analysis of the actual progress made during the previous implementation period up to and including the period for calculating current visibility conditions, for the most impaired days and the clearest days. See 40 CFR 51.308(f)(1)(iv). Appendix D of the August 2019 Guidance explains that the "actual progress made during the previous implementation period up to and including the period for calculating current visibility conditions" is determined by calculating the difference between the average visibility condition in the period of 2003-2007 and the average visibility condition for each subsequent 5-year period, up to and including the 5-year period that determines current visibility conditions. See August 2029 Guidance, Appendix D, at D-1. Consistent with the Regional Haze Rule and our guidance, this analysis should be added to the SIP.

37. Provision # 28 of the Consent Order between ODEQ and ONEOK contained in Appendix F provides that "This agreement shall remain open until the Regional Haze SIP into which it is incorporated is superseded by a subsequent EPA-approved Regional Haze SIP." This provision is vague. For instance, it is not clear if the portion of the provision stating "This agreement shall remain open…" is intended to mean that the agreement shall remain in effect and binding upon the parties, or whether something else is intended. Additionally, the portion of the provision stating "…until the Regional Haze SIP into which it is incorporated is superseded by a subsequent EPA-approved Regional Haze SIP" could be interpreted in more than one way. It is not clear if the State and the company interpret this provision to mean that when EPA approves Oklahoma's Regional Haze SIP for the third planning period, the Regional Haze SIP for the second planning period will be considered to be "superseded" and thus the ONEOK Consent Order will no longer be effective. If so, this provision is inappropriate given that when EPA approves a revision to a SIP, the revision either adds to the existing SIP and/or may replace or revise specific provisions in the existing SIP but it does not necessarily supersede the previously approved SIP. Therefore, provision #28 should be removed or redacted from the final SIP submitted to EPA.

38. Section 3.2 of the SIP narrative discusses the deciview visibility index at the Wichita Mountains and states that Table 3-8 lists the 2018 RPGs for the Wichita Mountains. However, it appears that this is erroneously labeled as "EPA-calculated RPG for 2028" in Table 3-8. We recommend that the label in Table 3-8 be corrected to state "EPA-calculated RPG for 2018."

39. Figure 4-4 presented in the SIP narrative shows the breakdown of Oklahoma 2014 NEI NOx emissions, including the breakdown of oil and gas NOx emissions. In light of the large proportion of Oklahoma NOx emissions from oil and gas, it would be informative for ODEQ to include a breakdown of NOx emissions by category for 2017 NEI emissions as well given that 2017 is the most recent year of NEI data available.

40. Section 1 of the SIP narrative includes a short summary of Oklahoma's request under the Safe, Accountable, Flexible, Efficient Transportation Equity Act of 2005 (SAFETEA) to administer the State's environmental regulatory programs in certain areas of Indian Country. At the end of that paragraph is the statement: "For the purposes of this Planning Period 2 RH SIP, DEQ intends to request information and seek reductions as necessary to meet the goals of the RH Rule in all areas of the state." (See SIP narrative at page 6). This statement is not sufficiently clear or specific. The state should, following the contours of any approval pursuant to Section 10211(a) of the Safe, Accountable, Flexible, Efficient Transportation Equity Act of 2005: A Legacy for Users, Pub. Law 109-59, 119 Stat. 1144, 1937 (August 10, 2005), expressly address the geographic scope of where the plan will apply and to what areas of Indian country.

[EXTERNAL] Proposed Oklahoma RH SIP, Planning Period 2 - Comments
Holt, Lynn C <LCHolt@dcpmidstream.com>
Wed 6/29/2022 2:11 PM
To:

- DEQ AQD SIP Comments <aqdsipcomments@deq.ok.gov>

Cc:

- Holt, Lynn C <LCHolt@dcpmidstream.com>;
- Ondak, Stephen R <SROndak@dcpmidstream.com>

To whom it may concern,

DCP has reviewed the Draft Regional Haze State Implementation Plan for the Second Planning Period dated June 1, 2022, and is submitting the following observations and comments with respect to those portions relevant to DCP Operating - Chitwood Gas Plant.

In section 6.4.2.7, second sentence, annual emissions emitted by DCP identified by ODEQ are 833 tons of NOx from various natural gas fueled engines on site. This value is not limited to only the natural gas engines on site. The 833 tons NOx includes 11 tons from other non-engine sources. The 2016 emissions inventory included 822 tons of NOx from natural gas fueled engines. In addition, DCP revised the 2016 inventory in Jan 2020. The revised inventory represented lower emissions than originally reported due to correcting the actual run hours of a diesel fired pump operation and revising emissions for another engine based on stack test data. The corrected NOx emissions for engine only sources is 765.5 tons NOx in 2016. DCP does not believe this is a major change in the draft SIP, however suggestions revision in the interest of completeness and accuracy.

In Section 6.4.2.7, fourth sentence, ODEQ identified the classification of the engines as two-stroke lean burn with the exception of C-6 and C-7 which are not classified. DCP has classified these engines as four-stroke lean burn engines based on the exhaust oxygen in excess of the threshold limit of 2% excess oxygen. These engines were evaluated as such in DCP has attempted to install controls on the units in the past and was unable to achieve reliable operation at reduced combustion oxygen levels. Therefore these two (2) engines are considered and authorized as lean burn engines. While also not a significant point to the overall draft SIP, DCP feels the inclusion is important for completeness since the other engines are classified.

Section 6.4.2.7 states that “at the suggestion of EPA, DEQ calculated the cost options at a lower interest rate (3.25%) than the rate used by DCP (7%)”. DCP disagrees with the assertion that the lower interest rate is appropriate. DCP also included the current (February 2022) cost of borrowing capital in the additional response submitted on February 17, 2022, as 5.54%. The cost of borrowing has significantly increased in the past several months, not decreased; therefore DCP disagrees that a 3.25% rate is appropriate and respectfully suggests that 7% is a more appropriate benchmark.

Thank you for the opportunity to comment and thank you for providing an email option for submittal of comments.

Sincerely,
DCP Operating Company, LP

Lynn Holt
Principal Environmental Specialist
COK / Liberal
T: (405) 568-3775
C: (903) 754-0945

Jared Milano

From: Candace Meyer <Candace.Meyer.482214504@p2a.co>
Sent: Tuesday, June 28, 2022 1:57 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] We need more progress to improve our air.

Dear Air Quality Division, ODEQ Melanie Foster,

I write today because I deeply value national parks and wilderness areas protected under the Regional Haze Rule.

I am very disappointed that the Department's proposed Regional Haze plan will not amount to any new reductions in pollution even though sources harm visibility in places like Wichita Mountains, Caney Creek Wilderness and Guadalupe Mountains National Park. Moreover, many of the polluting sources in Oklahoma are impacting communities hardest hit by the problem such as Garfield, Muskogee, and Choctaw counties.

The draft SIP is woefully inadequate and fails to require cost-effective controls for polluting sources across the state. Oklahoma is obligated to make progress toward improving air quality and limiting haze pollution in Class I areas—if the plan is left unchanged, it will not do these things or comply with the federal Clean Air Act or the EPA's Regional Haze Rule.

I urge you to revise the plan by:

--Requiring emission controls for the sources the state selected for review in this planning period;
--Establishing a much lower cost-of-control thresholds for reasonable progress that is in line with other states;
--Correcting the inflated cost of controls calculations; and,
--Thoroughly assessing environmental injustice impacts as recommended by EPA.

These revisions will ensure the state is making reasonable progress towards clearer air in our national parks, wilderness areas and communities.

Regards,
Candace Meyer
822 N Stewart Ave
Norman, OK 73071

Jared Milano

From: Joe Henry <Joe.Henry.145243137@p2a.co>
Sent: Tuesday, June 28, 2022 9:46 AM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] We need more progress to improve our air.

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Regards,
Joe Henry
1901 E Lindsey St
Norman, OK 73071

Jared Milano

From: Jay Hiller <Jay.Hiller.9206148@p2a.co>
Sent: Saturday, July 2, 2022 2:51 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] We need more progress to improve our air.

Dear Air Quality Division, ODEQ Melanie Foster,

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Regards,
Jay Hiller
9408 Winding Hollow Rd
Oklahoma City, OK 73151

Jared Milano

From: Kathy Nix <Kathy.Nix.331142277@p2a.co>
Sent: Tuesday, June 28, 2022 10:35 AM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] We need more progress to improve our air.

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Regards,
Kathy Nix
901 Regal Rd
Yukon, OK 73099

Jared Milano

From: Larry Sherman <Larry.Sherman.557415616@p2a.co>
Sent: Tuesday, June 28, 2022 10:24 AM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] We need more progress to improve our air.

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These revisions will ensure the state is making reasonable progress towards clearer air in our national parks, wilderness areas and communities.

Regards,
Larry Sherman
4401 High Point
Edmond, OK 73025

Jared Milano

From: Maurice Hawthorne <Maurice.Hawthorne.425199514@p2a.co>
Sent: Tuesday, June 28, 2022 2:20 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] We need more progress to improve our air.

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Regards,
Maurice Hawthorne
468 NW 1025th Ave
Wilburton, OK 74578

Jared Milano

From: Nannette Tresner <Nannette.Tresner.132957526@p2a.co>
Sent: Tuesday, June 28, 2022 11:04 AM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] We need more progress to improve our air.

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Regards,
Nannette Tresner
165 Coonrod Dr
Mannford, OK 74044

Jared Milano

From: Patrick Green <Patrick.Green.46939540@p2a.co>
Sent: Tuesday, June 28, 2022 7:52 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] We need more progress to improve our air.

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Regards,
Patrick Green
14946 East 93rd St N
Owasso, OK 74055

Jared Milano

From: Scheree Davis <Scheree.Davis.41085336@p2a.co>
Sent: Wednesday, June 29, 2022 1:58 AM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] We need more progress to improve our air.

Dear Air Quality Division, ODEQ Melanie Foster,

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Regards,
Scheree Davis
24352 S 4090 Rd
Claremore, OK 74019

Jared Milano

From: Timothy Stebler <Timothy.Stebler.557534669@p2a.co>
Sent: Wednesday, June 29, 2022 3:21 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] We need more progress to improve our air.

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--Establishing a much lower cost-of-control thresholds for reasonable progress that is in line with other states;
--Correcting the inflated cost of controls calculations; and, iy eh
--Thoroughly assessing environmental injustice impacts as recommended by EPA.

These revisions will ensure the state is making reasonable progress towards clearer air in our national parks, wilderness areas and communities.

Regards,
Timothy Stebler
2024 E 19th Ave
Stillwater, OK 74074

Jared Milano

From: Vickie Harvey <Vickie.Harvey.558006961@p2a.co>
Sent: Thursday, June 30, 2022 4:30 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] We need more progress to improve our air.

Dear Air Quality Division, ODEQ Melanie Foster,

I write today because I deeply value national parks and wilderness areas protected under the Regional Haze Rule.

I am very disappointed that the Department's proposed Regional Haze plan will not amount to any new reductions in pollution even though sources harm visibility in places like Wichita Mountains, Caney Creek Wilderness and Guadalupe Mountains National Park. Moreover, many of the polluting sources in Oklahoma are impacting communities hardest hit by the problem such as Garfield, Muskogee, and Choctaw counties.

The draft SIP is woefully inadequate and fails to require cost-effective controls for polluting sources across the state. Oklahoma is obligated to make progress toward improving air quality and limiting haze pollution in Class I areas—if the plan is left unchanged, it will not do these things or comply with the federal Clean Air Act or the EPA's Regional Haze Rule.

I urge you to revise the plan by:

--Requiring emission controls for the sources the state selected for review in this planning period;
--Establishing a much lower cost-of-control thresholds for reasonable progress that is in line with other states;
--Correcting the inflated cost of controls calculations; and,
--Thoroughly assessing environmental injustice impacts as recommended by EPA.

These revisions will ensure the state is making reasonable progress towards clearer air in our national parks, wilderness areas and communities.

Regards,
Vickie Harvey
18435 SE 74th St
Oklahoma City, OK 74857

Jared Milano

From: Weldon Williams <Weldon.Williams.33498922@p2a.co>
Sent: Wednesday, June 29, 2022 4:31 AM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] We need more progress to improve our air.

Dear Air Quality Division, ODEQ Melanie Foster,

I write today because I deeply value national parks and wilderness areas protected under the Regional Haze Rule.

I am very disappointed that the Department's proposed Regional Haze plan will not amount to any new reductions in pollution even though sources harm visibility in places like Wichita Mountains, Caney Creek Wilderness and Guadalupe Mountains National Park. Moreover, many of the polluting sources in Oklahoma are impacting communities hardest hit by the problem such as Garfield, Muskogee, and Choctaw counties.

The draft SIP is woefully inadequate and fails to require cost-effective controls for polluting sources across the state. Oklahoma is obligated to make progress toward improving air quality and limiting haze pollution in Class I areas—if the plan is left unchanged, it will not do these things or comply with the federal Clean Air Act or the EPA's Regional Haze Rule.

I urge you to revise the plan by:

--Requiring emission controls for the sources the state selected for review in this planning period;
--Establishing a much lower cost-of-control thresholds for reasonable progress that is in line with other states;
--Correcting the inflated cost of controls calculations; and,
--Thoroughly assessing environmental injustice impacts as recommended by EPA.

These revisions will ensure the state is making reasonable progress towards clearer air in our national parks, wilderness areas and communities.

Regards,
Weldon Williams
7625 North 140th Ave E
Owasso, OK 74055

Jared Milano

From: Anna Blewett (annablewett57@gmail.com) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Wednesday, June 29, 2022 2:24 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Introduce a Regional Haze Plan that requires cost-effective pollution controls to protect our wilderness areas

Dear Oklahoma DEQ,

Oklahoma must propose a regional haze plan that effectively reduces pollution to fulfill the state?s statutory and regulatory obligation to improve air quality for our wilderness areas and communities.

To satisfy the text and purpose of the Regional Haze Rule and the Clean Air Act, we ask that the state?s plan:

- Require cost-effective, technically-feasible emission controls identified in the review of emission-reducing measures (four-factor analyses) for the coal power plants and oil and gas facilities the state selected for review in this planning period.
- Establish a cost-effectiveness threshold for reasonable progress and one that is in line with other states.
- Thoroughly assess environmental justice impacts (as EPA recommended).

Not only does poor air quality affect the health and enjoyment of those visiting our wilderness areas and national parks, it also threatens our economies. Our national parks provide nearly $42 billion in economic benefit and support hundreds of thousands of jobs across the country each year. Without strong safeguards protecting the air we breathe, we can?t keep these places and local economies strong, let alone keep people healthy.

Sincerely,

Anna Blewett
4508 S Butternutt ave
Broken Arrow, OK 74011
annablewett57@gmail.com
(918) 521-4409

Jared Milano

From: Allison Lemke (allison.k.lemke@ou.edu) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Wednesday, June 29, 2022 12:34 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Introduce a Regional Haze Plan that requires cost-effective pollution controls to protect our wilderness areas

Dear Oklahoma DEQ,

Oklahoma must propose a regional haze plan that effectively reduces pollution to fulfill the state?s statutory and regulatory obligation to improve air quality for our wilderness areas and communities.

To satisfy the text and purpose of the Regional Haze Rule and the Clean Air Act, we ask that the state?s plan:

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Not only does poor air quality affect the health and enjoyment of those visiting our wilderness areas and national parks, it also threatens our economies. Our national parks provide nearly $42 billion in economic benefit and support hundreds of thousands of jobs across the country each year. Without strong safeguards protecting the air we breathe, we can?t keep these places and local economies strong, let alone keep people healthy. Thank you in advance for keeping Oklahoma safe.

Sincerely,

Allison Lemke
18365 Chuckwagon Trl
Norman, OK 73072
allison.k.lemke@ou.edu
(405) 310-7277

Jared Milano

From: Betty Ripley (brown.ripley@gmail.com) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Wednesday, June 29, 2022 8:49 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Oklahoma's wilderness areas deserve clean air

Dear Oklahoma DEQ,

Please work to improve air quality for Oklahoma's wilderness areas which create the distinctive beauty of our state.

Oklahoma must propose a regional haze plan that effectively reduces pollution to fulfill the state?s statutory and regulatory obligation to improve air quality for our wilderness areas and communities.

To satisfy the text and purpose of the Regional Haze Rule and the Clean Air Act, we ask that the state?s plan:

- Require cost-effective, technically-feasible emission controls identified in the review of emission-reducing measures (four-factor analyses) for the coal power plants and oil and gas facilities the state selected for review in this planning period.
- Establish a cost-effectiveness threshold for reasonable progress and one that is in line with other states.
- Thoroughly assess environmental justice impacts (as EPA recommended).

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Sincerely,

Betty Ripley
2909 Windmill Circle
Norman, OK 73072
brown.ripley@gmail.com
(405) 838-0670

Jared Milano

From: Barbara VanHanken (bvanhanken@gmail.com) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Wednesday, June 29, 2022 2:16 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Introduce a Regional Haze Plan that requires cost-effective pollution controls to protect our wilderness areas

Dear Oklahoma DEQ,

Oklahomans have lived too long with bad air as reported by the American Lung Association annually. Tulsa is rated with an F or D for air quality. We must have accountability for improving the health and welfare of all its citizens.

Oklahoma must propose a regional haze plan that effectively reduces pollution to fulfill the state?s statutory and regulatory obligation to improve air quality for our wilderness areas and communities.

To satisfy the text and purpose of the Regional Haze Rule and the Clean Air Act, we ask that the state?s plan:

- Require cost-effective, technically-feasible emission controls identified in the review of emission-reducing measures (four-factor analyses) for the coal power plants and oil and gas facilities the state selected for review in this planning period.
- Establish a cost-effectiveness threshold for reasonable progress and one that is in line with other states.
- Thoroughly assess environmental justice impacts (as EPA recommended).

Not only does poor air quality affect the health and enjoyment of those visiting our wilderness areas and national parks, it also threatens our economies. Our national parks provide nearly $42 billion in economic benefit and support hundreds of thousands of jobs across the country each year. Without strong safeguards protecting the air we breathe, we can?t keep these places and local economies strong, let alone keep people healthy.

Sincerely,

Barbara VanHanken
2212 E 38th St
Tulsa, OK 74105
bvanhanken@gmail.com
(918) 671-6217

Jared Milano

From: Carly Costley (carlycostley@yahoo.com) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Wednesday, June 29, 2022 12:40 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Introduce a Regional Haze Plan that requires cost-effective pollution controls to protect our wilderness areas

Dear Oklahoma DEQ,

Oklahoma must propose a regional haze plan that effectively reduces pollution to fulfill the state?s statutory and regulatory obligation to improve air quality for our wilderness areas and communities.

To satisfy the text and purpose of the Regional Haze Rule and the Clean Air Act, we ask that the state?s plan:

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Not only does poor air quality affect the health and enjoyment of those visiting our wilderness areas and national parks, it also threatens our economies. Our national parks provide nearly $42 billion in economic benefit and support hundreds of thousands of jobs across the country each year. Without strong safeguards protecting the air we breathe, we can?t keep these places and local economies strong, let alone keep people healthy.

Sincerely,

Carly Costley
3536 E 22nd Pl
Tulsa, OK 74114
carlycostley@yahoo.com
(918) 520-5124

Jared Milano

From: Cameron Cross (crossfiredude@att.net) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Thursday, June 30, 2022 12:52 AM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Introduce a Regional Haze Plan that requires cost-effective pollution controls to protect our wilderness areas

Dear Oklahoma DEQ,

Oklahoma must propose a regional haze plan that effectively reduces pollution to fulfill the state?s statutory and regulatory obligation to improve air quality for our wilderness areas and communities.

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Sincerely,

Cameron Cross
5106 E. 22nd Place
Tulsa, OK 74114
crossfiredude@att.net
(918) 292-9244

Jared Milano

From: Cathy Reynolds (cathyreynolds@juno.com) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Wednesday, June 29, 2022 2:30 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Introduce a Regional Haze Plan that requires cost-effective pollution controls to protect our wilderness areas

Dear Oklahoma DEQ,

Oklahoma must propose a regional haze plan that effectively reduces pollution to fulfill the state?s statutory and regulatory obligation to improve air quality for our wilderness areas and communities.

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Not only does poor air quality affect the health and enjoyment of those visiting our wilderness areas and national parks, it also threatens our economies. Our national parks provide nearly $42 billion in economic benefit and support hundreds of thousands of jobs across the country each year. Without strong safeguards protecting the air we breathe, we can?t keep these places and local economies strong, let alone keep people healthy.

Sincerely,

Cathy Reynolds
181488 N 2580 Rd
Walters, OK 73572
cathyreynolds@juno.com
(580) 875-3677

Jared Milano

From: Cherie Wheeler (cdwheeler19@gmail.com) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Wednesday, June 29, 2022 2:03 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Introduce a Regional Haze Plan that requires cost-effective pollution controls to protect our wilderness areas

Dear Oklahoma DEQ,

Oklahoma must propose a regional haze plan that effectively reduces pollution to fulfill the state?s statutory and regulatory obligation to improve air quality for our wilderness areas and communities.

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Not only does poor air quality affect the health and enjoyment of those visiting our wilderness areas and national parks, it also threatens our economies. Our national parks provide nearly $42 billion in economic benefit and support hundreds of thousands of jobs across the country each year. Without strong safeguards protecting the air we breathe, we can?t keep these places and local economies strong, let alone keep people healthy.

Sincerely,

Cherie Wheeler
6721 S Knoxville Ave
Tulsa, OK 74136
cdwheeler19@gmail.com
(918) 408-6888

Jared Milano

From: Dale Bushyhead (ravetwodawn@hotmail.com) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Wednesday, June 29, 2022 12:42 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Introduce a Regional Haze Plan that requires cost-effective pollution controls to protect our wilderness areas

Dear Oklahoma DEQ,

Oklahoma must propose a regional haze plan that effectively reduces pollution to fulfill the state?s statutory and regulatory obligation to improve air quality for our wilderness areas and communities.

To satisfy the text and purpose of the Regional Haze Rule and the Clean Air Act, we ask that the state?s plan:

- Require cost-effective, technically-feasible emission controls identified in the review of emission-reducing measures (four-factor analyses) for the coal power plants and oil and gas facilities the state selected for review in this planning period.
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Sincerely,

Dale Bushyhead
1203 E 143rd St
Glenpool, OK 74033
ravetwodawn@hotmail.com
(918) 257-4118

Jared Milano

From: Deborah Hirt (aviannovice@aol.com) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Wednesday, June 29, 2022 12:52 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Introduce a Regional Haze Plan that requires cost-effective pollution controls to protect our wilderness areas

Dear Oklahoma DEQ,

Save our lands from smog!

Oklahoma must propose a regional haze plan that effectively reduces pollution to fulfill the state?s statutory and regulatory obligation to improve air quality for our wilderness areas and communities.

To satisfy the text and purpose of the Regional Haze Rule and the Clean Air Act, we ask that the state?s plan:

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Sincerely,

Deborah Hirt
209 West Lakeview Rd., #A, #A
Stillwater, OK 74075
aviannovice@aol.com
(814) 319-4091

Jared Milano

From: Douglas Horton (crusade2000@aol.com) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Wednesday, June 29, 2022 2:43 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Introduce a Regional Haze Plan that requires cost-effective pollution controls to protect our wilderness areas

Dear Oklahoma DEQ,

Oklahoma must propose a regional haze plan that effectively reduces pollution to fulfill the state?s statutory and regulatory obligation to improve air quality for our wilderness areas and communities.

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Sincerely,

Douglas Horton
26 N 65th W Ave.
Tulsa, OK 74127
crusade2000@aol.com
(918) 282-5474

Jared Milano

From: Debe Judah (dsjudah@yahoo.com) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Wednesday, June 29, 2022 3:29 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Introduce a Regional Haze Plan that requires cost-effective pollution controls to protect our wilderness areas

Dear Oklahoma DEQ,

Oklahoma must propose a regional haze plan that effectively reduces pollution to fulfill the state?s statutory and regulatory obligation to improve air quality for our wilderness areas and communities.

To satisfy the text and purpose of the Regional Haze Rule and the Clean Air Act, we ask that the state?s plan:

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Sincerely,

Debe Judah
4028 E 87th St
Tulsa, OK 74137
dsjudah@yahoo.com
(918) 254-9730

Jared Milano

From: Douglas Weirick (dweirick@gmail.com) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Wednesday, June 29, 2022 2:46 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Introduce a Regional Haze Plan that requires cost-effective pollution controls to protect our wilderness areas

Dear Oklahoma DEQ,

Oklahoma must propose a regional haze plan that effectively reduces pollution to fulfill the state?s statutory and regulatory obligation to improve air quality for our wilderness areas and communities.

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Sincerely,

Douglas Weirick
530 Rebecca Ln
Ada, OK 74820
dweirick@gmail.com
(580) 399-3796

Jared Milano

From: Elise Kilpatrick (ekil@cox.net) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Wednesday, June 29, 2022 12:55 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Introduce a Regional Haze Plan that requires cost-effective pollution controls to protect our wilderness areas

Dear Oklahoma DEQ,

Oklahoma must propose a regional haze plan that effectively reduces pollution to fulfill the state?s statutory and regulatory obligation to improve air quality for our wilderness areas and communities.

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Sincerely,

Elise Kilpatrick
1904 S Cheyenne Ave
Tulsa, OK 74119
ekil@cox.net
(918) 557-9902

Jared Milano

From: Ellen Trump (ellenrayejo@hotmail.com) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Wednesday, June 29, 2022 12:51 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Introduce a Regional Haze Plan that requires cost-effective pollution controls to protect our wilderness areas

Dear Oklahoma DEQ,

The health of the environment corresponds directly to the quality of health of the people, fauna, and flora. Please propose a haze plan.
Thank you,
Ellen Trump

Oklahoma must propose a regional haze plan that effectively reduces pollution to fulfill the state?s statutory and regulatory obligation to improve air quality for our wilderness areas and communities.

To satisfy the text and purpose of the Regional Haze Rule and the Clean Air Act, we ask that the state?s plan:

- Require cost-effective, technically-feasible emission controls identified in the review of emission-reducing measures (four-factor analyses) for the coal power plants and oil and gas facilities the state selected for review in this planning period.
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Sincerely,

Ellen Trump
7608 NW 39th St
Bethany, OK 73008
ellenrayejo@hotmail.com
(405) 365-4420

Jared Milano

From: Frank Barry (franknberi@yahoo.com) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Wednesday, June 29, 2022 2:24 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Introduce a Regional Haze Plan that requires cost-effective pollution controls to protect our wilderness areas

Dear Oklahoma DEQ,

Oklahoma must propose a regional haze plan that effectively reduces pollution to fulfill the state?s statutory and regulatory obligation to improve air quality for our wilderness areas and communities.

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Sincerely,

Frank Barry
612 SW 6th St
Moore, OK 73160
franknberi@yahoo.com
(405) 659-5682

Jared Milano

From: Gary Cathey (grandpa320@gmail.com) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Wednesday, June 29, 2022 12:36 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Introduce a Regional Haze Plan that requires cost-effective pollution controls to protect our wilderness areas

Dear Oklahoma DEQ,

I go hunting and fishing need to protect our outdoors

Oklahoma must propose a regional haze plan that effectively reduces pollution to fulfill the state?s statutory and regulatory obligation to improve air quality for our wilderness areas and communities.

To satisfy the text and purpose of the Regional Haze Rule and the Clean Air Act, we ask that the state?s plan:

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Sincerely,

Gary Cathey
12416 Sweetwater Dr
Yukon, OK 73099
grandpa320@gmail.com
(405) 819-1570

Jared Milano

From: HOWARD BAER (baer@nhn.ou.edu) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Wednesday, June 29, 2022 1:05 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Introduce a Regional Haze Plan that requires cost-effective pollution controls to protect our wilderness areas

Dear Oklahoma DEQ,

Oklahoma must propose a regional haze plan that effectively reduces pollution to fulfill the state?s statutory and regulatory obligation to improve air quality for our wilderness areas and communities.

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Sincerely,

HOWARD BAER
1110 Mockingbird Ln
Norman, OK 73071
baer@nhn.ou.edu
(405) 701-1709

Jared Milano

From: Hayley Brown (hayley.mariecardenas@gmail.com) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Wednesday, June 29, 2022 2:37 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Introduce a Regional Haze Plan that requires cost-effective pollution controls to protect our wilderness areas

Dear Oklahoma DEQ,

Oklahoma must propose a regional haze plan that effectively reduces pollution to fulfill the state?s statutory and regulatory obligation to improve air quality for our wilderness areas and communities.

To satisfy the text and purpose of the Regional Haze Rule and the Clean Air Act, we ask that the state?s plan:

- Require cost-effective, technically-feasible emission controls identified in the review of emission-reducing measures (four-factor analyses) for the coal power plants and oil and gas facilities the state selected for review in this planning period.
- Establish a cost-effectiveness threshold for reasonable progress and one that is in line with other states.
- Thoroughly assess environmental justice impacts (as EPA recommended).

Not only does poor air quality affect the health and enjoyment of those visiting our wilderness areas and national parks, it also threatens our economies. Our national parks provide nearly $42 billion in economic benefit and support hundreds of thousands of jobs across the country each year. Without strong safeguards protecting the air we breathe, we can?t keep these places and local economies strong, let alone keep people healthy.

Sincerely,

Hayley Brown
447223 E 993 Rd
Gore, OK 74435
hayley.mariecardenas@gmail.com
(918) 315-3851

Jared Milano

From: Holly Hunter (hhunter1111@gmail.com) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Friday, July 1, 2022 1:02 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Please protect our air quality in Oklahoma

Dear Oklahoma DEQ,

This is more important than ever. Oklahoma should lead the way in protecting our air, regardless of what other states do. Thank you.

Oklahoma must propose a regional haze plan that effectively reduces pollution to fulfill the state?s statutory and regulatory obligation to improve air quality for our wilderness areas and communities.

To satisfy the text and purpose of the Regional Haze Rule and the Clean Air Act, we ask that the state?s plan:

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Sincerely,

Holly Hunter
6417 Ellen Ln
Oklahoma City, OK 73132
hhunter1111@gmail.com
(469) 235-1228

Jared Milano

From: James And Audrey Martin (jemartin@ou.edu) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Wednesday, June 29, 2022 6:35 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Introduce a Regional Haze Plan that requires cost-effective pollution controls to protect our wilderness areas

Dear Oklahoma DEQ,

Oklahoma must propose a regional haze plan that effectively reduces pollution to fulfill the state?s statutory and regulatory obligation to improve air quality for our wilderness areas and communities.

To satisfy the text and purpose of the Regional Haze Rule and the Clean Air Act, we ask that the state?s plan:

- Require cost-effective, technically-feasible emission controls identified in the review of emission-reducing measures (four-factor analyses) for the coal power plants and oil and gas facilities the state selected for review in this planning period.
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Sincerely,

James And Audrey Martin
4304 Harrogate Dr
Norman, OK 73072
jemartin@ou.edu
(405) 831-3660

Jared Milano

From: Joe Allen Henry (joeallendesign@yahoo.com) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Wednesday, June 29, 2022 12:52 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Introduce a Regional Haze Plan that requires cost-effective pollution controls to protect our wilderness areas

Dear Oklahoma DEQ,

Oklahoma must propose a regional haze plan that effectively reduces pollution to fulfill the state?s statutory and regulatory obligation to improve air quality for our wilderness areas and communities.

To satisfy the text and purpose of the Regional Haze Rule and the Clean Air Act, we ask that the state?s plan:

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Sincerely,

Joe Allen Henry
1901 E. LINDSEY ST., NORMAN OK 73071
Norman, OK 73071
joeallendesign@yahoo.com
(405) 928-5785

Jared Milano

From: John Hinds (hayduke215@gmail.com) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Wednesday, June 29, 2022 1:22 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Introduce a Regional Haze Plan that requires cost-effective pollution controls to protect our wilderness areas

Dear Oklahoma DEQ,

Oklahoma must propose a regional haze plan that effectively reduces pollution to fulfill the state?s statutory and regulatory obligation to improve air quality for our wilderness areas and communities.

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Sincerely,

John Hinds
1516 S 67th E Ave
Tulsa, OK 74112
hayduke215@gmail.com
(918) 262-1174

Jared Milano

From: Jolene Robertson (vjrobertson49@gmail.com) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Thursday, June 30, 2022 4:58 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Introduce a Regional Haze Plan that requires cost-effective pollution controls to protect our wilderness areas

Dear Oklahoma DEQ,

Oklahoma must propose a regional haze plan that effectively reduces pollution to fulfill the state?s statutory and regulatory obligation to improve air quality for our wilderness areas and communities.

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Sincerely,

Jolene Robertson
2408 East Prospect Ave
Ponca City, OK 74604
vjrobertson49@gmail.com
(580) 763-7615

Jared Milano

From: Jessica Sherwood (heal41hp@yahoo.com) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Thursday, June 30, 2022 10:42 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Introduce a Regional Haze Plan that requires cost-effective pollution controls to protect our wilderness areas

Dear Oklahoma DEQ,

Oklahoma must propose a regional haze plan that effectively reduces pollution to fulfill the state?s statutory and regulatory obligation to improve air quality for our wilderness areas and communities.

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Sincerely,

Jessica Sherwood
411 W. K Pl.
Jenks, OK 74037
heal41hp@yahoo.com
(918) 298-3102

Jared Milano

From: Joan York (joan.york@sentienceonline.net) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Wednesday, June 29, 2022 3:08 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Introduce a Regional Haze Plan that requires cost-effective pollution controls to protect our wilderness areas

Dear Oklahoma DEQ,

Oklahoma must propose a regional haze plan that effectively reduces pollution to fulfill the state?s statutory and regulatory obligation to improve air quality for our wilderness areas and communities.

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Sincerely,

Joan York
111 East Redbud Drive
Stillwater, OK 74075
joan.york@sentienceonline.net
(405) 747-7803

Jared Milano

From: Karla Hinton (khintonou1@gmail.com) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Wednesday, June 29, 2022 8:47 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Introduce a Regional Haze Plan that requires cost-effective pollution controls to protect our wilderness areas

Dear Oklahoma DEQ,

Oklahoma must propose a regional haze plan that effectively reduces pollution to fulfill the state?s statutory and regulatory obligation to improve air quality for our wilderness areas and communities.

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Sincerely,

Karla Hinton
2104 Ashley Place
Ponca City, OK 74604
khintonou1@gmail.com
(580) 401-9010

Jared Milano

From: Kara Mccullar (karamccullar@hotmail.com) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Wednesday, June 29, 2022 12:59 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Introduce a Regional Haze Plan that requires cost-effective pollution controls to protect our wilderness areas

Dear Oklahoma DEQ,

Oklahoma must propose a regional haze plan that effectively reduces pollution to fulfill the state?s statutory and regulatory obligation to improve air quality for our wilderness areas and communities.

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Sincerely,

Kara Mccullar
1234 main
Oklahoma City, OK 73127
karamccullar@hotmail.com
(405) 405-4050

Jared Milano

From: Kathy Walsh (kath68144@yahoo.com) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Wednesday, June 29, 2022 2:40 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Introduce a Regional Haze Plan that requires cost-effective pollution controls to protect our wilderness areas

Dear Oklahoma DEQ,

Oklahoma must propose a regional haze plan that effectively reduces pollution to fulfill the state?s statutory and regulatory obligation to improve air quality for our wilderness areas and communities.

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Sincerely,

Kathy Walsh
12701 N PENNSYLVANIA AVE, APT 177N
Oklahoma City, OK 73120
kath68144@yahoo.com
(405) 541-5898

Jared Milano

From: LaDonna Darius (nahaky98@yahoo.com) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Wednesday, June 29, 2022 12:44 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Introduce a Regional Haze Plan that requires cost-effective pollution controls to protect our wilderness areas

Dear Oklahoma DEQ,

It's important to have clean air so that people like me who have breathing problems can have clean air to breathe so that our lungs work better.
I have lived in San Diego, CA. It was very hard to breathe there. And the plant and animal life also suffered from all the pollution as well.
Please do all you can to clean the air and keep it clean.
Thank you,
LaDonna Darius

Oklahoma must propose a regional haze plan that effectively reduces pollution to fulfill the state?s statutory and regulatory obligation to improve air quality for our wilderness areas and communities.

To satisfy the text and purpose of the Regional Haze Rule and the Clean Air Act, we ask that the state?s plan:

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Sincerely,

LaDonna Darius
700 N. Elliott St, Apt 409
Pryor, OK 74361
nahaky98@yahoo.com
(918) 892-7203

Jared Milano

From: Lana Henson (lanarh@aol.com) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Wednesday, June 29, 2022 1:45 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Introduce a Regional Haze Plan that requires cost-effective pollution controls to protect our wilderness areas

Dear Oklahoma DEQ,

Oklahoma must propose a regional haze plan that effectively reduces pollution to fulfill the state?s statutory and regulatory obligation to improve air quality for our wilderness areas and communities.

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Sincerely,

Lana Henson
2009 N Gatewood
Oklahoma City, OK 73106
lanarh@aol.com
(405) 528-8358

Jared Milano

From: Lisa Lewis (alis.wisel@gmail.com) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Wednesday, June 29, 2022 1:52 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Introduce a Regional Haze Plan that requires cost-effective pollution controls to protect our wilderness areas

Dear Oklahoma DEQ,

Oklahoma must propose a regional haze plan that effectively reduces pollution to fulfill the state?s statutory and regulatory obligation to improve air quality for our wilderness areas and communities.

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Sincerely,

Lisa Lewis
924 Devon St.
Stillwater, OK 74074
alis.wisel@gmail.com
(405) 269-3854

Jared Milano

From: Lynn Rambo-Jones (rambojones@me.com) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Wednesday, June 29, 2022 12:33 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Introduce a Regional Haze Plan that requires cost-effective pollution controls to protect our wilderness areas

Dear Oklahoma DEQ,

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Sincerely,

Lynn Rambo-Jones
12617 Bell Oak Rd
Edmond, OK 73013
rambojones@me.com
(405) 830-4795

Jared Milano

From: Michael Battles (1kasereidlukehart2@gmail.com) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Wednesday, June 29, 2022 3:05 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Introduce a Regional Haze Plan that requires cost-effective pollution controls to protect our wilderness areas

Dear Oklahoma DEQ,

Quit killing the beauty of " GOD'S " beautiful earth !!!!!

Oklahoma must propose a regional haze plan that effectively reduces pollution to fulfill the state?s statutory and regulatory obligation to improve air quality for our wilderness areas and communities.

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Sincerely,

Michael Battles
16620 Valley Crest
EDMOND, OK 73012
1kasereidlukehart2@gmail.com
(405) 285-8110

Jared Milano

From: Maggie Gibson (margaretgibson@ou.edu) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Wednesday, June 29, 2022 2:11 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] We Need a Regional Haze Policy!!

Dear Oklahoma DEQ,

Please consider implementing a regional haze plan to improve the air quality of our Oklahoma wilderness! I have loved being outdoors for my entire life, and it is devastating to me that we are not doing everything possible to maintain these beautiful spaces. If you love Oklahoma, you must help clean our air.

Oklahoma must propose a regional haze plan that effectively reduces pollution to fulfill the state?s statutory and regulatory obligation to improve air quality for our wilderness areas and communities.

To satisfy the text and purpose of the Regional Haze Rule and the Clean Air Act, we ask that the state?s plan:

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Sincerely,

Maggie Gibson
1203 Rebecca Lane, Apt 217
Norman, OK 73072
margaretgibson@ou.edu
(405) 420-3190

Jared Milano

From: Matt Lloyd (mattrlloyd@gmail.com) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Wednesday, June 29, 2022 2:03 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Introduce a Regional Haze Plan that requires cost-effective pollution controls to protect our wilderness areas

Dear Oklahoma DEQ,

Oklahoma must propose a regional haze plan that effectively reduces pollution to fulfill the state?s statutory and regulatory obligation to improve air quality for our wilderness areas and communities.

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Sincerely,

Matt Lloyd
1622 East 32nd Place
Tulsa, OK 74105
mattrlloyd@gmail.com
(714) 642-0908

Jared Milano

From: Nikki Harris (marcandnik@yahoo.com) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Wednesday, June 29, 2022 12:59 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Introduce a Regional Haze Plan that requires cost-effective pollution controls to protect our wilderness areas

Dear Oklahoma DEQ,

Oklahoma must propose a regional haze plan that effectively reduces pollution to fulfill the state?s statutory and regulatory obligation to improve air quality for our wilderness areas and communities.

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Sincerely,

Nikki Harris
8950 Forest Ridge Ct
Skiatook, OK 74070
marcandnik@yahoo.com
(918) 578-4522

Jared Milano

From: Patrick Green (pdgreen01@cox.net) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Wednesday, June 29, 2022 10:51 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Introduce a Regional Haze Plan that requires cost-effective pollution controls to protect our wilderness areas

Dear Oklahoma DEQ,

Oklahoma must propose a regional haze plan that effectively reduces pollution to fulfill the state?s statutory and regulatory obligation to improve air quality for our wilderness areas and communities.

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Sincerely,

Patrick Green
14946 E 93rd St N
Owasso, OK 74055
pdgreen01@cox.net
(918) 272-4168

Jared Milano

From: Pandora Pinazza (ppinazza@hotmail.com) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Wednesday, June 29, 2022 2:55 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Introduce a Regional Haze Plan that requires cost-effective pollution controls to protect our wilderness areas

Dear Oklahoma DEQ,

Oklahoma must propose a regional haze plan that effectively reduces pollution to fulfill the state?s statutory and regulatory obligation to improve air quality for our wilderness areas and communities.

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Sincerely,

Pandora Pinazza
1005 villas creek dr
Edmond, OK 73003
ppinazza@hotmail.com
(405) 323-0732

Jared Milano

From: Renee Buchholtz (reneebuchholtz@gmail.com) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Wednesday, June 29, 2022 12:35 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Introduce a Regional Haze Plan that requires cost-effective pollution controls to protect our wilderness areas

Dear Oklahoma DEQ,

Oklahoma must propose a regional haze plan that effectively reduces pollution to fulfill the state?s statutory and regulatory obligation to improve air quality for our wilderness areas and communities.

To satisfy the text and purpose of the Regional Haze Rule and the Clean Air Act, we ask that the state?s plan:

- Require cost-effective, technically-feasible emission controls identified in the review of emission-reducing measures (four-factor analyses) for the coal power plants and oil and gas facilities the state selected for review in this planning period.
- Establish a cost-effectiveness threshold for reasonable progress and one that is in line with other states.
- Thoroughly assess environmental justice impacts (as EPA recommended).

Not only does poor air quality affect the health and enjoyment of those visiting our wilderness areas and national parks, it also threatens our economies. Our national parks provide nearly $42 billion in economic benefit and support hundreds of thousands of jobs across the country each year. Without strong safeguards protecting the air we breathe, we can?t keep these places and local economies strong, let alone keep people healthy.

Sincerely,

Renee Buchholtz
305 e plantation terr
Mustang, OK 73064
reneebuchholtz@gmail.com
(501) 952-4215

Jared Milano

From: Robert Fiegel (bobfiegel@swbell.net) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Wednesday, June 29, 2022 2:52 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Introduce a Regional Haze Plan that requires cost-effective pollution controls to protect our wilderness areas

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Sincerely,

Robert Fiegel
514 NW 164th St
Edmond, OK 73013
bobfiegel@swbell.net
(405) 359-8487

Jared Milano

From: Radha Singh (raisingh@hotmail.con) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Wednesday, June 29, 2022 1:35 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Introduce a Regional Haze Plan that requires cost-effective pollution controls to protect our wilderness areas

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Sincerely,

Radha Singh
3450 n commerce
Ardmore, OK 73401
raisingh@hotmail.con
(580) 224-4422

Jared Milano

From: Timothy Stebler (timstebler1943@gmail.com) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Wednesday, June 29, 2022 3:52 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Introduce a Regional Haze Plan that requires cost-effective pollution controls to protect our wilderness areas

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Sincerely,

Timothy Stebler
2024 E 19th Ave
Stillwater, OK 74074
timstebler1943@gmail.com
(405) 269-7838

Jared Milano

From: Victoria Dickey (torrrideee@yahoo.com) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Wednesday, June 29, 2022 1:22 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Introduce a Regional Haze Plan that requires cost-effective pollution controls to protect our wilderness areas

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Sincerely,

Victoria Dickey
1224 W. Memphis St.
Broken Arrow, OK 74012
torrrideee@yahoo.com
(918) 344-6781

Jared Milano

From: Vicki Muir (innercircle@cox.net) Sent You a Personal Message <kwautomail@phone2action.com>
Sent: Wednesday, June 29, 2022 1:48 PM
To: DEQ AQD SIP Comments
Subject: [EXTERNAL] Introduce a Regional Haze Plan that requires cost-effective pollution controls to protect our wilderness areas

Dear Oklahoma DEQ,

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Sincerely,

Vicki Muir
1901 Bella Vista Dr
Edmond, OK 73013
innercircle@cox.net
(405) 229-4588

[EXTERNAL] Conservation Organizations Comments on Oklahoma's Regional Haze Plan
Natalie Levine <nlevine@npca.org>
Fri 7/1/2022 9:29 AM
To:

- DEQ AQD SIP Comments <aqdsipcomments@deq.ok.gov>

Cc:

- Nance.Earthea@epa.gov <Nance.Earthea@epa.gov>;
- Garcia.David@epa.gov <Garcia.David@epa.gov>;
- Sanjay Narayan <sanjay.narayan@sierraclub.org>;
- Chloe Crumley <ccrumley@npca.org>;
- Editor@protectnps.org <Editor@protectnps.org>;
- Melanie Foster <melanie.foster@deq.ok.gov>

Dear Ms. Foster,

The Coalition to Protect America's National Parks, National Parks Conservation Association and Sierra Club submit the following comments regarding the Oklahoma Department of Environmental Quality's (ODEQ) Draft Regional Haze State Implementation Plan for the Second Planning Period. All referenced attachments can be accessed here: https://drive.google.com/drive/folders/15vA5oh8a_1lnOKw2VPmL0dYtASwjZOSN?usp=sharing.

If possible please confirm receipt of this email, these comments and that you can access the attachments. We appreciate ODEQ's consideration of these comments; please don't hesitate to contact any of us with any questions.

Thank you,
Natalie

Natalie Levine (she/her)
Climate and Conservation Program Manager

National Parks Conservation Association
C: 202-660-2059 | nlevine@npca.org | **npca.org**

Preserving Our Past. Protecting Our Future.

****My regular working hours are 8:30am-4:30pm pacific time. I will respond to messages within those hours. I understand those might not be your working hours; please do not feel obligated to reply outside of your normal working hours.***

July 1, 2022

Via electronic mail to AQDSIPComments@deq.ok.gov

Melanie Foster
Air Quality Division
Oklahoma Department of Environmental Quality
P.O. Box 1677
Oklahoma City, OK 73101-1677

Re: Public Comments of Conservation Organizations on Oklahoma's Draft Regional Haze State Implementation Plan for the Second Period

Dear Ms. Foster:

Please accept these public comments submitted jointly by the Coalition to Protect America's National Parks, National Parks Conservation Association and Sierra Club (together the "Conservation Organizations") on Oklahoma's Draft Regional Haze State Implementation Plan for the Second Planning Period (the "Draft SIP") dated June 1, 2022. The Conservation Organizations thank the Oklahoma Department of Environmental Quality ("ODEQ") in advance for its consideration of these comments.

The Coalition to Protect America's National Parks ("Coalition") is a non-profit organization composed of over 2,100 retired, former and current employees of the National Park Service (NPS). The Coalition studies, speaks, and acts for the preservation of America's National Park System. As a group, we collectively represent over 40,000 years of experience managing and protecting America's most precious and important natural, cultural, and historic resources.

National Parks Conservation Association ("NPCA") is a national organization whose mission is to protect and enhance America's national parks for present and future generations. NPCA performs its work through advocacy and education, with its main office in Washington, D.C. and 24 regional and field offices. NPCA has over 1.7 million members and supporters nationwide, with more than 14,600 in Oklahoma. NPCA is active nationwide in advocating for strong air quality requirements to protect our parks, including submission of petitions and comments relating to visibility issues, regional haze State Implementation Plans, climate change and mercury impacts on parks, and emissions from individual power plants and other sources of

pollution affecting national parks and communities. NPCA's members live near, work at, and recreate in all the national parks, including those directly affected by emissions from Oklahoma's sources.

Sierra Club is a national nonprofit organization with 67 chapters across every state and more than 646,000 members, including more than 3,200 in Oklahoma. Sierra Club is dedicated to exploring, enjoying, and protecting the wild places of the earth; to practicing and promoting the responsible use of the earth's ecosystems and resources; to educating and enlisting humanity to protect and restore the quality of the natural and human environment; and to using all lawful means to carry out these objectives. Sierra Club has long participated in regional haze rulemakings and related litigation across the country, in order to advocate for public health and for our nation's public lands.

As explained in detail below, the Conservation Organizations have serious concerns regarding ODEQ's Draft SIP. In order to conform to the letter as well as the policy of applicable regional haze law, ODEQ must address the errors, flaws, and omissions in the Draft SIP addressed in the body of these comments. Those errors, flaws and omissions include (but are not limited to):

1. ODEQ has not sought or disclosed sufficient data to document the determinations underlying its SIP;

2. ODEQ has not adequately addressed the impacts of transboundary emissions originating in Texas;

3. ODEQ has arbitrarily excluded sources of pollution from its control analysis, including area sources and BART sources; and

4. ODEQ has prescribed insufficient pollution controls for those sources it has considered, relying on an unreasonable Q/d threshold, as well as incorrect cost and control data.

As it currently stands, ODEQ's Draft SIP does not meet the legal requirements of the Clean Air Act or federal regulations, and therefore cannot be approved by the U.S. Environmental Protection Agency ("EPA"). We urge ODEQ to revise the plan to address the fundamental flaws identified in these comments.

The Conservation Organizations appreciate ODEQ's consideration. We welcome a dialogue in the event ODEQ has any questions or otherwise would like to discuss ways to improve the Draft SIP.

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1 Legal Framework

1.1. The Clean Air Act's Visibility Provisions and the Regional Haze Rule

The Clean Air Act establishes "as a national goal the prevention of any future, and the remedying of any existing, impairment of visibility in mandatory class I Federal areas which impairment results from manmade air pollution." 42 U.S.C. § 7491(a)(1). To that end, EPA issued 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). Together, the Clean Air Act and EPA's Regional Haze Rule require states to periodically develop and implement state implementation plans ("SIPs"), each of which must contain a long-term strategy encompassing *enforceable* "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); *see also* 42 U.S.C. § 7410(a)(2); 40 C.F.R. § 51.308.

In developing its long-term strategy, a state must consider all anthropogenic sources of visibility impairment and evaluate different emission reduction strategies, including but not limited to those prescribed by the BART provisions.[1] A state should consider "major and minor stationary sources, mobile sources and area sources."[2] At a minimum, a state must consider the following factors in developing its long-term strategy:

> (A) Emission reductions due to ongoing air pollution control programs, including measures to address reasonably attributable visibility impairment;
> (B) Measures to mitigate the impacts of construction activities;
> (C) Emissions limitations and schedules for compliance to achieve the reasonable progress goal;
> (D) Source retirement and replacement schedules;
> (E) Smoke management techniques for agriculture and forestry management purposes including plans as currently exist within the State for these purposes;
> (F) Enforceability of emission limitations and control measures; and
> (G) The anticipated net effect on visibility due to projected changes in point, area, and mobile emissions over the period addressed by the long-term strategy.[3]

Additionally, a state:

> Must include in its implementation plan a description of the criteria it used to determine which sources or groups of sources it evaluated and how the four factors were taken into consideration in selecting the measures for inclusion in its long-term strategy.[4]

[1] 40 C.F.R. § 51.308(f).
[2] *Id.* § 51.308(f)(2)(i).
[3] *Id.* § 51.308(f)(2)(iv).
[4] 40 C.F.R. § 51.308(f)(2)(i).

In developing its plan, the state must document the technical basis for the SIP, including monitoring data, modeling, and emission information, including the baseline emission inventory upon which its strategies are based.[5] All of this information is part of a state's revised SIP and subject to public notice and comment. A state's reasonable progress analysis must consider the four factors identified in the Clean Air Act and regulations. *See* 42 U.S.C. § 7491(g)(1); 40 C.F.R. § 51.308(f)(2)(i) ("the costs of compliance, the time necessary for compliance, the energy and non-air quality environmental impacts of compliance, and the remaining useful life of any potentially affected anthropogenic source of visibility impairment.").

Notably, the statute does *not* list visibility improvement as a fifth factor in the reasonable progress analysis, and in implementing those statutory factors, EPA has made clear that it is *not* appropriate to reject a cost-effective control measures based on purportedly insufficient visibility benefits. In determining whether each state's haze plan satisfies the statutory mandate to make reasonable progress, EPA reviews adherence to the above-mentioned criteria and whether the state follows the requirements to consult with other states and federal land managers, and reasonably considers the four statutory factors for reasonable progress. 40 C.F.R. §§ 51.308(d)(1)(iii)-(iv); (d)(3); (f).

1.2. EPA's 2017 Revisions to the Regional Haze Rule

On January 10, 2017, the EPA revised the Regional Haze Rule to strengthen and clarify the reasonable progress and consultation requirements of the rule. *See generally* 82 Fed. Reg. 3078. In particular, the rule revisions make clear that states are to *first* conduct the required four-factor analysis for its sources, considering the four statutory factors, and *then* use the results from its four-factor analyses and determinations to develop the reasonable progress goals.[6] Thus, the rule "codif[ies]" EPA's "long-standing interpretation" of the SIP "planning sequence" States are required to follow:

> (1) [C]alculate baseline, current and natural visibility conditions, progress to date and the [Uniform Rate of Progress] URP;
> 2) [D]evelop a long-term strategy for addressing regional haze by evaluating the four factors to determine what emission limits and other measures are necessary to make reasonable progress;
> (3) [C]onduct regional-scale modeling of projected future emissions under the long-term strategies to establish RPGs and then compare those goals to the URP line; and
> (4) [A]dopt a monitoring strategy and other measures to track future progress and ensure compliance.[7]

Thus, the Regional Haze Rule makes clear that a state must conduct four-factor analysis and cannot rely on uniform rate of progress as an excuse for failing to perform the core functions of the law:

[5] 40 C.F.R. § 51.308(f)(2)(i).
[6] 82 Fed. Reg. 3,078, 3,090-91 (Jan. 10, 2017).
[7] *Id.* at 3,091.

> The CAA requires states to determine what emission limitations, compliance schedules and other measures are necessary to make reasonable progress by considering the four factors. The CAA does not provide that states may then reject some control measures already determined to be reasonable if, in the aggregate, the controls are projected to result in too much or too little progress. Rather, the rate of progress that will be achieved by the emission reductions resulting from all reasonable control measures is, by definition, a reasonable rate of progress. … [I]f a state has reasonably selected a set of sources for analysis and has reasonably considered the four factors in determining what additional control measures are necessary to make reasonable progress, then the state's analytical obligations are complete if the resulting RPG for the most impaired days is below the URP line. *The URP is not a safe harbor*, however, and states may not subsequently reject control measures that they have already determined are reasonable.[8]

Moreover, for each Class I area within its borders, a state must determine the uniform rate of progress, which is the amount of progress that, if kept constant each year, would ensure that natural visibility conditions are achieved in 2064. 40 C.F.R. § 51.308(d)(1)(i)(B). If a state establishes reasonable progress goals that provide for a slower rate of improvement in visibility than the uniform rate of progress, the state must provide a technically "robust" demonstration, based on a careful consideration of the statutory reasonable progress factors, that "there are no additional emission reduction measures for anthropogenic sources or groups of sources" that can reasonably be anticipated to contribute to visibility impairment in affected Class I areas.[9]

Although many states addressed the Clean Air Act's BART requirements in their initial regional haze plans, EPA's 2017 revisions to the Regional Haze Rule make clear that BART was not a once-and-done requirement. Indeed, states "will need" to reassess "BART-eligible sources that installed only moderately effective controls (or no controls at all)" for any additional technically-achievable controls in the second planning period.[10]

To the extent that a state declines to evaluate additional pollution controls for any source relied upon to achieve reasonable progress based on that source's planned retirement or decline in utilization, it must incorporate those operating parameters or assumptions as enforceable limitations in the second planning period SIP. The Clean Air Act requires that "[e]ach state implementation plan . . . *shall*" include "enforceable limitations and other control measures" as necessary to "meet the applicable requirements" of the Act. 42 U.S.C. § 7410(a)(2)(A). The Regional Haze Rule similarly requires each state to include "enforceable emission limitations" as necessary to ensure reasonable progress toward the national visibility goal.[11] Therefore, where the state relies on a sources' plans to permanently cease operations or projects that future operating parameters (*e.g.*, limited hours of operation or capacity utilization) will differ from past practice, or if this projection exempts additional pollution controls as necessary to ensure

[8] *Id. at* 3,093 (emphasis added).
[9] 40 C.F.R. § 51.308 (f)(2)(ii)(A).
[10] 82 Fed. Reg. at 3,083; *see also id.* at 3,096 ("states must evaluate and reassess all elements required by 40 CFR 51.308(d)").
[11] *See* 40 C.F.R. § 51.308(d)(3) ("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.").

reasonable progress, then the state "must" make those parameters or assumptions into enforceable limitations. [12]

Finally, the state's SIP revisions must meet certain procedural and consultation requirements.[13] The state must consult with the Federal Land Managers ("FLMs") and look to the FLMs' expertise of the lands and knowledge of the way pollution harms them to guide the state to ensure SIPs do what they must to help restore natural skies. The rule also requires that in "developing any implementation plan (or plan revision) or progress report, the State must include a description of how it addressed any comments provided by the Federal Land Managers."[14]

1.3. EPA's July 8, 2021 Regional Haze Clarification Memorandum

On July 8, 2021, EPA issued a memo which further clarified certain aspects of the revised Regional Haze Rule and provided further information to states and EPA regional offices regarding their planning obligations for the Second Planning Period.[15] EPA's July 2021 "Clarification Memo" confirms that certain aspects of ODEQ's proposed SIP are fundamentally flawed and cannot be approved. Particularly relevant here, EPA made clear that States must secure additional emission reductions that build on progress already achieved; there is an expectation that reductions are additive to ongoing and upcoming reductions under other CAA programs.[16] In evaluating sources for emission reductions, EPA emphasized that:

> Source selection is a critical step in states' analytical processes. All subsequent determinations of what constitutes reasonable progress flow from states' initial decisions regarding the universe of pollutants and sources they will consider for the second planning period. States cannot reasonably determine that they are making reasonable progress if they have not adequately considered the

[12] 40 C.F.R. §§ 51.308(i); (d)(3) ("The long-term strategy must include enforceable emissions limitations, compliance schedules . . ."); (f)(2) (the long-term strategy must include "enforceable emissions limitations"); *see also* Memorandum from Peter Tsirigotis, Director at EPA Office of Air Quality Planning and Standards, to EPA Air Division Directors Regions, "Guidance on Regional Haze State Implementation Plans for the Second Implementation Period," EPA-457/B-19-003, at 22 (Aug. 2019), https://www.epa.gov/sites/production/files/2019-08/documents/8-20-2019_-_regional_haze_guidance_final_guidance.pdf. ["2019 Guidance"] ("in selecting sources for control measure analysis," the state may choose "not selecting sources that have an enforceable commitment to be retired or replaced by 2028"); *id*. at 34 (To the extent a retirement or reduction in operation "is being relied upon for a reasonable progress determination, the measure would need to be included in the SIP and/or be federally enforceable.") (citing 40 C.F.R. § 51.308(f)(2)); 2019 Guidance at 43 ("[i]f a state determines that an in-place emission control at a source is a measure that is necessary to make reasonable progress and there is not already an enforceable emission limit corresponding to that control in the SIP, the state is required to adopt emission limits based on those controls as part of its long-term strategy in the SIP via the regional haze second planning period plan submission.").

[13] For example, in addition to the Regional Haze Rule requirements, states must also follow the SIP processing requirements in 40 C.F.R. §§ 51.104, 51.102.

[14] *Id.* § 51.308(i)(3).

[15] July 8, 2021 Memo from Peter Tsirogotis to Regional Air Directors, Clarifications Regarding Regional Haze State Implementation Plans for the Second Implementation Period at 3, https://www.epa.gov/visibility/clarifications-regarding-regional-haze-state-implementation-plans-second-implementation [hereinafter, "2021 Clarification Memo"].

[16] *Id*. at 2.

> contributors to visibility impairment. Thus, while states have discretion to reasonably select sources, this analysis should be designed and conducted to ensure that source selection results in a set of pollutants and sources the evaluation of which has the potential to meaningfully reduce their contributions to visibility impairment.[17]

Thus, it is generally not reasonable to exclude from further evaluation large sources or entire sectors of visibility impairing pollution. Moreover, the Clarification Memo reiterates that the fact that a Class I area is meeting the Uniform Rate of Progress is "not a safe harbor" and does not excuse the state from its obligation to consider the statutory reasonable progress factors in evaluating reasonable control options.[18]

For sources that have previously installed controls, states should still evaluate the "full range of potentially reasonable options for reducing emissions," including options that may "achieve greater control efficiencies, and, therefore, lower emission rates, using their existing measures."[19] Moreover, "[i]f a state determines that an in-place emission control at a source is a measure that is necessary to make reasonable progress and there is not already an enforceable emission limit corresponding to that control in the SIP, the state is required to adopt emission limits based on those controls as part of its long-term strategy in the SIP via the regional haze second planning period plan submission."[20] This means that so-called "on-the-way" measures, including anticipated shutdowns or reductions in a source's emissions or utilization, that are relied upon to forgo a four-factor analysis or to shorten the remaining useful life of a source "*must* be included in the SIP" as enforceable emission reduction measures.[21] In addition, the Clarification Memo makes clear that a state should generally not reject cost-effective and otherwise reasonable controls merely because there have been emission reductions since the first planning period owing to other ongoing air pollution control programs or merely because visibility is otherwise projected to improve at Class I areas. Finally, the Clarification Memo confirms EPA's recommendation that states take into consideration environmental justice concerns and impacts in issuing any SIP revision for the second planning period.

In sum, EPA's 2021 Clarification Memo makes clear that the states' regional haze plans for the second planning period must include meaningful emission reductions to make reasonable progress towards the national goal of restoring visibility in Class I areas. The Clarification Memo confirms that ODEQ's efforts to avoid emission reductions—by asserting, for example, that reductions are not necessary because visibility has improved, because reductions are anticipated at some later date or due to implementation of another program, or because a source has some level of control—is at odds with Oklahoma's haze obligations under the Clean Air Act and the Regional Haze Rule itself.

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[17] *Id*. at 3.
[18] *Id*. at 2.
[19] *Id*. at 7.
[20] *Id*. at 8.
[21] *Id*. at 8-9 (emphasis added).

2 ODEQ Has Not Sought or Made Available Critical Data Documentation Underlying its Draft SIP

For these comments, emissions and controls information for all EGUs were downloaded from EPA's Air Markets Program Data (AMPD) website.[22] Additional information was obtained from the Energy Information Agency (EIA).[23] Lastly, the Title V permits for a number of units were reviewed.

2.1. ODEQ Must Include Unit-Level Emission Data in Its SIP

In preparation for these comments, the ODEQ was requested to provide (1) unit-specific emissions information for non-EGUs (or point to where that information is kept). ODEQ promptly provided that information, along with a number of Title V permits that were requested.

Knowing and verifying the emissions from each unit and the existing controls installed on the individual units at facilities emitting hundreds to thousands of tons of air pollution annually is a critical function of an air agency that must control the emissions from these sources under a variety of state and federal programs. With respect to the regional haze program, this information is necessary to (1) verify that the right units/processes at facilities have been identified to receive four-factor analyses and (2) verify that the emissions from these units used in cost-effective calculations are actually representative of expected future operations. Therefore, although the information was promptly provided, the emissions data must be made a part of the Oklahoma Regional Haze SIP. Without this information, ODEQ cannot satisfy the documentation requirements of 40 CFR 51.308(f)(2)(iv), discussed later in these comments.

Title V permits are another essential tool, as they list all the emission limits for these units, along with testing requirements, controls, and vital information concerning the type and functioning of the units. Although the Title V permits were promptly supplied when requested, they are not downloadable from ODEQ's site. Therefore, for the same reason, ODEQ must include this information in its SIP or provide an external link to that information.

2.2. ODEQ Must Demand Better Cost Data Documentation

In some cases, ODEQ correctly questioned source data, equipment life, interest rates, and other information related to the four-factor analyses provided by sources.[24] In a few cases, ODEQ has noted that even if the information were corrected, it would not have changed its decision regarding the implementation of the controls in question. However, it appears that in most cases ODEQ has accepted the source's explanations for its use of this data and information, even though doing so is demonstrably incorrect. Thus, ODEQ has failed to require that sources properly conduct cost-effectiveness calculations, as thoroughly documented in these comments.

[22] See https://ampd.epa.gov/ampd/. This information is compiled and assessed in spreadsheets that are included in this analysis.
[23] See https://www.eia.gov/electricity/data/eia923/.
[24] See "second request letters" in Appendix E.

In its 2017 revision to the Regional Haze Rule, EPA specifically emphasized the need for the proper documentation of this type of data:[25]

> We are changing proposed 40 CFR 51.308(f)(2)(iv), regarding documentation requirements, to be 40 CFR 51.308(f)(2)(iii) ... to "document the technical basis, including modeling, monitoring, cost, engineering, and emissions information, on which the State is relying to determine the emission reduction measures that are necessary to make reasonable progress in each mandatory Class I area it affects." The purpose of this provision is to require states to document all of the information on which they rely to develop their long-term strategies, which will primarily be information used to conduct the four-factor analysis. Therefore, in addition to modeling, monitoring and emissions information, we are making it explicit that states must also submit the cost and engineering information on which they are relying to evaluate the costs of compliance, the time necessary for compliance, the energy and non-air quality impacts of compliance and the remaining useful lives of sources.

The Regional Haze Guidance reinforces this point:[26]

> As part of meeting the requirement of the Regional Haze Rule for the state to document the cost and engineering information on which the State is relying to determine the emission reduction measures that are necessary to make reasonable progress (40 CFR 51.308(f)(2)(iii)), every source-specific cost estimate used to support an analysis of control measures must be documented in the SIP. If information about a source has been asserted to be confidential, we recommend the state consult with its EPA Regional office regarding whether such confidentiality is appropriate and allowed under the CAA and if so how it can be reconciled with the need for adequate documentation of the basis for the SIP.

ODEQ must therefore correct these fundamental failures in the documentation of its SIP. Unless these issues are addressed, ODEQ cannot satisfy Section 51.308(f) which requires "supporting documentation for all required analyses" or Section 51.308(f)(2)(iii) which requires that ODEQ "must document the technical basis, including modeling, monitoring, cost, engineering, and emissions information, on which the State is relying to determine the emission reduction measures that are necessary to make reasonable progress in each mandatory Class I Federal area it affects."

3 ODEQ's Consultation Documentation Is Inadequate

It appears that the only information on ODEQ's consultation, other than the short summaries presented in Sections 6 and 8, appears in Appendix A. Appendix A contains links to some documents, including ODEQ's letters to Texas, Nebraska, Arkansas, and Louisiana. There are no links to any of the reply letters. ODEQ's consultation record is therefore incomplete.

[25] See 82 FR 3096 (January 10, 2017).
[26] See Guidance on Regional Haze State Implementation Plans for the Second Implementation Period, EPA-457/B-19-003 August 2019. Page 32.

The requirement in section 51.308(f)(2)(iii) to "document the technical basis, including modeling, monitoring, cost, engineering, and emissions information, on which the State is relying" extends to ODEQ's consultation requirement, as consultation is intended to determine whether additional "emission reduction measures that are necessary to make reasonable progress" are necessary.

Additionally, without this information, ODEQ cannot demonstrate under section 51.308(f)(2(ii) that it "has included in its implementation plan all measures agreed to during state-to-state consultations or a regional planning process, or measures that will provide equivalent visibility improvement." Therefore, ODEQ must fully present all responses to its letters that it received for other state agencies.

4 ODEQ Must Document the Impacts from Texas

Section 51.308(f)(2)(ii) requires that Oklahoma "consult with those states that have emissions that are reasonably anticipated to contribute to visibility impairment in the mandatory Class I Federal area …." Therefore, in order to address this requirement, ODEQ must first establish which states do have such impacts and the magnitude of those impacts.

Despite the fact of the well-established impact of Texas sources on the Wichita Mountains during the first planning period, ODEQ pays scant attention to the subject in its SIP. In fact, it does not present any information concerning the actual impacts from Texas sources on the Wichita Mountains. Mainly, when it does mention Texas, it does so in the context of noting emission reductions that have occurred as a result of large point sources retiring. The exception to this is in reviewing its consultations with Texas: ODEQ there notes that it requested that Texas consider 15 sources to consider "for further analysis."[27]

Consequently, ODEQ must provide documentation of the scope and magnitude of the impacts that Texas sources have on the Wichita Mountains. For that matter, it must do the same for other states as well. Unless it provides that documentation, it cannot demonstrate that it has in fact satisfied the consultation requirement in section 51.308(f)(2)(ii).

5 ODEQ Should Have Insisted that Texas Reduce Its Emissions

On page 42, ODEQ summarizes its consultation with Texas:

> On July 17, 2020, DEQ sent a letter to TCEQ requesting Texas consider the fifteen sources listed in Table 6-5 for further analysis and to continue to consult with DEQ regarding any resulting analyses or measures at the above-listed sources. On August 11, 2020, DEQ and TCEQ held a web conference during which TCEQ communicated its planned recommendations for Texas's SIP. TCEQ's photochemical modeling projected minimal visibility benefits from potential

[27] See page 42.

> controls on sources of interest. TCEQ concluded that further controls were not necessary to meet reasonable progress at affected Class I areas.

As indicated earlier in these comments, ODEQ has not presented any information that actually establishes the impact of Texas sources on the Wichita Mountains and must do so. Despite its failure to present that information, ODEQ obviously concluded that a number of sources in Texas have the potential to impact the Wichita Mountains. ODEQ's failure to press Texas to control its sources abuses the spirit and intent of the consultation requirements in section 51.308(f)(2(ii).

6 Problems with ODEQ's Source Selection

6.1. ODEQ Must Consider Area Sources

Section 40 CFR 51.308(f)(2)(i) indicates that states should consider evaluating major and minor stationary sources or groups of sources, mobile sources, and area sources. Table 4-3 indicates that nonpoint (area) sources are the top NOx emitters of any sector for ODEQ's 2017 emission inventory. ODEQ also presents Figure 4-3, which is a pie chart depicting source-type contributions to the 2014 and 2017 NOx emission inventories, and Figure 4-4, which depicts sector contributions to the 2014 NOx emission inventory. It is unclear how Figure 4-4 relates to Figure 4-3. ODEQ must improve its presentation of its NOx emission inventory to (1) make it clear how much the oil and gas sector contributes and (2) the point and non-point source breakdown.

On page 21, ODEQ attributes the apparent increase in NOx area source contributions from 2014 to 2017, at least in part, to its improved and more accurate NOx emission inventory data gathering and accounting procedures. Regardless, it is apparent that NOx area source emissions, in particular those from the oil and gas sector, are quite significant. Because there does not appear to be any real consideration of how area sources could be analyzed and potentially controlled, it does not appear that ODEQ has satisfied section 51.308(f)(2)(i). ODEQ must therefore reexamine its source selection methodology to ensure it has properly considered area sources.

6.2. ODEQ Cannot Incorporate Resource Constraints into Its Regional Haze Decision Making

As indicated above, ODEQ does not properly assess NOx area sources. It provides the following explanation on page 22 for not doing so:

> Where appropriate, larger oil and gas point sources have been evaluated for potential NOx controls during Planning Period 2. The sheer number of small oil and gas sources makes it extraordinarily inefficient and impracticable for ODEQ, a state agency with limited means, to evaluate each source individually for possible emission reductions.

Similarly, on page 30, ODEQ indicates that one of the reasons it chose to perform a separate source selection for NOx and SO_2, instead of adopting the usual procedure of basing it on the combined effects of NOx and SO_2, was because "given the resource intensity of conducting a four-factor analysis, DEQ focused on greater emissions of one pollutant, not split between moderate emissions of two pollutants." Obviously, here, ODEQ adopted its split source selection strategy because it concluded it would result in fewer sources to evaluate, thus easing its resource burden.

Again, on page 36, ODEQ states that one of the reasons it did not subject sources that underwent a BART analysis in the first planning period to four-factor analyses was because "eliminating sources identified in the AOI study that underwent BART reduced the potential for expending valuable resources on analyzing sources with little opportunity for further reductions."

ODEQ's resource excuse for not properly considering NOx area sources, in particular those from the oil and gas sector and BART sources, is untenable. ODEQ must not base its source selection methodology on any type of resource consideration. First, as this is a *state* SIP, ODEQ is not solely responsible for mustering the resources necessary to complete the SIP. Therefore, if it requires additional resources, it should draw them from other state agencies. Second, the Clean Air Act, 42 U.S.C. §7410(a)(2)(E) requires that each SIP provide "necessary assurances that the State ... will have adequate personnel, funding, and authority under State (and, as appropriate, local) law to carry out such implementation plan (and is not prohibited by any provision of Federal or State law from carrying out such implementation plan or portion thereof).[28] This requirement of the Clean Air Act ensures that states do not underfund their environmental agencies as an excuse for not adequately administering SIPs. Thus, ODEQ cannot base any aspect of its SIP on a lack of resources. If it doesn't have adequate personnel or other resources in order to conduct a complete source selection and the resulting four-factor analyses, it is obligated to allocate and/or acquire those resources. ODEQ must therefore reexamine its source selection methodology in order to ensure that it has selected sources for four-factor analyses without regard to resource considerations.

6.3. ODEQ Cannot Give BART Sources a Blanket Exemption to Four-Factor Analyses

Beginning on page 35, ODEQ describes its rationale for excluding certain sources from four-factor analyses that otherwise met its single source selection methodology:

> [T]hirteen emission units at six facilities were required, through either Oklahoma's Planning Period 1 RH SIP or EPA's FIP, to implement BART controls in conjunction with Planning Period 1. All thirteen emissions units reduced NOx emissions by installation of (or in some cases utilizing existing) low-NOx burners. For the six coal-fired BART units, existing PM controls were considered to meet BART requirements. BART SO_2 requirements for these six units have been applied as follows: the four OG&E units have installed dry-gas desulfurization, one PSO unit was retired, and the other is applying dry-sorbent/carbon injection SO_2 controls until its retirement in 2026. It is unlikely that a new four-factor analysis would

[28] See https://www.govinfo.gov/content/pkg/USCODE-2013-title42/html/USCODE-2013-title42-chap85-subchapI-partA-sec7410.htm.

> result in a finding that additional cost-effective controls are available and appropriate for these emission units.

ODEQ simply concludes that the mere fact that the source in question received a BART evaluation in the first planning period is sufficient criteria for excluding it from a second planning period reasonable progress analysis. In a number of cases, such as the OG&E Muskogee Units 4 and 5, Sooner Station and the PSO Northeastern Station, its decision appears sound for SO_2, as it is unlikely that a four-factor analysis would conclude that additional cost-effective controls for SO_2 are available.[29] In fact, in Sooner's case the two units are exceeding their FIP required emissions limits and now demonstrate two of the best performing dry scrubbing systems in the United States. ODEQ should therefore ensure their permits are amended to reflect this level of performance.

However, this same conclusion cannot be made for NOx for these sources, as none have any post-combustion NOx controls and remain large sources of NOx, even though some have switched to burning natural gas (Muskogee Units 4 and 5). Southwestern and Seminole are other examples.

ODEQ does not provide any documentation to demonstrate its assertion that these BART sources could not be further cost-effectively controlled. ODEQ's blanket exemption of its BART sources conflicts with the Regional Haze Rule, as indicated by Section 51.308(e)(5), which states the following:

> After a State has met the requirements for BART or implemented an 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 paragraphs (d) and (f) of this section, as applicable, in the same manner as other sources.

EPA further reinforces this requirement in its 2017 Regional Haze Rule revision:[30]

> The BART requirement was a one-time requirement, but a BART-eligible source may need to be re-assessed for additional controls in future implementation periods under the CAA's reasonable progress provisions. Specifically, we anticipate that a number of BART-eligible sources that installed only moderately effective controls (or no controls at all) will need to be reassessed. Under the 1999 RHR's 40 CFR 51.308(e)(5), BART-eligible sources are subject to the requirements of 40 CFR 51.308(d), which addresses regional haze SIP requirements for the first implementation period, in the same manner as other sources going forward.

It is very likely that a properly performed NOx four-factor analysis would conclude that cost-effective controls are available for a number of these and other sources that ODEQ wrongly excludes. Thus, ODEQ's blanket BART exemption is likely illegal. ODEQ must properly assess the BART sources it has given an exemption to four-factor analyses.

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[29] Note this is not true for Muskogee Unit 6, as discussed in the next section.

[30] See 82 FR 3083 (January 10, 2017).

6.4. ODEQ Must Evaluate Muskogee 6 for Cost-effective Controls

As indicated above, ODEQ provided Muskogee Station a blanket exemption from four-factor reviews because Units 4 and 5 had undergone BART analyses in the first round SIP review. The incorrectness of this general exemption aside, it certainly does not extend to Unit 6. Unit 6 did not undergo a BART analysis in the first planning period, as its construction date fell outside of the BART window. Although Units 4 and 5 have since switched to natural gas, at the time of the BART analyses, Units 4, 5, and 6 were essentially identical, all being 572 MW tangentially-fired Combustion Engineering boilers that burned coal.

According to information from EPA, Unit 6's NOx control consists of overfire air with no post-combustion NOx controls and has no SO_2 controls.[31] Just as Units 4 and 5 were evaluated for both NOx and SO_2, Unit 6 should now be evaluated for NOx and SO_2 in this planning period. Furthermore, there is no reason to conclude that the same controls that were found to be cost-effective for Units 4 and 5 in the first planning period would somehow cease to be cost-effective for Unit 6. Consequently, ODEQ must evaluate Muskogee Unit 6 for both SO_2 and NOx controls.

6.5. ODEQ's Source Selection Strategy Is Unsound, Undocumented, and Arbitrary

The discussion elsewhere in these comments concerning cost documentation also applies to ODEQ's source selection strategy as well: 40 CFR 51.308(f)(2)(iii) requires that ODEQ "document the technical basis, including modeling, monitoring, cost, engineering, and emissions information, on which [it] is relying to determine the emission reduction measures that are necessary to make reasonable progress in each mandatory Class I area it affects." As discussed below, ODEQ's source selection strategy suffers from unsound and arbitrary decision making, and a lack of documentation.

6.5.1. ODEQ's Single Pollutant Source Selection Reasoning Is Unsound

Beginning on page 30, ODEQ describes its source selection methodology. As indicated above, ODEQ did not adopt the usual procedure of selecting sources based on their combined NOx and SO_2 impacts. Rather, ODEQ evaluated impacts by calculating Q/d separately for NOx and SO_2, and provides the following justification for having done so on page 30:

> When analyzing source contribution to visibility impairment, DEQ considered NOx and SO_2 emissions separately instead of aggregating contributions from each pollutant for a total source contribution. Visibility impairment at the WMWA is clearly dominated by NOx in winter conditions and SO_2 in most of the rest of the year (see Figures 3-2 and 3-3 in Section 3). If DEQ had considered the total contribution of a source from both NOx and SO_2 together, the potential for visibility improvement by controlling aggregated emissions would not reasonably correspond with the MIDs identified through monitoring. Control options for NOx

[31] See https://ampd.epa.gov/ampd/. This information is compiled and assessed in spreadsheets that are included in this analysis.

> and SO_2 vary widely, resulting in the possibility that controlling one, but not both, is cost effective. The visibility improvement from controlling one pollutant at a source identified through aggregate contribution would be far less than would be considered cost effective. Additionally, given the resource intensity of conducting a four-factor analysis, DEQ focused on greater emissions of one pollutant, not split between moderate emissions of two pollutants.

First, it is not unusual for one pollutant to seasonally impact visibility impacts at Class I Areas. In fact, this is the usual situation for many Class I Areas.

Second, ODEQ's statement that this typical situation somehow justifies or supports its decision to separately evaluate NOx and SO_2 because "the potential for visibility improvement by controlling aggregated emissions would not reasonably correspond with the MIDs [Most Impacted Days] identified through monitoring" is irrational. There is no requirement or view expressed anywhere in the Clean Air Act, the Regional Haze Rule, or guidance that source selection should be tied to seasonal pollutant visibility impacts. As ODEQ indicates in Figure 6-1, both ammonium nitrate and ammonium sulfate impact the WMWA fairly equally. In such a situation, it makes no difference whether one pollutant or the other dominates during particular times of the year: controlling either pollutant will improve annual visibility. Furthermore, the fact that NOx and SO_2 both significantly impact visibility at the WMWA reinforces the need to perform source selection on the basis of "aggregated emissions." ODEQ's reference to the "the potential for visibility improvement by controlling aggregated emissions," has no relationship to the source selection process or in fact cost-effectiveness analysis. Controls are almost always assessed on the basis of how much they control one pollutant.

ODEQ is correct that, "[c]ontrol options for NOx and SO_2 vary widely, resulting in the possibility that controlling one, but not both pollutants, is cost effective." Again, that is not unusual. States routinely select sources by considering both NOx and SO_2 impacts together only to later find that only one or no pollutant controls turn out to be cost-effective. ODEQ's off-handed consideration of it during source selection wrongly biases control analyses.

ODEQ's next statement that "[t]he visibility improvement from controlling one pollutant at a source identified through aggregate contribution would be far less than would be considered cost effective" indicates a consideration that is also temporally out of order and thus biases the source selection process. ODEQ does not know at this stage of the process what controls may be cost-effective and what visibility improvement they may bring. In fact, ODEQ does not quantify the visibility improvement resulting from any of the controls it considers in any of its four-factor analyses, and thus has no basis on which to make this or similar statements.

In summary, all of ODEQ's above statements are a red herring, deflecting attention from ODEQ's apparent fundamental motivation, which it states at the end of the above quote: selecting sources by considering both NOx and SO_2 together would result in more sources selected, which would result in a resource drain to ODEQ. As indicated above, this conflicts with the Clean Air Act. Therefore, ODEQ must revise its source selection strategy. Either ODEQ must provide a rational basis that justifies its decision to select sources by separately

considering NOx and SO_2, or ODEQ must selected sources on the basis of the combined impacts of NOx and SO_2.

6.5.2. ODEQ's Q/d Threshold Is Arbitrary

On page 32, ODEQ states that it began its source selection by identifying sources with a Q/d value of 5 tons per year per kilometer or greater, which as discussed above is based on separate calculations for NOx and SO_2. ODEQ does not present any discussion or justification for selecting a Q/d threshold of 5. As indicated above, this does not satisfy the documentation requirement of 40 CFR 51.308(f)(2)(iii). ODEQ cannot satisfy this requirement due to its complete lack of any justification for selecting its Q/d threshold of 5. This is especially important because, as discussed above, ODEQ has separately calculated Q/d for NOx and SO_2—an unusual strategy that should correspond to a lower Q/d value than that used by states using combined NOx and SO_2 emissions, which ODEQ admits to having chosen due to resource constraints.

6.5.3. ODEQ's Source Selection Threshold Is Arbitrary and Illegal

On page 32, ODEQ states that following elimination of sources from four-factor analyses based on its single pollutant Q/d source selection described above, it further eliminated sources by applying a 0.5% or greater contribution threshold based on dividing the Extinction Weighted Residence Time (EWRT) by the distance from WMWA to the source. ODEQ's only justification for this additional threshold is expressed on page 33: "Given the successful reduction in visibility impairment over the last decade, 0.5% is an appropriate threshold for identifying sources of the greatest importance for further analysis." In fact, this exceedingly thin justification is no justification at all, but a prohibited action under the Regional Haze Rule: [32]

> Treating the URP as a safe harbor would be inconsistent with the statutory requirement that states assess the potential to make further reasonable progress towards natural visibility goal in every implementation period. Even if a state is currently on or below the URP, there may be sources contributing to visibility impairment for which it would be reasonable to apply additional control measures in light of the four factors. Although it may conversely be the case that no such sources or control measures exist in a particular state with respect to a particular Class I area and implementation period, this should be determined based on a four-factor analysis for a reasonable set of in-state sources that are contributing the most to the visibility impairment that is still occurring at the Class I area. It would bypass the four statutory factors and undermine the fundamental structure and purpose of the reasonable progress analysis to treat the URP as a safe harbor, or as a rigid requirement.

As previously mentioned, and again here, the Regional Haze Rule makes it clear that states should not eliminate sources that could have cost-effective controls from consideration because a

[32] 82 FR 3099 (January 10, 2017).

reasonable progress goal is below the URP. EPA's recent Clarification Memo reinforces this point:[33]

> The 2017 RHR preamble and the August 2019 Guidance clearly state that it is not appropriate to use the URP in this way, i.e., as a "safe harbor." The URP is a planning metric used to gauge the amount of progress made thus far and the amount left to make. It is not based on consideration of the four statutory factors and, therefore, cannot answer the question of whether the amount of progress made in any particular implementation period is "reasonable progress." This concept was explained in the RHR preamble. Therefore, states must select a reasonable number [of] sources and evaluate and determine emission reduction measures that are necessary to make reasonable progress by considering the four statutory factors.

Because ODEQ used the URP as a safe harbor, it must revisit its source selection methodology, reconsider its thresholds, reasonably select a set of sources for four-factor analyses, and justify that decision making through adequate documentation.

7 ODEQ's Control Determinations Are Arbitrary

ODEQ does not present a coherent basis for rejecting controls. The only explanations ODEQ provides when it rejects controls can be found in Section 6 in the short paragraph summaries it presents on each four-factor analysis, which include statements such as: "DEQ concurs this is a reasonable conclusion," or "the controls would not be cost-effective." This in fact is a violation of section 51.308(f)(2)(i) of the Regional Haze Rule:

> The State must evaluate and determine the emission reduction measures that are necessary to make reasonable progress by considering the costs of compliance, the time necessary for compliance, the energy and non-air quality environmental impacts of compliance, and the remaining useful life of any potentially affected anthropogenic source of visibility impairment. The State should consider evaluating major and minor stationary sources or groups of sources, mobile sources, and area sources. The State must include in its implementation plan a description of the criteria it used to determine which sources or groups of sources it evaluated and how the four factors were taken into consideration in selecting the measures for inclusion in its long-term strategy. In considering the time necessary for compliance, if the State concludes that a control measure cannot reasonably be installed and become operational until after the end of the implementation period, the State may not consider this fact in determining whether the measure is necessary to make reasonable progress.

As the rule requires, ODEQ must include in its implementation plan "a description of … how the four factors were taken into consideration in selecting the measures for inclusion in its long-

[33] Memorandum from Peter Tsirigotis, Dir., EPA, to Reg'l Air Dirs., Regions 1–10 (July 8, 2021), hereafter referred to as the "Clarification Memo," available here: https://www.epa.gov/visibility/clarifications-regarding-regionalhaze-state-implementation-plans-second-implementation. Page 15.

term strategy." Although ODEQ cites to the four-factors of section 51.308(f)(2)(i) in its SIP, during the entirety of its review, it presents no information as to how it has considered them.

Apparently realizing this error, ODEQ attempts to rectify it for "costs of compliance" beginning on page 45, near the end of its SIP and well after it has finished rejecting controls. Here, ODEQ performs a contorted attempt to cite to a NOx cost-effectiveness threshold without actually adopting it. It cites to the 2016 CSAPR rule in which EPA adopted a position that it was acceptable to develop EGU NOx ozone season emission budgets using a control stringency of $1,400 per ton. ODEQ then states that "DEQ is not selecting a $1,400 per ton NOx cost-of-control threshold; rather, DEQ believes that a NOx cost of-control level in the range of $1,400 to $2,000 is consistent with the goals of the Regional Haze program." But then one paragraph later, ODEQ states, "DEQ concludes that a NOx cost-of-control threshold in the $1,400 to $2,000 per ton range is appropriate and reasonable."

In the next paragraph, ODEQ notes that $5,000/ton has been widely used as a reasonable threshold in evaluating regional haze SO_2 controls. It then opines that "[t]here is no reason to assume that this cost threshold must increase at every subsequent Regional Haze planning period." ODEQ does not actually state that it is adopting a $5,000/ton threshold for SO_2, and concludes by stating, "Given these technical and cost considerations, DEQ affirms that the submitted analyses reached the reasonable conclusions, and this implementation plan revision does not impose a requirement to install further SO_2 controls on the 12 sources subject to the four-factor analysis requirement or on any other sources during this planning period."

The only rationale for "selecting" such a low NOx threshold that emerges from the record is to limit the sources it examines. ODEQ does not explain why, considering the fact that $5,000/ton has been widely used as a reasonable threshold in evaluating regional haze SO_2 controls, it could not have adopted it for NOx as well. This is completely arbitrary. ODEQ must revisit its entire source selection strategy and elucidate a rational basis for establishing source selection thresholds.

8 ODEQ Must Include Refined Coal in Its Four-Factor Analyses

According to EIA data, a number of the EGUs in Oklahoma have burned in the past or presently burn what is referred to as "refined" coal onsite, presumably in order to take advantage of federal income tax credits. These include AES Shady Point, GREC and River Valley.[34] In order to qualify for this tax credit, the Internal Revenue Service (IRS) requires that these EGUs must demonstrate "a reduction of at least 20 percent of the emissions of nitrogen oxide (NOx) and at least 40 percent of the emissions of either sulfur dioxide (SO_2) or mercury (Hg) released when burning the refined coal."[35]

It is unknown which facilities actually claim this tax break. Regardless, for every EGU that burns refined coal, claims the tax break, and has or will undergo a four-factor analysis, DEQ must require that the EGU demonstrate any NOx reduction it has achieved from refined coal. Because refined coal is minimally required to result in a 20% NOx reduction, it must be

[34] See https://www.eia.gov/electricity/data/eia923/.
[35] See https://www.irs.gov/irb/2010-40_IRB#NOT-2010-54.

evaluated like any other NOx control. Furthermore, if the EGU is also claiming a 40% SO_2 reduction, it must demonstrate that as well.

9 Review of the Oxbow Kremlin Calcined Coke Plant Four-Factor Analysis

The Oxbow Calcining Kremlin Calcining Plant is located in Garfield County. Its Title V Permit states that it receives raw petroleum coke by truck and rail from various refinery sources. It processes this raw coke through kilns, with natural gas and propane as a supplemental fuel, in order to calcine the coke. The calcined coke is loaded into bags, trucks or railcars for final shipment to customers. The facility operates three rotary kilns. Due to the age of the facility, it has been exempted from most rules and regulations.[36] Two reports present in Appendix E are reviewed, consisting of a September 2020 Trinity Report, which references a September 2020 Sargent & Lundy (S&L) report.[37]

9.1. ODEQ Must Require Documentation for the Kremlin Cost-Effectiveness Calculations

As noted throughout this section, Kremlin's contractors, Trinity and S&L, make a number of unsubstantiated claims regarding the types of, and limitations of, the SO_2 control systems evaluated. Considering the evidence presented herein that many of these claims are in fact unjustified, ODEQ must demand proper documentation from Kremlin. As indicated above, this is a requirement of 40 CFR 51.308(f)(2)(iii). In addition, Kremlin's contractor S&L, which produced the control cost analyses, must be required to provide documentation for its figures; instead they have no documentation whatsoever. Lastly, ODEQ must state in the SIP that it has specifically reviewed the confidential information that has been redacted in S&L's report and has found it credible and its use acceptable.

9.2. The Kremlin Plant Must include NOx in Its Four-Factor Analysis

In Appendix E, ODEQ instructs Oxbow Calcining that the Kremlin Plant's four-factor analysis for its three kilns is limited to SO_2.[38] As the following table indicates, the Kremlin Plant's NOx emissions are significant:[39]

Table 1. Historical NOx and SO_2 Emissions from the Kremlin Calcined Coke Plant

Year	SO_2 (tons)	NOx (tons)
2016	12,663.0	610.4

[36] Part 70 Permit, Air Quality Division State of Oklahoma Department of Environmental Quality, Permit Number: 2019-0973-TVR3 Oxbow Calcining LLC, revised 10/20/2006. Pdf page 2 of the July 1, 2021 staff evaluation.
[37] Regional Haze Reasonable Progress Analysis, Oxbow Calcining LLC Kremlin Calcined Coke Plant, prepared by Trinity Consultants, September 29, 2020, hereafter referred to in this section as "the Trinity Report." SO_2 Control Technologies Evaluation to Support Regional Haze Rule Analysis, Revision 0, September 29, 2020, Sargent & Lundy. Hereafter referred to in this section as "the S&L Report."
[38] Letter to Whitney Hall from Kendal Stegman, dated July 1, 2020. Pdf page 175 of Appendix E.
[39] Emission data obtained from https://www.deq.ok.gov/air-quality-division/emissions-inventory/state-emissions-totals-infographics/.

Year	SO_2 (tons)	NOx (tons)
2017	16,681.8	768.6
2018	17,644.7	771.2
2019	12,716.9	603.9
2020	13,656.9	592.0

The South Coast Air Control District has identified a number of potential post-combustion controls that are feasible for coke calcining kilns, including SCR, LoTOx, and UltraCat.[40] These controls are capable of 95% NOx removal. ODEQ must therefore require that NOx controls be evaluated as part of the Kremlin Calcining Plant four-factor analysis.

9.3. The Kremlin SO_2 Scrubber Design SO_2 Values Are Too High

On page 2-3 of its report, Trinity states that it adopted the S&L SO_2 emission figures for the three kilns when performing its cost-effectiveness calculations. These figures are compiled by S&L, along with maximum SO_2 values and are reproduced below:[41]

Table 2. S&L Kremlin Kiln SO_2 Emissions

Emission	Kiln 1	Kiln 2	Kiln 3	Relevant Totals
Hourly SO_2 (lb/hr)	1,626	1,447	924	
Annual Average SO_2 (tons)	6,556	5,674	2,950	15,180
Maximum Monthly SO_2 (tons)	761	755	381	
Maximum Annual SO_2 (tons)	9,132	9,060	4,572	22,764

According to S&L, the hourly emission rates represent the average lb/hr rates for the period of January 2015 to December 2019. The annual emission rates represent the 12-month annual average tons/yr for the period of January 2018 to December 2019. The maximum monthly emissions rates shown represent the monthly total tons/month for the baseline period of January 2018 to December 2019.

S&L states that it used the maximum values to design the SO_2 control equipment, reasoning that such controls would have to be designed to treat exhaust gas based on these historical conditions. However, S&L further notes that the facility's existing Operating Permit Air Permit No. 2014-1698TVR2 (M-2), dated August 9, 2017, includes a combined maximum SO_2 emission limit of 4,790.90 lb/hr for the facility. Therefore, the maximum monthly emission rates reflect the maximum that each unit has reached separately, but not operating all at once.

[40] See Preliminary Draft Staff Report, Proposed Rule 1109.1 – Emissions of Oxides of Nitrogen from Petroleum Refineries and Related Operations and Proposed Rescinded Rule 1109 – Emissions of Oxides of Nitrogen from Boilers and Process Heaters in Petroleum Refineries, August 2021. See discussion beginning on pdf page 183. Available here: http://www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/1109.1/pdsr_pr-1109-1_75_day.pdf?sfvrsn=6.

[41] See page 6 of the S&L Report.

This is an important consideration: even if the facility operated 24 hours a day continuously all year (24/7/365), its permit would restrict it to a maximum annual SO_2 emission of 20,984 tons (4,790.9 tons x 8,760 hrs/yr x ton/2,000 lbs). However, S&L's SO_2 control equipment is based on a maximum of 22,764 tons. S&L therefore overdesigned its control equipment.

9.4. The Kremlin Wet Scrubber Cost-Effectiveness Calculation Is Greatly Inflated

As discussed below, the Kremlin cost-effectiveness calculations contain a number of assumptions that serve to greatly inflate Trinity's cost-effectiveness calculations. These include (1) not considering combining the exhaust from all three kilns into one flue gas cooler and one absorber, (2) actually concluding that a separate waste heat electricity generation unit is required in order to lower the scrubber inlet temperature, (3) assuming a scrubber efficiency that is too low (4) assuming a contingency that is too high, (5) assuming too many additional operational personnel are needed, and (6) assuming an equipment life that is too low. None of these flaws were corrected by ODEQ.

9.4.1. Kremlin's Scrubber Efficiency Figures Are Low

S&L provides no justification for its assumption that Kremlin's wet scrubber should be assumed to have an efficiency of 94%, its dry scrubber 92%, and DSI 40%. On page 2-3 of its report, Trinity attempts to link these figures back to EPA's BART FIP, and to cite to EPA's action regarding the Nelson Unit 6 in Louisiana. However, Trinity's linkage fails for several reasons. In its BART FIP, EPA actually assumed wet scrubber efficiencies of 98% with a floor of 0.04 lbs/MMBtu. Similarly, EPA assumed dry (SDA) scrubber efficiencies of 95% with a floor of 0.06 lbs/MMBtu. In other words, if operation of the SDA at 94% would cause the SO_2 outlet to fall below 0.06 lbs/MMBtu, then whatever efficiency corresponded to 0.06 lbs/MMBtu was used. This is clearly explained in EPA's proposal.[42] A similar approach was adopted for the Entergy Nelson evaluation.[43] It should be further noted that had Trinity followed all of the procedures outlined in these two actions, from which it attempts to cherry-pick data, much of the adjustments outlined below to Kremlin's cost-effectiveness calculations would not have been necessary.

9.4.2. Kremlin Does Not Adequately Consider Cooling Options

Beginning on page 7 of its report, S&L discusses the options to lower the flue gas temperature exiting the kilns prior to entering the SO_2 control devices it considers. S&L states that the flue gas temperature is approximately 1,700 – 1,850°F, and that it must be lowered to 400°F to accommodate any of the SO_2 controls it considers, which consists of wet scrubbing, dry scrubbing and Dry Sorbent Injection (DSI). S&L does not provide any documentation for this

[42] See 82 FR 925. Note these values were in fact first established in the Oklahoma FIP.

[43] See 82 FR 32298: "Entergy assessed SDA and wet FGD as being capable of achieving SO_2 emission rates of 0.06 lb/MMBtu and 0.04 lb/ MMBtu, respectively. As we discuss in the TSD, based on review of IPM documentation, industry publications, and real-world monitoring data, we agree with the LDEQ that 98% control efficiency for wet FGD and 95% control efficiency for SDA are reasonable assumptions and consistent with the emission rates identified by Entergy."

temperature data and ODEQ must require Kremlin to provide that data under 40 CFR 51.308(f)(2)(iii). This documentation should (1) confirm the temperature of the flue gas at the point at which it would enter the various SO_2 controls contemplated, and (2) confirm the upper limit of the SO_2 control device inlet temperature.

S&L considers three methods to reduce the temperature of the flue gas: (1) water-based quenching, (2) air-based quenching, and (3) a waste heat recovery system used to drive a steam turbine generator (one for each kiln) which produces electricity for sale to the grid.

Kremlin Must Consider Closed Loop Cooling

S&L dismisses water-based quenching because it claims that it would increase Kremlin's water usage by approximately 180% which would require an additional 1,200 gpm for the cooling alone. On page 7, S&L opines that this rate of water cannot be guaranteed "due to the unconfirmed availability and/or Enid Kaw Lake Pipeline water take-off restrictions, as well as the significant amount of water lost to atmosphere." S&L then concludes that water-based quenching is not considered to be a reliable or practical flue gas temperature control option and was not evaluated further. ODEQ must require that Kremlin provide documentation to support this water usage claim. S&L provides little detail concerning the water-based cooling system it envisions, only stating the following on page 7 of its report:

> This temperature reduction option requires the injection of water into new ductwork designed for the new flue gas conditions and to allow for adequate water/flue gas contact. Water-based quenching systems would require significant quantities of freshwater, which would be lost to the atmosphere through evaporation.

It appears that S&L only evaluates a wet, open loop, "once through" water-based cooling system, in which large quantities of water are allowed to evaporate and must therefore be replaced. This is perplexing, as S&L is undoubtedly aware, the power generation industry has been using water conservation cooling towers and closed loop dry cooling systems for decades. Regarding water conservation cooling towers, the oft cited reference, "Cooling Tower Fundamentals" states:[44]

> The evaporative cooling tower was originally conceived as a water conservation device, and it continues to perform that function with an ever-increasing efficiency, sacrificing only from 3% to 5% of the circulating water to evaporation, drift and blowdown. This conservation rate in excess of 95% is a boon to industrial areas which are confronted with a limited or costly water supply.

Also, beyond this, dry cooling uses water contained in a closed loop, resulting in no loss to evaporation. Dry cooling is common in arid location where water conservation is a necessity.[45]

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[44] Hensley, John C., ed. 2006. Cooling Tower Fundamentals. SPX Cooling Technologies, Inc. 2006. Page 65. Available here: https://spxcooling.com/wp-content/uploads/Cooling-Tower-Fundamentals.pdf.

[45] See for instance, https://spgdrycooling.com/news/dry-cooling/, or https://www.babcock.com/home/environmental/spig-cooling-systems/dry-cooling-systems, or https://www.evapco.com/dry-cooling-101.

Thus, considerable water savings could be realized by the use of a typical water conservation type cooling tower system or a dry cooling system. ODEQ must therefore require that Kremlin consider both a (1) water conservation type cooling tower system and (2) a dry cooling system.

Kremlin Wrongly Dismisses Air Cooling

On page 8, S&L dismisses air-based cooling. Without any documentation, S&L opines that air-based cooling may result in dew-point corrosion in the heat exchanger, causing more frequent outages. It concludes that due to the relatively larger footprint in an already severely space constrained location as compared to water-based quenching, corrosion risks and potentially increased maintenance costs, air-based quenching is not considered a technically feasible or practical flue gas cooling technology for the facility and therefore was not evaluated further.

First, because S&L specifies that the flue gas temperature must be cooled to 400°F, corrosion is unlikely to be an issue. The composition of the exhaust is similar to that of a coal-fired boiler, and the concern is to prevent the condensation of sulfuric acid. As the Electric Power Research Institute (EPRI) reports in its Wet Stacks Design Guide, "Depending on the sulfur content of the coal and the moisture content of the flue gas, the sulfuric acid dewpoint of the unscrubbed bypass gas is 260 to 300 degrees F (127-149°C)."[46] Thus, the exhaust temperature will be above the point at which sulfuric acid condensation should occur. S&L's completely undocumented concerns aside, even if corrosion were a problem, this is a maintenance item and is therefore not a technical feasibility issue.

Second, S&L presents no documentation concerning the size of the air-cooling system that would be needed, or that such a size prevents its implementation. As ODEQ's own permit evaluation indicates, "The facility occupies an area of 320 acres, of which approximately 80 acres have been developed for the calcining operation."[47] Thus, information in the record indicates the facility has a great deal of available space. As even a causal examination of the aerial photographs of EGUs and industrial facilities indicates, cooling systems are often located some distance away from the fuel burning unit. Thus, any amount of additional available space offers flexibility. S&L itself notes on page 3 of its report that "[t]he Kremlin facility has open space available on-site, north of the existing kilns, which can be used for any additional equipment." S&L's space constraint concerns therefore appear to be specious. ODEQ must require that Kremlin consider an air-cooled system.

Kremlin Wrongly Claims an Electrical Power Generation Plant Is a Necessary Part of Scrubbing

After erroneously dismissing water and air cooling, S&L comes to the conclusion that the only suitable cooling system for the Kremlin plant is one that captures the waste heat, and uses it to produce steam that then drives a steam turbine generator to produce electricity. If this were

[46] Wet Stacks Design Guide, TR-107099 9017, Final Report, November 1996, prepared by BURNS & McDonnell for Electric Power Research Institute. Page 1-6. Available here: https://www.epri.com/research/products/TR-107099.

[47] ODEQ, Air Quality Division Memorandum, July 1, 2021, Evaluation of Permit Application No. 2019-0973-TVR3 Oxbow Calcining LLC Kremlin Calcining Plant (FAC ID 801). Page 1.

not incredible enough, S&L then states on page 12 of its report, "Since the primary purpose of the heat recovery system is to provide flue gas cooling, it should be noted that auxiliary power consumption costs for the APC and supporting systems are still included in this evaluation, no credit for base plant auxiliary power consumption savings or excess power generation sale to the grid were accounted for in this evaluation." In other words, S&L claims that a separate power generation plant is a necessary requirement for the installation of a scrubber at the Kremlin plant, but concludes that *it would be improper to offset this cost by considering the value of the produced electricity.* Further inflating the cost, S&L claims that separate steam turbine generators are necessary for each of the kilns. As indicated above, both water-based dry cooling and air-cooling are widely used and technically feasible. Instead of employing one of these technologies, S&L artificially inflates Kremlin's SO_2 control cost-effectiveness calculations by only considering that waste heat steam turbine generators are necessary. ODEQ must correct this situation.

9.4.3. Kremlin Must Consider One Flue Gas Cooler and Scrubber for All Three Kilns

The erroneous assumptions S&L makes with regard to the type of flue gas cooler aside, S&L considers it necessary to configure a separate flue gas cooler and induced draft fan for each kiln. S&L states on page 26 of its report that it assumed two wet flue gas systems: one to service Kilns 1 and 2 and another for Kiln 3, due to "site space constraints." On page 31, S&L makes the same assumptions for its dry scrubbing cost analysis. In addition, approximately three times as many personnel are required to operate all of this equipment than if one set of systems serviced all three kilns, which further inflates the cost. No documentation, such as site drawings or pictures was presented to substantiate these claims.

Because combining the exhaust from all three kilns into a common duct with one induced draft fan, one cooling system, one scrubber system (likely one absorber for either dry or wet scrubbing), and a reduction in operating personnel, would result in significant cost savings, ODEQ must require that Kremlin investigate this configuration.

9.4.4. Kremlin's 20 Year Operating Life Assumption Is Not Justified

On page 43 of its report, S&L makes the following statement regarding equipment life:

> Considering the novel application of this equipment on the calcining process, it is unknown what effects the process flue gas will have on the typical equipment life and how costs would be applied to achieve longer equipment lifespans. When the process conditions are well established, an industry standard 20-year equipment life is assumed to be representative of the most economical equipment design (i.e., material of constructions, equipment components and other design aspects are engineered and/or selected for ensuring the supplied system will not require complete refurbishment outside of typical manufacturer directed maintenance program for the duration of a 20-year useful life). Equipment could be designed to achieve a longer useful life but would likely result in substantially increased capital and operating costs. Thus, the 20-year equipment life of the control measures was

used in the four-factor analysis to calculate emission reductions, amortized costs, and cost-effectiveness.

There is nothing novel about the control equipment being considered or the environment in which the equipment will function. The mere fact that this equipment will be applied to a petroleum pet coke calcining plant instead of an EGU or an industrial boiler that burns petroleum coke is an insignificant determinant to equipment life. S&L's statement that "When the process conditions are well established, an industry standard 20-year equipment life is assumed to be representative of the most economical equipment design" is completely unsupported and has no relationship to any guidance or recommendations in the Control Cost Manual.

Regarding this, the Control Cost Manual states: "The life of the control is defined in this Manual as the equipment life. This is the expected design or operational life of the control equipment. This is not an estimate of the economic life, for there are many parameters and plant-specific considerations that can yield widely differing estimates for a particular type of control equipment."[48] EPA has consistently assumed a thirty-year equipment life for scrubber retrofits, scrubber upgrades, SCRs, and SNCR installations. Much of this is summarized and cited in EPA's response to comments document for its Texas and Oklahoma Regional Haze SIP final disapproval and FIP.[49]

A number of EGU contractors have been assuming an equipment life of twenty years for SNCR systems, by reference to the Control Cost Manual. The 4/25/2019 SNCR update of the Control Cost Manual does state on page 1-53, "Thus, an equipment lifetime of 20 years is assumed for the SNCR system in this analysis."[50] However, this is a calculation example and does not indicate that EPA universally considers the equipment life for all SNCR systems installed on EGUs to be twenty years. Just prior to this statement, EPA notes, "As mentioned earlier in this chapter, SNCR control systems began to be installed in Japan the late 1980's. Based on data EPA collected from electric utility manufacturers, at least 11 of approximately 190 SNCR systems on utility boilers in the United States were installed before January 1993. In responses to another Institute of Coal Research (ICR), petroleum refiners estimated SNCR life at between 15 and 25 years." Therefore, based on a 1993 SNCR installation date, these SNCR systems are at least twenty-eight years old, which all other considerations aside, strongly argues for a thirty-year equipment life. Furthermore, an SNCR system is much less complicated than a SCR system, for which EPA clearly indicates the life should be thirty years. In an SNCR system, the only parts exposed to the exhaust stream are lances with replaceable nozzles. The injection lances must be regularly checked and serviced, but this can be done relatively quickly,

[48] See Control Cost Manual, Section 1, Chapter 2, Cost Estimation: Concepts and Methodology, November 2017, page 22.

[49] See 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, available here: https://www.regulations.gov/document?D=EPA-R06-OAR-2014-0754-0087. See pages 240-245, 268, and 274. See also the Texas BART FIP proposal, which conducted extensive cost determinations for scrubber upgrades, at 82 FR 930 and 938. See also Control Cost Manual, Section 4, Chapter 2, Selective Catalytic Reduction, June 2019, pdf page 80: "For the purposes of this cost example, the equipment lifetime of an SCR system is assumed to be 30 years for power plants."

[50] Section 4, Chapter 1, Selective Noncatalytic Reduction, April 2019, page 1-53.

if necessary, is relatively inexpensive, and should be considered a maintenance item. In this regard, the lances are analogous to SCR catalyst, which is not considered when estimating equipment life. All other items, which comprise the vast majority of the SNCR system capital costs, are outside the exhaust stream and should be considered to last the life of the facility or longer.

Thus, all types of scrubbers, DSI systems, SCR systems, SNCR systems, and NOx combustion controls should have equipment lives of thirty years unless the unit's retirement is secured by an enforceable commitment. Unless there is a documentable reason to select a shorter life, thirty years should also be the default equipment life used for the cost analyses of these types of controls in any application. Use of a shorter equipment life artificially inflates the cost-effectiveness figures (higher $/ton).

ODEQ questioned Kremlin's use of a 20-year operating life in its January 31, 2022, letter.[51] In response, Kremlin merely reiterated the language from page 43 of the S&L report, reproduced above. ODEQ must reject this as inadequate and require that absent real documentation (not provided in this case) or an enforceable commitment for a shorter life, a 30-year equipment must be used in all cost-effectiveness calculations.

9.4.5. ODEQ Must Verify Kremlin's Interest Rate

Kremlin uses a 10% interest rate, documented by a signed affidavit by the Treasurer of Oxbow Carbon LLC, mush of which has been redacted.[52] ODEQ must state in its SIP whether it finds this documentation satisfactory. This is necessary in order to comply with the documentation requirements of 40 CFR 51.308(f)(2)(iii).

9.4.6. Miscellaneous Cost-Inflating Items That Must Be Removed From S&L's Analyses

As indicated in Appendix A of its report, S&L included sales tax in all of its cost analyses. It appears that for Kremlin's application, air pollution control equipment is exempt from sales tax in Oklahoma.[53] ODEQ must confirm whether this this is true and if exempt, require that it be removed.

S&L includes owner's costs and escalation during construction charges. However, as the Control Cost Manual indicates, "owner's costs and AFUDC costs are capital cost items that are not included in the EPA Control Cost Manual methodology, and thus are not included in the total capital investment (TCI) estimates in this section."[54] Similarly, regarding escalation the Control Cost Manual also states:[55]

[51] See Appendix E, pdf page 270.
[52] See Appendix E, pdf page 279.
[53] See https://oklahoma.gov/tax/search.html?term=pollution+control+.
[54] Control Cost Manual, Section 4, Chapter 2, Selective Catalytic Reduction, June 2019, pdf page 65.
[55] Control Cost Manual, Section 1 Introduction, Chapter 2 Cost Estimation: Concepts and Methodology, November 2017, page 18.

> This Manual uses real prices for estimation of capital costs (in this case, an older capital cost to a more recent year), and other costs for any given cost analysis, not nominal prices. Using a price of reagent, catalyst, or other cost input to reflect possible price changes over the equipment lifetime is not correct in adjusting for inflation. Hence, the inclusion of price inflation via escalation estimates or having input prices reflect price changes over time as part of capital cost estimation is not allowed under the Control Cost Manual Methodology.

Therefore, DEQ must require that these cost items be removed from all control cost analyses.

S&L includes a contingency of 20% of the direct and indirect costs, which is excessive. Kremlin has presented no information that would indicate that the installation of a cooling system and a scrubber, both of which are mature technologies and have been installed on hundreds of sources, present any unique challenges. As the Control Cost Manual states: "A default value of 10% of the direct and indirect costs is typically used for CF [contingency factor]. However, values of between 5% and 15% may be used."[56] Unless documentation is provided that justifies a higher value, ODEQ must require that the low end of this range be used.

9.4.7. Revised Kremlin Wet Scrubber Cost-Effectiveness Calculation for Kiln 1

As discussed above, S&L has taken a number of opportunities to wrongly inflate the cost-effectiveness of SO_2 control equipment at the Kremlin facility. Neither S&L nor Trinity have presented any significant documentation to support the key cost items. In addition, S&L only provides an all-in-one capital cost, which includes the cost of the scrubber and that of the steam turbine generator. S&L further fails to provide costs for two other technically feasible cooling options to lower kiln flue gas temperature to that suitable for use with SO_2 control equipment: a dry cooler and an air cooler. Therefore, an accurate revision to S&L's inflated SO_2 controls cannot be performed.

Two approaches were taken to address this issue. Option 1 makes the adjustments described in the subsections above, and deletes obvious charges related to the installation of the steam turbine generator. This option inherently overpredicts the cost-effectiveness because it still retains S&L's costs for the steam turbine generator and S&L's failure to consider a single wet scrubber and cooling system that would serve all three kilns through common flue gas ducting.

Option 2 retains these corrections, plus it applies a 20% reduction in the purchased equipment and direct installation costs to estimate the savings from the substitution of dry cooling for the steam turbine generator. Because of S&L's failure to separate out the capital cost items, no documentation can be provided to support this 20% reduction. Nevertheless, it is offered as a conservative indication of the additional cost inflation inherent in S&L's costs due to inclusion of the steam turbine generator. The revised cost-effectiveness for both options are presented below:

[56] Control Cost Manual, Section 5, SO_2 and Acid Gas Controls, Chapter 1 Wet and Dry Scrubbers for Acid Gas Control, April 2021. Page 1-79. It should be noted that

Table 3. Revised Cost-Effectiveness of Wet Scrubber for Kremlin Kiln 1

Direct Costs	Unit 1	Option 1	Option 2	Comments
Purchased Equipment Costs (PEC)	$49,178,000	$49,178,000		Includes scrubber + steam turbine generator
Sales Tax	$2,459,000	$0	$0	Assumed sales tax not applicable
Freight	$2,459,000	$2,459,000		
Total PEC	$54,096,000	$51,637,000	$41,309,600	Option 2 conservatively reduces Option 1 figure by 20% to delete steam turbine and assume dry cooling
Direct Installation Costs				
Total Direct Installation Costs (TDIC)	$27,781,000	$27,781,000	$22,224,800	Conservatively reduced by 20% in Option 2 to delete steam turbine and assume dry cooling
Total Direct Costs (TDC = PEC +TDIC)	$81,877,000	$79,418,000	$63,534,400	
Indirect Costs (31% of TDC)	$25,382,000	$24,619,580	$19,695,664	
Owners Cost		-$1,588,360	-$1,270,688	Delete disallowed owners' costs
Total Indirect Costs (TIC)	$25,382,000	$23,031,220	$18,424,976	
Contingency Percentage (% of TDC + TIC)	20	10	10	Reduce contingency to 10%
Contingency	$21,451,800	$10,244,922	$8,195,938	
Total Capital Investment (TCI)	$128,710,800	$112,694,142	$90,155,314	
Escalated TCI (2024)	$144,865,000	$112,694,142	$90,155,314	Escalation not allowed

Equipment Life (years)	20	30	30	
Interest Rate (%)	10	10	10	
Capital Recovery Factor (CRF)	0.1175	0.1061	0.1061	
Annualized Capital Costs (CRF x TCI)	$15,118,000	$11,954,510	$9,563,608	
Escalated Annualized Capital Costs	$17,016,000	$11,954,510	$9,563,608	Escalation (and double escalation) not allowed
Operating Costs				
Increased Waste Disposal Costs	$991,000	$991,000	$991,000	
Limestone Reagent Costs	$800,000	$800,000	$800,000	
Increased Auxiliary Power Cost	$519,000	$519,000	$519,000	
Increased Water Cost	$1,690,000	$393,770	$393,770	Assume dry cooling (no water loss), so reduced to 23.3% (280 gpm/1,200 gpm)[57]
Demineralized Water Cost	$678,000	$0	$0	Assumed to be used in the steam turbine, so deleted for dry cooling
Total Variable O&M Costs	$4,678,000	$2,703,770	$2,703,770	
Fixed O&M Costs				
Labor (operator and supervisor)	$7,723,000	$2,246,400	$2,246,400	CCM annual labor cost for scrubber = 12 x 2,080 hrs/yr x $60/hr. Assumed additional 1/2 for dry

[57] See page 7 of the S&L report: "water requirements at the facility would increase approximately 180% of the current facility consumption rate of 670 gpm, requiring approximately 1,200 gpm for the cooling alone. Water will also be required to operate some of the SO_2 control systems, requiring an additional approximately 150 to 280 gpm depending on the technology."

				cooling system
Maintenance Materials	$1,228,000	$1,228,000	$1,228,000	
Water Supply Pipeline Right-of-Way	$70,000	$0	$0	Not needed for dry cooling
Water Treatment System Rental	$2,160,000	$0	$0	Not needed for dry cooling
Total Fixed O&M Costs	$11,181,000	$3,474,400	$3,474,400	
Indirect Operating Costs (4% of TCI)	$5,148,000	$4,507,766	$3,606,213	
Total Annual Operating Costs	$21,007,000	$10,685,936	$9,784,383	
Escalated Total Annual Operating Cost (2004)	$23,644,000	$10,685,936	$9,784,383	Escalation not allowed
Total Annualized Costs	$36,125,000	$22,640,446	$19,347,990	
Escalated Total Annualized Costs	$40,660,000	$22,640,446	$19,347,990	Escalation not allowed
Control Efficiency (%)	94	98	98	Based on emission reduction, efficiency is 94.3. Used 98% in revised
Baseline SO_2 Emissions (tons)	6,556	6,556	6,556	
Emissions Reduction (tons)	6,185	6,425	6,425	
Cost-Effectiveness ($/ton)	**$6,574**	**$3,524**	**$3,011**	

As can be seen from the above table, after correcting for the issues described above in Option 1, a cost-effectiveness of $3,524/ton results. Further making conservative and reasonable estimated corrections in Option 2 to the purchased equipment and direct installation costs to delete the steam turbine generator, further reduces the cost-effectiveness to $3,011/ton. Still, this figure is likely high, because of S&L's failure to consider a single wet scrubber and cooling system that would serve all three kilns through common flue gas ducting.

S&L and Trinity also perform a cost-effectiveness calculation for a wet scrubber assuming a water supply pipeline is not an option, and all the additional water must be trucked into the facility. However, as discussed earlier, use of a dry cooling system would not require any significant additional water, so evaluation of this option is moot.

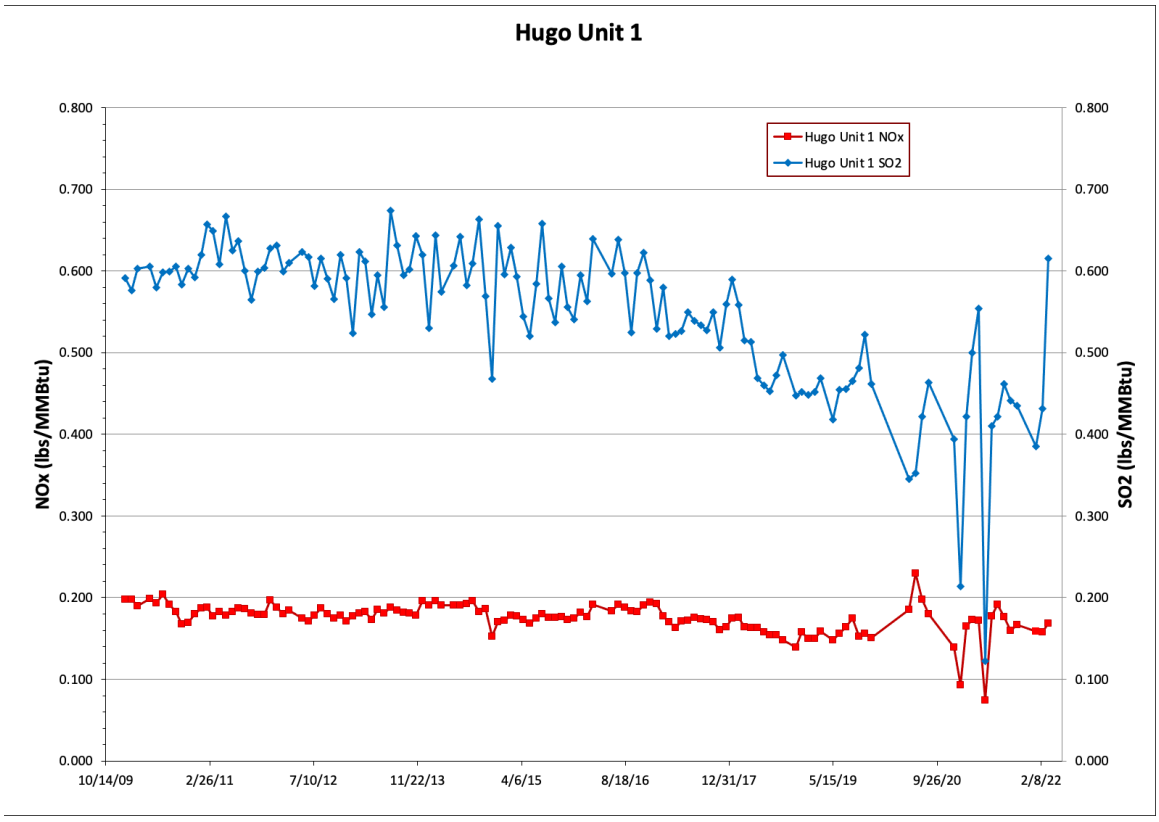
Due to time constraints, similar calculations were not made for the wet scrubbers Kilns 2 and 3, and for Trinity and S&L's dry scrubber and DSI evaluations. However, the cost-effectiveness figures for these options would be improved by similar margins.

10 Review of the Western Farmers Electric Cooperative Hugo Four-Factor Analysis

The Western Farmers Electric Cooperative (WFEC) owns and operates the Hugo Electric Generating Plant, located in Choctaw County, Oklahoma. It consists of one 477 MW dry bottom wall-fired unit that burns subbituminous coal. This unit is fitted with NOx combustion controls and no SO_2 controls. The four-factor report, which is present in Appendix E, is reviewed below.[58]

The SO_2 and NOx emissions for Hugo Unit 1 are presented below:[59]

Figure 1. Hugo Unit 1 Historical Emissions



[58] Regional Haze Rule Four-Factor Reasonable Progress Analysis, prepared by Trinity Consultants, August 20, 2020, hereafter referred to in this section as "the Trinity Report."
[59] See the file entitled, "OK EGU emissions.xlsx."

The gradual decrease in the SO_2 rate, seen to occur beginning in 2017 appears to reflect usage of a lower sulfur coal. The fluctuations present in the SO_2 rate likely also reflect differences in the sulfur content of the coal, since the unit has no SO_2 controls.

10.1. Hugo's Scrubber and DSI Cost-Effectiveness Methodologies Are Invalid

As ODEQ points out in its letter to Western Farmers, its methodology of escalating 2009 $/kW figures picked from other scrubber and DSI cost analyses is not valid, due to the length of escalation time.[60] ODEQ rightly points out that the Control Cost Manual clearly states this approach is invalid:[61]

> It should be noted that the accuracy associated with escalation (and its reverse, deescalation) declines the longer the time period over which this is done. Escalation with a time horizon of more than five years is typically not considered appropriate as such escalation does not yield a reasonably accurate estimate. Thus, obtaining new price quotes for cost items is advisable beyond five years. If longer escalation periods are unavoidable due to limited recent cost data that is reasonably available, then the analysis should use the principles in this Manual chapter to provide as accurate an escalation as possible consistent with the Manual given the limitations of the cost analysis. The appropriate length of time for escalation can vary as a result of significant changes in the cost of major production inputs (e.g., energy, steel, chemical reagents, etc.) and technological changes in control measures, particularly if these changes occur in an unusually short period of time. Hence, shorter time periods for escalation and de-escalation are clearly preferred over longer ones.

In this case, escalation beyond five years is not "unavoidable" since the Control Cost Manual itself provides cost models for wet and dry scrubbers.[62] Western Farmers' response that the Control Cost Manual's "rule of thumb" is not substantiated or that it is "out-of-context" is obviously incorrect.[63] Thus, ODEQ must follow through and require that Hugo properly perform its cost-estimates.

10.2. Hugo's Scrubber Cost-Effectiveness Calculation Is Inflated

Using the cost models referenced above, the cost-effectiveness was calculated for wet and dry scrubbers for the Hugo EGU. In so doing, the same emission dataset used by Trinity in its report— monthly emissions from 2018 through 2019—was also used. However, a number of

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[60] See Appendix E, pdf page 377.

[61] Control Cost Manual, Section 1 Introduction, Chapter 2 Cost Estimation: Concepts and Methodology, November 2017. Page 19 (citing Vatavuk, W., Updating the CE Plant Cost Index, Chem. Eng., pp. 62-70, January 2002).

[62] See the spreadsheet in Section 5: https://www.epa.gov/economic-and-cost-analysis-air-pollution-regulations/cost-reports-and-guidance-air-pollution. Alternatively, note that EPA's IPM cost models, on which these cost models are based, include wet and dry scrubbing and DSI costs, have been available since the first planning period and were used extensively.

[63] See Appendix E, pdf page 380.

corrections were made. These include the SO_2 inlet, which Hugo calculates as 0.462 lbs/MMBtu, which based on the data is actually 0.479 lbs/MMBtu.

Trinity refers to its calculation of the fractional time the unit operates as a "capacity factor." This is incorrect, as the capacity factor is defined as the ratio of the electrical energy produced by a generating unit for the period of time considered to the electrical energy that could have been produced at continuous full power operation during the same period.[64] Calculations based simply on the time the unit was operating overlook the usual situation in which the power plant can be listed as running for the full time period (e.g., 24 hours/day, 30 day/month, 365 days/yr) but was not running at full load. Therefore, Trinity's use of a 0.45 capacity factor is wrong and its reference to EPA's FIP's use of this methodology is incorrect.

Also, Trinity calculates an SO_2 baseline of 3,211 tons, based on multiplying its average SO_2 emission rate of 0.462 lbs/MMBtu by its average annual heat input of 13,901,244 MMBtu/yr. Using the corrected SO_2 inlet of 0.479 results in a value of 3,327 tons, which compares more closely to an average of the 2018-2019 SO_2 emissions of 3,379 tons, and is the method EPA's cost model calculates SO_2 emissions in the analyses that follow.

Lastly, the interest rate used was 4%, which is the current Bank Prime rate. A summary of the cost-effectiveness calculations is presented below:[65]

Table 4. Hugo Unit 1 Dry Scrubber Cost-Effectiveness

SDA Selected Input and Outputs		
Fuel type	Coal	
Retrofit factor	1	
MW rating	446	MW
SO_2 inlet (lbs/MMBtu)	0.479	Btu/lb
Annual MWh output	1,196,982	MWh
Total System Capacity Factor (CF_{total})	0.306	
Net plant heat input rate (NPHR)	11.6	MMBtu/MW
SO_2 outlet	0.06	lb/MMBtu
Scrubber efficiency	87.47	5
Plant elevation	480	feet
Desired dollar-year	2020	
Interest rate	4.00	Percent
Equipment life	30	years
Total Capital Investment (TCI)	$222,908,249	
Direct Annual Costs (DAC)	$6,183,184	
Indirect Annual Costs (IDAC)	$12,954,172	
Total Annual Costs (TAC) = DAC + IDAC	$19,137,356	

[64] See https://www.eia.gov/tools/glossary/index.php?id=Capacity_factor.
[65] See the file entitled, "Hugo wetanddryscrubbers_controlcostmanualspreadsheet_may_2021.xlsm."

SO_2 removed	2,908.9	tons/yr
Cost-effectiveness	**$6,579**	**$/ton**

Table 5. Hugo Unit 1 Wet Scrubber Cost-Effectiveness

Wet FGD Selected Input and Outputs		
Fuel type	Coal	
Retrofit factor	1	
MW rating	446	MW
SO_2 inlet (lbs/MMBtu)	0.479	Btu/lb
Annual MWh output	1,196,982	MWh
Total System Capacity Factor (CF_{total})	0.306	
Net plant heat input rate (NPHR)	11.6	MMBtu/MW
SO_2 outlet	0.04	lb/MMBtu
Scrubber efficiency	91.65	%
Plant elevation	480	feet
Desired dollar-year	2020	
Interest rate	4.00	Percent
Equipment life	30	years
Total Capital Investment (TCI)	$245,391,313	
Direct Annual Costs (DAC)	$6,875,794	
Indirect Annual Costs (IDAC)	$14,272,716	
Total Annual Costs (TAC) = DAC + IDAC	$21,148,511	
SO_2 removed	3,047.8	tons/yr
Cost-effectiveness	**$6,939**	**$/ton**

As can be seen from the above, dry and wet scrubber cost-effectiveness figures of $6,579/ton and $6,939/ton are much lower than the figures of $8,203/ton and $8,462/ton that Trinity calculates.

It should be further noted that the Hugo scrubber cost-effectiveness calculations are highly sensitive to the year of the data used, which reflects the recent declining capacity of the unit. As indicated by the following table, Hugo's capacity has declined in recent years but it experienced a slight rebound in 2021.

Table 6. Hugo's Historical Capacity

Year	Operating Time (hours)	SO_2 (tons)	Avg. SO_2 Rate (lb/MMBtu)	NOx (tons)	Avg. NOx Rate (lb/MMBtu)
2010	7,486.1	8,597.9	0.594	2,724.7	0.188
2011	8,359.6	9,278.5	0.622	2,730.8	0.184
2012	7,852.2	8,066.0	0.603	2,414.3	0.179
2013	8,468.5	10,877.6	0.602	3,348.2	0.183
2014	7,032.1	8,964.9	0.605	2,834.0	0.188
2015	8,231.2	8,525.5	0.581	2,593.3	0.175
2016	6,789.4	7,275.5	0.597	2,301.1	0.187
2017	8,010.3	8,136.6	0.537	2,652.6	0.172
2018	5,578.2	5,117.7	0.494	1,690.6	0.161
2019	2,302.1	1,640.2	0.464	571.9	0.158
2020	1,072.0	569.7	0.426	242.7	0.179
2021	3,265.6	2,427.0	0.447	957.4	0.173

Rerunning the above cost-effectiveness calculations based on the data from individual years (as opposed to Trinity's average of 2018-2019 data) results in the following:[66]

Table 7. Hugo Unit 1 Wet and Dry Scrubber Cost-Effectiveness for Different Capacity Factors

Year	Dry Scrubber Cost Analysis ($/ton)	Wet Scrubber Cost Analysis ($/ton)
2017	$2,963	$3,075
2018	$4,486	$4,697
2019	$12,599	$13,386

Obviously, 2020's data would result in an even higher cost-effectiveness value. Therefore, after revising Hugo's scrubber cost-effectiveness to correct the errors discussed above, ODEQ must make a determination in its SIP as to which data it finds is likely to be representative of future operations and make its four-factor determination on that basis.

10.3. Trinity Does Not Provide Documentation for Its DSI Efficiency

On page 2-1 of its report, Trinity indicates in Table 2-1 that the DSI efficiency it is using in its cost-effectiveness calculation for Hugo is 40%. It states it has adopted that figure from the

[66] See the file, "Hugo wetanddryscrubbers_controlcostmanualspreadsheet_may_2021-yearly.xlsm."

October 2012 Settlement Agreement for the Public Service Company of Oklahoma (PSO) Northeastern Plant. The use of a settlement agreement, which involved consideration of the emission reduction from the retirement of another unit, is in no way any justification for a four-factor determination of Hugo. When evaluating units not subject to settlement agreements, such as in its Texas BART FIP, EPA adopted the following strategy:[67]

> We will evaluate each unit at its maximum recommended DSI performance level, according to the IPM DSI documentation,[75] assuming milled trona: 80% SO_2 removal for an ESP installation and 90% SO_2 removal for a baghouse installation. This level of control is within the range that can be achieved by SO_2 scrubbers, and thus allows a better comparison of the costs of DSI and scrubbers.

Thus, Trinity's DSI efficiency is unsupported, and by information supplied by its own co-contractor (S&L) to EPA under contract, is demonstrably low.

10.4. Hugo's DSI Cost-Effectiveness Calculation Is Greatly Inflated

As indicated above, Hugo's DSI cost-effectiveness calculation relies on the same fundamentally flawed methodology of escalating a $/kW figure picked from another DSI cost analyses. As with the scrubber cost-effectiveness calculations detailed above, EPA has provided a DSI cost-effectiveness spreadsheet that has been in wide use since the first planning period.[68]

Therefore, Hugo's DSI cost-effectiveness was calculated using the same basic inputs from the revised scrubber cost-effectiveness, along with the DSI efficiencies discussed above:[69]

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[67] See FR 82 925 (January 4, 2017) (citing IPM Model—Updates to Cost and Performance for APC Technologies, Dry Sorbent Injection for SO_2 Control Cost Development Methodology, Final March 2013, Project 12847–002, Systems Research and Applications Corporation, Prepared by Sargent & Lundy, p. 7)

[68] See https://www.epa.gov/power-sector-modeling/retrofit-cost-analyzer. Note the Retrofit Cost Analyzer incorporates cost algorithms from EPA's IPM cost models developed by S&L. These IPM cost algorithms, have been continuously updated since the first planning period.

[69] See the file entitled, "Hugo DSI Cost Estimate.xlsx."

Table 8. Hugo DSI with ESP Cost-Effectiveness

Variable	Designation	Units	Value
EPC Project?			☐ FALSE
Capacity Factor		%	30.6
Unit Size	A	(MW)	447
Retrofit Factor	B		1.00
Heat Rate	C	(Btu/kWh)	8544
SO2 Rate	D	(lb/MMBtu)	0.479
Type of Coal	E		PRB
Particulate Capture	F		ESP
Sorbent	G		Milled Trona
Removal Target	H	(%)	80
Heat Input	J	(Btu/hr)	3.82E+09
NSR	K	(Btu/hr)	3.32
Sorbent Feed Rate	M	(ton/hr)	7.29
Estimated HCL Removal	V	(%)	81
Sorbent Waste Rate	N	(ton/hr)	5.71
Fly Ash Waste Rate Include in VOM? ☑	P	(ton/hr)	10.91
Aux Power **Include in VOM?** ☑	Q	(%)	0.33
Sorbent Cost	R	($/ton)	170
Waste Disposal Cost	S	($/ton)	50
Aux Power Cost	T	($/kWh)	0.06
Operating Labor Rate	U	($/hr)	60
Interest Rate		(%)	4
Equipment Lifetime		(years)	30

Annual Capacity Factor =	30.6%	
Annual MWhs =	1,198,210	
Annual Heat Input MMBtu =	10,237,509	
Annual Tons SO2 Created =	2,452	At 100% S conversion
Annual Tons SO2 Removed =	1,962	At removal efficiency of 80%
Annual Avg SO2 Emission Rate, lb/MMBtu =	0.383	Value is AT or ABOVE a 0.1 floor ra
Capital Recovery factor =	0.0578	
Annual Capital Cost =	$1,012,000	
Annual FOM Cost =	$404,000	
Annual VOM Cost =	$5,782,000	
Total Annual DSI Cost =	$7,198,000	
Capital Cost, $/MWh =	0.84	
FOM Cost, $/MWh =	0.34	
VOM Cost, $/MWh =	4.83	
Total DSI Cost, $/MWh =	6.01	
Capital Cost, $/ton =	515.93	
FOM Cost, $/ton =	205.96	
VOM Cost, $/ton =	$2,948	
DSI cost-effectiveness, $/ton =	**$3,670**	

Because Hugo is fitted with an ESP, an ESP was selected as the particulate control device in the cost model. Thus, equipped with an ESP and assuming 80% efficiency, a DSI cost-effectiveness figure of $3,670/ton results. These figures are in 2016 dollars. Escalated to 2020, this figure become $4,039/ton.[70] This contrasts with the absurd value of $41,003/ton that Trinity presents. Even if, the unreasonably low DSI efficiency of 40% used by Trinity was adopted, the cost-effectiveness would still be $4,058/ton, which escalated to 2020 becomes $4,466/ton. Thus, ODEQ must require that Hugo revise its DSI cost-effectiveness and correct the errors described above.

11 Review of the Grand River Dam Authority Four-Factor Analysis

The Grand River Dam Authority operates the Grand River Energy Center (GREC) located in Mayes County. GREC comprises three units. Unit 1 was a 540 MW coal-fired dry bottom wall-fired unit that burned subbituminous coal, but is now retired. Unit 2 is a 594 MW coal-fired dry bottom wall-fired unit that burns subbituminous coal. This unit is fitted with NOx combustion controls and a dry scrubber. Unit 3 is a 600 MW natural gas-fired combined cycle unit. The four-factor report, which is present in Appendix E, is reviewed below.[71]

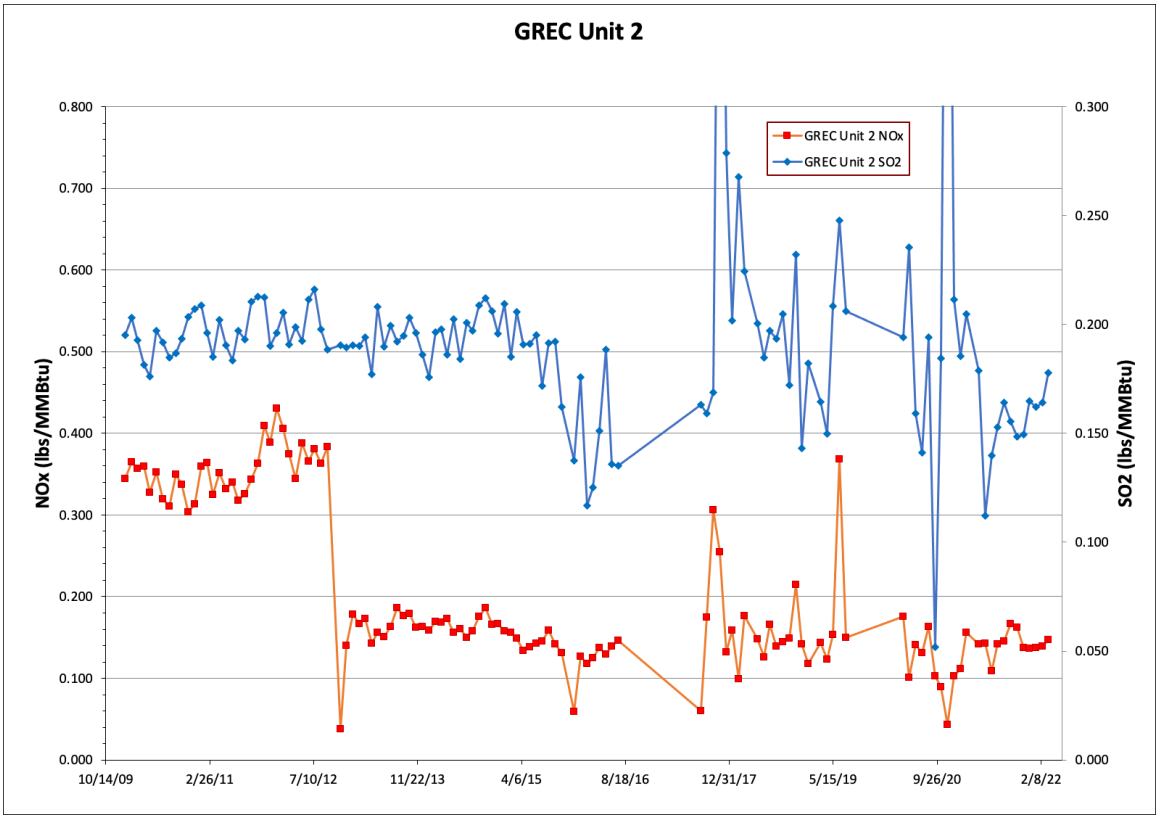
The SO_2 and NOx emissions for GREC Unit 2 are presented below:[72]

[70] The CEPCI index for 2016 is 541.7 and that for 2020 is 596.2. Thus, the figures are multiplied by the factor 596.2/541.7 = 1.10.

[71] Final Four Factor Analysis Grand River Energy Center Unit 2, prepared for Grand River Dam Authority by Black & Veatch, September 8, 2020. Hereafter referred to in this section as "the B&V report."

[72] See the file entitled, "OK EGU emissions.xlsx."

Figure 2. GREC Unit 2 Historical Emissions



As can be seen from the above graph, starting in September 2012, the NOx emissions for Unit 2 significantly improved. Also, beginning in late 2015, the SO_2 emissions for Unit 2 became erratic. There is no discussion for this in GREC's four-factor analysis and ODEQ must require it, as it impacts that analysis.

11.1. GREC's Four-Factor Report Is Fundamentally Inadequate

GREC's four-factor report is fundamentally incomplete, as it lacks any details concerning the bottom-line cost-effectiveness figures it summarizes in Table 4-3. As a consequence, there is no way for any member of the public to fully assess GREC's analysis. GREC's undocumented figures rest on a thin claim of confidentiality.

On page 1-3 and 2-1, GREC's redacts Unit 2's historical capacity factor for 2016 and 2019, which is easily back-calculated based on public data present in EPA's AMPD website and present in a spreadsheet attached to these comments.[73] Therefore, there is no justification for this redaction.

GREC redacts 2019 emission data in Table 2-1, which again is public information and thus unjustifiable.

[73] See the file entitled, "OK EGU emissions.xlsx."

In Table 3-3, GREC redacts the maximum sulfur loading of Unit 2's scrubber and on page 4-3 redacts the maximum sulfur content the scrubber can treat while functioning at an 85% efficiency. There is no conceivable commercial or competitive advantage to withholding this information, especially since GREC must report the sulfur percentage of the coal it does burn on a monthly basis to the Energy Information Agency, and this data is publicly available.[74]

In Table 3-2 GREC redacts what is indicates is its forecasted future capacity factor, which it apparently incorporated into its cost-effectiveness figures. GREC notes that its forecasted capacity factor "is not definitive; present circumstances and expectations suggest the potential value indicated. The increasing levels of renewables generation in the Southwest Power Pool mean that the current conditions for economic dispatch of coal-fired generation are not likely to change."[75]

ODEQ correctly objects to GREC's use of a forecasted capacity factor in its January 31, 2022 letter to GREC, requesting an explanation and explaining that if it is not based on recent historical operations, it may not be appropriate for GREC to base its four-factor analysis on it without an enforceable commitment to operate at that capacity factor.[76] GRCE simply replies in its February 28, 2022 letter that "[t]he forecasted capacity factor was based on recent historical operations of GREC from 2016-2020." First, if this is actually the case, then there is no basis for GREC to redact its forecasted capacity factor, since as indicated above, historical emission data is public. Second, ODEQ is correct that unless GRCE is willing to enter into an enforceable commitment for a reduced capacity for Unit 2, then it must base its cost-effectiveness calculations on recent historical data, which again is public information and must not be redacted.

On page 7 and elsewhere of the B&V report, GREC redacts the life of Unit 2 on which its cost-effectiveness calculations were based. ODEQ correctly objects to GREC's assumed short operating life in that same letter:

> The assumption of a shortened remaining useful life in the cost analysis for controls evaluated for Unit 2 appears to be based on "operating projections." As discussed in the August 2019 Guidance, this is not an appropriate approach. The Guidance explains that "In the situation where an enforceable shutdown date does not exist, the remaining useful life of a control under consideration should be full period of useful life of that control as recommended by EPA's Control Cost Manual." (See August 2019 Guidance at 34.)

In its reply, GRCE states the following:

> The life of control equipment in the EPA Control Cost Manual, for example, provides a range, kg., 20 to 30 years for the assumed lifetime of a control device. It is arbitrary for EPA to force the use of one particular value within the range. The study was based on the most representative value based on known conditions at the

[74] See https://www.eia.gov/electricity/data/eia923/.
[75] Page 3-2 of the B&V report.
[76] See Appendix E, pdf page 74.

> time of the study. The GREC facility does not have an enforceable shutdown date. The useful life of the controls in consideration were developed based on GRDA's understanding at the time of the unit's remaining useful life.

As indicated elsewhere in these comments, GREC's assertion that the equipment life is a flexible range from which a company can adopt any value it desires is wrong. Unless GREC is willing to enter into an enforceable commitment to the contrary, ODEQ must require that it base its cost-effectiveness calculations on a 30-year equipment life.

Also, in its January 31, 2022 letter to GREC, ODEQ again correctly requests that GRCE provide line-item cost calculations and any vendor quotes obtained for all the control options evaluated in the four-factor analysis. ODEQ points out to GREC that documentation of the technical basis of GRCE's demonstration is a requirement of the Regional Haze Rule under 51.308(f)(2)(iii) (as noted several times throughout these comments). GRCE's reply in its February 28, 2022 letter is that its analysis contains commercially sensitive information, such as economic criteria and cost calculations and on that basis asserts a confidentiality claim. GRCE further states that ODEQ is in possession of the unredacted version of its four-factor analysis.

ODEQ must formally review GRCE's confidentiality claim. As indicated below, it appears that most, if not all of the redacted material should not be considered confidential. Furthermore, GREC's general single-sentence claim that its entire cost-effectiveness analysis should be held confidential because it contains commercially sensitive information, such as economic criteria and cost calculations, is absurd. That same generalized claim could be asserted by every commercial source subject to a four-factor analysis. ODEQ must demand that GREC provide a substantially, if not entirely, unredacted cost-effectiveness calculations, or ODEQ must perform and present those calculations itself.

11.2. GREC Does Not Adequately Assess Scrubber Upgrades to Unit 2

The obvious path forward in GREC's SO_2 four-factor analysis for Unit 2 is to upgrade or optimize its existing dry scrubber. EPA has long recognized that scrubber upgrades are cost-effective. However, B&V minimizes this likelihood. For instance, on page 4-3, B&V states: "The current system was designed to remove 85 percent of the incoming SO_2 based on the design information in Section 3, while burning coal with a sulfur content of up to [redacted] percent, so there is minimal potential for upgrades within the existing system to have a significant effect on SO_2 removal." B&V provides no documentation for this claim. ODEQ must require the following:

- Documentation that the *scrubber system* (as opposed to just the absorber) was designed to only remove 85% of the SO_2 at the redacted sulfur content. ODEQ must investigate whether this efficiency figure includes a bypass, and whether this bypass can be partially or completely eliminated.

- Determination of the design scrubber efficiency *for the coal GREC is currently burning*.

- It appears from what discussion B&V does present, that it contemplates an SDA replacement and not an additional SDA module. ODEQ must clarify this and if the cost-effectiveness calculation in fact only considers replacement of the entire SDA system, ODQ must require that an additional SDA module also be considered.

- As indicated in the figure above that depicts GREC's historical emissions, beginning in late 2015, the SO_2 emissions for Unit 2 became erratic. Before this point, the SO_2 emissions were much more tightly controlled. An examination of GREC's coal sulfur data does not indicate any obvious change in the type of coal or the monthly coal sulfur content before or after this point, nor does it indicate any obvious change in the range of monthly sulfur content. ODEQ must require that this be investigated, as one obvious reason is that GREC's scrubber system may not be properly operated or maintained.

12 Review of the OG&E Horseshoe Four-Factor Analysis

OG&E owns and operates the Horseshoe Lake Generating Station, located in Oklahoma County, Oklahoma. It consists of five units. Unit 6 is a 167 MW natural gas wall-fired boiler. Unit 7 is a 210 MW natural gas wall-fired boiler. Unit 8 is a 404 MW natural gas tangentially-fired boiler. Units 9 and 10 are both 45.5 MW simple cycle gas turbines. None of these units have any NOx controls beyond water injection for the Units 9 and 10. Two reports were reviewed consisting of a September 2020 Trinity report, which references a September 2020 S&L report, both of which are present in Appendix E.[77] Graphs of the NOx emissions are not presented, as they do not indicate anything noteworthy.

Both S&L and Trinity's SCR cost-effectiveness figures are flawed, due to similar issues described below regarding their SNCR cost analyses, and are quite inflated. However, these calculations are not reviewed herein because after applying EPA's SCR Control Cost Manual cost model the resulting cost-effectiveness figures remain unfavorable.

12.1. OG&E's SNCR Cost-Effectiveness Figures Are Greatly Inflated

S&L does not provide any documentation for the capital costs of its SNCR cost analyses for Units 6, 7, and 8, which Trinity uses to calculate cost-effectiveness figures of $24,528/ton, $36,107/ton, and $36,066/ton, respectively.[78] In so doing, S&L utilizes several improper parameters which inflate the cost-effectiveness. These include a contingency of 20%, a 20-year operating life, and a 7% interest rate. No documentation was provided for these parameters, and as discussed earlier in these comments, they are therefore improper and ODEQ must require that they be revised.

In addition, S&L bases its cost analysis on urea-based SNCR systems, which due to the cost of the reagent, result in much less favorable (higher $/ton) cost-effectiveness figures. For these

[77] Regional Haze Four-Factor Reasonable Progress Analysis, OGE, Horseshoe Lake Generating Station, prepared by Trinity Consultants, September 29, 2020. Hereafter referred to in this section as "the Trinity report." OG&E Horseshoe Lake Station Unit 6-10, Regional Haze Second Planning Period Cost Evaluation to Support Four-Factor Analysis, Sargent & Lundy, September 28, 2020. Hereafter referred to in this section as "the S&L Report."

[78] Note that Units 9, and 10 are not well suited to SNCR, as they are simple cycle combustion turbines.

reasons, primarily due to the lack of documentation and the inability to fundamentally adjust S&L's cost analyses for ammonia-based SNCR systems, EPA's SNCR Control Cost Manual cost model was employed to more reasonable calculate the SNCR cost-effectiveness for Units 6, 7, and 8.[79] The following tables summarize the result for 40% SNCR efficiency cases for Units 6, 7, and 8:

Table 9. Selected Input and Outputs Horseshoe Lake Unit 6, SNCR 40% Efficiency

Fuel type	Natural Gas	
Retrofit factor	1	
MW rating	176	MW
HHV	1,033	Btu/lb
Annual MWh output	244,799	MWh
Net plant heat input rate (NPHR)	8.2	MMBtu/MW
Desired SNCR efficiency	40	Percent
Time the SNCR and Boiler Operate	106	days
NOx inlet	0.243	lb/MMBtu
NOx outlet	0.1458	lb/MMBtu
Reagent	Ammonia	
Plant elevation	1,079	feet
NSR	1.95	
Desired dollar-year	2020	
Interest rate	4	Percent
Equipment life	30	years
Total Capital Investment (TCI)	$4,802,201	
Direct Annual Costs (DAC)	$130,922	
Indirect Annual Costs (IDAC)	$279,728	
Total Annual Costs (TAC) = DAC + IDAC	$410,651	
NOx removed	98	tons/year
Cost-effectiveness	**$4,209**	**$/ton**

Table 10. Selected Input and Outputs Horseshoe Lake Unit 7, SNCR 40% Efficiency

Fuel type	Natural Gas	
Retrofit factor	1	
MW rating	210	MW
HHV	1,033	Btu/lb
Annual MWh output	296,114	MWh
Net plant heat input rate (NPHR)	8.2	MMBtu/MW

[79] See https://www.epa.gov/economic-and-cost-analysis-air-pollution-regulations/cost-reports-and-guidance-air-pollution. Section 4. The results of these calculations are contained in the file entitled, "Horseshoe SNCR CCM cost-effectiveness.xlsm."

Desired SNCR efficiency	40	Percent
Time the SNCR and Boiler Operate	99	days
NOx inlet	0.164	lb/MMBtu
NOx outlet	0.0984	lb/MMBtu
Reagent	Ammonia	
Plant elevation	1,079	feet
NSR	2.51	
Desired dollar-year	2020	
Interest rate	4	Percent
Equipment life	30	years
Total Capital Investment (TCI)	$5,037,761	
Direct Annual Costs (DAC)	$137,311	
Indirect Annual Costs (IDAC)	$293,450	
Total Annual Costs (TAC) = DAC + IDAC	$430,760	
NOx removed	80	tons/year
Cost-effectiveness	**$5,409**	**$/ton**

Table 11. Selected Input and Outputs Horseshoe Lake Unit 8, SNCR 40% Efficiency

Fuel type	Natural Gas	
Retrofit factor	1	
MW rating	404	MW
HHV	1,033	Btu/lb
Annual MWh output	238,021	MWh
Net plant heat input rate (NPHR)	8.2	MMBtu/MW
Desired SNCR efficiency	40	Percent
Time the SNCR and Boiler Operate	67	days
NOx inlet	0.122	lb/MMBtu
NOx outlet	0.0732	lb/MMBtu
Reagent	Ammonia	
Plant elevation	1,079	feet
NSR	3.10	
Desired dollar-year	2020	
Interest rate	4	Percent
Equipment life	30	years
Total Capital Investment (TCI)	$6,566,060	
Direct Annual Costs (DAC)	$144,066	
Indirect Annual Costs (IDAC)	$382,473	
Total Annual Costs (TAC) = DAC + IDAC	$526,539	
NOx removed	48	tons/year

Cost-effectiveness	**$11,056**	**$/ton**

Neither S&L nor Trinity provide any documentation for the SNCR efficiencies assumed in their calculations, simply assuming NOx outlet values of 0.15 lbs/MMBtu for Unit 6 and 0.12 lbs/MMBtu for Units 7 and 8. SNCR performance is in fact, very site-specific and it is difficult to predict without sophisticated modeling tools. However, the Control Cost Manual provides data that indicates a reasonable range is 40% to 60%.[80] Therefore, the above SNCR cost models were also run using that range of efficiencies. Below is a summary of the results:

Table 12. Summary of SNCR Cost-Effectiveness for Horseshoe Lake Units 6, 7, and 8

Unit	40%	50%	60%
6	$4,209/ton	$3,538/ton	$3,083/ton
7	$5,409/ton	$4,545/ton	$3,960/ton
8	$11,056/ton	$9,172/ton	$7,898/ton

As can be seen from the above summary, S&L and Trinity's cost-effectiveness figures for SNCR are extremely inflated, even considering a modest SNCR efficiency of 40%. ODEQ must therefore reassess its determination that SNCR is not cost-effective.

13 Review of the DCP Chitwood Gas Plant Four-Factor Analysis

DCP Operating owns and operates the Chitwood Gas Plant, located in Grady County, Oklahoma. The plant runs nine compressor engines. C-1, C-2, C-3, and C-4 are 880-hp Cooper-Bessemer GMV-8 two-stroke lean-burn (2SLB) engines. C-5 is an 880-hp Clark HRA-8 2SLB. C-6 and C-7 are 1320-hp Ingersol-Rand KVS-8 four-stroke lean-burn (4SLB) engines. C-8 and C-9 are 1100-hp Cooper-Bessemer GMV-10 2SLB engines. ODEQ states that C-5, which has been out of service, will not be included in the Title V permit renewal, which is currently being reviewed. The four-factor report, which is present in Appendix E, is reviewed below.[81]

Controls evaluated include SCR and typical Low Emissions Combustion (LEC) controls. DCP obtained a vendor quote for the LEC from Siemens and an SCR system vendor quote from AeriNOx.[82] The LEC controls could be provided with two basic options: a 1g/hp option and a 6g/hp option.[83] The 1g/hp option included a replacement electronic high pressure fuel injection system, a direct power cylinder peak firing pressure management system, modifying the heads to receive precombustion chambers, fuel injectors for the precombustion chambers and an upgraded turbocharger. The 6g/hp option included modification to the cylinder heads to receive precombustion chambers, fuel injectors for the precombustion chambers, and an upgraded turbocharger.

[80] See Control Cost Manual, Section 4 – NOx Controls, Chapter 1, Selective Noncatalytic Reduction, Revised 4/25/2019. Page 1-2 to 1-5.
[81] Regional Haze Four-Factor Reasonable Progress Analysis, DCP Operating Co. Chitwood Gas Plant, prepared by Trinity Consultants, October 1, 2020. Hereafter referred to in this section as "the Trinity report."
[82] These quotes are attached to DCP's four-factor analysis.
[83] The vendor also provided a 2g/hp option for the KVS engines but this was not explored by Trinity.

Chitwood's SCR vendor indicated that it does not recommend that SCR systems be installed on uncontrolled engines (engines not already controlled to 6g/hp) due to a large variance in combustion instability and typically poor air/fuel ratio controls which can cause operational issues for the SCR system to function correctly. Consequently, SCR was only considered as an additional control after the 6g/hp LEC controls were already installed. Because the resulting 1g/hp equals the 1g/hp LEC option but at greater cost, it is not further considered in this review.

13.1. Chitwood Includes Undocumented Costs in Its Cost-Effectiveness Calculation

On page 24 (pdf) of its report, Trinity lists the cost of the equipment for the 1g/hp and 6g/hp options. Below is that information *on a per-engine basis* for the GMV-8 engines with the 1g/hp option. Costs for other engines are similar.

Table 13. Trinity's Listing of Costs for Chitwood Engine Controls

	Control Description	Cost Source	GMV-8 1 gram option ($)
1	Clean burn conversion equipment and installation	Siemens	$1,710,000
2	Intercooler bundles for turbocharger addition	Siemens	$125,000
3	Replacement exhaust manifolds for GMV units	Siemens	$220,000
4	Updated air intake filters and housing	Siemens	$100,000
5	Replacement cylinder heads	Siemens	$40,000
6	Control panel installation	Siemens	$250,000
7	Turbocharger pad installation	DCP	$50,000
8	Initial engine health analysis	DCP	$12,000
9	Safety/inspector/fire watch for each engine build	DCP	$100,000
10	Engineering costs for project/site managers and engineer	DCP	$56,250
11	HP fuel installation to engine room for 1 gram option	DCP	$43,750
12	Oxidation catalyst installation for 1 gram option	Miratech	$115,000
	Total Capital Cost for clean burn technology	**--**	**$2,822,000**
13	CBT annual maintenance costs	Siemens	$59,024

Siemen's quote does not contain any of the items below Item 1. In particular, the quote states, "The following pricing as mentioned above is *for a full turnkey solution* [emphasis added] and is budgetary only - non-binding for informational purposes only." It does make some assumptions, some of which that are pertinent to this review are reproduced below:

a) Power cylinder heads do not have PCCs [precombustion chambers]; but they can be machined to accept PCCs.

b) Engines do not have turbochargers, or require replacement turbochargers to meet necessary air spec for NOx reduction.

c) Existing turbo pads are adequate for supporting the new turbocharger, its mounting structure and modification to piping.

d) Assume engines have PLC [programmable logic controller] based Unit Control Panels. Our controls will be placed in their own subpanel with HMI and set adjacent to existing unit control panels.

e) An engine health assessment will be performed on the engine by DCP Midstream or by Dresser-Rand EASE program resources (charged at T&M rates) to verify engine operating condition and health prior to completing design work for the solution package.

f) Safety, inspectors, and fire watch personnel have not been included in this estimate.

Thus, there does not appear to be any requirement in the Siemens' quote for Items 2, 3, 4 and 5. Regarding Item 2, intercoolers are an integral part of turbocharging systems and the Siemens' quote indicates a "turnkey solution" and does not assume a separate intercooler installation by a third party. Regarding Items 3 and 4, the Siemens' quote does not mention the need for replacement exhaust manifolds or updated air intake filters and housings. Regarding Item 5, the Siemen's quote does not state the need for cylinder head replacement, and specifically includes modification of the existing heads for precombustion chambers. It is assumed that the vendor is familiar with the specific engines for which it is providing a quote. Regardless, GMV model cylinder heads have been modified to receive replacement precombustion chambers for many years.[84] Regarding Item 6, the Siemens' quote does assume the existence of current PLC based Unit Control Panels, but specifically states that their own panels "will be placed in their own subpanel with HMI and set adjacent to existing unit control panels." Programmable logic controllers have been in wide use in industrial environments for decades. Therefore, ODEQ must require that Chitwood justify the need for this $250,000 item, *for each engine*, which considering the information in the record, seems unlikely. Regarding Item 9, "Safety/inspector/fire watch for each engine build" is undocumented and $100,000 for each engine appears to be an excessive charge to have a worker standby with a fire extinguisher. It is difficult to understand how this cost could be higher than $56,250 cost for the project/site managers and engineer.

Regarding 12, there is no mention of the need for an oxidation catalyst in the Siemens' quote. On page 2-2 of its report, Trinity states, "An oxidation catalyst will need to be installed in order to stay under current permit values, and the cost for this additional control is included in the cost control analysis." Presumably this refers to potential increases in CO, which Siemens states in its quote could increase. However, Chitwood's Title V Permit indicates that engines C-1 through C-8 are grandfathered:[85]

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[84] Olsen, D. B., Adair, J. L., & Willson, B. D. (2005). *Precombustion Chamber Design and Performance Studies for a Large Bore Natural Gas Engine. ASME 2005 Internal Combustion Engine Division Spring Technical Conference.* Available here: https://www.researchgate.net/publication/267577761_Precombustion_Chamber_Design_and_Performance_Studies_for_a_Large_Bore_Natural_Gas_Engine.

[85] Staff permit evaluation dated April 18, 2017, page 17, which precedes the actual permit: Part 70 permit, Permit No. 2016-1248-TVR3, DCP Operating Company, LP, issued April 20, 2017.

> Based on emission calculations, this facility is a major source of HAP. Engines C-1 through C-9 were constructed prior to December 12, 2002 and are therefore existing. However since the engines are all 4SLB & 2SLB engines with a site rating of more than 500 HP, *the engines have no applicable requirements* [emphasis added].

Specific Condition No. 6 further states, "Engine C-10 shall be operated with exhaust gases passing through a functioning catalytic converter." Thus, it appears that engines C-1 through C-8 do not have any requirement "to stay under current permit values" as Trinity states above. ODEQ must therefore clarify the need to install oxidation catalysts, which Trinity lists for all the engines.

13.2. Chitwood's Calculated Emissions and Emission Reductions Are Low

On page 2-2 of its Report, Trinity discusses how it calculated the baseline NOx emissions and the NOx emissions reductions from the controls it considered. Trinity states it only considered 2019 emissions and in order to account for year-to-year variability, and to provide a more accurate assessment of potential reductions, the 2019 emissions were equally redistributed for each engine type and each engine service. It states that detailed calculations are in Appendix A. However, there are not any detailed emissions calculations in Appendix A, beyond a factor termed "DRE %," which appears to represent a percentage emission reduction.

Because the emissions reported to ODEQ are in tons and the controlled emission rate from the vendor is in g/hp, a direct verification of Trinity's calculations cannot be made without additional information. ODEQ must require that Chitwood document and justify its emission reduction factor. This is a requirement of the Regional Haze Rule under 51.308(f)(2)(iii) (as noted several times throughout these comments).

Even though its controlled emission rate cannot be verified, Chitwood's baseline emission were examined, using information provided by ODEQ via a public information request.[86] The information below contrasts Trinity's emission reduction calculation with a revised version, that simply averaged the individual engine emissions from 2018-2020:[87]

Table 14. Revised Chitwood Engine Emissions

EU ID	Trinity Baseline NOx	Revised Baseline NOx	DRE %	Controlled Emissions (tpy)	Emissions Reduction (tpy)	Revised Emissions Reduction (tpy)
C-1 GMV-8	89.61	107	57.1	38.4	51.2	61.1
C-1 GMV-8	89.61	107	92.9	6.4	83.2	99.4
C-2 GMV-8	89.61	71.6	57.1	38.4	51.2	40.9

[86] This is why this type of data is a necessary part of the SIP.
[87] See the file entitled, "Chitwood cost-effectiveness.xlsx."

EU ID	Trinity Baseline NOx	Revised Baseline NOx	DRE %	Controlled Emissions (tpy)	Emissions Reduction (tpy)	Revised Emissions Reduction (tpy)
C-2 GMV-8	89.61	71.6	92.9	6.4	83.2	66.5
C-3 GMV-8	19.38	45	57.1	8.3	11.1	25.7
C-3 GMV-8	19.38	45	92.9	1.4	18	41.8
C-4 GMV-8	72.36	**72.36**[88]	57.1	31	41.3	41.3
C-4 GMV-8	72.36	**72.36**[62]	92.9	5.2	67.2	67.2
C-6 KVS-8	83.59	90.3	45.5	45.6	38	41.1
C-6 KVS-8	83.59	90.3	90.9	7.6	76	82.1
C-7 KVS-8	83.59	72.8	45.5	45.6	38	33.1
C-7 KVS-8	83.59	72.8	90.9	7.6	76	66.2
C-8 GMV-10	54.57	99.3	57.1	23.5	31.3	56.7
C-8 GMV-10	54.57	99.3	92.9	3.9	50.8	92.2
C-9 GMV-10	54.57	62.3	57.1	23.5	31.3	35.6
C-9 GMV-10	54.57	62.3	92.9	3.9	50.8	57.9

As can be seen from the above, in most cases the revised emissions were above those calculated by Trinity. Again, ODEQ must require that Trinity justify its calculations.

13.3. Chitwood's Cost-Effectiveness Figures Are Inflated

In addition to the issues described above, Trinity uses an undocumented 7% interest rate. As with other undocumented interest rates discussed in these comments, it has been revised to the current Bank Prime rate of 4% in the revised cost-effectiveness that follows. Note that some details of these calculations are omitted for space constraints here but are available:[89]

[88] No emissions were reported for C-4 for 2018 through 2020, so there was no choice but to adopt Trinity's value.
[89] See the file entitled, "Chitwood cost-effectiveness.xlsx" for all details related to this calculation.

Table 15. Revised Chitwood Engine Cost-Effectiveness Figures

EU ID	Control Option	Trinity Baseline NOx	Revised Baseline NOx	Controlled Emissions (tpy)	Emissions Reduction (tpy)	Revised Emissions Reduction (tpy)	Total Capital Cost ($)	Capital Recovery Factor (CRF)	Annualized Capital Cost ($)	Annual O&M Cost ($)	Total Annual Cost ($)	Cost-effectiveness ($/ton)
C-1 GMV-8	CBT (6 g)	89.61	107	38.4	51.2	61.1	$1,294,500	0.058	$74,861	$56,474	$131,335	$2,150
C-1 GMV-8	CBT (1 g)	89.61	107	6.4	83.2	99.4	$1,928,250	0.058	$111,511	$59,024	$170,535	$1,716
C-2 GMV-8	CBT (6 g)	89.61	71.6	38.4	51.2	40.9	$1,294,500	0.058	$74,861	$56,474	$131,335	$3,212
C-2 GMV-8	CBT (1 g)	89.61	71.6	6.4	83.2	66.5	$1,928,250	0.058	$111,511	$59,024	$170,535	$2,564
C-3 GMV-8	CBT (6 g)	19.38	45	8.3	11.1	25.7	$1,294,500	0.058	$74,861	$56,474	$131,335	$5,111
C-3 GMV-8	CBT (1 g)	19.38	45	1.4	18	41.8	$1,928,250	0.058	$111,511	$59,024	$170,535	$4,079
C-4 GMV-8	CBT (6 g)	72.36	**72.36**	31	41.3	41.3	$1,294,500	0.058	$74,861	$56,474	$131,335	$3,179
C-4 GMV-8	CBT (1 g)	72.36	**72.36**	5.2	67.2	67.2	$1,928,250	0.058	$111,511	$59,024	$170,535	$2,537
C-6 KVS-8	CBT (6 g)	83.59	90.3	45.6	38	41.1	$994,500	0.058	$57,512	$56,474	$113,986	$2,774
C-6 KVS-8	CBT (1 g)	83.59	90.3	7.6	76	82.1	$1,638,250	0.058	$94,740	$59,024	$153,764	$1,873
C-7 KVS-8	CBT (6 g)	83.59	72.8	45.6	38	33.1	$994,500	0.058	$57,512	$56,474	$113,986	$3,441
C-7 KVS-8	CBT (1 g)	83.59	72.8	7.6	76	66.2	$1,638,250	0.058	$94,740	$59,024	$153,764	$2,324
C-8 GMV-10	CBT (6 g)	54.57	99.3	23.5	31.3	56.7	$1,334,500	0.058	$77,174	$56,474	$133,648	$2,357
C-8 GMV-10	CBT (1 g)	54.57	99.3	3.9	50.8	92.2	$2,018,250	0.058	$116,716	$59,024	$175,740	$1,905
C-9 GMV-10	CBT (6 g)	54.57	62.3	23.5	31.3	35.6	$1,334,500	0.058	$77,174	$56,474	$133,648	$3,757
C-9 GMV-10	CBT (1 g)	54.57	62.3	3.9	50.8	57.9	$2,018,250	0.058	$116,716	$59,024	$175,740	$3,036

As can be seen from the above revised summary, Chitwood's cost-effectiveness is inflated and is approximately double what it should be, based on the issues noted above. These figures may improve further, depending on Trinity's NOx emission calculation.

On page 2-5 of its report, Trinity makes various arguments related to the cost of the controls. ODEQ should consider, as noted above, that these engines, with the exception of C-9, have escaped permitting limits for decades due to being grandfathered into the program. LEC controls have been regularly found to be cost-effective for many years across the United States and there is a great deal of information available to support this conclusion. For instance, in 2000, EPA calculated LEC cost-effectiveness figures for lean burn engines of $404/ton to $530/ton, depending on the efficiency, and for SCR of $1,066/ton.[90] A more recent 2015 EPA publication lists the cost of LEC for lean burn compressor engines as $649/ton.[91] Even more recently, the NPCA commissioned a comprehensive report on reasonable progress four-factor control analysis for the oil and gas industry.[92] This study cites many examples of LEC for engines similar to those used by Chitwood, resulting in much lower cost-effectiveness figures.

14 Conclusion

We urge ODEQ to reevaluate its Draft SIP especially in light of EPA's July 8, 2021 Clarification Memo and these comments, which confirm that the Draft SIP is fundamentally flawed. Due to the deficiencies outlined above and in the attached and referenced exhibits, the state must revise and reissue a valid regional haze SIP for public notice and comment. Please do not hesitate to contact us with any questions or to discuss the matters raised in these comments.

Respectfully submitted,

Sanjay Narayan
Managing Attorney
Sierra Club
2101 Webster St., Suite 1300
Oakland, CA 94612
Sanjay.narayan@sierraclub.org

Chloe Crumley
Field Representative, Texas and Oklahoma
National Parks Conservation Association
6705 W Highway 290, Suite 50261
Austin, TX 78735
ccrumley@npca.org

[90] See NOx Emissions Control Costs for Stationary Reciprocating Internal Combustion Engines in The NOx SIP Call States, E.H. Pechan & Associates, Inc, Revised Final Report, August 11, 2000. Available here: https://www.epa.gov/economic-and-cost-analysis-air-pollution-regulations/cost-reports-and-guidance-air-pollution. Page 17.

[91] Technical Support Document (TSD) for the Cross-State Air Pollution Rule for the 2008 Ozone NAAQS Docket ID No. EPA-HQ-OAR-2015-0500, Assessment of Non-EGU NOx Emission Controls, Cost of Controls, and Time for Compliance, U.S. Environmental Protection Agency Office of Air and Radiation November 2015. Page 13. Available here: https://www.epa.gov/economic-and-cost-analysis-air-pollution-regulations/cost-reports-and-guidance-air-pollution.

[92] Assessment of Cost Effectiveness Analyses for Controls Evaluated Four – Factor Analyses for Oil and Gas Facilities for the New Mexico Environment Department's Regional Haze Plan for the Second Implementation Period, July 2, 2020, Prepared for National Parks Conservation Organization by Vicki Stamper & Megan Williams.

Michael B. Murray
Chair
Coalition to Protect America's National Parks
2 Massachusetts Ave NW, Unit 77436
Washington, DC 20013
Editor@protectnps.org

CC (via email):
Earthea Nance, Regional Administrator, EPA Region 6, Nance.Earthea@epa.gov
David Garcia, Director, Air and Radiation Division, EPA Region 6, Garcia.David@epa.gov

15 List of Attachments:

All Accessible Here:
https://drive.google.com/drive/folders/15vA5oh8a_1lnOKw2VPmL0dYtASwjZOSN?usp=sharing

- Chitwood cost-effectiveness.xlsx
- El_ODEQ_2016-2020 Annual Point Source Emissions.xlsx
- Horseshoe SNCR CCM cost-effectiveness.xlsx
- Hugo DSI Cost Estimate.xlsx
- Hugo wetanddryscrubbers_controlcostmanualspreadsheet_may_2021-yearly.xlsx
- Hugo wetanddryscrubbers_controlcostmanualspreadsheet_may_2021.xlsm
- InfoRequest_2022-06-07-formatted.xlsx
- Kremlin.xlsx
- OK EGU emissions.xlsx