COMMENTS BY THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY AND THE PUBLIC UTILITY COMMISSION OF TEXAS REGARDING THE PROPOSED STATE OF TEXAS REGIONAL HAZE AND INTERSTATE VISIBILITY TRANSPORT FEDERAL IMPLEMENTATION PLAN

DOCKET ID NO. EPA-R06-OAR-2016-0611

I. Summary

On January 4, 2017, the United States Environmental Protection Agency (EPA) published in the *Federal Register* (82 FR 912) a notice of proposed rulemaking regarding a federal implementation plan (FIP) to implement Best Available Retrofit Technology (BART) under the EPA Regional Haze rule for electric generating units (EGU) in Texas. The EPA is also proposing disapproval of portions of Texas' Regional Haze state implementation plan (SIP) and several other SIP revisions related to interstate visibility transport. The Texas Commission on Environmental Quality (TCEQ) and Public Utility Commission of Texas (PUCT) provide the following comments on this proposed rule.

II. Comments

The TCEQ appreciates the EPA's efforts to work with the TCEQ to resolve concerns with Texas' Regional Haze SIP.

During the EPA's review of Texas' Regional Haze SIP submittal, the EPA has made a strong effort to engage with the TCEQ to discuss its concerns with the SIP and possible options for resolution. The TCEQ appreciates that EPA's efforts to work with the TCEQ on the Regional Haze SIP. While the TCEQ has significant concerns with the EPA's proposed FIP for BART on EGUs in Texas, the TCEQ hopes this cooperative effort will continue and will ultimately lead to a resolution with an approved Regional Haze SIP for Texas.

The TCEQ and PUCT disagree with the EPA's interpretation regarding the consideration of energy impacts of compliance in BART analyses.

The EPA argues that it is not required to consider impacts to grid reliability because it interprets "energy impacts of compliance" as meaning the energy impacts of complying by installing retrofit controls on a source that continues operation (82 FR 937). However, nothing in the BART guidelines prohibits consideration of grid impacts and the guidelines do specifically speak to indirect impacts, including allowing consideration of concerns regarding locally scarce fuels that may be better used for alternative purposes and potential significant economic disruption and unemployment. Additionally, as the EPA itself acknowledges, energy impacts of compliance can include parasitic loads that decrease the available power a source may put to the grid. The EPA has argued in other regulatory contexts that the electrical grid is an interconnected system. What affects the available power generation of one generator affects the system, and a decrease in one power generation source must be offset by an increase in another power generation source. The energy impacts of compliance on an individual source can have a direct impact on the entire system. The EPA's own arguments regarding the interconnected nature of the electrical grid do not support the EPA's interpretation of energy impacts of compliance.

Furthermore, in other guidance on Regional Haze, the EPA states that costs of compliance can be interpreted to encompass the cost of compliance for individual sources or source

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categories, and more broadly the implication of compliance costs to the health and vitality of industries within a state (Guidance for Setting Reasonable Progress Goals under the Regional Haze Program June 1, 2007, page 5-1). It is not logical for the EPA to interpret "energy impacts of compliance" so narrowly to exclude impacts to grid reliability when it interprets "costs of compliance" much more broadly.

The EPA should consider the potential impacts of the proposed FIP on the reliability of the electrical grid in Texas regardless of how the EPA interprets BART analyses.

The EPA's proposed FIP affects more than 14,000 megawatts of electrical generating capacity in Texas, yet the EPA did not consider the potential impacts to grid reliability or even consult with the Public Utility Commission of Texas prior to proposing this FIP. In the proposed FIP, the EPA only rationalizes why it is not required to consider energy impacts to the electrical grid in its BART analysis and why the requirements of Presidential Executive Orders 12866 and 13211 don't apply to this proposal. The federal government's stated purpose of Executive Order 13211 is to ensure that federal agencies appropriately weigh and consider the effects of the federal government's regulations on the supply, distribution, and use of energy. As with the previous Regional Haze FIP, because the rule is limited to Texas, the EPA discounts its responsibility to weigh and consider the effects on the wholly-contained electrical grid in Texas and the limited interconnection with the national grid. Regardless of the EPA's interpretation of "energy impacts of compliance" and executive order requirements, the proposed FIP affects a signification portion of the state's electrical grid, and consideration should be given to the potential impacts on grid reliability within Texas given its unique grid environment.

Recent studies conducted by The Electric Reliability Council of Texas, Inc. (ERCOT) have shown that units affected by capital-intensive retrofit requirements to comply with the previous Regional Haze FIP are likely to be retired.[1] Additional studies indicate the likelihood of significant transmission reliability impacts if multiple units are retired with limited advance warning to grid planners and market participants.[2] Impacts from the proposed BART rule would likely be consistent with the previous Regional Haze FIP. As such, a consideration of the potential impacts to grid reliability from this rule is appropriate.

The EPA's proposed sulfur dioxide (SO_2) controls for the BART-affected coal-fired power plants represents more control than is necessary to satisfy BART. The EPA should consider an alternate control approach for these BART-affected units using source or system caps.

The EPA acknowledges in the proposal that the SO_2 reductions from this FIP exceed the reductions assumed under the budget provided to Texas for the CSAPR. Also, the EPA still maintains that the Cross State Air Pollution Rule (CSAPR) is better-than-BART. However, the EPA has not explained why this proposed FIP represents BART for the affected power plants when the proposal results in more SO_2 reductions than the BART-alternative that EPA says is better than BART. In the EPA's November 2016 proposal to remove Texas from the SO_2 and annual NO_X CSAPR programs after the D.C. Circuit Court found the budgets to

[1] See http://www.ercot.com/content/wcm/key_documents_lists/77730/2016_LTSA_Update_6_21_2016.pptx
[2] See Section 4.2.5 and Appendix M of the 2016 ERCOT Regional Transmission Plan, available at: http://www.ercot.com/content/wcm/lists/89476/2016_Regional_Transmission_Plan_-_Public_Version.zip

be illegal over-control, the EPA stated that Texas was one of the states that was expected to have higher SO_2 emissions under the CSAPR scenario (81 FR 78963). The EPA discusses at length why the CSAPR programs are still better than BART in the November 2016 proposal but only states that the BART scenario results in more reductions than the CSAPR scenario without providing any rational explanation why the BART scenario results in more SO_2 reductions than the better-than-BART alternative. Furthermore, Texas is the only state proposed to be removed from the CSAPR SO_2 program as a result of the remand from the D.C. Circuit Court, and the EPA's proposed determination of SO_2 BART in Texas with this FIP would appear to be counter to its determination that CSAPR is better-than-BART. The EPA provides no technical or legal explanation for this disconnect between its Texas-specific proposed BART determination and its continued determination that CSAPR is better-than-BART.

Because the CSAPR level of control is, by the EPA's own determination, better than BART the EPA should have considered an equivalent control level in its BART analysis. For example, a potential alternative is the concept of system-wide emission caps using CSAPR allocations. A SO_2 system-cap approach for BART would be based on establishing a cap on all the BART subject units under common ownership and control based on CSAPR allocations to those specific units. System-wide caps for these BART subject units based on CSAPR allocations would provide flexibility while actually being more stringent than CSAPR because the companies would not have the ability to trade allocations with non-BART facilities or with companies in other states. Furthermore, the EPA has approved system-cap approaches under the TCEQ's Chapter 117 rules for nitrogen oxides (NO_x). As discussed in other comments below, if such an approach using CSAPR allocations or some other similar variation can be demonstrated to be more stringent than CSAPR itself, then the EPA's CSAPR-is-better-than-BART determination should satisfy some of the demonstration requirements for BART alternatives.

Even if not based on CSAPR allocations, the EPA should consider a source-cap or system-cap approach as an alternative to unit-by-unit rate-based standards. Source- and system-cap strategies achieve equivalent reductions by setting mass-based limits (e.g., ton per day) for a group of units derived from rate-based standards and baseline levels of activity for the units. In this context, the rate-based standards used to set the caps would be the emission rates determined to represent BART. These types of cap approaches allow companies to consider a broader range of alternative strategies. An example of a source-cap-based alternative would be combining a shutdown of one BART unit at a site with a less stringent, more cost-effective control technology on another BART unit at a site. By over-controlling one unit, a lesser degree of reduction on another unit still achieves the same overall reductions compared to both units installing controls to meet the BART rate-based limit. Under a FIP with only unit-by-unit rate-based limits, as proposed by EPA, such an alternative strategy would not be allowed and EPA would have to revise its FIP to allow the company to pursue the alternative. A similar approach using system-caps would provide additional flexibility for companies with BART-subject units at more than one site. Additionally, a system-cap trading program to allow companies to trade with other companies with separate systems would provide additional flexibility and allow companies to take advantage of reductions already occurring at other BART subject facilities. If the EPA is averse to creating a system-cap trading program for a single state, an alternative would be to allow for a state system-cap trading program that would allow companies to trade between systems once the EPA has approved the state program.

A state should be able to independently rely on EPA's CSAPR-is-better-than-BART determination if the state can demonstrate that a state-only program for EGUs is more stringent than CSAPR.

While the TCEQ has not proposed any action to implement a Texas-only program for EGUs based in some way on CSAPR as a means of satisfying BART, and these comments in no way represent a commitment to propose such an action, the TCEQ should be able to rely on the EPA's CSAPR-is-better-than-BART determination to satisfy certain aspects of the BART alternative provisions in 30 Code of Federal Regulations (CFR) Part 51, §51.308(e)(2) if such a program can be demonstrated to be more stringent than CSAPR. Specifically, the state should be able rely on the EPA's determination that CSAPR resulted in greater reasonable progress than source-specific BART to satisfy the requirements of §51.308(e)(2)(i)(E) and (e)(3):

> *§51.308(e)(2)(i)(E): A determination under paragraph (e)(3) of this section or otherwise based on the clear weight of evidence that the trading program or other alternative measure achieves greater reasonable progress than would be achieved through the installation and operation of BART at the covered sources.*
>
> *§51.308(e)(3): A State which opts under 40 CFR 51.308(e)(2) to implement an emissions trading program or other alternative measure rather than to require sources subject to BART to install, operate, and maintain BART may satisfy the final step of the demonstration required by that section as follows: If the distribution of emissions is not substantially different than under BART, and the alternative measure results in greater emission reductions, then the alternative measure may be deemed to achieve greater reasonable progress. If the distribution of emissions is significantly different, the State must conduct dispersion modeling to determine differences in visibility between BART and the trading program for each impacted Class I area, for the worst and best 20 percent of days. The modeling would demonstrate "greater reasonable progress" if both of the following two criteria are met:*
>
> > *(i) Visibility does not decline in any Class I area, and*
> >
> > *(ii) There is an overall improvement in visibility, determined by comparing the average differences between BART and the alternative over all affected Class I areas.*

The TCEQ acknowledges that other requirements of §51.308(e)(2) would still need to be satisfied, such as monitoring, recordkeeping, reporting, and provisions for emission trading programs. While the CSAPR option is specifically listed §51.308(e)(4), the EPA's Regional Haze rules do not prohibit a state from relying on EPA's modeling demonstration that CSAPR resulted in greater reasonable progress when using an alternative under §51.308(e)(2). If a state-only program is more stringent than CSAPR, for example a program based on CSAPR allocations but without interstate trading, requiring a state to conduct extensive modeling to demonstrate what the EPA has already demonstrated for a less stringent program is illogical and places an unnecessary and wasteful burden on states.

The EPA's determination that the SO_2 BART controls are economically feasible and will not result in shutdowns at coal-fired EGUs is contradicted by the EPA's own Integrated Planning Model (IPM) results.

The EPA proposes the SO_2 BART controls as being economically feasible and claims that it is unable to conclude that the proposed BART controls would severely impact the viability of continued plant operations (82 FR 938). However, the EPA's own IPM predictions appear to contradict the EPA's claims. Table 3-19 for the EPA's most recent IPM v.5.16 base case results (EPA Base Case v.5.16 for 2015 Ozone NAAQS Transport NODA Using IPM, Incremental Documentation, December 2016, pages 59-65) includes BART Regulations and specifically lists Big Brown, Monticello, and Coleto Creek. While the IPM documentation identifies these SO_2 controls as SO_2 BART, other Texas coal-fired EGUs listed on the table include Tolk, Sandow, and Limestone, which are not BART-eligible units but were subject to the EPA's recently stayed Regional Haze Reasonable Progress FIP. While the table may misidentify the applicable regulation as BART, the control level assumed for IPM modeling for Big Brown Units 1 and 2, Monticello Units 1 and 2, and Coleto Creek is the same level that the EPA has proposed for BART purposes. The EPA's 2023 parsed IPM data file for the ozone transport NODA (EPA Docket ID No. EPA-HQ-OAR-2016-0751-0029) specifically lists Big Brown Units 1 and 2, Monticello Units 1 and 2, Coleto Creek as coal retirements by 2023.

Furthermore, while Monticello Units 1 and 2 were mistakenly identified as mothballed units in the prior version of IPM (v.5.15) for the EPA's final Clean Power Plan rule, both Big Brown units and Coleto Creek were identified as continuing active units in the prior IPM base case results (Docket ID No. EPA-HQ-OAR-2016-0602-0219) and in both the rate-based and mass-based 2030 policy case results (Docket ID Nos. EPA-HQ-OAR-2016-0602-36473 and EPA-HQ-OAR-2016-0602-36475) with the Clean Power Plan in place. The more recent v.5.16 version of IPM results, which also includes the Clean Power Plan rule in place despite the rule being stayed by the United States Supreme Court, predicts that these units will cease to be economically viable with the level of SO_2 control applied in the proposed BART FIP.

The SO_2 BART control levels proposed for Texas' EGUs are inconsistent with and more stringent than SO_2 BART controls implemented or approved by other EPA regions and are not supported by the data the EPA used in determining the control levels, particularly with regard to lignite-fired units.

With regard to dry flue gas desulfurization (FGD) scrubber control levels, the EPA approved 0.09 pound per million British thermal unit (lb/MMBtu) as BART for the Big Stone unit in South Dakota's Regional Haze SIP (April 26, 2012 *Federal Register*, 77 FR 24848) based on dry scrubber control. Yet, for the two Harrington units, EPA Region 6 proposes 0.06 lb/MMBtu as BART. In response to comments concerning the stringency of the 0.09 lb/MMBtu SO_2 BART limit, EPA Region 8 defended South Dakota's BART determination, stating the following:

> *We agree that, in some cases, wet and dry scrubbers can achieve greater emission reductions than those assumed by South Dakota. However, when the sulfur content of the coal is low, a lower control efficiency is anticipated. Due to the very low sulfur content of the coal burned at Big Stone I, on average 0.57%, it is unlikely that the high control efficiencies cited by the commenter could be achieved. South Dakota also provided explanatory information in its response to comments in Appendix E of the SIP that it considered SO_2 inlet concentrations in its estimation of possible control*

> *efficiencies. In addition, BART emission limits, which apply at all times, including during startup and shutdown must allow an adequate margin for compliance. Therefore, with regard to the proposed emission limits for dry scrubbers at Big Stone I, we find that South Dakota's limit of 0.09 lb/MMBtu is reasonable for dry scrubbers at the facility, and we are approving it.* (77 FR 24848)

The average SO_2 lb/MMBtu emission rate for the Big Stone prior to the installation of the dry FGD unit was 0.75 lb/MMBtu (average 2005 - 2014). The average SO_2 lb/MMBtu emission rate for the two Harrington units is approximately 0.5 lb/MMBtu over 2005 - 2016, less than the level being achieved by the Big Stone unit, which the EPA determined would be unlikely to be able to achieve high control efficiencies.

Based on BART SO_2 information provided with the supplemental information provided for IPM v.5.16, the proposed SO_2 BART limit of 0.04 lb/MMBtu is more stringent than any other BART level approved or determined by the EPA (Table 3-19, EPA Base Case v.5.16 for 2015 Ozone NAAQS Transport NODA Using IPM, Incremental Documentation, December 2016, pages 59-65). Outside of the EPA's proposed BART FIP for Texas, the most common BART SO_2 limit on a lb/MMBtu basis for wet FGD scrubbed coal-fired units is 0.15 lb/MMBtu, both for retrofits and existing scrubbers, which corresponds to the default BART level recommended in the BART Guidelines (BART Guidelines, Section IV.E.4). The EPA attempts to defend the proposed BART control level of 0.04 lb/MMBtu for wet FGD retrofits based on a selection of retrofits on other units. However, of the units the EPA selected in defending its proposed BART limit, Milton R. Young Unit 1 is the only unit that fires lignite (Technical Support Document for the Texas Regional Haze BART Federal Implementation Plan, BART FIP TSD, Docket ID No. EPA-R06-OAR-2016-0611-004, page 120). Four of the units subject to the EPA's proposed BART retrofit limit of 0.04 lb/MMBtu burn lignite blended with subbituminous coal: Big Brown Units 1 and 2, and Monticello Units 1 and 2. However, the EPA has only included one lignite-fired coal unit in its technical justification of the proposed limit of 0.04 lb/MMBtu. Furthermore, the EPA fails to note in its analysis that Milton R. Young Unit 1 actually routinely exceeds the proposed limit of 0.04 lb/MMBtu after the unit was retrofitted with wet FGD in 2011. The emissions data provided for Milton R. Young Unit 1 by the EPA in the technical support documents (Docket ID No. EPA-R06-OAR-2016-0611-0008, TX187-0008-0033-BOD-Selected BOD SO2 Averages-3) indicates that from January 1, 2012 to June 30, 2015, the average of all 30 boiler operating day averages was 0.046 lb/MMBtu. Over this time period Milton R. Young Unit 1 exceeded 0.040 lb/MMBtu 62% of the time and exceeded 0.050 lb/MMBtu 47% of the time. Figure 1 below is the emissions trend chart for Milton R. Young Unit 1 from the EPA's technical support document with only minor formatting changes, illustrating the unit's SO_2 emissions exceed the EPA's proposed emission standard for wet FGD retrofits. Additionally, the North Dakota Regional Haze SIP established a SO_2 BART limit for both of the Milton R. Young units based on 95% removal, not the 98% removal assumed by EPA Region 6 in proposing its 0.04 lb/MMBtu limit, and the North Dakota SO_2 BART limits for the Milton R. Young units were approved by EPA Region 8 (77 FR 20929). In responding to comments regarding its approval of the SO_2 BART limits in North Dakota SIP, EPA Region 8 stated the following.

> *However, there is very limited data on the performance of wet or dry scrubbers at units firing lignite, such as those in North Dakota. In a 2007 BACT determination for two new lignite-fired boilers at Oak Grove Station in Texas, the Texas Commission on Environmental Quality established an SO_2 emission limit of 0.192 lb/MMBtu on a 30-day rolling average. Based on this, we find that the emission limits established by North Dakota are not unreasonable.* (77 FR 20929)

The EPA also attempts to support its 0.04 lb/MMBtu limit by highlighting three particular units: Scherer Unit 2, Iatan Unit 1, and Boswell Energy Center (Technical Support Document for the Texas Regional Haze BART Federal Implementation Plan, BART FIP TSD, Docket ID No. EPA-R06-OAR-2016-0611-004, page 122). The EPA cites these units as operating at levels of 0.01 to 0.03 lb/MMBtu for sustained periods. However, not only are these units fired with Powder River Basin (PRB) subbituminous coal, only the Boswell Energy Center Unit 3 is a BART-eligible unit.

EPA Region 6 has not justified why its proposed BART determinations for SO_2 control on coal-fired EGUs in Texas are inconsistent with other EPA BART determinations. The proposed SO_2 limit for retrofit wet scrubbers on lignite-fired units is not supported by the EPA's own data provided with the proposed FIP. The EPA should not arbitrarily assume that wet FGD scrubbers on lignite-fired units can achieve the same level of SO_2 emission rate on a lb/MMBtu basis as low-sulfur PRB subbituminous coal-fired units.

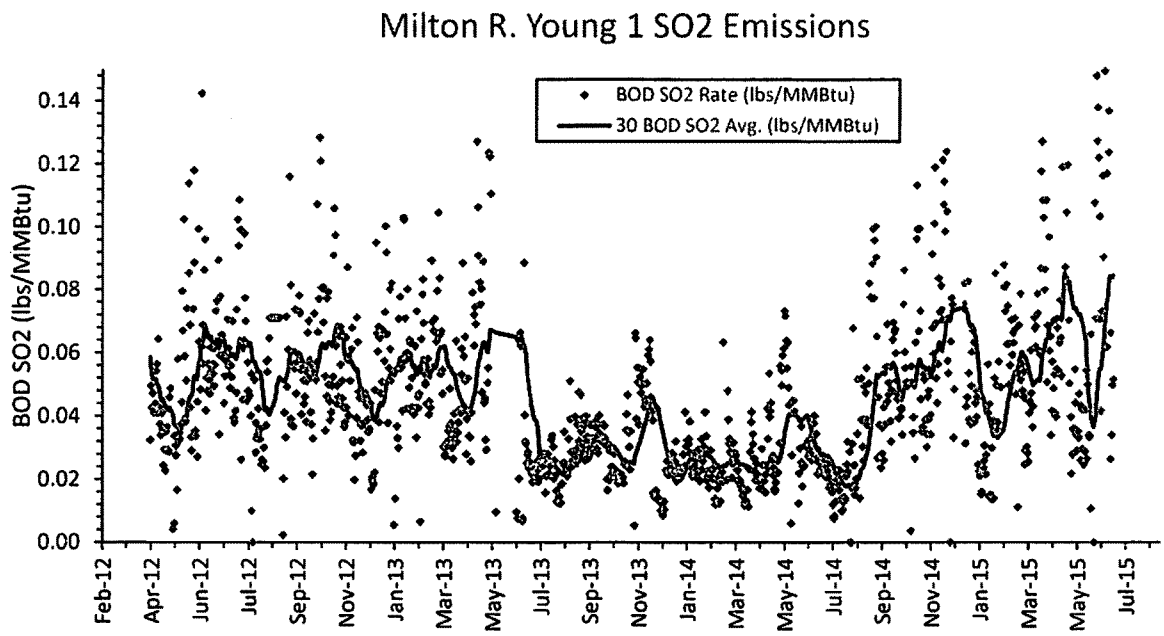

Figure 1: EPA SO_2 Emission Trend Data for Milton R. Young Unit 1 (Source: Docket ID No. EPA-R06-OAR-2016-0611-0008, TX187-0008-0033-BOD-Selected BOD SO2 Averages-3)

The retrofit SO_2 BART control levels proposed for Texas' EGUs are more stringent than the EPA's recent New Source Performance Standard (NSPS) for new coal-fired EGUs in 40 CFR Part 60, Subpart Da.

The EPA's proposed SO_2 standards for retrofit scrubbers of 0.04 lb/MMBtu for wet scrubbers and 0.06 lb/MMBtu for spray dry absorber (SDA) scrubbers are more stringent than the recent NSPS standards for newly constructed, reconstructed, or modified units in 40 CFR Part 60, Subpart Da. The SO_2 standards for units newly or reconstructed after May 3, 2011 under §60.43Da(l)(1) are 1.0 pound per megawatt-hour (lb/MWh) gross energy

output, 1.2 lb/MWh net energy output, or 97% reduction. The SO_2 standards for units modified after May 3, 2011 under §60.43Da(l)(2) are 1.4 pound per megawatt-hour (lb/MWh) gross energy output or 90% reduction. The output-based standards for new or reconstructed units are approximately equivalent to 0.1 lb/MMBtu and the output-based standard for modified units is approximately equivalent to 0.14 lb/MMBtu, significantly higher than either of the retrofit standards proposed by the EPA. The percent reduction assumed by the EPA was 98%, more stringent than the 97% established in the NSPS for new and reconstructed units and significantly more stringent than the 90% for modified units. While the BART Guidelines in Appendix Y to 40 CFR Part 51 do not necessarily bind the EPA to the NSPS standards, the EPA should have considered the NSPS level of control (BART Guidelines, Section IV.D.2). Furthermore, while the EPA notes in footnote 13 to the BART Guidelines that the NSPS does not automatically represent BART, the NSPS standards referred to in footnote 13 were approximately 20 years old at the time the EPA included that note in the BART Guidelines. The NSPS SO_2 limits in §60.43Da(l) were established in February 2012, just five years ago. The EPA discussed the 1971 NSPS for EGUs in the BART FIP Technical Support Document (Technical Support Document for the Texas Regional Haze BART Federal Implementation Plan, BART FIP TSD, Docket ID No. EPA-R06-OAR-2016-0611-004, page 138). However, the EPA provided no discussion of the 2012 NSPS. The EPA has failed to follow its own BART Guidelines or justified why the proposed BART SO_2 control levels for retrofits are more stringent than the recent NSPS SO_2 control levels.

The EPA did not properly evaluate the emission standards with regard to applying the standards at all times including startup and shutdown operations.

The EPA's proposed emission standards apply at all times, including startup and shutdown operations. However, the EPA has not given proper consideration to emission spikes that can occur during startup operations that can cause a significant spike in even a 30-boiler operating day average until the startup day rolls out of the 30-day average. The EPA's own emissions trend data provided in the technical support documents demonstrates that such spikes would represent a compliance problem for some of the units that the EPA evaluated in establishing the proposed BART emission standards. Figures 2 and 3 provide examples from the EPA's technical support document with selected 30-boiler operating day average data (Docket ID No. EPA-R06-OAR-2016-0611-0008, TX187-0008-0033-BOD-Selected BOD SO2 Averages-3) for two units with wet FGD. While all the spikes in the SO_2 emissions trend for Jeffrey Energy Center Unit 3 and James H. Miller Unit 4 may not necessarily be associated with startup operations, the EPA's data demonstrates the significant variation that can occur in SO_2 emission rates even when using a 30-boiler operating day average which the EPA has not accounted for in selecting the proposed emission limits for retrofit scrubbers.

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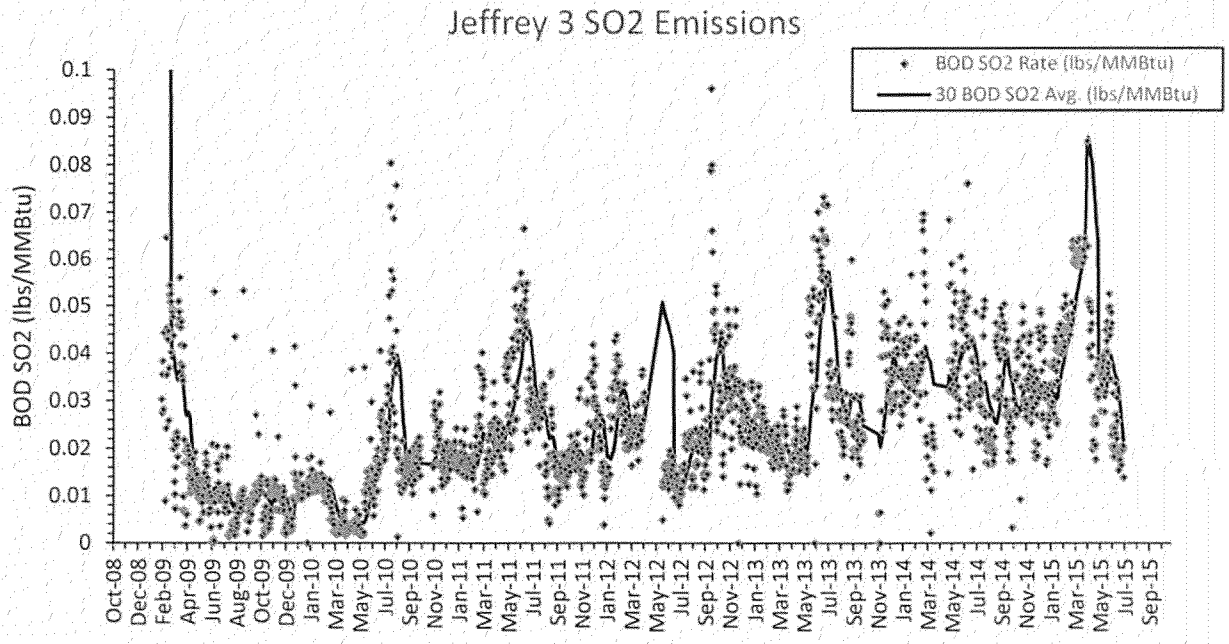

Figure 2: EPA SO_2 Emission Trend Data for Jeffrey Energy Center Unit 3 (Source: Docket ID No. EPA-R06-OAR-2016-0611-0008, TX187-0008-0033-BOD-Selected BOD SO2 Averages-3)

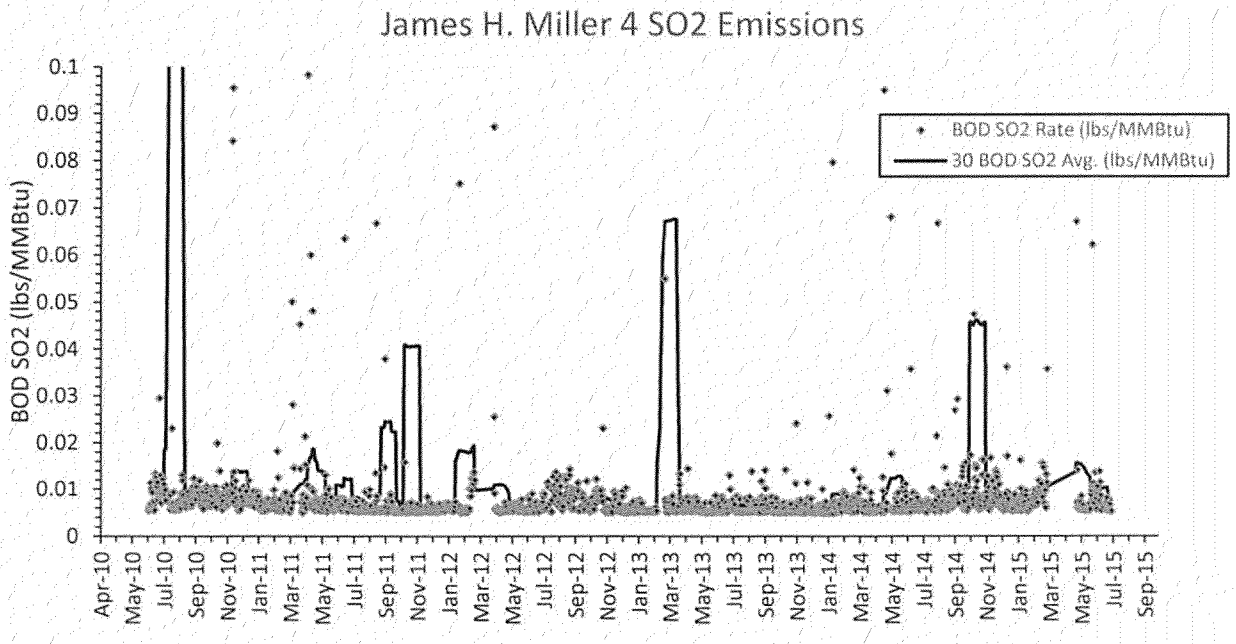

Figure 3: EPA SO_2 Emission Trend Data for James H. Miller Unit 4 (Source: Docket ID No. EPA-R06-OAR-2016-0611-0008, TX187-0008-0033-BOD-Selected BOD SO2 Averages-3)

The EPA should reconsider its evaluation of dry sorbent injection (DSI) technology for SO_2 control in the BART analysis.

For units not currently equipped with SO_2 scrubbers, EPA Region 6 determined that wet FGD scrubbers were BART for most units and SDA represented BART for the two Harrington units. However, the EPA's own cost analysis shows that for some of the units DSI is more cost effective on a dollar per ton SO_2 reduced basis than either wet FGD or SDA scrubbers. Furthermore, while cost effectiveness is an important metric in evaluating the costs of compliance, it is by no mean the sole or determining metric. The capital costs for wet FGD and SDA SO_2 scrubbers are substantially higher than DSI, 10 - 15 times higher in most of the EPA's cost calculations. While DSI may not represent a technologically feasible option for all units subject to BART, the substantial difference in capital costs should be given consideration for units that DSI is feasible. The statutory requirement in FCAA §169A for evaluating BART is to consider the "costs of compliance" not the cost effectiveness of compliance. Capital costs are a more direct indicator of the compliance costs incurred by the affected entity than a dollar per ton of emission reduced metric.

The EPA's selection of 30 years as the remaining useful life of the BART affected units is arbitrary and overestimated for the affected coal-fired EGUs in Texas. The EPA's overestimated remaining useful life grossly biases the EPA's cost effectiveness calculations for certain emission controls.

While coal-fired EGUs can remain operational for 60 - 70 years and the affected BART units could theoretically last another 30 years, the EPA's selection of 30 years for the remaining useful life of these units is arbitrary and does not take into consideration the current state of the energy sector and many other factors that will affect how long these units will continue to remain operational. The age of the coal-fired EGUs subject to the EPA's proposed FIP range from 35 to 46 years, which the average being approximately 40 years. EPA's assumed 30 years of remaining useful life assumes these units will remain operational until they are 65 to 76 years old. However, this assumption does not reflect actual operational life data from the United States Department of Energy, Energy Information Administration (EIA). Figure 4 presents the age brackets for operable coal-fired EGUs with over 40 years of operation, based on EIA's 2015 Form EIA-860 data. Less than 5% of the operable fleet in 2015 was greater than 65 years in age.

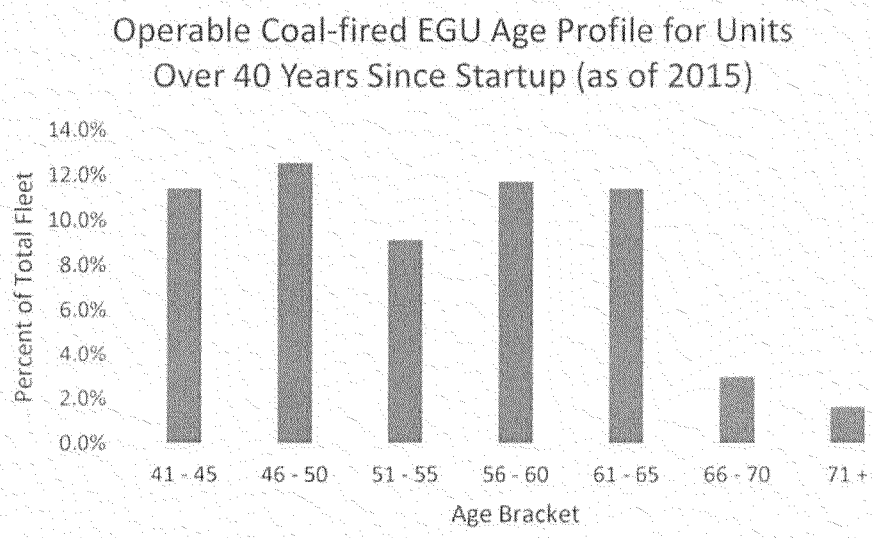

Figure 4: Coal-fired EGU Age Profile (United States Department of Energy, EIA, 2015 Form EIA-860 data).

For units in EIA's 2015 Form EIA-860 data with expected retirement dates, the average expected age at retirement is only 53 years and the median age is 57 years. Based on just the current age profile of the units affected by the EPA's proposed FIP and the EIA information from Form EIA-860, the expected remaining useful life of these units is more likely between 10 - 20 years, not the 30 years assumed by the EPA. Other factors, such as the current energy sector market pressure and other regulatory impacts, could shorten the remaining useful life even further.

Furthermore, the EPA's cost effectiveness calculations of some of the technologies evaluated by the EPA are significantly biased as a result of using a 30-year time for annualizing capital costs. While the cost effectiveness of DSI remains relatively flat over different time periods for remaining useful life due to its relatively low capital costs, cost effectiveness estimates for wet FGD and SDA are significantly impacted by the time period assumed for remaining useful life due to the far higher capital costs associated with those technologies. Figure 5 illustrates the impact of remaining useful life assumed when calculating cost effectiveness on the same technologies evaluated by the EPA using the EPA's same cost estimates. The EPA's cost effectiveness estimates for wet FGD and SDA are severely underestimated as a result of the EPA's artificially high remaining useful life estimate.

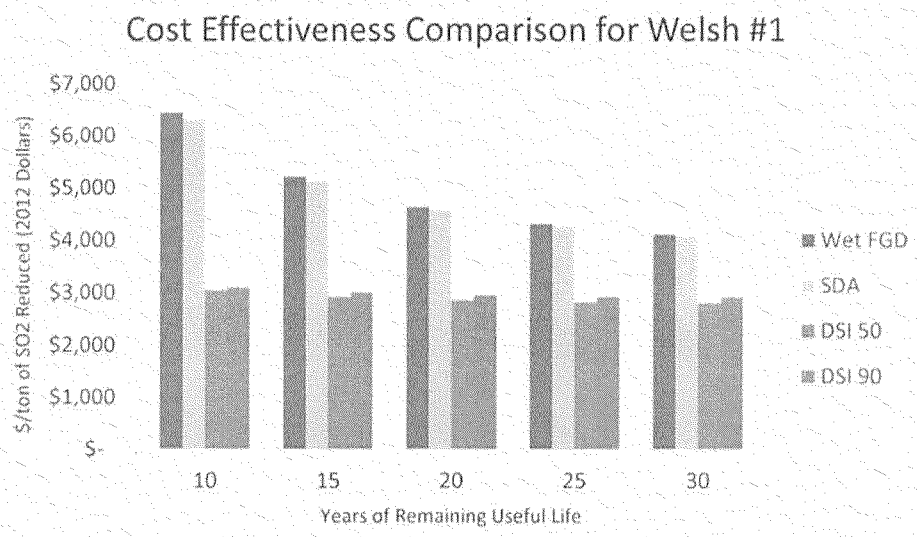

Figure 5: Cost Effectiveness Comparison for Welsh #1

Averaging times for compliance for the proposed SO_2 and particulate matter (PM) emission limits for coal-fired EGUs should be specified in the rule. The EPA should also clarify the methodology for averaging emissions for compliance.

The EPA states in the proposed FIP preamble that the SO_2 emission limits are on a 30-boiler operating day basis. However, the actual rule text proposed by the EPA does not include this or any other averaging time for compliance with the SO_2 emission limits. Similarly, the EPA did not include an averaging time for the proposed 0.030 lb/MMBtu filterable PM emission limit. An averaging time must be included in the rule for affected entities to know how to clearly determine and demonstrate compliance with the emission limits. For consistency, the averaging time for the PM BART limit should be the same as the PM surrogate limit in 40 CFR Part 63, Subpart UUUUU, i.e., the Mercury and Air Toxics Standards (MATS) rule, as the MATS rule PM surrogate limit is the basis of the EPA's proposed PM BART limit.

Additionally, in the EPA's technical support document with selected 30-boiler operating day average data (Docket ID No. EPA-R06-OAR-2016-0611-0008, TX187-0008-0033-BOD-Selected BOD SO2 Averages-3), the EPA averaged using the preceding 30-boiler operating day daily lb/MMBtu values for determining the rolling 30-boiler operating day averages. However, the proposed rule does not specify how emissions are averaged for showing compliance with the SO_2 standard.

The proposed continuous emissions monitoring system (CEMS) requirements in §52.2287(e)(2) are incomplete and inconsistent with both 40 CFR Part 60, Subpart Da and 40 CFR Part 75 requirements. The EPA should just incorporate by reference the applicable CEMS requirements from either 40 CFR Part 60, Subpart Da or 40 CFR Part 75.

The CEMS requirements that EPA has proposed in §52.2287(e)(2) are not consistent with other federal SO_2 and diluent monitoring requirements that apply to the affected facilities. Furthermore, §52.2287(e)(2) does not include certification and other quality assurance/quality control (QA/QC) provisions for CEMS. These facilities already have the necessary CEMS installed that are subject to permit and federal requirements for CEMS that would require certification and QA/QC. However, rather than attempt to recreate separate monitoring system provisions for monitoring that are already established under other federal regulations and risk creating conflicts, the EPA should just incorporate by reference the appropriate regulations (e.g., 40 CFR Part 75 monitoring).

The TCEQ and PUCT disagree with the EPA's assertion that the PM screening analysis for EGUs in the 2009 Regional Haze SIP is "no longer reliable or accurate" because CSAPR can no longer be relied upon as an alternative to source-by-source BART for SO_2 and NO_x. (82 FR p. 917(3)) The EPA should approve the TCEQ's PM screen modeling for EGUs, as it proposed to do on December 14, 2015.

The EPA is incorrect when it states that language in a guidance memo (Regional Haze Regulations and Guidelines for Best Available Retrofit Technology (BART) Determinations, Joseph Paisie, EPA Geographic Strategies Group, July 19, 2006) absolutely bars a state from conducting pollutant-specific modeling to determining BART eligibility. This memo did not state, as the EPA suggests, that pollutant-specific modeling, as the TCEQ conducted for EGUs, is only appropriate when BART for other pollutants is satisfied with a BART alternative such as the Clean Air Interstate Rule (CAIR) or CSAPR. In fact, the memo says the opposite: that such modeling *may* be appropriate where an alternative program is used for other pollutants. The EPA incorrectly claims that Texas' SIP acknowledges PM-only modeling is inappropriate where an alternative to BART is not employed (Technical Support Document for the Texas Regional Haze BART Federal Implementation Plan, BART FIP TSD, Docket ID No. EPA-R06-OAR-2016-0611-004, page 26, footnote 39). The Texas SIP did not say that. The TCEQ has always acknowledged that EGUs could be subject to BART for SO_2 and NO_x if CAIR was not upheld or replaced. However, the lack of an alternative does not undermine or render invalid the PM screen modeling conclusions for those EGUs as it pertained to that pollutant.

The EPA's own CAMx modeling shows "that on a source-wide level, impacts from PM emissions on the maximum impacted days from each [coal-fired] source at each Class I area was 3% of the total visibility impairment or less...". This EPA modeling supports the conclusions from the screen modeling conducted by the TCEQ showing these same units did not meet the 0.5 deciview (dv) threshold (Technical Support Document for the Texas Regional Haze BART Federal Implementation Plan, BART FIP TSD, Docket ID No. EPA-R06-OAR-2016-0611-004, page 82). For gas-fired units, the EPA found that PM emissions are "inherently low." (Technical Support Document for the Texas Regional Haze BART Federal Implementation Plan, BART FIP TSD, Docket ID No. EPA-R06-OAR-2016-0611-004, page 83). The additional determination by the EPA that existing controls (baghouses and electrostatic precipitators) plus compliance with the MATS filterable PM limit of 0.03 lb/MMBtu is already BART further supports the TCEQ's conclusion that there are no significant visibility

impacts from PM emissions from these sources and BART controls for PM are therefore unnecessary. Thus, the FIP for PM BART is unnecessary and the EPA should approve the screen modeling the TCEQ conducted, as they proposed to do in December 2015.

The EPA should document and justify the source of the range of cost-effectiveness estimates that the EPA is claiming to be acceptable for the proposed BART FIP.

In multiple places of the BART analysis technical support document the EPA states that the cost-effectiveness estimates are within a range that the EPA has previously found to be acceptable (Technical Support Document for the Texas Regional Haze BART Federal Implementation Plan, BART FIP TSD, Docket ID No. EPA-R06-OAR-2016-0611-004). In some cases, the EPA states that the cost-effectiveness was previously found to be acceptable for BART purposes and in some cases the EPA only states that the estimate was previously determined to be acceptable. However, the EPA does not provide any supporting information or citation for this range of acceptable cost-effectiveness that the EPA is using for the proposed BART determinations. The EPA should provide the actual range of acceptable cost-effectiveness it is using and the source of those cost-effectiveness estimates determined to be acceptable. Additionally, if the range of acceptable cost-effectiveness that the EPA is using includes sources other than EGUs or controls installed for purposes other than BART, then the EPA must justify why it is appropriate to apply the acceptability of such cost-effectiveness estimates to BART analyses.

The EPA has not provided sufficient technical justification for the use of CALPUFF beyond its acceptable range.

In the proposed FIP and the BART Screening TSD, the EPA has stated that the appropriate maximum distance at which to use CALPUFF is 300 kilometers (km) to approximately 400 km. Yet, the EPA has used CALPUFF to determine visibility impacts up to 436.1 km without providing any technical justification. The EPA has used CALPUFF at a distance greater than 400 km in Method 2 (use of model plants to evaluate visibility impacts).

In the 2005 BART Final Rule, the EPA detailed a possible template for the use of model plants situated to determine visibility impacts of sources that are located at distances greater than the appropriate CALPUFF range. In the supporting study, the example model plants were situated "...at distances 50, 100, and 200 km..." (FR 70, page 39163). Further, the "Interagency Workgroup on Air Quality Modeling (IWAQM) Phase 2 Summary Report and Recommendations for Modeling Long Range Transport Impacts" specifies the appropriate maximum range to use CALPUFF is 200 km and that CALPUFF could be cautiously used between 200 and 300 km. In 2003 the EPA, as part of revising the "Guideline on Air Quality Models", once again stated that the 200 to 300 km range is appropriate use and that with "Puff Splitting" CALPUFF could be used for distances greater than 300 km (FR 68, page 18441). Given the various performance issues identified with the use of CALPUFF in the EPA's December 2016, "Reassessment of IWAQM Phase 2 Summary Report: Revisions to Phase 2 Recommendations" and the various technical analysis that do not recommend the use of CALPUFF beyond distances greater than 300 km, without proper justification, the EPA's use of CALPUFF at distances greater than 400 km is scientifically unjustifiable.

The EPA should have screened out the Newman facility based on CALPUFF modeling or used CAMx modeling to quantify the visibility impacts and BART applicability of Newman.

Although the CALPUFF modeling conducted by the EPA did not show the impacts of the Newman facility to exceed the 0.5 dv threshold, the EPA decided not to screen out the Newman facility due to its location at the outer edge of the CALMET domain. The EPA states that due to its location, CALPUFF will not be able to capture the impacts of Newman's emissions that transport out of the domain and come back into the domain, thereby underestimating Newman's contribution. However, the EPA does not take the next logical step of estimating Newman's visibility impacts using CAMx modeling. Instead, the EPA attempts to show that Newman has impacts greater than 0.5 dv in Class I areas within the modeling domain using direct CALPUFF modeling and, when it fails, it states that the modeling is "inconclusive" and chooses to keep Newman as a BART source without proceeding to the next more comprehensive screening method of using CAMx. The EPA should not arbitrarily state that a source is subject to BART without quantifying its visibility impacts. The EPA should screen out the Newman facility based on CALPUFF modeling or use CAMx to appropriately screen Newman and determine its visibility impacts.

The natural conditions estimates used by the EPA potentially overestimate the impact of facilities identified as subject to BART and therefore, potentially overstate the estimated benefits of the proposed FIP requirements.

The Regional Haze Rule (EPA 1999) directs states to work towards the goal of reaching "natural conditions" by 2064. However, the default natural conditions estimates (NCII) used by the EPA in the proposed FIP are inappropriate for south central Class I areas including those in Texas.[3]

The Regional Haze Rule states at 40 CFR § 51.308(d)(2)(iii) that "[f]or each mandatory Class I Federal area located within the State, *the State* must determine the following . . . Natural visibility conditions for the most impaired and least impaired days . . . " [emphasis added]. Using the required methodology, the TCEQ has determined more realistic, refined estimates, approximating 100 percent soil and course mass (CM) as natural, for the two Class I areas in Texas are scientifically justified, as opposed to the default NCII estimates used by the EPA or the suggestion by the federal land managers to approximate 80 percent of soil and CM to be natural. These refined site-specific estimates were based on analysis of the conditions and influences affecting Big Bend and Guadalupe Mountains National Parks, rather than an analysis for broad areas of the United States, which was the approach taken by EPA.

Specifically, Class I areas located in West Texas are heavily impacted by large dust storms and windblown dust from the surrounding highly erodible soils. These dust events should be considered when estimating the natural conditions for Class I areas in Texas. As shown in the figure below, the result of including this site-specific information is that the more

[3] See Appendix 5-1: Discussion of the Original and Revised Interagency Monitoring of Protected Visual Environments (IMPROVE) Algorithms; Appendix 5-2: Estimate of Natural Visibility Conditions; Appendix 5-2a: Natural Events: Dust Storms in West Texas; Appendix 5-2b: Estimating Natural Conditions Based on Revised IMPROVE Algorithm; Appendix 5-2c: Texas Natural Conditions SAS Program File and Data; see under References - Gillet. al. 2005; Kavouras *et. al.* 2006, 2007.

representative estimates of natural conditions calculated by the TCEQ are higher than the default NCII values used by the EPA.

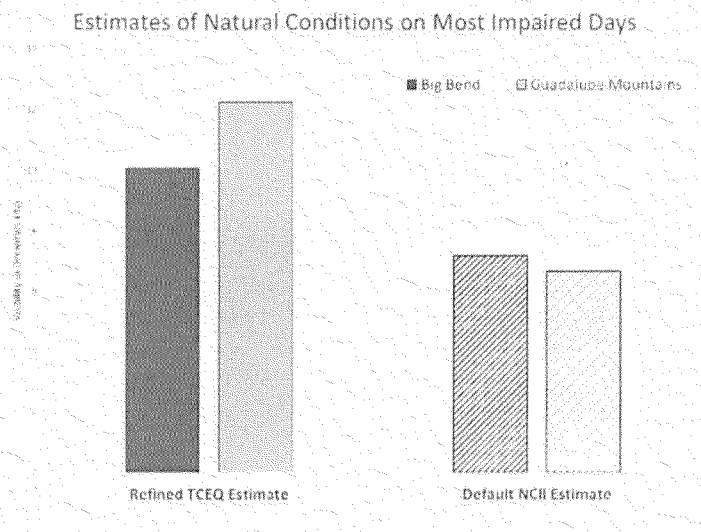

Figure 6: Comparison of Natural Conditions Estimates

The table below was derived by comparing the natural conditions estimates in the TCEQ 2009 SIP and the 2016 Regional Haze FIP for Texas and Oklahoma. These results indicate that the refined estimates of natural conditions developed by the TCEQ lead to *lower* estimates of potential improvement as compared to the default NCII estimates used by the EPA. In essence, the default NCII estimates inflate the reductions required to reach actual natural conditions potential benefits of measures taken under the Regional Haze Rule.

Improvement Needed to Reach Natural Conditions (Extent Baseline Exceeds Natural Visibility Conditions on Most Impaired Days)		
	Refined TCEQ Estimate	Default NCII Estimate
Big Bend	7.21 dv	10.14 dv
Guadalupe Mountains	4.93 dv	10.54 dv

Figure 7: Comparison of Potential Improvement Estimates

The estimates of natural conditions continue to be important in the context of the BART FIP, because the source impacts calculated during the BART screening process are compared against these natural condition estimates to assess the significance of the visibility impacts and the resulting benefits of potential controls. Because the NCII estimates for Class I areas in Texas are too low (as demonstrated in Texas 2009 SIP and described above), resulting benefits identified in EPA's BART FIP are overestimated, which could result in over-control of the identified sources. The TCEQ and PUCT urge the EPA to use the refined, more scientifically justified estimates of natural conditions for Class I areas in Texas provided by the TCEQ in the 2009 Regional Haze SIP.