



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 7
901 NORTH 5TH STREET
KANSAS CITY, KANSAS 66101

JUN 26 2009

Ms. Shelley Kaderly
Air Quality Division Administrator
Nebraska Department of Environmental Quality
P.O. Box 98922
Lincoln, NE 68509-8922

RE: Nebraska Public Power District Gerald Gentleman Station PSD BART Construction
Permit Comments

Dear Ms. Kaderly:

On May 21, 2009, the United States Environmental Protection Agency (EPA) Region 7 received notification of the Nebraska Department of Environmental Quality's (the State) intent to issue a Prevention of Significant Deterioration (PSD) construction permit for Nebraska Public Power District (NPPD) Gerald Gentleman Station (GGS) Unit 2 which is subject to Best Available Retrofit Technology (BART). The permitting action allows for the replacement of Unit 2's existing burners with a new low NO_x burner system, supported by an overfire air port system. Unit 1 currently employs the low NO_x burner system. The facility is a publicly owned electric utility and is located at 6089 South Highway 25, Sutherland, Nebraska.

Enclosed are EPA's comments on the proposed permitting action. Since the Regional Haze and PSD comments are distinct, they are broken out into two sections in the enclosed: Regional Haze (BART) and PSD. EPA appreciates the opportunity to review the draft permit and provide comment. However, it is difficult for EPA to fully assess and comment on the draft permit without the ability to concurrently review a draft State Implementation Plan (SIP) demonstrating all components of the State's Regional Haze Program. EPA is providing the following comments with the caveat that clarified, edited, or additional comments may be made when the final SIP is submitted for review.

The State has proposed a NO_x emission limit of 0.23 lb/MMBtu for GGS Units 1 and 2. EPA agrees this is the presumptive NO_x emission limit for these units under Regional Haze BART guidance. However, as detailed in the enclosed, EPA has found that the draft BART analysis does not adequately justify the level of SO₂ control the State has proposed for both units. Please note that as a result of the Finding of Failure to Submit a Regional Haze SIP,

issued January 15, 2009, a Federal Implementation Plan clock is running and will expire January 15, 2011 unless EPA receives and takes final action to approve the State's Regional Haze SIP prior to that date. The EPA will work with the State to resolve any outstanding issues in order to expedite the submittal of an approvable RH SIP. Nevertheless, failure by the State to either address EPA's comments with respect to SO₂ emission controls proposed as BART for GGS, or failure to submit documentation fully supporting its proposal may impact the approvability of this plan by EPA.

Please consider these comments as constructive to the continued development of your Regional Haze SIP. Please contact me if you have any questions or comments regarding this letter.

Sincerely,



Becky Weber
Division Director
Air & Waste Management Division

Enclosure

cc: W. Clark Smith, Permitting Section Supervisor

Regional Haze (BART) and Prevention of Significant Deterioration Permit Comments

Regional Haze (BART)

1. Obligations under the Regional Haze Rule

The permit application fact sheet implies that the State is only obligated to address visibility protection through the application of BART, on BART subject sources, and reasonable progress only if Nebraska source emissions are identified in another State's Regional Haze SIP. The State further asserts that, as no other states have identified a "need for reasonable progress reductions from Nebraska", the application of BART is the primary element of the State's Regional Haze Program.

The State is correct in that it is obligated to address visibility protection through the application of BART, on BART subject sources, and reasonable progress if Nebraska source emissions are identified in another State's Regional Haze SIP as being reasonably anticipated to cause or contribute to visibility impairment in a Class I area, but the State's obligations do not end there. It should be clear that Nebraska does not need to be specifically named by another state in order for the State to be obligated to establish a long-term strategy in its own Regional Haze SIP. As noted in 40 CFR 51.308(d)(3) the State must submit a long-term strategy that addresses regional haze visibility impairment for each mandatory Class I Federal area located outside the State which may be affected by emissions from the State.

It should also be noted that the State participated in a regional planning process lead by the Central Regional Air Planning Association (CENRAP). States that have submitted Regional Haze SIPs and participated in the CENRAP consultation process utilized the modeling produced by CENRAP to established their goals for reasonable progress toward achieving natural visibility conditions, and to determine what additional controls may be needed to achieve those goals (Missouri, Oklahoma, and Louisiana for example). The modeling was based on emissions reduction data that projected emissions sources with the installation of "on the books" (permanent and enforceable through existing federally approved plans) and "on the way" (expected to be adopted and included into federally enforceable plans such as Regional Haze SIPs) control technologies. The "on the books" and "on the way" data included presumptive BART control installation at Gerald Gentleman Station (GGS). The State has the opportunity to undertake its own modeling effort if it disputes the CENRAP modeling results or feels that it may provide a more representative modeling demonstration. As noted in 40 CFR 51.308(d)(3)(ii), even if Nebraska chooses to do its own modeling, the State must ensure it has included all measures needed to achieve its apportionment of emissions reduction obligations agreed upon through the regional planning process.

In addition to the CENRAP modeling, other States (Missouri, Oklahoma, Colorado for example) relied on EPA's IPM modeling results for 2015 and 2020 to project what level of control could be anticipated from sources like GGS in order to meet their own State's visibility goals. In the case of the IPM models, control levels at GGS for SO₂ and NO_x were projected to be at least equal to presumptive BART.

2. Presumptive BART

GGs Unit's 1 and 2 are 665 MW and 700 MW respectively. When summed, the total plant capacity is 1365 MW. These units have been in existence since 1974 and 1977. Clearly GGS meets the EPA's definition (as described in 51.308 and the required guidelines of Appendix Y) of a "presumptive" EGU. For 750 MW power plants and above, the burden is on the State to justify the conclusion that the presumptive limits (or better) are not appropriate. Where the costs of control and the visibility benefits are in the range of the assumptions used by EPA in establishing the presumptions, EPA has concluded that certain controls are highly cost effective and provide substantial visibility benefits. There may be compelling reasons for the State to adopt either less control or greater control than the presumptive levels but as discussed further below, the State's analysis has not provided the justification to do so.

3. Cost effectiveness (\$/ton)

In the BART determination, and in the fact sheet, the State identifies the cost of SO₂ controls to be about \$2,700/ton at the presumptive emission limit of 0.15 lb/MMBtu. The State asserted that this was a reasonable cost. EPA agrees that as calculated the cost is reasonable, however it is EPA's experience that Flue Gas Desulfurization (FGD) control technology can operate at a much higher control efficiency rate than 0.15 lb/MMBtu possibly even as low as 0.02 lb/MMBtu (which could improve the cost effectiveness even more). It is not EPA's intent to require analysis of each possible level of efficiency for a control technology, but it is important that when analyzing the technology that the most stringent emission control levels the technology is capable of achieving are considered. Otherwise, an unrealistically low assessment of the emission reductions potential of a certain technology could result in inflated cost effectiveness figures.

4. Use of the \$/deciview (\$/dv) metric

In the BART determination and the permit application fact sheet the State uses a metric of \$/dv to establish that controls are not cost effective. The State asserts that an annual cost of nearly \$108 million/yr/dv (for SO₂) is an order of magnitude greater than what other facilities are proposing to spend on BART controls.

The State generally concludes that wet and dry scrubbers are technologically feasible, and provides detailed cost effectiveness estimates (in cost/ton) that it found reasonable for BART. The State provided a reasonable overview of the cost of compliance and other energy and non-air quality impacts of SO₂ controls (including water rights procurement estimates of nearly \$12 million). Despite this, the State concludes that SO₂ controls are not appropriate based on a \$/dv-improved metric. The State argues that even though SO₂ can be effectively controlled for around \$2,700 per ton removed, these controls provide an improvement of 1.0 dv at a cost of about \$108,000,000. As a consequence, the State dismisses further consideration of scrubbers for SO₂ control.

EPA has concerns with the State's use of the \$/dv metric in such a manner. Those concerns are:

- A) The BART guidelines do allow States the option of considering the \$/dv metric in evaluating cost effectiveness, but given the significant difficulties in developing a meaningful method for calculating \$/dv, EPA does not recommend it for use as the sole factor in making a BART determination and would likely not approve a SIP based on that basis.
- B) Given the limitations of the approach, \$/dv should be used, when the State chooses to do so, only as a supplement to \$/ton in evaluating cost effectiveness. In keeping with the BART guidelines, the cost of compliance and degree of visibility factors should be considered along with all of the 5 factors for final decisions on level of control.
- C) Cost estimates must be reasonable; EPA recommends that the State base cost estimates on the OAQPS Cost Manual and explain and justify assumptions and conclusions used in developing alternatives.
- D) Even when used only as a supplement to \$/ton, a \$/dv analysis is likely to be meaningless if the analysis does not take into account the visibility impacts at multiple Class I areas or ignores the total improvement (i.e., the frequency, magnitude and duration of the modeled changes in visibility). For example the BART determination only examines visibility improvement calculated in a "worst day" scenario. It has been suggested that the State would see more benefit in the visibility improvement calculation if it were to consider multiple day and multiple condition effects of reduced SO₂ emissions.

EPA's BART rulemaking record strongly suggests that states should find scrubbers to be cost effective BART control for units of a size similar to Gerald Gentleman^{1 2 3}.

¹ 40 CFR Part 51, Appendix Y, Section IV.E.4. Sulfur dioxide limits for utility boilers

... For a currently uncontrolled EGU greater than 200 MW in size, but located at a power plant smaller than 750 MW in size, such controls are generally cost-effective and could be used in your BART determination considering the five factors specified in CAA section 169A(g)(2). While these levels may represent current control capabilities, we expect that scrubber technology will continue to improve and control costs continue to decline. You should be sure to consider the level of control that is currently best achievable at the time that you are conducting your BART analysis.

² "...while States are not required to follow these guidelines for EGUs located at power plants with a generating capacity of less than 750 MW, based on our analysis detailed below, we believe that States will find these same presumptive controls to be highly-cost effective, and to result in a significant degree of visibility improvement, for most EGUs greater than 200 MW, regardless of the size of the plant at which they are located. A State is free to reach a different conclusion if the State believes that an alternative determination is justified based on a consideration of the five statutory factors. Nevertheless, our analysis indicates that these controls are likely to be among the most cost effective controls available for any source subject to BART, and that they are likely to result in a significant degree of visibility improvement.. (70 FR 39131)"

³ "Having considered the comments received, we have determined that there is ample data to support the determination that the BART presumptive limits outlined in today's action are readily achievable by new wet or semi-dry FGD systems across a wide range of coal types and sulfur contents based on proven scrubber technologies currently operational in the electric industry (70 FR 39132).

4.1 Cost comparison to other facilities

In the BART determination document GGS is compared to several other units across the nation in an effort to demonstrate that the estimated cost of control at GGS is an order of magnitude greater than what other facilities are proposing to spend on BART controls (\$/dv metric). However, in the document GGS is compared to units at other facilities that are not of the same type (United Taconite, MN and CEMEX Lyons, CO) or units at other facilities that already have flue gas desulfurization controls (Xcel Sherco, MN). A cost comparison with these types of facilities is not a reasonable comparison. As a consequence, the comparison is informative but not persuasive in distinguishing GGS as an outlier or one which demonstrates that GGS's costs and visibility improvement are outside of what's contemplated by the statute and regulations.

The State could provide a cost comparison with units of the same type as GGS, without previous control measures, in the same power pool, etc., in order to better demonstrate a comparative range of control costs. As an example, an appropriate comparison would be to consider the BART determinations made at certain facilities and the proposed BART determination for GGS. The visibility impacts from GGS are greater than impacts from Kansas' Kansas City Power & Light (KCP&L) LaCygne facility and Westar Jeffrey Energy Center facility. The Kansas sources "contribute" or "cause" (98th percentile) about 0.5-2 dv impact at one or more Class I areas on more than 60 days a year. GGS "cause" (98th percentile) about 2-3 dv impact at one or more Class I areas on more than 60 days a year. Kansas, in conjunction with KCPL and Westar, determined that the visibility impact was significant and that scrubbers were cost effective control. The sources are in the process of installing them. These controls significantly reduce visibility impacts and the number of days on which they occur, sending a strong signal that GGS is not unique in this regard.

In addition, the document "Setting BART SO₂ Limits for Electric Generating Units: Control Technology and Cost Effectiveness" lists GGS in its Appendix B. As such, it can be shown that EPA considered GGS when establishing what the presumptive level for SO₂ should be nationwide and what should be considered cost effective control for those limits.

5. Visibility improvement calculations

The BART determination (supplemental information) and permit application fact sheet reference computations of visibility improvement only for SO₂ controls set to emissions limits of 0.15 lbs/MMBtu and 0.1 lbs/MMBtu. It is likely that the facility could demonstrate a greater reduction in visibility impact (and increased cost effectiveness) if it were to consider the true control efficiency of the SO₂ control technology instead of assigning the control level that would just achieve the presumptive level of pollution reduction. Again, it is not EPA's intent to require analysis of each possible level of efficiency for a control technology, but it is important that when analyzing the technology, the most stringent emission control levels the technology is capable of achieving are taken into account. An unrealistically low assessment of

the emission reductions potential of a certain technology could result in artificially low assessments of visibility improvement and estimates of cost effectiveness.

The State evaluated the improvements in visibility that will result from each control strategy, however, the State did not demonstrate the cumulative improvements in visibility that could result from combined reductions (from both NO_x and SO₂ control). The BART determination discusses that low NO_x burner and overfire air technology for NO_x control could result in about a 0.60 dv incremental reduction and that scrubber technology for SO₂ control could result in about a 1.0 dv incremental reduction at just one Class I area (Badlands). It could be effective for the State to consider the incremental reductions as a cumulative improvement resulting from both technologies (0.60dv + 1.0 dv = 1.6 dv), particularly in any \$/dv analysis in which the State may wish to engage.

As mentioned above in the \$/dv section of this document, the visibility improvement estimates are likely to be less meaningful if the analysis does not take into account the visibility impacts at multiple Class I areas. The State has demonstrated in its BART determination that GGS impacts multiple Class I areas on multiple days.

Table 1: GGS Visibility Impact (Baseline Scenario)

	2001		2002		2003	
	Days > 0.5 dV	98 th Percentile dV	Days > 0.5 dV	98 th Percentile dV	Days > 0.5 dV	98 th Percentile dV
Badlands (SD)	54	2.845	55	2.828	60	3.121
Great Sand Dunes (CO)	3	0.295	6	0.48	6	0.42
Hercules Glades (MO)	24	0.826	10	0.616	11	0.594
Mingo (MO)	10	0.615	5	0.432	5	0.438
Rocky Mountain (CO)	13	1.136	16	1.246	13	1.053
Wichita Mountains (OK)	28	1.032	27	1.206	29	1.392
Wind Cave (SD)	34	2.452	33	2.591	41	2.217

Highlight sections indicate a 98th % impact greater than 0.5 dv.

The potential emission reductions that would be obtained from SO₂ control at GGS (49,785 tpy uncontrolled to 9,970 tpy controlled) would not only result in a deciview improvement at Badlands, the improvement will likely occur at some level, at all impacted Class I areas.

It should also be noted that the BART determination, and fact sheet, demonstrate that even at the presumptive SO₂ emission rate, GGS would still have a greater than 1.0 dv impact for the Badlands Class I area (at a minimum). The fact that GGS would, even at the presumptive emission rate, cause or contribute to visibility impairment at at least one Class I area demonstrates the need for additional SO₂ control at GGS even after consideration of the statutory five factors under the guidelines.

Table 2: GGS Visibility Improvement (SO₂ Controls)

Control Option	Class I Area with Greatest Impact from GGS	2001	2002	2003
		Badlands	Badlands	Badlands
Baseline (no SO ₂ Control)	SO ₂ Modeled Emission Rate (lb/MMBtu)	0.749	0.749	0.749
	Modeled 98 th Percentile Value (dV)	2.845	2.828	3.121
	Number of Days Exceeding 0.5 dV	54	55	60
FGD Control (0.15 lb/MMBtu)	Modeled 98 th Percentile Value (dV)	1.836	2.125	2.478
	Visibility Impairment Improvement (Δ dV)	1.009	0.703	0.643
	Number of Days Exceeding 0.5 dV	36	35	39

Highlight section indicates a 98th % impact greater than 1.0 dv post control.

6. Use of construction permits to enforce BART emissions limits

As you are aware, the State must provide for public notice and opportunity for comment, and EPA must review and approve of any proposed changes to federally approved enforceable emission limits as a SIP revision. While use of construction permits may provide for enforceability of the BART emission limits, it is recognized that minor changes to permits often occur during construction and operation of the units. If changes were made to the construction permit which affect, in any manner, the permit requirements related to the BART emission limits, the source could not rely on such changes until The State requested and EPA approved them into the SIP. This restriction applies even if the primary purpose of the permit revision is not to change BART obligations. Since there is no discretion to change the limits without a corresponding SIP change, The State may wish to consider utilizing a rulemaking or state enforceable agreement, incorporated into and approved as part of the SIP, to ensure the BART emission limits are enforceable in accordance with Section 110(a)(2)(A) of the Clean Air Act.

7. Explanation of Water Use and Target Species Protection

The State continues to raise water as a potential obstacle to the installation of scrubbers at GGS, both in terms of its supply and impacts on endangered species. It is certain that western Nebraska, along with other western states, face significant water supply issues; in particular in times of recent drought. The State describes that wet and dry scrubbers would need approximately 4,000 and 3,300 acre-feet of water, respectively, resulting in potential land and crop loss if water rights must be transferred from crop production to operation of scrubbers at GGS. The State further states that "it would be difficult to acquire the water rights necessary to

operate either type of control and the costs would be substantial.” The State estimates a one-time cost of \$12 million for purchase of land and water rights and an annual cost of \$3.3 million due to lost crop revenue and property taxes.

Based on EPA’s review of the cost spreadsheet, provided by GGS as supplemental information to the BART determination, the State’s estimates of the land and water rights purchase price, crop revenue and property tax losses (given in the fact sheet) may be over-stated. Based on the design assumptions used by the State in its cost spreadsheet, each wet scrubber would utilize approximately 1,146 gallon per minute or approximately 1,500 acre-feet if operated continuously throughout the year. At the \$3,000 per acre price (estimate given by the State), by EPA’s calculations GGS would have a one time purchase price of approximately \$9 million for the land and water rights vs. the \$12 million estimate in the fact sheet.

EPA questions whether the cost of lost crops plays any role in the BART analysis. However, even if those costs, in addition to the cost of land and water are considered, they would only add marginally to the cost of scrubbers. In terms of total cost effectiveness, costs increase from approximately \$2,724 to \$2,826 per ton of SO₂ removed when considering the State’s estimated cost of water, crop, and land loss. For purposes of BART control selection, the cost is similar to the range identified by EPA in its economic modeling for “presumptive” control units and similar to the cost (\$2000/ton at the presumptive emission limit of 0.15 lb/MMBtu) the State determined was reasonable. Unless new-use water rights are unobtainable as a result of a moratorium or the costs are substantially beyond those analyzed by the State and EPA, we believe the “cost of water” issue is not a significant factor in the BART control analysis.

To the extent endangered species play any role in selecting BART controls, the analysis provided by the State is inconclusive. The analysis suggests that low water availability could impact species such as piping plover, whooping crane, least tern and pallid sturgeon but offers no technical analysis on the direct impact of additional water use from GGS. Further, scrubbers may have a positive impact on endangered species through the reduction of SO₂ emissions. Other benefits, such as reduced mercury emissions, could occur as well. If the State intends to use endangered species as a decision point in its BART analysis, then it should be done in a way that weighs both positive and negative environmental aspects of scrubber operation. If the State believes that endangered species would be adversely impacted by scrubbers at GGS, EPA recommends that Nebraska consult with the U.S. Fish and Wildlife Service and any other federal agency with oversight responsibilities, as appropriate, before concluding that scrubbers are not BART control. If the endangered species discussion is intended only for information purposes, then it should be treated as such.

PSD

1. Commencement of Construction timeline discrepancies

The draft PSD permit states: “Construction shall commence on the installation of the required BART equipment within eighteen (18) months of Regional Haze SIP approval.” New source review - PSD requires the commencement of construction within 18 months of the issuance of the permit. If approval of the SIP is not accomplished within a short period of time and GGS

chooses to delay construction for nearly 18 months after the Regional Haze SIP approval, GGS risks not having a valid PSD permit. This paragraph should be edited to state that construction shall commence on the installation within 18 months of the issuance of the PSD construction permit.

Sampling and Recording Keeping Conditions

Paragraph XIV.(B)(1)(a)(i) on page 6 of the draft permit notes sampling and recording conditions for Unit 1. These same conditions should be included in the permit for Unit 2.