



# United States Department of the Interior

NATIONAL PARK SERVICE

Air Resources Division

P.O. Box 25287

Denver, CO 80225



IN REPLY REFER TO:

N3615 (2350)

August 17, 2011

Thomas Webb  
U. S. Environmental Protection Agency Region 9  
Planning Office, Air Division  
75 Hawthorne Street  
San Francisco, California 94105

Docket ID No. EPA-R09-OAR-2011-0130

Dear Mr. Webb:

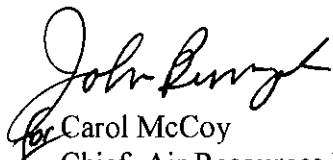
The National Park Service and the U. S. Fish and Wildlife Service have reviewed EPA Region 9's proposal to approve Nevada's Regional Haze State Implementation Plan. We believe that Nevada has met most of the requirements of the Regional Haze Rule. However, we recommend that EPA not approve two areas of the Nevada Plan as currently submitted. Our comments below and enclosed supplement comments that we provided to the Nevada Department of Environmental Protection (NDEP) on March 6, 2009.

We disagree with NDEP's determination of Best Available Retrofit Technology (BART) for reducing nitrogen oxide emissions from the Reid Gardner Generating Station (RGGS). As discussed in the enclosed comments, we believe that SCR is cost effective and should be considered BART for RGGS.

We continue to be concerned that the Nevada Plan does not include a reasonable progress analysis that is consistent with the requirements of Section 308 (d) (1) of the Regional Haze Rule and EPA's "Guidance for Setting Reasonable Progress Goals under the Regional Haze Program." NDEP reported the expected visibility improvement due to implementation of existing federal requirements and anticipated BART determinations, but did not consider what additional emissions reductions beyond those already being implemented might be reasonable to improve visibility. We refer EPA Region 9 to the Federal Register notice for Tennessee's State Implementation Plan (EPA-R04-OAR-2009-0786-201033, Fed Reg:76,111, page 33673) for an example of more complete reasonable progress analysis by a state that is projecting greater visibility improvements by 2018 than the uniform rate of progress.

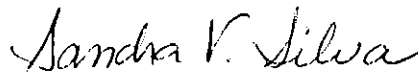
We appreciate the opportunity to work closely with EPA to improve visibility conditions at our National Parks and Wilderness Areas. For further information regarding our comments, please contact Pat Brewer, National Park Service at (303) 969-2153 or Tim Allen, U.S. Fish and Wildlife Service at (303) 914-3802.

Sincerely,



Carol McCoy  
Chief, Air Resources Division  
National Park Service

Sincerely,



Sandra V. Silva  
Chief, Branch of Air Quality  
U.S. Fish & Wildlife Service

Enclosure

cc:

Todd Hawes  
U.S. EPA OAQPS  
Mail Code C539-04  
Research Triangle Park, NC 27711

**National Park Service comments on EPA's Proposed BART for  
Nevada Energy's Reid Gardner Generating Station Units 1, 2 and 3  
August 17, 2011**

Reid Gardner Generating Station (RGGS) consists of three units owned and operated by Nevada Energy (NVE) with a nominal generating capacity of 110 megawatts (MW) each. The units are wall-fired boilers, which burn primarily bituminous coal, and are subject to Best Available Retrofit Technology (BART) requirements. Current controls for nitrogen oxides (NO<sub>x</sub>) are Low-NO<sub>x</sub> Burner and Over-Fire Air, for sulfur dioxide (SO<sub>2</sub>) are soda ash scrubbers, and for particulate matter (PM<sub>10</sub>) is a mechanical collector. RGGS causes visibility impairment in Grand Canyon National Park (NP) and contributes to impairment in Zion and Joshua Tree NPs. Following are our comments on EPA's June 22, 2011, proposed rule. These comments supplement the comments that we provided to the Nevada Department of Environmental Protection (NDEP) on March 6, 2009.

***SO<sub>2</sub> Emissions Limits:***

We commend the NDEP action to lower the SO<sub>2</sub> limit.

***NO<sub>x</sub> Emissions Limits:***

NDEP and EPA list several possible concerns with using ammonia in Selective Catalytic Reduction (SCR). These same concerns apply to Selective Non-Catalytic Reduction (SNCR). We are puzzled why NDEP and EPA would reject SCR in favor of SNCR on the bases of these concerns, especially when EPA has proposed SCR as BART for other western facilities.

The potential for creating a visible stack plume can be addressed by proper operational procedures. NDEP presented no evidence to support its speculation that ammonia residues from SCR could affect disposal of fly ash. Our research into this issue indicates that this concern is without merit and should not be considered without site-specific evidence.

The issue of ammonia transport was addressed by the Institute for Clean Air Companies<sup>1</sup>:

“Concern over the handling of ammonia was initially raised as a problem with SCR technology applications due to the transportation and storage of a hazardous gas under pressure. However, large quantities of ammonia already are used for a variety of applications with an excellent overall safety record. (In 2006, 17 billion pounds of ammonia were produced in the U.S.) These applications include the manufacture of fertilizers and a variety of other chemicals, as well as refrigeration. With the proper controls, ammonia use is safe and routine.

To avoid the risk of handling anhydrous ammonia, many current applications of SCR technology use aqueous ammonia or urea. Aqueous ammonia is typically over 70 percent water so that end users avoid nearly all of the safety issues associated with anhydrous ammonia gas. Most utility SCR installations on coal-fired boilers in the east use either aqueous ammonia or urea.”

We disagree with EPA's assertion that “the BART determinations were conducted in a manner consistent with the RHR BART requirements in 40 CFR 51.308(e), the EPA's BART

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<sup>1</sup> “Selected Catalytic Reduction (SCR) control of NO<sub>x</sub> emissions from fossil fuel fired electric power plants” prepared by NO<sub>x</sub> Control Technical Division, Institute of Clean Air Companies, Inc. May 2009

Guidelines, and EPA's Air Pollution Control Cost Manual..." with respect to the RGGGS because NDEP did not properly

- Evaluate Control Effectiveness of Remaining Control Technologies (STEP 3)
- Evaluate Impacts and Document the Results (STEP 4)
- Evaluate Visibility Impacts (STEP 5)

**NDEP underestimated the effectiveness of Selective Catalytic Reduction (STEP 3).** The RGGGS boilers are all dry-bottom, wall-fired units, and are thus similar to the larger dry-bottom, wall-fired units at the San Juan Generating Station (SJGS) in New Mexico. We know of no reason why SCR would not be as effective at RGGGS as at SJGS, and none has been presented. In its (excellent) BART analysis of SJGS, EPA Region 6 correctly stated that:<sup>2</sup>

"SCRs are routinely designed and have routinely achieved a NO<sub>x</sub> control efficiency of 90% and a NO<sub>x</sub> emission rate as low as 0.04 lb/MMBtu, based on a 30-day rolling average."

"The U.S. EPA analyzed Clean Air Markets NO<sub>x</sub> data for twenty two existing units that are achieving limits below 0.07 lb/MMBtu on a 30-day rolling average. Eight of these units were operating at or above 90% removal efficiency and not one was operating at less than 86%. Moreover, this data was collected from 2003, before the NO<sub>x</sub> SIP Call and other regulatory programs for NO<sub>x</sub> were in place. Because compliance with the NO<sub>x</sub> SIP Call was generally not required until May of 2005, performance has improved since that point, compared to 2003. A recent reanalysis of Clean Air Markets data by EPA indicates "many boilers retrofitted with SCR are achieving an emission rate of 0.03 - 0.06 lb/MMBtu."

As a result, in its January 5, 2011, Federal Register Notice, EPA Region 6 stated:<sup>3</sup>

p498: We have determined, as outlined below, that the SJGS is subject to BART and are proposing to require that units 1, 2, 3, and 4 meet an emission limit for NO<sub>x</sub> of 0.05 lbs/MMBtu.

p499: As discussed further below, we have concluded that a NO<sub>x</sub> emission limit of 0.05 lbs/MMBtu is BART for the SJGS, and performed our visibility modeling on that basis. (Additional information is provided in the TSD).

p499: In our own SCR cost analysis, which we present later in this section, we have revised the control efficiency for SCR from 0.07 lbs/MMBtu to 0.05 lbs/MMBtu.

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<sup>2</sup> EPA-R06-OAR-2010-0846-0003.1 November 2010 "Revised BART Cost Effectiveness Analysis for Selective Catalytic Reduction at the Public Service Company of New Mexico San Juan Generating Station," Final Report Prepared for Ellen Bellk, U.S. Environmental Protection Agency Region 6, Multi-media Planning and Permitting Division, Prepared by Phyllis Fox, Ph.D., PE (Consultant) RTI Project Number 0209897.004.085

<sup>3</sup> Federal Register /Vol. 76, No. 3 /Wednesday, January 5, 2011 / Proposed Rules ENVIRONMENTAL PROTECTION AGENCY 40 CFR Part 52 [EPA-R06-OAR-2010-0846; FRL-9246-8] Approval and Promulgation of Implementation Plans; New Mexico; Federal Implementation Plan for Interstate Transport of Pollution Affecting Visibility and Best Available Retrofit Technology Determination AGENCY: Environmental Protection Agency (EPA). ACTION: Proposed rule.

p502: PNM performed their SCR cost estimate on the basis of a NO<sub>x</sub> control rate of 0.07 lbs/MMBtu. We concluded that SCR could reliably achieve NO<sub>x</sub> control at a rate of 0.05 lbs/MMBtu on a 30-day rolling average basis, for each of the four units of the SJGS. Because this did not require a change in the capital cost of the SCR unit, and only necessitated the purchase of additional reagent, this had the effect of improving the cost effectiveness. We have concluded that the analysis concerning the achievability of the emissions limit, and the cost of achieving those limits, is more accurate.

p503: We determined that the SCR could achieve an emission rate of 0.05 lb NO<sub>x</sub>/MMBtu and included this emission rate in modeling the SCR control scenario (compared to 0.07 lb NO<sub>x</sub>/MMBtu assumed by NMED).

p503: Therefore, after having identified all available retrofittable NO<sub>x</sub> control technologies, eliminated those that were not technically feasible, evaluated the NO<sub>x</sub> control effectiveness of those remaining, evaluated the impacts and having documented the results, we propose that NO<sub>x</sub> BART for all the units of the SJGS is SCR with a 30 day rolling average of 0.05 lbs/ MMBtu.

p504: For NO<sub>x</sub> emissions, we are proposing to require the SJGS to meet an emission limit of 0.05 pounds per million British Thermal Units (lb/MMBtu) individually at Units 1, 2, 3, and 4. This NO<sub>x</sub> limit is achievable by installing and operating SCR.

p506: (2) *NO<sub>x</sub> emission limit*. The NO<sub>x</sub> limit for each unit in the plant, expressed as nitrogen dioxide (NO<sub>2</sub>), shall be 0.05 pounds per million British thermal units (lb/MMBtu) as averaged over a rolling 30 calendar day period.

EPA Region 9 provided no explanation as to why it disagreed with our comments to NDEP, as well as EPA Region 6's analysis of SCR at SJGS, in determining that NDEP was correct in its assumption that SCR could achieve 0.083 – 0.098 lb/mmBtu on an annual basis. EPA should revisit the issue of SCR control effectiveness because it is critical in calculating annual cost-effectiveness and visibility improvement (discussed below).

**NDEP did not properly Evaluate Impacts and Document the Results (STEP 4).** Contrary to EPA's statement, neither NVE nor NDEP followed the OAQPS Control Cost Manual to estimate SCR costs. (For example, NVE included millions of dollars of Allowance for Funds Used During Construction costs that have been typically rejected by EPA.) Despite these errors, the cost-effectiveness values noted in the NDEP BART analysis for Low-NO<sub>x</sub> Burners with Over-Fire Air and SCR ranged from \$2,386 to \$2,660 per ton of NO<sub>x</sub> removed. These values are well within the costs proposed for BART controls for several facilities in western states.

BART is not necessarily the most cost-effective solution. Instead, it represents a broad consideration of technical, economic, energy, and environmental (including visibility improvement) factors. North Dakota Department of Health proposed \$3,778 per ton for NO<sub>x</sub> controls for Great River Energy's Stanton facility. Oregon DEQ established a cost/ton threshold of \$7,300 based upon the premise that improving visibility in multiple Class I areas warrants a higher cost/ton than where only one Class I area is affected. In its BART proposal for SJGS, New Mexico used a range from \$5,946/ton to \$7,398/ton. Colorado uses \$5,000/ton (but will

consider higher costs when multiple Class I areas are impacted), New York uses \$5,500/ton, and Wisconsin is using \$7,000 - \$10,000/ton as its BART threshold. EPA has proposed SCR at the Four Corners Power Plant at \$2,500 - \$3,200/ton, and at SJGS at \$1,600-1,900/ton. Even if we accept NVE/NDEP's estimates of \$2,386 to \$2,660 per ton of NO<sub>x</sub> removed by SCR, those costs appear reasonable in the context of what has been accepted by EPA and other states, especially when considering improvements to visibility in multiple Class I areas.

**NDEP did not properly Evaluate Visibility Impacts (STEP 5).**

We are especially concerned that the NDEP BART analysis did not address improvements in visibility in a quantitative manner, for example, by comparing the various RGGGS control alternatives to the costs and benefits inherent in BART proposals by other states and/or sources. In its BART analysis, NVE estimates that aggressive NO<sub>x</sub> controls (ROFA+SCR or combustion controls+SCR) at RGGGS result in about 0.7 deciviews improvement from each unit at Grand Canyon National Park. As presented in NVE's BART analysis, that equates to approximately \$7 million per deciview (dv) of improvement. Even just considering the one Class I area for which benefits were estimated, and accepting the (likely overstated) costs and underestimated benefits presented by NVE, the costs per unit of visibility improvement for the ROFA/combustion control plus SCR scenario at RGGGS are well within the range of what was selected or proposed for BART controls at EGUs in other states. Our (ongoing) analysis of BART proposals from around the U.S. lead us to the conclusion that a cost per dv of \$14 – \$20 million represents a reasonable average cost-effectiveness for improving visibility at the most-impacted Class I area. The NVE analysis suggests that RGGGS could install the ROFA/combustion control plus SCR scenario at a much more favorable cost-effectiveness ratio than the typical state or EGU proposing BART. There are five Class I areas within 300 kilometers of RGGGS. NVE presented baseline air quality modeling results showing that the facility causes or contributes to visibility impairment at three Class I areas,<sup>4</sup> but only calculated improvement based on impacts at Grand Canyon National Park. NDEP did not consider the benefits to any Class I area besides Grand Canyon National Park.

It simply does not make sense to use the same metric to evaluate the effects of reducing emissions from a BART source that impacts only one Class I area as for a BART source that impacts multiple Class I areas. And, it does not make sense to evaluate impacts at one Class I area, while ignoring others that are similarly significantly impaired. If emissions from RGGGS are reduced, the benefits will be spread well beyond only the most-impacted Class I area, and this must be accounted for. While NVE presented data describing improvements to visibility at Grand Canyon National Park that would result from the various control scenarios it investigated, neither NVE nor NDEP have explained how they incorporated this information on impacts upon all Class I areas into their BART decision. For example, as part of its BART determination, OR DEQ evaluated the benefits of various control strategies on all 14 of the Class I areas within 300 km of the plant. EPA has presented summed visibility modeling results for multiple Class I areas in its analyses of SJGS, Four Corners Power Plant, and Navajo Generating Station. EPA has also summed visibility impacts at Class I areas in its "CAIR-is Better-than-BART" analyses.

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<sup>4</sup> RGGGS causes visibility impairment at Grand Canyon National Park, and contributes to visibility impairment at Zion and Joshua Tree National Parks. Impacts at Bryce Canyon National Park and Sycamore Canyon Wilderness Area are below the threshold for contributing to visibility impairment.

NDEP has effectively ignored the other Class I areas where RGGS is also causing or contributing to visibility impairment. The dollar cost per increment of visibility improvement would be substantially lower if full consideration is given to all affected Class I areas that would benefit from emission reductions at RGGS.

### **Conclusions & Recommendations**

- NDEP did not follow the BART Guidelines because it did not properly evaluate the effectiveness, costs, and degree of visibility improvement of adding SCR to RGGS.
- NDEP did not follow the EPA Control Cost Manual because the NVE analysis, from which it derived its SCR cost estimates, used a consultant's proprietary, internal costing procedures.
- Even using the data presented by NDEP, the costs of adding SCR to RGGS are reasonable in the context of BART determinations by EPA and other states.
- EPA should require SCR on RGGS units 1, 2, and 3 for BART.