APPENDIX C

FEDERAL LAND MANAGEMENT AGENCY COMMENTS AND NEVADA'S RESPONSE

Appendix C
Federal Land Management Agency Comments and Nevada's Response, April 17, 2009

On January 5, 2009, pursuant to 40 C.F.R. 51.308(i)(2), the Nevada Division of Environmental Protection (NDEP) provided the Federal Land Managers (FLMs) with a draft Regional Haze State Implementation Plan (SIP) for a 60-day review. NDEP received comment letters from:

- The United States Department of the Interior National Parks Service (NPS) and Fish and Wildlife Service (FWS) on March 6, 2009, and
- The United States Department of Agriculture Forest Service (FS) on March 4, 2009.

Nevada replied to the FLMs on April 17, 2009 with the responses presented below. The responses are organized by SIP chapter. The source of the comment is indicated by NPS-FWS or FS. Complete copies of the FLM comment letters follow the set of comments and responses.

EXECUTIVE SUMMARY

COMMENT 1 (FS): *Within this section it seems appropriate to discuss the relationship of the regional haze program to other state air permitting programs such as the Prevention of Significant Deterioration program. We note that the PSD program can be an effective tool to prevent degradation of "Best Days," and that new sources should be consistent with or accounted for in RH SIP revisions.*

RESPONSE: NDEP added a paragraph to the Executive Summary (see paragraph 7 of the Long-term Strategy for Regional Haze section) noting the value of Nevada's existing PSD and NSR programs to the regional haze program. In addition, we wish to point to Chapter Seven, 2nd paragraph of section 7.1 (Long-Term Strategy Overview), and 1st paragraph of section 7.9.2 (Additional Emissions Control Programs), where Nevada also notes the relationship between its permitting and regional haze programs.

CHAPTERS ONE AND TWO – There were no comments on these chapters.

CHAPTER THREE

COMMENT 2 (NPS-FWS p.2): *As noted in Table 3-8 (page 3-19), point and area source emissions of nitrogen oxides are predicted to increase over the planning period. The geographic location of these emission increases may be important to protecting the best days in nearby Class I areas. We recognize that the emissions increase may only reflect the most recent WRAP 2018 projection and, therefore, not incorporate the controls NDEP is implementing under BART. If that is the case, an acknowledgement of BART reductions should be made in Chapter Three.*

RESPONSE: Chapter Three discusses the sources of impairment in Nevada and presents the emission inventory data and analyses used in Nevada's SIP. Most of the tables and figures in this chapter reference the Plan02d and PRP18a emissions inventories. Chapter One (1.3.2 Emissions Analyses and Projections) describes the development of these inventories in detail, but the most

significant feature of the PRP18a inventory, as it relates to this comment, is that it incorporates presumptive BART emission limits for BART-eligible coal-fired EGUs for SO_2 only and not for NO_x. Text was added to Chapter Three, Section 3.8, to clarify that Plan02d and PRP18a were used for the figures and tables. In addition, text was also added to Section 3.8.2 to clarify that BART controls for NO_x were not included in the PRP18a inventory.

Additional emissions reductions for both SO_x and PM_{10}, beyond those identified in PRP18a, due to the implementation of BART controls on Nevada sources are discussed in Chapter Seven (section 7.2) and identified in Table 7-1. Please note that the PRP18a inventory also includes LS Power's proposed 1500 MW coal-fired White Pine Energy Station near Ely in eastern NV. However, LS Power announced on March 5, 2009 that it is indefinitely postponing construction due to current economic conditions and increasing regulatory uncertainties (see press release at http://www.lspower.com/News/newsArticle030509.htm), which may result in additional emissions reductions from the PRP18a inventory. LS Power still has a pending application for an operating permit to construct with NDEP as of March 18, 2009, and the emissions will not be formally removed from the projected inventory until the application is withdrawn.

With respect to the geographic location of the sources of emissions, Chapter Three, Section 3.8, shows region-wide emissions expressed in the figures of Regional Maps of emissions by pollutant as well as bar charts representing a comparison of county level emissions for Plan02d and PRP18a. These figures and charts provide the data to assess the regions of Nevada which may potentially contribute to the visibility impairment at Class I areas in adjacent states.

COMMENT 3 (NPS-FWS p.2): *We support the plan's specific identification of the uncertainty contained in Section 7.9.3.1 (page 7-16) and we request that the NDEP commit to updating that information in the mid-term reporting required by the Regional Haze Rule.*

RESPONSE: See response under Chapter Nine.

CHAPTER FOUR

COMMENT 4 (NPS-FWS p.2-3): *Chapter Four is a good description of the sources that impact Jarbidge Wilderness and of the sources in Nevada that affect visibility at Class I areas (in) other States. Tables 4-3 and 4-4 show the results of WRAP modeling using the Particulate Matter Source Attribution Tracking (PSAT) algorithm. We note that the contribution assigned to outside of the model domain in this work is highly uncertain, and likely to underestimate the contribution of regions within the model for sulfate and nitrate since it did not account for recirculation of pollutant nor natural sources assumptions outside of the domain.*

Yet, as noted in the tables for various pollutants, we agree that Nevada is a minor contributor to current and projected visibility impairment for most Class I areas outside of the State. If current emissions projections and BART controls are implemented, Nevada's contributions to extinction, particularly for sulfate and nitrate, should keep pace with, or exceed, expectations for attaining the uniform rate of reasonable progress in most Class I areas. Again, it is important that new source development be fully reviewed to assure that increases in emissions in clean areas still provide for Class I progress toward natural conditions.

RESPONSE: Chapter Four focuses on visibility and source apportionment and may not be the place to discuss the review of new source development. However, NDEP does discuss the relationship between NSR and PSD permitting processes and regional haze in the Executive Summary, section 7.1 Long-Term Strategy Overview, section 7.6 Retirement and Replacement Schedule and section 7.9.2 Additional Emissions Control Programs. See also NDEP's response to Executive Summary and Chapter Seven FLM comments. No modifications were made to Chapter Four due to this comment.

COMMENT 5 (FS): *Table 4-4. A footnote should be added to Death Valley monitoring site to identify it is not a Class I area.*

RESPONSE: NDEP erroneously included Death Valley not only in Table 4-4 but also Table 4-3. These tables identify Nevada's nitrate and sulfate extinction contribution to Class I areas outside of Nevada, respectively. Since Death Valley National Park is not a mandatory Class I area, NDEP has removed it from these tables and modified the accompanying descriptive text and figures on pages 4-14 through 4-18.

CHAPTER FIVE

COMMENT 6 (FS): *In the BART determinations, NDEP expresses the averaging period for NO_x emission limits as 12-month rolling averages, SO_2 emission limits as 24-hour averages (or 30-day average for Mohave), and PM_{10} emission limits as 3-hour averaging period. While an annual NO_x limit may be appropriate to be protective of the National Ambient Air Quality Standard for NO_2, this state implementation plan is designed to be protective of regional haze, which is an instantaneous phenomenon as experienced by a visitor to a national park or wilderness area. As such, we believe a shorter averaging period needs to be defined for NO_x limits.*

The EPA BART rule specifies a 30-day rolling average as appropriate for NO_x presumptive limits for electric generating units. Additionally, model-predictions of haze are based upon 24-hour averages. As such, we request NDEP to specify a shorter averaging period and corresponding NO_x limit to be consistent with the EPA rule.

RESPONSE: The EPA BART rule specifies that the BART determination for fossil fuel fired power plants having a total generating capacity greater than 750 MW must be made pursuant to the guidelines in appendix Y of 40 CFR Part 51. Except for the Mohave Generating Station (MGS), all Nevada sources subject to BART determinations (i.e., the NV Energy units) are less than this generation threshold and are not required to follow the guidelines. Additionally, the 30-day average recommended in the EPA guidelines was made in light of ensuring continuous compliance while also meeting the requirements of other applicable requirements (e.g., Acid Rain) and consistency with a proposed (at that time) NSPS rule. It is worthwhile to note that the Acid Rain program is based on annual NOx emissions.

The 12-month rolling averages were used for the NV Energy units to provide operational flexibility for sources. For MGS, in addition to the 12-month rolling average Nevada BART establishes a mass emission rate averaged over a 1 hour period for NO_x. This mass emission rate was based on the original 0.10 lb/MMBtu emission rate. However, it was determined that this rate could not be achieved in practice over the range of heat inputs. Mohave did say they could

achieve the equivalent mass emission rate of 788 lb/hr, which was what the modeled visibility improvements were based on. By having the one hour mass emission rate, the BART limit will ensure that the visibility improvements that were modeled would be protected. Nevada believes that the NO_x averaging periods specified in the SIP are adequate and will result in significant visibility improvement.

COMMENT 7 (NPS-FWS p.5): *The core purpose of the BART program is to improve visibility in our Class I areas. BART is not necessarily the most cost-effective solution but instead, BART represents a broad consideration of technical, economic, energy, and environmental (including visibility improvement) factors. We believe that it is essential to consider both the degree of visibility improvement in a given Class I area as well as the cumulative effects of improving visibility across all of the Class I areas affected.*

In general, NDEP did a good job in assessing the control technology aspects of the sources subject to BART and subsequent BART determinations, and we applaud NDEP's decisions to go beyond company proposals. However, we do want to share two concerns.

In addition to performing an analysis of the cost for removing each ton of pollutant for the control strategies selected as feasible and for further evaluation, NDEP also evaluated those strategies on the basis of incremental cost. While that is certainly a valid and useful parameter, it must be used with caution and its results placed into the proper perspective. The basic premise underlying the incremental cost analysis is to identify those strategies that contribute relatively little environmental benefit in proportion to their cost. Because, in most cases, the cost of pollution control rises exponentially with control efficiency, the slope of the cost curve will also increase. For this reason, rigid use of incremental cost effectiveness will always result in the choice of the cheapest option if carried to its ultimate extent. (For example, if this approach were used to evaluate PM controls, it is likely that all controls more expensive than a multiple cyclone would be rejected.) According to the NSR Workshop manual, "As a precaution, the difference in incremental costs among dominant alternatives cannot be used by itself to argue one dominant alternative is preferred to another." Instead, it should be used to compare closely performing options. (footnote: 40 CFR Part 51 Appendix Y, "Guidelines for BART Determinations Under the Regional Haze Rule" Part IV(D)(4)(e): "You should consider the incremental cost effectiveness in combination with the average cost effectiveness when considering whether to eliminate a control option." And (IV)(D)(4)(g): "You should exercise caution not to misuse these [average and incremental cost effectiveness] techniques…[but consider them in situation where an option shows]…slightly greater emissions reductions…")

RESPONSE: NDEP did consider the incremental costs for the various proposed control strategies and we recognize the limitations of this method. However, NDEP evaluated the control cost, incremental cost, and capital cost in combination and used a "least-cost envelope" to identify dominant alternatives by generating graphical plots of total annualized costs for total emissions reductions for all control alternatives identified in the BART analysis consistent with Appendix Y, Part IV(D)(4)(e)(2). We then considered the breaks in the combined economic factors to identify the BART control technology for further evaluation. The cost data from the NV Energy facilities is presented in Table 1, attached.

For example, at Reid Gardner Unit #1 the control option identified as NO_x BART, ROFA with Rotamix, has capital costs of nearly $8 million, control cost of approximately $1100 per ton and

incremental cost of just over $800 per ton reducing NO_x emissions by 1308 tons from baseline emissions. The next most stringent control option, LNB with OFA and SCR, has capital costs of more than $35 million (more than 4 times greater), control cost of more than $2500 per ton (more than 2 times greater) and incremental cost of more than $6000 per ton (more than 7 times greater) and is projected to reduce annual emissions by 1850 tons from baseline emission, an increase of only 542 tons. In consideration of these three cost factors, NDEP identified the BART control technology. Thus, NDEP did not base our decision on "rigid use of incremental cost effectiveness". No changes were made to the SIP as a result of this comment.

COMMENT 8 (NPS-FWS p.5-6): *Our second overarching concern is that NDEP does not appear to have given much weight to the visibility benefits that could be realized from the control strategies evaluated. At least, it is not clear how NDEP applied this factor in developing its BART conclusions. As we discuss later, there appears to be great inconsistency among the costs and visibility benefits that would result from the various control strategies chose by NDEP as representing BART.*

We are focusing our comments on the BART determination for the Reid Gardner (RG) facility operated by NV Energy (NVE) since it has larger emission than the other BART sources. We have conducted a preliminary review of the other BART sources and also have some initial questions and comments.

RESPONSE: NDEP has consistently evaluated the economic factors as part of our evaluation of proposed BART controls on a unit-by-unit basis, as described in our response above. As USDOI pointed out in their initial comments above, NDEP has identified BART controls more stringent than those proposed by the facilities. One of the results of this decision is a lack of additional modeling results, which has somewhat hampered our evaluation of visibility improvement due to the various proposed BART control scenarios.

However, Table 5-4 in each of NV Energy's BART analysis reports compares the modeled visibility improvement for each proposed NO_x control scenario at the closest Class I area. These data were considered by NDEP in our evaluation of BART controls consistent with guidance provided in Appendix Y, Part IV(D)(5), which states, in part "If the highest modeled effects are observed at the nearest Class I area, you may choose not to analyze the other Class I areas any further as additional analyses might be unwarranted.". These tables show clear breaks in visibility improvement, annualized costs, and cost per deciview reduction, paralleling those reflected by the cost factors. All of these data were considered in NDEP's identification of BART. Table 1, attached, compiles and presents the cost and visibility improvement data considered by NDEP.

The modeling conducted by NV Energy does not always reflect the BART emission limits proposed by NV Energy, especially for NO_x and PM_{10}. NV Energy's consideration of NDEP's comments regarding their initial identification of BART limits resulted in NV Energy identifying more restrictive NO_x emission limits in their final BART analysis reports. However, these more restrictive limits were not modeled, nor were the emission rates NDEP identified as BART. NV Energy's reports identify the BART emission limits proposed by NV Energy (see the Recommendations section of each BART analysis report) as well as the modeled emission rates (see Table 5-1 of each BART analysis report).

Chapter 5, Table 5-8 of Nevada's regional haze SIP, identifies the differences in emissions modeled by NV Energy and the emissions based on the BART controls identified by NDEP. Section 5.6 discusses the visibility improvement resulting from BART implementation in Nevada. In general, there is a linear relationship between CALPUFF modeled visibility and emission rates. The visibility improvement resulting from BART installation is expected to be proportional to the difference in modeled annual emissions and the annual NDEP BART emissions. No changes were made to the SIP as a result of this comment.

COMMENT 9 (NPS-FWS p.6): ***Comments on Reid Gardner BART Determination, Sulfur Dioxide (SO_2).*** *We are pleased that the proposed SO_2 limit has been reduced from 0.40 pounds pr million Btu of heat input (lb/mmBtu) to 0.25 lb/mmBtu on a 24-hour average basis. However, in view of the extremely low (0.05 lb/mmBtu) actual annual SO_2 emissions presented in the US EPA Clear Air Markets (CAM) database, we note that the limit could better reflect the lower actual emissions.*

We suggest a full review of the CAM data to determine the actual performance of the existing scrubbers and the variability in their emissions. Normally, maximum 24-hour average emissions are approximately 50 percent higher than the average emission rate calculated using annual emissions data. If that ratio holds true for the units at RG, the facility may be able to meet a 24-hour average emissions limit of 0.10 lb/mmBtu or lower.

RESPONSE: Although the proposed BART SO_2 emission rates for Reid Gardner[1] are higher than baseline emissions (in lb/MMBtu), NDEP has identified SO_2 BART controls for Reid Gardner in consideration of the CAA factors, as well as uncertainties in future coal supply for this facility and changes in boiler operation from the current pressurized operation to balanced draft operation. NDEP has opted for a less stringent BART emission limit to provide operational flexibility during this time of transition and to ensure the limits are achievable under the new operating scenario.

NDEP notes that Reid Gardner has been operating at its current emission levels in absence of a permit limit for SO_2. It is the nature of the scrubbers and the operation of such that has led to these unprecedented low annual emissions from units of their age. NDEP is confident that these units will continue to be operated in their highly-efficient historic manner and do not see the need to impose an additional limit outside of regulatory guidance until operational history is established under the new scenario. Emissions from Reid Gardner, as well as other sources will be reviewed under the auspices of reasonable progress for the 2018 SIP update. NDEP has added explanatory text to NDEP's BART Review documents and Chapter 5 of Nevada's regional haze SIP as a result of this comment.

COMMENT 10 (NPS-FWS p.6): *It is our understanding that the proposed 24-hour limit would become the most stringent SO2 limit applicable to this facility. As a consequence, there appears to be no other constraint on RG that would prevent it from operating continuously at that*

[1] After Nevada's response to FLM comments on the 60-day consultation draft of Nevada's RH SIP, the SIP was revised and a revised draft was released for a 30-day public comment period in April-May 2009. In response to public comments (contained in Appendix D), Nevada is revising the BART requirements at NV Energy's Reid Gardner Generating Station. A regulatory amendment lowering the SO_2 emission limits for units 1, 2 and 3 from 0.25 to 0.15 lb/10_6 Btu, 24-hour average, has been submitted to the State Environmental Commission for presentation at their December 9, 2009 Hearing. See Appendix A for details.

emission limit, and this could result in substantially higher annual emissions. However, a limit that reflects good utilization of the existing scrubbers would not require scrubber upgrades or incur additional costs, but would also prevent emissions from increasing. In addition to a more-stringent 24-hour limit, we also suggest that an annual limit (e.g., 0.06 lb/mmBtu) be included that reflects the normal clean operation of this facility.

RESPONSE: NDEP will duly consider this comment during permitting associated with Reid Gardner's BART control installation. No changes have been made to the regional haze SIP due to this comment.

COMMENT 11 (NPS-FWS p.6): ***Particulate Matter (PM10).*** *While we agree that a fabric filter represents BART for filterable PM10, no justification is presented for the proposed limit of 0.015 lb/mmBtu. We have seen stack results and permit limits at 0.010 lb/mmBtu and lower, (footnote: We have seen actual stack test data from the East Kentucky Power-Spurlock Unit #3 which indicates that a much lower limit can be achieved. As a result, the East Kentucky Power-JK Smith Unit #1 & #2 project has proposed a limit on filterable PM10 of 0.0009 lb/mmBtu and a total PM10 limit of 0.012 lb/mmBtu. Also, on June 30, 2008, the Virginia Department of Environmental Quality issued a permit to Dominion Power for it Southwest Virginia Hybrid Energy Center that limits filterable particulate emissions to 0.010 lb/mmBtu and total PM10 to 0.012 lb/mmBtu.) and believe that RG can achieve a lower limit on filterable PM10 than proposed by NDEP.*

RESPONSE: NV Energy's BART analysis reports for Reid Gardner state "For Table 2-1 below, the PM_{10} emission rate shown is equal to the fabric filter vendor guarantee." (section 2.0) and Table 2-1 lists 0.015 lb/MMBtu, "A fabric filter retrofit project is currently planned to be installed by July 1, 2010, on Reid Gardner 1 with guaranteed filterable particulate emissions from the fabric filter of 0.015 lb/MMBtu." (section 3.2.3.2), and "The guaranteed PM_{10} control technology emission rate is 0.015 lb/MMBtu."(section 3.2.3.3). NDEP will not specify emissions limits lower than vendor's guarantees.

NDEP notes that the emission limit chosen as BART is in line with new construction Prevention of Significant Deterioration (PSD) Best Available Control Technology (BACT) determinations. For example, NDEP has three coal-fired EGU's that have conducted BACT analyses that have undergone public review in the last two years. One plant selected a PM_{10} (filterable) BACT of 0.02 lb/MMBtu on a 24-hour average. Another selected 0.01 lb/MMBtu on a 3-hour average. The BART limit selected by R-G is 0.015 lb/MMBtu on a 3-hour average. This *retrofit* limit is comparable to the limits for new construction. Therefore, NDEP does not see the benefit in further analysis of the BART limit. No changes have been made to the SIP text as a result of this comment.

COMMENT 12 (NPS-FWS p.7): *We also request an analysis of controls for condensable PM10 which can represent a substantial component of total PM10 emissions, and can thus affect visibility.*

RESPONSE: Comprehensive review of 40 CFR Part 51 (Appendix Y) has not identified specific reference to control of condensable particulate matter under BART. The Guidelines do make reference to direct particulate matter emissions for determining whether sources cause or contribute to visibility impairment. In addition, no guidance has been provided on how to

evaluate whether condensable PM_{10} is a significant component of particulate matter that causes or contributes to visibility impairment at any Class I area.

Additionally, at this time there is no post-combustion technology to directly control condensable particulate emissions. Condensable emissions can be controlled through application of combustion controls and the control of precursors of condensable particulate emissions, the primary constituents of which are oxides of nitrogen and sulfur. The post combustion control of both these oxide species have been discussed with appropriate BART limits applied. No changes were made to the SIP text as a result of this comment.

COMMENT 13 (NPS-FWS p.7): ***Nitrogen Oxides (NOx).*** *We are pleased that, by proposing addition of Rotating Over-Fire Air (ROFA) with Rotamix, NDEP is moving beyond the combustion controls proposed by NVE. However, NDEP is proposing a higher NOx limit for RG Unit #3 than for units #1 and #2, even though the CAM data show that RG Unit #3 has the lowest current emission rate among the units at the plant. We request a justification of why higher NOx emissions, and therefore lower control efficiencies, are proposed for Unit #3.*

RESPONSE: NV Energy discusses control cost and expected emission information in their *BART Analysis for Reid Gardner Station Unit 3* report under Establishing Emission Reduction Levels from BART Analysis Results in the Executive Summary. This text describes the difficulty in securing cost estimates and vendor guarantees without contracts. The relevant portions are reproduced below:

> "As an integral part of the BART analysis process, control cost and expected emission information was developed for NOx, SO2, and PM10. This information is assembled from various sources including emission reduction equipment vendors, NV Energy operating and engineering data, and internal CH2M HILL historical information.
>
> The level of accuracy of the cost estimate can be broadly classified as American Association of Cost Engineers (AACE) Class V or "Order of Magnitude," which can be categorized as +50 percent/-30 percent. There are several reasons for selecting this range of cost estimates to be included in the BART analysis. They are primarily a result of the difficulty in receiving detailed and accurate information from equipment vendors based on limited available data provided to the vendors. Because of the active power industry marketplace, obtaining engineering and construction information is restricted due to vendor workload. Material and construction labor costs also change rapidly in today's active economy. However, this level of cost estimate precision is adequate for comparison of control technology alternatives. The accuracy of expected emissions may also be questionable, and is also attributable to the inability to gain timely and accurate vendor information. This is exemplified by the difficulty in obtaining background information, and the vendor time required to develop accurate emission projections for study purposes in comparison to their response to actual project request for proposals. Also, variance in expected emissions can be dependent upon the pollutant under consideration (i.e., particulate emissions can generally be more accurately predicted than NOx emissions). Therefore, when establishing emission limitations in permits, consideration of variability in cost and expected emissions information must be considered."

The report goes on to say:

> "There is significant uncertainty involved in obtaining vendor emission guarantees and associated equipment/construction costs at this stage of analysis when retrofitting older boiler units. Site specific engineering is required on a "unit by unit" basis to determine the most effective control technology." Executive Summary, Recommendations, NOx Emission Control
>
> "For this BART analysis, information pertaining to LNB with OFA, ROFA with Rotamix, SNCR, and SCR was based on a combination of vendor information, internal CH2M HILL information, and the EPA Air Pollution Cost Control Manual. Sources of cost estimates for Reid Gardner 3 are listed in

Table 3-1, which also summarizes the control technology options evaluated in this BART analysis, along with projected NOx emission rates. ….

It should be noted estimated emissions information from NOx technologies presented represent design targets. With a significant potential for variability in emissions due to changes in unit operation, a longer averaging period results in a higher probability in meeting the permit emissions value. Emissions based on a 24-hour averaging period are not directly comparable to emissions targets based on a longer averaging time." 3.2.1.3 Step 2: Eliminate Technically Infeasible Options

NDEP utilized the control efficiency data presented by NV Energy with the associated caveats reproduced above. The higher emission rates for Unit 3 are further explained in NDEP's response to the next USDOI comment which explains the use of different baseline emissions (in lb/MMBtu) as the starting point for calculation of emission limits. In addition, NDEP generally lends latitude to the experienced operators of a given facility. They understand the operational history and idiosyncrasies of a given unit. Therefore, NDEP had no reason to question the higher NO_x control efficiencies for one unit over the other. It is also beneficial to understand that these units were not constructed at the same time, and even if they were, identical units have been proven to not operate identically. No changes were made to the SIP text as a result of this comment.

COMMENT 14 (NPS-FWS p.7): *In reviewing the effectiveness of combustion controls as a precursor to application of SCR, NVE and NDEP have assumed that combustion controls can achieve NOx reductions in a range of 6 to 24 percent. Our data (provided in Appendix A) on BART sources and/or states proposing combustion controls indicates that typical NOx reduction efficiencies range between 15 and 63 percent. We request that NDEP review the effectiveness assumptions in its BART determination and provide support for variations from engineering norms.*

RESPONSE: NV Energy has proposed combustion controls for Reid Gardner with NO_x control efficiencies ranging from 6 to 24 percent for LNB with OFA and 38 to 59 percent for ROFA with Rotamix. The corresponding emission limits are 0.355 to 0.421 lb/MMBtu and 0.191 to 0.278 lb/MMBtu, respectively. Appendix A, provided by USDOI, lists proposed combustion controls with efficiencies ranging from 15 to 63 percent and emission limits of 0.15 to 0.43 lb/MMBtu. It is Nevada's position that the effectiveness assumptions presented by NV Energy do not vary significantly from engineering norms based on the information presented by USDOI. Therefore, no additional support materials will be provided. No changes to the SIP text were made as a result of this comment.

COMMENT 15 (NPS-FWS p.7): *NDEP has assumed that control of NOx through a combination of combustion controls and Selective Catalytic Reduction (SCR) technologies could reduce NOx emissions to 0.085 lb/mmBtu, resulting in a 77 percent reduction of potential emissions. Our review (provided in Appendix B) of eastern coal-fired Electric Generating Units (EGUs) retrofitted with SCR indicates that those EGUs can achieve 0.06 lb/mmBtu on a 30-day rolling average basis while they are in operation. We note that Nevada Energy assumed that these controls could achieve an emission rate of 0.07 lb/mmBtu for its cost and air quality modeling analyses. We request that NDEP review its assumption regarding achievable emissions limits for a combination of combustion controls and SCR and provide support for any annual rate higher than 0.06 lb/mmBtu.*

RESPONSE: As described in Chapter Five, section 5.5 Summary of BART Control Analyses, NDEP evaluated CAM and other emissions data to determine baseline emissions in lb/MMBtu. These data are tabulated in Table 1 of NDEP's BART Determination Reviews. Appendix A of NV Energy's BART analysis reports presents similar data. Note the differences in annual heat input and NO_x emissions, 9,048,563 MMBtu and 1452 tons by NV Energy and 10,063,851 MMBtu and 2268 tons by NDEP, for Reid Gardner Unit 3. Analysis of these data demonstrate that the uncontrolled emission rate using NV Energy's baseline is 0.32 lb/MMBtu while it is 0.45 lb/MMBtu using NDEP's baseline. The emission rates calculated by applying the control efficiencies provided by NV Energy are 0.07 lb/MMBtu and 0.098 lb/MMBtu, respectively. Thus, the proposed emission rates are calculated from the control efficiencies, which NDEP has confirmed are within engineering norms, based on data provided by USDOI (see NDEP response to comment above). No changes were made to the SIP text as a result of this comment.

COMMENT 16 (NPS-FWS p.7-8): *The capital costs noted for the combination of combustion control and SCR are $278 per kilowatt (kW) of energy output. Those costs are higher than any real-world costs found in available literature. (Please see the "PSNM Survey" page of Appendix C.) We did not find any facility-specific information in the SIP record that supports these costs, nor was there any indication that RG would experience any exceptional BART retrofit costs. As a result, the cost-effectiveness values noted in the NDEP BART analysis ranged from $2,386 to $2,600 per ton of NOx removed. Nevertheless, those values are substantially lower then the $3,778 per ton estimated by the North Dakota Department of Health for its proposed BART controls for NOx emissions from Great River Energy's Stanton facility that impacts only two Class I areas.*

Using data found in the SIP documentation and US EPA Control Cost Manual approach (recommended by the BART Guidelines), we estimate cost (in Appendix D) to achieve an emission rate of 0.06 lb/mmBtu, representing 83 to 86 percent control efficiency on an annual-average basis, would result in cost of $135 to $163 per kW and a range of $1,568 to $1,752 per ton of NOx removed. Our cost/kW is well within the range of real-world values cited above, and our cost per ton is similar to that accepted by NDEP for its proposed BART strategy, but with greater benefits to visibility. [footnote: Our cost estimates for SCR at RG are also lower thtn the BART strategies proposed by North Dakota for EGUs at Leland Olds, Stanton, and MR Young facilities (provided in Appendix E to our comments).] Based on our calculations, we believe that NDEP's cost are overestimated and request that documentation of facility-specific conditions affecting cost be provided.

RESPONSE: Nevada has evaluated this comment in light of the cost per kW data provided in Appendix C. NDEP notes the most recent cost data (2008) in the literature for the combination combustion controls and SCR are from ODEQ for Boardman and these costs are similar to those proposed for Reid Gardner ($278/kW vs $207-267/kW). The most recent "real-world" costs (see PSNM Survey of Appendix C) date back to 2006. In addition, Summary of Summaries in Appendix C shows average and median total capital investment of $320 and $301/kW for SCR and $346 to $334/kW for combustion control plus SCR. These costs were compiled by USDOI from many sources/agencies and reflect costs higher than those proposed by NV Energy.

Although NDEP can concur with use of the EPA Control Cost Manual approach, NDEP has issue with the use of the "NPS version of corrected OAQPS Cost Manual…" spreadsheets included as Appendix D of the USDOI comments. We do not concur with the use of a modified

version of EPA's Control Cost Manual for numerous reasons, the most obvious being that the modifications are unilateral by the FLM community and have not been properly vetted through a public process or formally accepted by USEPA. Therefore, we acknowledge the discussion of costs based on the modified Cost Manual and but do not address them.

NDEP believes the BART costs proposed by NV Energy are not overestimated but are in line with other proposals across the nation (when compared with those listed in Appendix C) and it is therefore not necessary to provide additional documentation of facility-specific conditions affecting cost. NDEP has provided text from NV Energy's BART Analysis Reports (see NDEP response to the first USDOI comment under Nitrogen Oxides) identifying the problems with securing cost and emission data from vendors without formal contracts in place.

It is also our position that the selection of BART is specific to the individual facility based on expected emission rate, emissions performance level, expected emissions reductions, costs of compliance, energy impacts, non-air quality environmental impacts and modeled visibility impacts. Control costs at other facilities with their unique circumstances should not be a controlling factor in the selection of BART. No changes were made to the SIP text as a result of this comment.

COMMENT 17 (NPS-FWS p.8): *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 RG control alternatives to the costs and benefits inherent in the BART proposals by other states and/or sources. In its BART analysis, NVE estimates that aggressive NOx controls (ROFA+SCR or combustion controls+SCR) at RG result in about 0.7 deciview (dv) improvements at Grand Canyon National Park. As presented in NVE's BART analysis, that equates to approximately $7 million per 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 RG 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 US (provided in Appendix E) (footnote: Appendix E to our comments contains proposals to reduce NOx, SO2, and PM10, either individually, or in combination. While it may be relevant to cite cost/ton of pollutant in terms of the specific pollutant removed, it is not necessary to categorize the cost per dv of improvement because that parameter is not pollutant-specific. A dv of improvement due to reducing NOx is no different from a dv of improvement due to reducing SO2 or PM10.) are leading us to the conclusion that a cost per dv of $10 - $20 million represents a reasonable average cost-effectiveness for improving visibility at the most-impacted Class I area. (NDEP has determined that Low-NOx Burners plus Flue Gas recirculation represent BART for Tracy Unit #3. NVE estimated, in its BART submittal, that this option would result in a cost-effectiveness value of $10 million per dv.) The NVE analysis suggests that, at $7 million per dv, RG could install the ROFA/combustion control plus SCR scenario at a much more favorable cost-per-dv effectiveness ratio than the typical state or EGU proposing BART. Furthermore, our estimates (on the Appendix D "Gardner (NPS)" page) of more visibility improvement from increased efficiency of the equipment and lower costs equate to a $3 million cost per dv of improvement at Grand Canyon National Park alone.*

RESPONSE: NDEP has determined that additional modeling beyond the efforts of NV Energy is unwarranted, since the highest modeled effects are observed at the Class I area nearest the

facilities [see Appendix Y Part IV(D)(5)], as discussed in our response to USDOI comments above. Tabulated model results, shown on attached Table 1, clearly identify breaks in the visibility impacts (both number of days and percent deciview reduction), total annualized costs and $/dv reduction consistent with the breaks observed in the cost factors.

NDEP takes exception to the statement "…accepting the (likely overstated) costs and underestimated benefits…". Nevada has demonstrated, using data provided by USDOI, that the control costs are in line with BART proposals at a variety of facilities across the nation, as are the control efficiencies and emission limits. The demonstrations were provided as NDEP responses to USDOI comments above.

NDEP does not subscribe to the use of $/dv as a measure of cost effectiveness as this is an optional measure [from Appendix Y Part (V) (1) (4) "…and/or any other cost-effectiveness measures (such as $/deciview);…"] beyond the use of annualized costs, cost effectiveness, and incremental cost effectiveness. EPA has provided no guidance on the use of $/deciviews as a cost effectiveness measure and NDEP is concerned that it may be misused in that role. NDEP is unsure how the number and placement of Class I areas with respect to the facility may affect the usefulness of $/deciview as an effectiveness measure and therefore rely on the traditional measures of cost effectiveness. In addition, it is not the place of USDOI to conclude what constitutes reasonable average cost effectiveness. That is the role of states.

Finally, we cannot concur with the use of a modified Control Cost Manual, as stated in our responses above, and so NDEP chooses not to address the comments related to Appendix D. No changes were made to the SIP text as a result of this comment.

COMMENT 18 (NPS-FWS p.9): *There are five Class I areas with 300 kilometers of RG. NVE presented baseline air quality modeling results showing that the facility causes or contributes to visibility impairment at three Class I areas, (footnote: RG 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.) but only calculated improvement based on impacts at Grand Canyon National Park. Neither NVE nor NDEP discussed visibility improvement in the context of the benefits to all the impacted Class I areas.*

RESPONSE: The BART guidelines recommend analyzing visibility improvement for the highest impacted Class I area with the assumption that any improvement in the worse impacted area would result in improvement in the lesser impacted areas. Chapter Five, section 5.6 Visibility Improvement Due to BART Implementation, does present and discuss the visibility improvement for all Class I areas within 300 km of each subject-to-BART facility and concludes with a discussion of the visibility improvement considering all Nevada BART sources in a regional context. In addition, NV Energy presented modeling results for all Class I areas within 300 km of their BART facilities.

NV Energy conducted limited modeling for their determination of BART and, as discussed above, not all BART control scenarios have been modeled for the BART emission limits proposed by NDEP. However, it is commonly held that there is a linear relationship between emissions and modeled visibility impacts. Nevada anticipates greater visibility improvement than that modeled by NV Energy consistent with the data presented in Table 5-8 of Nevada's

SIP, which lists the WRAP baseline emission rates, NV Energy modeled emission rates and the NDEP BART emission rates. No changes were made to the SIP text as a result of this comment.

COMMENT 19 (NPS-FWS p.8): *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 RG 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, the Oregon Department of Environmental Quality (ODEQ) has recently posted on its website (footnote: http://www/deq.state.or.us/aq/haze/pge.htm) a proposal to require under the BART program that the Boardman power plant install a dry scrubber and SCR. As part of its BART determination, ODEQ evaluated the benefits of various control strategies on all 14 of the Class I areas within 300 km of the plant. The following is an excerpt from comments we sent to ODEQ in January 2009:*

> *The BART Guidelines represent an attempt to create a workable approach to estimating visibility impairment. As such, they require several assumptions, simplifications, and shortcuts about when visibility is impaired in a Class I area, and how much impairment is occurring. The Guidelines do not attempt to address the geographic extend of the impairment, but assume that all Class I areas are created equal, and that there is no difference between widespread impacts in a Class I area and isolated impacts in a Class I area. To address the problem of geographic extent, we have been looking at the cumulative impacts of a source on all Class I areas affected, as well as the cumulative benefits from reducing emissions. While there are certainly more sophisticated approaches to this problem, we believe that this is the most practical, especially when considering the modeling techniques and information available. In this case, we applied this cumulative approach to the Boardman analysis and found that the cumulative impact form the baseline condition on visibility in the 14 Class I areas is 29.7 dv, with a total of 2,367 "days" of impaired visibility across the 14 Class I areas.*

We note that ODEQ used a similar approach in its analyses.

NDEP has effectively ignored the other Class I areas where RG 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 emissions reductions at RG. We request that NVE present data showing the improvement that would result from application of the ROFA/combustion control plus SCR scenarios. We would be pleased to work with NDEP to further develop this approach.

RESPONSE: Chapter Five, section 5.2 Dispersion Modeling Results, Table 5-3 and Figures 5-1 through 5-2, presents the visibility improvement resulting from implementation of the BART limits proposed by NV Energy in their BART Analysis reports for Reid Gardner. In addition, Table 5-4 presents the visibility improvement at Grand Canyon National Park, the closest Class I area to the facility, for all proposed BART controls. As NDEP has discussed above, this approach is consistent with the guidelines given in Appendix Y. No changes were made to the SIP as a result of this comment.

COMMENT 20 (NPS-FWS p.9-10): ***Comments on BART determinations for Ft. Churchill, Mohave and Tracy EGUs.*** *In general, we are pleased that NDEP has chosen BART controls that are more stringent than those proposed by the sources. (Those BART determinations for*

NOx are summarized in Appendix F.) However, as we evaluated those NDEP determinations, we observed that there were some apparent discrepancies between the levels of control that the sources said were achievable by a given control strategy and the level of control assumed by NDEP in its determination. For example, the table below presents the NOx limits used by the sources as they evaluated the control technologies and fuels determined by NDEP to represent BART.

Comparisons between Source and NDEP NOx Limits

Source	Unit	BART Control Technology	Source Estimate	NDEP Limit
Ft. Churchill	Unit #1	LNB+FGR	0.14	0.20
Ft. Churchill	Unit #2	LNB+FGR	0.14	0.16
Reid Gardner	Unit #1	ROFA + Rotamix	0.16	0.20
Reid Gardner	Unit #2	ROFA + Rotamix	0.16	0.20
Reid Gardner	Unit #3	ROFA + Rotamix	0.20	0.28
Mohave	Unit #1	LNB+OFA	0.10	0.15
Mohave	Unit #2	LNB+OFA	0.10	0.15
Tracy	Unit #1	LNB+FGR	0.16	0.15
Tracy	Unit #2	LNB+FGR	0.16	0.12
Tracy	Unit #3	LNB+FGR	0.13	0.19

We suggest that NDEP include explanations as to how it arrived at its BART limits and why they differed from the emission rates used by the sources in evaluating those control strategies. (There also appear to be some discrepancies among the Tracy Unit #3 emission rates, control efficiencies, and visibility improvements presented by the source and discussed and adopted by NDEP.)

RESPONSE: The short answer is that both NDEP and NV Energy applied control efficiencies to calculate emission rates, however the baseline emission rates used were different. NDEP independently arrived at the proposed BART limits based on data reported to the EPA Clean Air Markets Division (acid rain data) and information presented by the sources.

Nevada discusses the analyses of BART controls in section 5.5, Summary of BART Control Analyses of our regional haze SIP. This section includes a discussion of the methodology employed in the determination of baseline emissions and BART emission limits. A similar explanation is presented in NDEP BART review documents (see NDEP Analysis section under Step 5). Of note is NDEP's determination of baseline emissions scenarios utilizing acid rain data for NO_x and SO_2 and annual emission data reported to NDEP for PM_{10}. The major difference between NDEP's and NV Energy's calculation of BART emission limits is the choice of the baseline emissions. NV Energy's control efficiencies were applied to NDEP's baseline emissions, in lb/MMBtu, to calculate the proposed BART emission rates presented in Chapter Five.

Generally, DOI is concerned that the level of control assumed by NDEP is disparate from the levels of control that the sources stated were achievable by a given control strategy. The requested explanations for the differences are identified by DOI's table. Specifically, DOI asks why the NDEP estimate and the source estimate are not the same.

In Chapter 5 of NDEP's BART report, NDEP explains that a different baseline data set is used based on data reported to the EPA Clean Air Markets Division. This baseline emission strategy is well documented in Chapter 5, page 5-9 of the draft Regional Haze SIP. NDEP used this reported baseline emission data and applied the expected performance of the control technology for NO_x for each BART eligible unit as proposed by the source to establish the BART NO_x emission limit. No changes were made to the SIP text as a result of this comment.

COMMENT 21 (NPS-FWS p. 10): *As we suggest above, we believe that greater emphasis should be placed upon the degree of visibility improvement that could be achieved in this program designed for that specific purpose. It follows that, if it is cost-effective to spend $10 million per dv to apply Low-NOx Burners plus Flue Gas recirculation at Tracy Unit #3, then application of that same criterion to the other proposals would result in determinations that lower emission rates could be achieved. We also suggest that, if NDEP were to consider the cumulative benefits that could be achieved at this $10 million/dv benchmark, the degree of emission reductions would be still greater.*

RESPONSE: As Nevada has stated earlier in our response to FLM comments, cost per deciview of visibility improvement is not a required measure of cost effectiveness [Appendix Y Part (V) (1) (4)]. In addition, Nevada is concerned with the rigorous application of this single matrix by the FLM community without guidance from EPA regarding its use. NDEP identified BART through the evaluation of the emission control technology available, the costs of compliance, the energy and non-air environmental impacts of compliance, any pollution control equipment in use at the source, the remaining useful life of the source and the degree of visibility improvement. Table 1, attached, clearly shows the breaks in cost and visibility factors at the control identified by NDEP as BART (shown by shaded cells in Table 1).

Note that NDEP identified LNB with SNCR as BART for Tracy Unit 3 with a cost effectiveness of $2,383 per ton, incremental cost of $1,952 per ton, a cost of $9.8M per deciview of improvement at the Desolation Wilderness Area, and a capital cost of $4.4M for a visibility improvement of 0.072 dv at Desolation (the closest Class I area). Unit 3 has the lowest cost effectiveness of the three Tracy units, but the highest capital costs and highest cost per deciview of visibility improvement of any of the control options identified as BART for a NV Energy facility. Table 1, attached, shows BART controls for Reid Gardner have a cost effectiveness of $1,038 to $1,588 per ton, incremental costs of $833 to $1,560 per ton, costs of $2.4M to $2.7M per deciview of improvement at Grand Canyon National Park, and capital costs of $7.9M for a visibility improvement of 0.514 to 0.63 dv at the Grand Canyon (the closest Class I area). Analysis of these data suggest some of the problems with the $/dv improvement at a measure of cost effectiveness. No changes were made to the SIP text as a result of this comment.

Regarding the cost per deciview, this is not an approach identified in 40 CFR 51.308 or in 40 CFR 51 Appendix Y. The preferred approach is based on cost per ton of pollutant removed.

CHAPTER SIX

COMMENT 22 (NPS-FWS p.3): *The setting of reasonable progress goals is linked to the development of a long-term strategy in that a state must consider appropriate measures, developed using the four statutory factors plus other considerations the state deems appropriate, then set reasonable progress goals for its Class I area(s) based on the projected results from*

implementing those measures. In addition, a state SIP should discuss how its long-term strategy addresses its share of reasonable progress at Class I areas located in other states.

Chapter Six is focused on the setting of reasonable progress goal for Jarbidge Wilderness and out-of-State Class I areas. While BART is part of a long-term strategy, the SIP discusses BART emissions limits in Chapter 5. We address specific BART determination issues later in this document.

Section 6.7 (page 6-15) states the NDEP rationale for its conclusions that the reasonable progress goal for the worst visibility days is reasonable. Item 1 notes that Jarbidge Wilderness is projected to attain or exceed the uniform rate of progress assessment guide that EPA established. In addition, Item 3 in Section 6.7 notes that reductions in anthropogenic emission is consistent with Nevada's share of emissions reductions to meet RPG's of Class I areas in other States. While these conditions are laudable and form key aspects of what is an appropriate long-term strategy, there needs to be a more rigorous assessment of what additional strategies, if any, are possible. Some reasonable number of control options must be evaluated and the State must decide whether to include them in the long-term strategy based on the statutory factors.

Given that Jarbidge is meeting the rate of progress in guidance from EPA, and that the assessment in Section 7.9.3.2 indicates that reductions in Nevada address its share of visibility impairment from key anthropogenic pollutant in most Class I areas, an examination focused on costs of some additional controls may be sufficient to complete the assessment four factor analysis. A comparison of costs of additional strategies on a dollar-per-ton basis with baseline emissions reduction programs would suffice if costs are extremely high for the amount of visibility improvement likely to occur.

RESPONSE: NDEP has added citations from USEPA's June 2007 *Guidance for Setting Reasonable Progress Goals Under the Regional Haze Program* supporting our rational for not assessing additional control options during the first regional haze planning period (see page 6-2 to 6-3, 6-7 to 6-8 and 6-16). A seventh factor has been added to the text of section 6.7, Demonstration That the RPG for Worst Days is Reasonable, explaining that any additional costs for compliance are unreasonable at this time and justifying why further analysis of the four statutory factors is unnecessary.

CHAPTER SEVEN

COMMENT 23 (FS): *Table 7-6 (page 7-18) summarizes Nevada's contribution to improvement in Class I areas outside of the State. We note that reductions in emissions from baseline to 2018 are given in State-wide totals. It would be more appropriate to assess regions of the State that are most contributing to the Class I area listed in the table. The column related to the weighted emission potential (WEP) reduction may address this issue but needs further elaboration in the text. Some of the WEP entries are negative implying that Nevada's contribution to those areas is moving in the wrong direction.*

Given the uncertainties of future projections, especially the type and placement of future energy sources, we request the long-term strategy contain a statement that new source review and prevention of significant deterioration programs are key components of a regional haze plan

designed to improve current visibility on the most impaired days and to protect visibility conditions at Class I areas.

RESPONSE: NDEP has included new text and figures in section 7.9.3.2 elaborating on the interpretation of the weighted emission potential data and noted the description of the WEP methodology and its limitations presented in Chapter 1 (section 1.3.3.2). The new text also references figures in Chapter Three showing a map of gridded SO_2 emissions for the WRAP region (Figure 3-10) and a breakdown of Nevada SO_2 emissions by county (Figure 3-11) which provide data to assess the regions of Nevada which maybe contributing to the visibility impairment at Class I areas in adjacent states.

In addition, see NDEP's response to the FLMs Chapter Three comments. NDEP's response describes why the projected emissions inventory and modeling scenarios, including WEP, are conservative portrayals of the visibility impacts due to Nevada's emissions. NDEP expects greater emissions reductions and correspondingly greater visibility improvement than is presented in the SIP.

NDEP also notes California's responses to FLM comments regarding Nevada's impacts on California's Class I areas. The comments and responses are reproduced below from Appendix F of California's Regional Haze SIP:

> **Comment: Nevada has a significant impact on several California Class 1 Areas, so the SIP should note that those areas rely on Nevada sufficiently addressing their contribution in order to achieve reasonable progress.**
> Response: California does not characterize Nevada's impacts on total light extinction at California's Class 1 Areas as significant. ARB examined the SOx and NOx tracer studies which show that concentrations of nitrates and sulfates attributable to Nevada sources are generally less than 10 percent of the total concentrations of nitrates and sulfates in each of the California sub-regions. However, when these concentrations are converted to percent contribution to total light extinction for the worst days annual average, their impact drops to barely 1 percent of total light extinction.
>
> **Comment: DOA suggests that the plan acknowledge the point source contribution of nitrates from Nevada to the Desolation, Mokelumne, and Hoover Wilderness Areas on the 20% worst days.**
> Response: Please refer to the response to DOI's comment 8. In Chapter 4 of the Plan, current out-of-state influences were evaluated for all source categories at Class 1 Areas on worst days. Despite modeling which shows elevated nitrate concentrations attributable to Nevada point sources on a few days each year, the actual contribution to total light extinction is less than one percent of the annual worst days average. Future impacts from Nevada could be more or less of the nit rate light extinction share, depending on the reductions of California mobile source nitrates in comparison with anticipated BART reductions from Nevada point sources. As noted in response to DOI's comments 18 and 19, the modeled impact of these future reductions will be evaluated during the mid-course review.

Nevada has modified text in the 4th paragraph on page iv of the Executive Summary and the 2nd paragraph on page 7-2 of section 7.1 Long-Term Strategy Overview to relate Nevada's NSR and PSD permitting programs to regional haze. We have also noted the relationship between our permitting program and regional haze in Section 7.6 Source Retirement and Replacement Schedule on page 7-7, and the 1st paragraph of section 7.9.2 Additional Emissions Control Programs, page 7-14.

COMMENT 24 (FS): *Please clarify that NDEP will revisit Nevada Cement, Fernley Plant during its mid-term review (5 years after EPA approval of the SIP) to clarify if the facility has been shut down or if not, to consider emission reductions as part of its reasonable further progress goals for Class I areas within and adjacent to Nevada.*

RESPONSE: Nevada Cement, Fernley Plant is BART eligible, but was found not to cause or contribute to visibility impairment at any Class I area. As such, this facility is not subject to a full BART determination. Thus, this source, along with all other Nevada sources will be reviewed during Nevada's adequacy determination as part of its five-year progress report. Chapter Nine (sections 9.3 Commitment to Progress Reports and 9.4 Determination of Current Plan Adequacy) explains this process and potential actions. No modifications were made to the SIP text due to this comment.

COMMENT 25 (FS): *While Jarbidge WA is projected to meet the 2018 URP, other Class I areas in adjacent states affected by emission sources in Nevada are not projected to meet the 2018 URP. Nevada analyzed its contribution to impacts in Class I areas in neighboring states and presented its analysis in Section 7.9.3.2 Please expand this table to include the Hoover, CA IMPROVE monitoring site.*

RESPONSE: Table 7-6 has been modified to include the IMPROVE monitor HOOV1 representing the Hoover Wilderness Area.

COMMENT 26 (FS): *Please use caution in citing or referring to other legally binding documents, which if modified may require re-opening the regional haze SIP. For example, please cite and use the Clean Air Act in terms of following the emission reduction and mitigation objectives instead of using an MOU between effected agencies. This will reduce the need to modify the RH SIP, should the MOU which only lasts 5 years, be modified, or expired.*

RESPONSE: NDEP is aware that a change in the *Smoke Management Plan*, the MOU or the NAC would necessitate a SIP revision. However, since these are the current state programs/regulations to manage smoke, we believe it is appropriate to include them specifically and will update the SIP as necessary.

COMMENT 27 (FS): *To aid in the public's understanding, please include a map showing the region within 15 miles of the specific areas (i.e., class I areas, smoke sensitive areas, and non-attainment areas) which have smoke management restrictions.*

RESPONSE: Nevada's Smoke Management plan identifies smoke sensitive areas as the following: "Smoke sensitive areas include but are not limited to Class I areas as well as other designated scenic and/or important views especially during times of significant visitor use, urban and rural population centers, homes, schools, hospitals, nursing homes, airports, recreational

areas, and other locations that may be sensitive to smoke impacts for health, safety, and/or aesthetic reasons". The electronic version of Nevada's Smoke Management Plan can be found at: http://ndep.nv.gov/baqp/technical/SMP2005.html. It is problematical and unreasonable to provide a figure in the RH SIP showing the regions within 15 miles of all specific areas which have smoke management restrictions (i.e. smoke sensitive areas described above). However, we have attached a figure to NDEP's response to comments showing the land status surrounding Nevada's Class I area (Jarbidge WA) and a 15 mile radius buffer. The town of Jarbidge has approximately 20 permanent residents. The other communities shown on the figure are either historic sites or ghost towns and have only a few permanent residents.

COMMENT 28 (FS): *As the terminology may sometimes be confusing, please segregate out what is required by the open burning regulation and what's required for prescribed burning.*

RESPONSE: Section 7.7 in Chapter Seven has been rewritten to clarify what types of open burning are regulated under the Nevada Administrative Code (NAC) and what is managed under the Nevada Smoke Management Program. The NAC applies to federal, state and private lands. In addition to the NAC, prescribed fires used specifically for land management purposes are controlled through implementation of the Nevada Smoke Management Program and compliance is achieved through a Memorandum of Understanding.

CHAPTER EIGHT

COMMENT 29 (NPS-FWS p.4): *Section 8.3 notes that monitoring is currently implemented under the visibility Federal Implementation Plan (FIP) for the original visibility protection rules for "reasonably attributable" impairment implement by EPA in the 1980's. We encourage NDEP to develop comprehensive rules to replace the FIP and which could still link to the cooperative state-federal IMPROVE program to accomplish cost-effective long-term monitoring.*

RESPONSE: Nevada's visibility FIP applies to only one facility in the southernmost tip of Nevada, Southern California Edison's Mohave Generating Station (MGS) and contains emission control requirements for PM_{10}, SO_2 and NO_x. Nevada's Regional Haze (RH) SIP in effect supersedes the FIP, in that the BART requirements for MGS are more stringent than the FIP requirements. NDEP will explore the possibility of having the visibility FIP rescinded.

The monitoring strategy in the FIP (i.e., 40 CFR 52.26) requires the EPA, in cooperation with the appropriate FLM, to monitor visibility within each visibility protection area in the state. Accordingly, the FLMs operate the IMPROVE program which addresses visibility monitoring at the Jarbidge WA. The IMPROVE network also addresses visibility monitoring at Class I areas outside the state. Nevada's RH SIP commits to continue using the IMPROVE monitoring data to evaluate progress toward achieving the goals of the Regional Haze Rule.

COMMENT 30 (NPS-FWS p.4): *In Section 8.6 (page 8-5), we would like to see a state commitment to work with federal agencies as a team if economic challenges are faced by the IMPROVE monitoring program.*

RESPONSE: A commitment to this effect has been added into section 8.6 of Chapter Eight.

COMMENT 31 (FS): *Specify the frequency in which NV commits to updating its statewide emissions inventory.*

RESPONSE: Nevada updates its point source emission inventory for major sources every year as required by USEPA. In addition, Nevada updates its entire emission inventory every three years as required by USEPA for the National Emission Inventory. This information has been added into section 8.6 of Chapter Eight.

CHAPTER NINE

COMMENT 32 (NPS-FWS p.2): *We support the plan's specific identification of the uncertainty contained in Section 7.9.3.1 (page 7-16) and we request that the NDEP commit to updating that information in the mid-term reporting required by the Regional Haze Rule.*

RESPONSE: Nevada has added text to Chapter Nine, section 9.3, "Commitment to Progress Reports," confirming that its mid-term report will include all of the required elements (from 51.308(g)(1-7)), as well as a reassessment of the uncertainty in the data.

COMMENT 33 (NPS-FWS p.4): *As already noted under the long-term strategy comments, there is uncertainty regarding future emissions projections from both existing and new sources, so future review requirements are a crucial part of the long-term strategy and should recognize that modifications to the control strategies may be necessary.*

RESPONSE: Nevada agrees that its long-term strategy must be reviewed for the 5-year progress report (and future SIP revisions and progress reports) and modified as necessary. This is noted in the Executive Summary, sections on the long-term strategy and periodic revisions and reports. It is also recognized in Chapters Seven and Nine.

COMMENT 34 (FS): *Based upon the source apportionment of sulfates and nitrates for the worst-case days, the Forest Service encourages Nevada to work with Idaho in identifying strategies to reduce impacts from area sources of nitrate and point sources of sulfates in Idaho to the Jarbidge Wilderness area.*

RESPONSE: In Chapter Nine, section 9.2.3, Nevada commits to continue to work with neighboring states that may be impacting or expected to impact Jarbidge WA. Idaho's area source emissions of nitrate are projected to grow by approximately forty percent (nearly 12,000 tons) from the baseline period to 2018, however Idaho's mobile source (both on-road and off-road) emissions of nitrate are projected to decrease by nearly sixty percent (42,000 tons), more than offsetting the growth of area source emissions. Growth of area source emissions is projected to occur primarily in the most populated counties, especially those along the Snake River Plain. Nevada recognizes the uncertainty in projecting area source emissions in section 7.9.3.1, Uncertainty, page 7-16 of our SIP and believes these same concerns apply to projecting Idaho's emissions.

Idaho's point source emissions of SO_2 are projected to decrease by more than forty percent (7,600 tons). Additional SO_2 reductions are expected due to the installation of controls under Idaho's BART requirements as part of Idaho's regional haze SIP. Amalgamated Sugar's Nampa facility, located in southwest Idaho is expected to install flue gas desulfurization for SO_2 control

and low-NO_x burners with over-fire air for NO_x control. Monsanto's P4 facility, located in extreme southeastern Idaho, is expected to install scrubbers for SO_2 control. Idaho is working with these facilities to determine the final projected emissions reductions resulting from the installation of these controls.

Nevada deems these controls as appropriate strategies for Idaho to reduce the impacts of their sources on the Jarbidge Wilderness Area during this initial regional haze planning period.

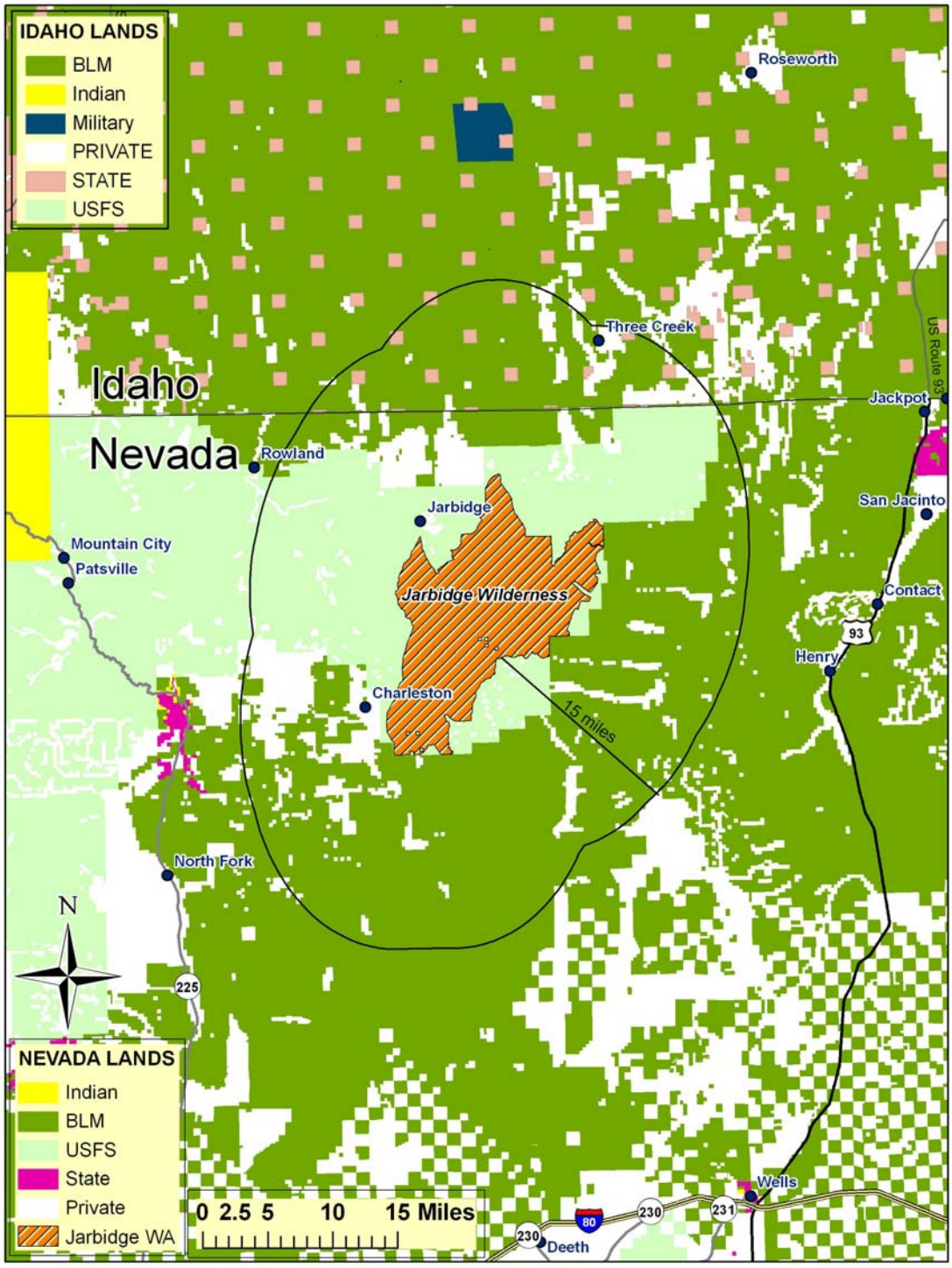
Table 1. BART NO_x Cost Factors and Visibility Improvement for NV Energy Facilities

	NOx Control				
Tracy Unit 1	**LNB w/SCR**	**ROFA w/Rotamix**	**LNB w/FGR**	**LNB w/SNCR**	**LNB**
Capital Cost	$21,175,000	$7,389,835	$1,820,000	$4,431,875	$1,232,000
Total Annual Cost	$2,439,826	$913,636	$276,611	$538,357	$152,661
NOx Removal Rate %	74.5%	49.1%	41.1%	31.3%	8.4%
NOx Emission Rate (Tons)	56	112	130	152	202
NOx Emission Rate (lb/MMBtu)	0.064	0.127	0.147	0.171	0.228
First Year Cost ($/ton removed)	$14,840	$8,432	$3,050	$7,794	$8,235
Incremental Cost ($/ton)	$27,227	$36,082	-$12,103	$7,632	$8,235
$M/dv Improvement at Desolation	28.704	16.315	5.885	14.954	16.962
98th Percentile ΔdV Reduction at Desolation	0.085	0.056	0.047	0.036	0.009
Tracy Unit 2	**LNB w/SCR**	**LNB w/SNCR**	**ROFA w/Rotamix**	**LNB w/FGR**	**LNB**
Capital Cost	$31,812,500	$4,624,375	$8,013,408	$2,156,000	$1,540,000
Total Annual Cost	$3,774,173	$692,411	$1,167,212	$398,425	$196,526
NOx Removal Rate %	85.2%	54.0%	52.0%	51.4%	38.7%
NOx Removed (Tons)	273	173	167	165	124
NOx Emission Rate (Tons)	47	148	154	156	197
NOx Emission Rate (lb/MMBtu)	0.037	0.114	0.119	0.120	0.152
First Year Cost ($/ton removed)	$13,803	$3,995	$6,994	$2,415	$1,582
Incremental Cost ($/ton)	$30,778	-$73,973	$399,253	$4,954	$1,582
$M/dv Improvement at Desolation	18.501	5.091	8.979	3.113	2.160
98th Percentile ΔdV Reduction at Desolation	0.204	0.136	0.13	0.128	0.091
Tracy Unit 3	**LNB w/SCR**	**ROFA w/Rotamix**	**LNB w/SNCR**	**LNB w/FGR**	**LNB**
Capital Cost	$35,862,500	$9,189,145	$4,431,875	$2,072,000	$1,232,000
Total Annual Cost	$4,397,281	$1,522,890	$706,459	$574,613	$175,861
NOx Removal Rate %	78.3%	45.2%	37.3%	28.8%	16.4%
NOx Removed (Tons)	622	359	296	229	130
NOx Emission Rate (Tons)	172	435	498	566	664
NOx Emission Rate (lb/MMBtu)	0.063	0.159	0.182	0.206	0.242
First Year Cost ($/ton removed)	$7,067	$4,240	$2,383	$2,511	$1,349
Incremental Cost ($/ton)	$10,928	$13,005	$1,952	$4,047	$1,349
$M/dv Improvement at Desolation	29.315	17.504	9.812	10.261	5.496
98th Percentile ΔdV Reduction at Desolation	0.150	0.087	0.072	0.056	0.032
Ft. Churchill 1	**LNB w/SCR**	**ROFA w/Rotamix**	**LNB w/SNCR**	**LNB w/FGR**	**LNB**
Capital Cost	$35,781,250	$5,250,940	$4,416,563	$1,610,000	$1,050,000
Total Annual Cost	$4,499,853	$1,669,757	$893,203	$490,969	$156,559
NOx Removal Rate %	87.4%	65.7%	62.1%	56.7%	49.5%
NOx Removed (Tons)	1057	794	751	686	598
NOx Emission Rate (Tons)	$152	$415	$458	$524	$611
NOx Emission Rate (lb/MMBtu)	0.056	0.152	0.167	0.191	0.223
First Year Cost ($/ton removed)	$4,259	$2,102	$1,190	$716	$262
Incremental Cost ($/ton)	$10,787	$17,842	$6,161	$3,842	$262
$M/dv Improvement at Mokelumne	9.000	na	2.467	1.479	0.529
98th Percentile ΔdV Reduction at Mokelumne	0.500	na	0.362	0.332	0.296
Ft. Churchill 2	**LNB w/SCR**	**ROFA w/Rotamix**	**LNB w/SNCR**	**LNB w/FGR**	**LNB**
Capital Cost	$35,781,250	$9,189,145	$4,416,563	$1,610,000	$1,050,000
Total Annual Cost	$4,480,514	$1,639,078	$862,142	$490,969	$156,559
NOx Removal Rate %	86.4%	63.0%	59.1%	53.2%	45.4%
NOx Removed (Tons)	745	543	510	459	391
NOx Emission Rate (Tons)	117	319	353	404	471
NOx Emission Rate (lb/MMBtu)	0.045	0.123	0.136	0.155	0.181
First Year Cost ($/ton removed)	$6,014	$3,017	$1,692	$1,070	$400
Incremental Cost ($/ton)	$14,082	$23,103	$7,296	$4,972	$400
$M/dv Improvement at Mokelumne	11.258	na	3.158	2.012	0.771
98th Percentile ΔdV Reduction at Mokelumne	0.398	na	0.273	0.244	0.203

Reid-Gardner Unit 1	ROFA w/SCR	LNB w/OFA & SCR	ROFA w/Rotamix	LNB w/OFA & SNCR	LNB w/OFA
Capital Cost	$38,484,900	$35,048,000	$7,884,900	$6,945,500	$4,448,000
Total Annual Cost	$5,394,746	$4,746,852	$1,450,193	$1,132,860	$551,737
NOx Removal Rate %	81.6%	81.6%	57.7%	40.9%	21.3%
NOx Removed (Tons)	1850	1850	1308	927	483
NOx Emission Rate (Tons)	417	417	959	1340	1784
NOx Emission Rate (lb/MMBtu)	0.085	0.085	0.195	0.273	0.364
First Year Cost ($/ton removed)	$2,916	$2,566	$1,109	$1,222	$1,143
Incremental Cost ($/ton)	$7,280	$6,085	$833	$1,308	$1,143
$M/dv Improvement at Grand Canyon	7.729	6.801	2.45	2.174	1.254
98th Percentile ΔdV Reduction at Grand Canyon	0.698	0.698	0.592	0.521	0.44
Reid-Gardner Unit 2	**ROFA w/SCR**	**LNB w/OFA & SCR**	**ROFA w/Rotamix**	**LNB w/OFA & SNCR**	**LNB w/OFA**
Capital Cost	$38,484,900	$35,048,000	$7,884,900	$6,945,500	$4,448,000
Total Annual Cost	$5,469,626	$4,795,602	$1,498,001	$1,155,269	$551,737
NOx Removal Rate %	82.2%	82.2%	59.0%	42.7%	23.7%
NOx Removed (Tons)	2010	2010	1443	1044	580
NOx Emission Rate (Tons)	435	435	1003	1401	1866
NOx Emission Rate (lb/MMBtu)	0.083	0.083	0.191	0.267	0.355
First Year Cost ($/ton removed)	$2,721	$2,386	$1,038	$1,106	$952
Incremental Cost ($/ton)	$7,001	$5,813	$860	$1,299	$952
$M/dv Improvement at Grand Canyon	7.442	6.525	2.378	2.063	1.152
98th Percentile ΔdV Reduction at Grand Canyon	0.735	0.735	0.63	0.56	0.479
Reid-Gardner Unit 3	**ROFA w/SCR**	**LNB w/OFA & SCR**	**ROFA w/Rotamix**	**LNB w/OFA & SNCR**	**LNB w/OFA**
Capital Cost	$38,484,900	$35,048,000	$7,884,900	$6,945,500	$4,448,000
Total Annual Cost	$5,401,669	$4,717,944	$1,379,809	$1,082,582	$551,737
NOx Removal Rate %	78.2%	78.2%	38.3%	29.9%	6.5%
NOx Removed (Tons)	1774	1774	869	678	147
NOx Emission Rate (Tons)	494	494	1400	1590	2121
NOx Emission Rate (lb/MMBtu)	0.098	0.098	0.278	0.316	0.421
First Year Cost ($/ton removed)	$3,045	$2,660	$1,588	$1,596	$3,742
Incremental Cost ($/ton)	$4,444	$3,688	$1,560	$1,000	$3,742
$M/dv Improvement at Grand Canyon	8.285	7.236	2.684	2.232	1.356
98th Percentile ΔdV Reduction at Grand Canyon	0.652	0.652	0.514	0.485	0.407

Attachment to Comment 28 (FS) response:

JARBIDGE WILDERNESS AREA with 15 MILE BUFFER and LAND STATUS



Nevada Division of Environmental Protection, Bureau of Air Quality Planning March 26, 2009

USDA United States Department of Agriculture | Forest Service | Intermountain Region | 324 25th Street Ogden, UT 84401 801-625-5605

File Code: 2580
Date: MAR 0 4 2009

Adele King Malone, ES IV, Supervisor
Planning Branch, Bureau of Air Quality Planning
Nevada Division of Environmental Protection
901 S. Stewart Street, Suite 4001
Carson City, NV 89701

Nevada Environmental Protection
MAR 0 9 2009
BAPC/Bishop

RECEIVED
MAR 0 9 2009
ENVIRONMENTAL PROTECTION

Dear Ms. Malone:

On January 5, 2009, the State of Nevada submitted a draft implementation plan describing your proposal to improve air quality regional haze impacts at mandatory Class I areas across your region. We appreciate the opportunity to work closely with the State through the initial evaluation, development, and now subsequent review of this plan. Cooperative efforts such as these ensure that, together, we will continue to make progress toward the Clean Air Act's goal of natural visibility conditions at our Class I wilderness areas and parks.

This letter acknowledges that the US Forest Service has received and conducted a substantive review of your proposed Regional Haze Rule implementation plan. Please note, however, that only the US Environmental Protection Agency (EPA) can make a final determination about the document's completeness, and therefore, only the EPA has the ability to approve the document. The Forest Service's participation in the State of Nevada's administrative process does not waive any legal defenses or sovereignty rights it may have under the laws of the United States, including the Clean Air Act and its implementing regulations.

As outlined in a letter to Michael Elges, dated January 19, 2007, our review focused on eight basic content areas. The content areas reflect priorities for the Federal Land Manager agencies. We are enclosing comments associated with these priorities. Please note we have highlighted comments in bold face that we feel warrant additional consultation prior to public release. We look forward to your response as required by 40 CFR 51.308(i)(3). For further information, please contact Rick Graw at (503) 808-2918 or Scott Copeland at (307) 332-9737.

Again, we appreciate the opportunity to work closely with the State of Nevada. The Forest Service compliments you on your hard work and dedication to significant improvement in our nation's air quality values and visibility.

Sincerely,

Harv Forsgren

HARV FORSGREN
Regional Forester

Enclosure

Comments

Section 1: Overview

Overall, we commend the State of Nevada on the content and presentation of the materials contained within the draft Regional Haze SIP. The organization of the material facilitated the review.

Section 1 provides an overview of the regional haze rule and requirements. Within this section it seems appropriate to discuss the relationship of the regional haze program to other state air permitting programs such as the Prevention of Significant Deterioration program. We note that the PSD program can be an effective tool to prevent degradation of "Best Days," and that new sources should be consistent with or accounted for in RH SIP revisions.

Section 4: Visibility and Source Apportionment Modeling

Table 4-4. A foot note should be added to Death Valley monitoring site to identify that it is not a Class I area.

Section 5: BART

In the BART determinations, NDEP expresses the averaging period for NO_x emission limits as 12-month rolling averages, SO_2 emission limits as 24-hour averages (or 30-day average for Mohave), and PM_{10} emission limits as 3-hour averaging period. While an annual NO_x limit may be appropriate to be protective of the National Ambient Air Quality Standard for NO_2, this state implementation plan is designed to be protective of regional haze, which is an instantaneous phenomenon as experienced by a visitor to a national park or wilderness area. As such, we believe a shorter averaging period needs to be defined for NO_x limits.

The EPA BART rule specifies a 30-day rolling average as appropriate for NO_x presumptive limits for electric generating units. Additionally, model-predictions of haze are based upon 24-hour averages. As such, we request NDEP to specify a shorter averaging period and corresponding NO_x limit to be consistent with the EPA rule.

Section 7: Long-Term Strategy for Nevada

Please clarify that NDEP will revisit Nevada Cement, Fernley Plant during its mid-term review (5 years after EPA approval of the SIP) to clarify if the facility has been shut down or if not, to consider emission reductions as part of its reasonable further progress goals for Class I areas within and adjacent to Nevada.

Section 7.7: Smoke Management Plan

Please use caution in citing or referring to other legally binding documents, which if modified may require re-opening the regional haze SIP. For example, please cite and use the Clean Air Act in terms of following the emission reduction and mitigation objectives instead of using an MOU between effected agencies. This will reduce the need to modify the RH SIP, should the MOU which only lasts 5 years, be modified, or expired?

Since anthropogenic fire and prescribed burning constitute a very small component of haze, the Forest Service would like to ensure that these practices are not unnecessarily regulated. As the Forest Service has responsibility both to ensure protection of wilderness areas and to restore fire as a natural component of the ecosystem, we continue our desire in working with NDEP in implementing any changes to their smoke management program.

To aid in the public's understanding, please include a map showing the region within 15 miles of the specific areas (i.e., class I areas, smoke sensitive areas, and non-attainment areas) which have smoke management restrictions.

As the terminology may sometimes be confusing, please segregate out what is required by the open burning regulation and what's required for prescribed burning.

Section 7.9: Long-Term Strategy

While Jarbidge WA is projected to meet the 2018 URP, other Class I areas in adjacent states affected by emission sources in Nevada are not projected to meet the 2018 URP.
Nevada analyzed its contribution to impacts in Class I areas in neighboring states and presented its analysis in Section 7.9.3.2. Please expand this table to include the Hoover, CA IMPROVE monitoring site.

Section 8: Monitoring Strategy

Please specify the frequency in which Nevada commits to updating its statewide emissions inventory.

Section 9: Coordination, Future Commitments and Requirements

Based upon the source apportionment of sulfates and nitrates for the worst-case days, the Forest Service encourages Nevada to work with Idaho in identifying strategies to reduce impacts from area sources of nitrate and point sources of sulfates in Idaho to the Jarbidge Wilderness area.

United States Department of the Interior

NATIONAL PARK SERVICE
Air Resources Division
P.O. Box 25287
Denver, CO 80225

IN REPLY REFER TO:

TAKE PRIDE IN AMERICA

March 6, 2009

N3615 (2350)

Mr. Michael Elges
Chief, Bureau of Air Quality Planning
Nevada Division of Environmental Protection
Suite 4001
901 S. Stewart St.
Carson City, Nevada 89501

Dear Mr. Elges:

On January 5, 2009, we received Nevada's draft implementation plan to address regional haze for review. We appreciate the opportunity to work closely with the State through the initial evaluation, development, and, now, subsequent review of this plan. Cooperative efforts such as these ensure that, together, we will continue to make progress toward the Clean Air Act's goal of natural visibility conditions at all of our most pristine National Parks and wilderness areas for future generations.

This letter acknowledges that the U.S. Department of the Interior, U.S. Fish and Wildlife Service (FWS), and National Park Service (NPS) have received and conducted a substantive review of your draft Regional Haze Rule implementation plan in fulfillment of your requirements under the federal regulations 40 CFR 51.308(i)(2). Please note, however, that only the U.S. Environmental Protection Agency (EPA) can make a final determination regarding the document's completeness and, therefore, ability to receive federal approval from EPA.

As outlined in a letter to each state dated August 1, 2006, our review focused on eight basic content areas. The content areas reflect priorities for the Federal Land Manager agencies, and we have enclosed comments associated with these priorities. Our major concerns with the plan are the assessment for reasonable progress at all Class I areas affected by emission from your State, and the determination of best available retrofit technology (BART) for the Reid Gardner facility. We look forward to your response, as per section 40 CFR 51.308(i)(3). For further information regarding our comments, please contact Bruce Polkowsky (NPS Air Resources Division) at (303) 987-6944, or Tim Allen of the FWS Branch of Air Quality at (303) 914-3802.

Again, we appreciate the opportunity to work closely with the State of Nevada and compliment you on your hard work and dedication to significant improvement in our nation's air quality values and visibility.

Sincerely,

Christine L. Shaver
Chief, Air Resources Division
National Park Service

Sincerely,

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

Enclosure

cc:
Adele Malone
Supervisor, Planning and Modeling
Bureau of Air Quality
Suite 4001
901 S. Stewart St.
Carson City, Nevada 89701

National Park Service and U.S. Fish and Wildlife Service Comments Regarding Nevada Draft Regional Haze Rule State Implementation Plan

On January 5, 2009, the State of Nevada submitted a draft Regional Haze Rule State implementation plan (SIP), pursuant to the requirements codified in federal rule at 40 CFR 51.308(i)(2), to the U.S. Department of the Interior, National Park Service (NPS) and the U.S. Fish and Wildlife Service (FWS). The NPS and FWS air programs have conducted a substantive review of the Nevada draft plan, and have provided the comments listed below. We are sending Appendices to these comments electronically. We look forward to the Nevada Department of Environmental Protection (NDEP) response as per section 40 CFR 51.308(i)(3). For further information regarding these comments, please contact Bruce Polkowsky (NPS) at (303) 987-6944 or Tim Allen (FWS) at (303) 914-3802.

OVERALL COMMENTS

We would like to commend the State of Nevada on a well-written draft SIP. In particular, Chapter One does an excellent job of setting the baseline conditions found a Jarbidge Wilderness Area as well as summarizing technical analyses conducted by the Western Regional Air Partnership (WRAP).

While not a Class I area managed by the Department of the Interior, we note that Nevada is establishing reasonable progress goals for Jarbidge Wilderness Area that meets the U.S. Environmental Protection Agency (EPA) target uniform rate of progress toward attaining natural conditions by 2064. This is commendable since most western Class I areas are not likely to have reasonable progress targets that attain the EPA uniform rate of progress.

Our general concerns with the plan, as elaborated below, center on documentation of a complete long-term strategy analysis based on, at a minimum, the four statutory factors, and a commitment to link the assessment of new and modified stationary sources to the protection of the twenty percent best visibility days at Jarbidge and Class I areas in other states that are likely impacted by these sources.

We are also providing comments on the best available retrofit technology (BART) for the Reid Gardner plant for consideration in your final action on that facility.

SPECIFIC COMMENTS

Remaining comments are organized according to the priorities that we presented in our August 1, 2006, letter, which outlined the Regional Haze concepts that are of importance to the NPS and FWS. Many of the following comments will also provide direction towards building the narrative of the draft SIP to address the documentation and content area comments noted above.

Baseline, Natural Condition, and Uniform Rate

We agree with methodologies NDEP used in establishing the baseline and natural conditions estimates as outlined in Chapter Two. Use of the Inter-Agency Monitoring of Protected Visual Environments (IMPROVE) monitoring network is appropriate for setting baseline conditions and tracking visibility. In addition, we concur with the adoption of EPA's guidance for setting the natural condition estimate. We understand there is uncertainty regarding dust impacts in many western Class I areas and will work with NDEP in assessing the need for any future adjustments to the natural conditions estimate for dust.

Emission Inventories

Chapter Three of the draft SIP provides a good overview of baseline and future emissions. We appreciate Table 3-6 (page 3-14) which provides a summary of emissions for both the base year (2002) and the target year (2018). We have encouraged all states to provide this basic information in summary form, since it is the basis for assuring reasonable progress.

We appreciate that the State included future energy development plans within the stationary source projections. As noted in Table 3-8 (page 3-19), point source and area source emissions of nitrogen oxides are predicted to increase over the planning period. The geographic location of these emissions increases may be important to protecting the best days in nearby Class I areas. We recognize that the emissions increase may only reflect the most recent WRAP 2018 projection and, therefore, not incorporate the controls NDEP is implementing under BART. If that is the case, an acknowledgement of BART reductions should be made in Chapter Three.

In addition, we understand that the 2018 projections are highly uncertain. We support the plan's specific identification of the uncertainty contained in Section 7.9.3.1 (page 7-16) and we request that the NDEP commit to updating that information in the mid-term reporting required by the Regional Haze Rule.

Area of Influence

Chapter Four is a good description of the sources that impact Jarbidge Wilderness and of the sources in Nevada that affect visibility at Class I areas other States. Tables 4-3 and 4-4 show the results of WRAP modeling using the Particulate Matter Source Attribution Tracking (PSAT) algorithm. We note that the contribution assigned to outside of the model domain in this work is highly uncertain, and likely to underestimate the contribution of regions within the model for sulfate and nitrate since it did not account for recirculation of pollutant nor natural sources assumptions outside of the domain.

Yet, as noted in the tables for various pollutants, we agree that Nevada is a minor contributor to current and projected visibility impairment for most Class I areas outside of the State. If current emissions projections and BART controls are implemented,

Nevada's contribution to extinction, particularly for sulfate and nitrate, should keep pace with, or exceed, expectations for attaining the uniform rate of reasonable progress in most Class I areas. Again, it is important that new source development be fully reviewed to assure that increases in emissions in clean areas still provide for Class I progress toward natural conditions.

Reasonable Progress Goals, and the Long-Term Strategy

The setting of reasonable progress goals is linked to the development of a long-term strategy in that a state must consider appropriate measures, developed using the four statutory factors plus other considerations the state deems appropriate, then set reasonable progress goals for its Class I area(s) based on the projected results from implementing those measures. In addition, a state SIP should discuss how its long-term strategy addresses its share of reasonable progress at Class I areas located in other states.

Chapter Six is focused on the setting of reasonable progress goal for Jarbidge Wilderness and out-of-State Class I areas. While BART is part of a long-term strategy, the SIP discusses BART emissions limits in Chapter 5. We address specific BART determination issues later in this document.

Section 6.7 (page 6-15) states the NDEP rationale for its conclusions that the reasonable progress goal for the worst visibility days is reasonable. Item 1 notes that Jarbidge Wilderness is projected to attain or exceed the uniform rate of progress assessment guide that EPA established. In addition, Item 3 in Section 6.7 notes that reductions in anthropogenic emissions is consistent with Nevada's share of emissions reductions to meet RPG's of Class I areas in other States. While these conditions are laudable and form key aspects of what is an appropriate long-term strategy, there needs to be a more rigorous assessment of what additional strategies, if any, are possible. Some reasonable number of control options must be evaluated and the State must decide whether to include them in the long-term strategy based on the statutory factors.

Given that Jarbidge is meeting the rate of progress in guidance from EPA, and that the assessment in Section 7.9.3.2 indicates that reductions in Nevada address its share of visibility impairment from key anthropogenic pollutants in most Class I areas, an examination focused on costs of some additional controls may be sufficient to complete the assessment four factor analysis. A comparison of costs of additional strategies on a dollar-per-ton basis with baseline emissions reduction programs would suffice if costs are extremely high for the amount of visibility improvement likely to occur.

Table 7-6 (page 7-18) summarizes Nevada's contribution to improvement in Class I areas outside of the State. We note that reductions in emissions from baseline to 2018 are given in State-wide totals. It would be more appropriate to assess regions of the State that are most contributing to the Class I area listed in the table. The column related to the weighted emission potential (WEP) reduction may address this issue but needs further elaboration in the text. Some of the WEP entries are negative implying that Nevada's contribution to those areas is moving in the wrong direction.

Given the uncertainties of future projections, especially the type and placement of future energy sources, we request the long-term strategy contain a statement that new source review and prevention of significant deterioration programs are key components of a regional haze plan designed to improve current visibility on the most impaired days and to protect visibility conditions at Class I areas.

Fire

Section 7.7 reviews the existing smoke management program which includes provisions that recognize Class I areas as sensitive receptors. We applaud the smoke management program's requirement for smoke minimization methods for larger prescribed fires near Class I areas, which parallels the WRAP Fire Emissions Forum recommendations for regional haze plans.

Regional Consistency

Unlike some areas of the country, the WRAP has not developed a regionally consistent policy approach to regional haze strategies outside of a sulfur dioxide reduction strategy implemented to address the Colorado Plateau Class I areas. The complexity of visibility impairment across the western U.S. does not lend itself to a simple control strategy. However the approach for assessing current conditions and examining future conditions has been coordinated by the WRAP and we concur with NDEP in its use of the WRAP Technical Support System (TSS) and the assessments supporting that database.

Verification and Contingencies

The draft SIP provides verification measures of Regional Haze planning through the commitment of continuing established monitoring programs. Section 8.3 notes that monitoring is currently implemented under the visibility Federal Implementation Plan (FIP) for the original visibility protection rules for "reasonably attributable" impairment implement by EPA in the 1980's. We encourage NDEP to develop comprehensive rules to replace the FIP and which could still link to the cooperative State-federal IMPROVE program to accomplish cost-effective long-term monitoring. In Section 8.6 (page 8-5), we would like to see a state commitment to work with Federal agencies as a team if economic challenges are faced by the IMPROVE monitoring program.

As already noted under the long-term strategy comments, there is uncertainty regarding future emissions projections from both existing and new sources, so the future review requirements are a crucial part of the long-term strategy and should recognize that modifications to the control strategies may be necessary. We view Sections 9.3, 9.4 and 9.5 (pages 9-5 to 9-6) as the state's commitment to tracking and correcting the long-term strategy as necessary.

Coordination and Consultation

We have worked with NDEP through the WRAP, as well as through direct communications, regarding the technical and policy development of the SIP and will continue both means of communication as the plan is implemented. We appreciate NDEP including Section 9.2.1 as an explicit coordination of SIP revisions.

BART

The core purpose of the BART program is to improve visibility in our Class I areas. BART is not necessarily the most cost-effective solution but instead, BART represents a broad consideration of technical, economic, energy, and environmental (including visibility improvement) factors. We believe that it is essential to consider both the degree of visibility improvement in a given Class I area as well as the cumulative effects of improving visibility across all of the Class I areas affected.

In general NDEP did a good job in assessing the control technology aspects of the sources subject to BART and subsequent BART determinations, and we applaud NDEP's decisions to go beyond company proposals. However, we do want to share two concerns.

In addition to performing an analysis of the cost for removing each ton of pollutant for the control strategies selected as feasible and for further evaluation, NDEP also evaluated those strategies on the basis of incremental cost. While that is certainly a valid and useful parameter, it must be used with caution and its results placed into the proper perspective. The basic premise underlying the incremental cost analysis is to identify those strategies that contribute relatively little environmental benefit in proportion to their cost. Because, in most cases, the cost of pollution control rises exponentially with control efficiency, the slope of the cost curve will also increase. For this reason, rigid use of incremental cost effectiveness will always result in the choice of the cheapest option if carried to its ultimate extent. (For example, if this approach were used to evaluate PM controls, it is likely that all controls more expensive than a multiple cyclone would be rejected.) According to the NSR Workshop manual, "As a precaution, the difference in incremental costs among dominant alternatives cannot be used by itself to argue one dominant alternative is preferred to another." Instead, it should be used to compare closely performing options.[1]

Our second overarching concern is that NDEP does not appear to have given much weight to the visibility benefits that could be realized from the control strategies evaluated. At least, it is not clear how NDEP applied this factor in developing its BART conclusions. As we shall discuss later, there appears to be great inconsistency among the

[1] 40 CFR Part 51 Appendix Y, "Guidelines for BART Determinations Under the Regional Haze Rule" Part IV(D)(4)(e): "You should consider the incremental cost effectiveness in combination with the average cost effectiveness when considering whether to eliminate a control option." And (IV)(D)(4)(g): "You should exercise caution not to misuse these [average and incremental cost effectiveness] techniques…[but consider them in situations where an option shows]…slightly greater emission reductions…"

costs and visibility benefits that would result from the various control strategies chosen by NDEP as representing BART.

We are focusing our comments on the BART determination for the Reid Gardner (RG) facility operated by NV Energy (NVE) since it has larger emissions than the other BART sources. We have conducted a preliminary review of the other BART sources and also have some initial questions and comments.

Comments on Reid Gardner BART Determination

Sulfur Dioxide (SO_2)

We are pleased that the proposed SO_2 limit has been reduced from 0.40 pounds per million Btu of heat input (lb/mmBtu) to 0.25 lb/mmBtu on a 24-hour average basis. However, in view of the extremely low (0.05 lb/mmBtu) actual annual SO_2 emissions presented in the US EPA Clean Air Markets (CAM) database, we note that the limit could better reflect the lower actual emissions.

We suggest a full review of the CAM data to determine the actual performance of the existing scrubbers and the variability in their emissions. Normally, maximum 24-hour average emissions are approximately 50 percent higher than the average emission rate calculated using annual emissions data. If that ratio holds true for the units at RG, the facility may be able to meet a 24-hour average emissions limit of 0.10 lb/mmBtu or lower.

It is our understanding that the proposed 24-hour limit would become the most stringent SO_2 limit applicable to this facility. As a consequence, there appears to be no other constraint on RG that would prevent it from operating continuously at that emission limit, and this could result in substantially higher annual emissions. However, a limit that reflects good utilization of the existing scrubbers would not require scrubber upgrades or incur additional costs, but would also prevent emissions from increasing. In addition to a more-stringent 24-hour limit, we also suggest that an annual limit (e.g., 0.06 lb/mmBtu) be included that reflects the normal clean operation of this facility

Particulate Matter (PM_{10})

While we agree that a fabric filter represents BART for filterable PM_{10}, no justification is presented for the proposed limit of 0.015 lb/mmBtu. We have seen stack results and permit limits at 0.010 lb/mmBtu and lower,[2] and believe that RG can achieve a lower limit on filterable PM_{10} than proposed by NDEP.

[2] We have seen actual stack test data from the East Kentucky Power-Spurlock Unit #3 which indicates that a much lower limit can be achieved. As a result, the East Kentucky Power-JK Smith Unit #1 & #2 project has proposed a limit on filterable PM_{10} of 0.009 lb/mmBtu and a total PM_{10} limit of 0.012 lb/mmBtu. Also, on June 30, 2008, the Virginia Department of Environmental Quality issued a permit to Dominion Power for its Southwest Virginia Hybrid Energy Center that limits filterable particulate emissions to 0.010 lb/mmBtu and total PM_{10} to 0.012 lb/mmBtu.

We also request an analysis of controls for condensable PM_{10} which can represent a substantial component of total PM_{10} emissions, and can thus affect visibility.

Nitrogen Oxides (NO_X)

We are pleased that, by proposing addition of Rotating Over-Fire Air (ROFA) with Rotamix, NDEP is moving beyond the combustion controls proposed by NVE. However, NDEP is proposing a higher NO_X limit for RG Unit #3 than for units #1 and #2, even though the CAM data show that RG Unit #3 has the lowest current emission rate among the units at the plant. We request a justification of why higher NO_X emissions, and therefore lower control efficiencies, are proposed for Unit #3.

In reviewing the effectiveness of combustion controls as a precursor to application of SCR, NVE and NDEP have assumed that combustion controls can achieve NO_x reductions in a range of 6 to 24 percent. Our data (provided in Appendix A) on BART sources and/or states proposing combustion controls indicates that typical NO_X reduction efficiencies range between 15 and 63 percent. We request that NDEP review the effectiveness assumptions in its BART determination and provide support for variations from engineering norms.

NDEP has assumed that control of NO_X through a combination of combustion controls and Selective Catalytic Reduction (SCR) technologies could reduce NO_X emissions to 0.085 lb/mmBtu, resulting in a 77 percent reduction of potential emissions. Our review (provided in Appendix B) of eastern coal-fired Electric Generating Units (EGUs) retrofitted with SCR indicates that those EGUs can achieve 0.06 lb/mmBtu on a 30-day rolling average basis while they are in operation. We note that Nevada Energy assumed that these controls could achieve an emission rate of 0.07 lb/mmBtu for its cost and air quality modeling analyses. We request that NDEP review its assumption regarding achievable emissions limits for a combination of combustion controls and SCR and provide support for any annual rate higher than 0.06 lb/mmBtu.

The capital costs noted for the combination of combustion control and SCR are $278 per kilowatt (kW) of energy output. Those costs are higher than any real-world costs found in available literature. (Please see the "PSNM Survey" page of Appendix C.) We did not find any facility-specific information in the SIP record that supports these costs, nor was there any indication that RG would experience any exceptional BART retrofit costs. As a result, the cost-effectiveness values noted in the NDEP BART analysis ranged from $2,386 to $2,600 per ton of NO_X removed. Nevertheless, those values are substantially lower than the $3,778 per ton estimated by the North Dakota Department of Health for its proposed BART controls for NO_X emissions from Great River Energy's Stanton facility that impacts only two Class I areas.

Using data found in the SIP documentation and the US EPA Control Cost Manual approach (recommended by the BART Guidelines), we estimate costs (in Appendix D) to achieve an emission rate of 0.06 lb/mmBtu, representing 83 to 86 percent control efficiency on an annual-average basis, would result in costs of $135 to $163 per kW and

a range of $1,568 to $1,752 per ton of NO_X removed. Our cost/kW is well within the range of real-world values cited above, and our cost per ton is similar to that accepted by NDEP for its proposed BART strategy, but with greater benefits to visibility.[3] Based on our calculations, we believe that NDEP's costs are overestimated and request that documentation of facility-specific conditions affecting costs be provided.

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 RG 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_X controls (ROFA+SCR or combustion controls+SCR) at RG result in about 0.7 deciview (dv) improvements at Grand Canyon National Park. As presented in NVE's BART analysis, that equates to approximately $7 million per 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 RG 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 US (provided in Appendix E)[4] are leading us to the conclusion that a cost per dv of $10 – $20 million represents a reasonable average cost-effectiveness for improving visibility at the most-impacted Class I area. (NDEP has determined that Low-NO_x Burners plus Flue Gas recirculation represent BART for Tracy Unit #3. NVE estimated, in its BART submittal, that this option would result in a cost-effectiveness value of $10 million per dv.) The NVE analysis suggests that, at $7 million per dv, RG could install the ROFA/combustion control plus SCR scenario at a much more favorable cost-per-dv effectiveness ratio than the typical state or EGU proposing BART. Furthermore, our estimates (on the Appendix D "Gardner (NPS)" page) of more visibility improvement from increased efficiency of the equipment and lower costs equate to a $3 million cost per dv of improvement at Grand Canyon National Park alone.

There are five Class I areas within 300 kilometers of RG. NVE presented baseline air quality modeling results showing that the facility causes or contributes to visibility impairment at three Class I areas,[5] but only calculated improvement based on impacts at Grand Canyon National Park. Neither NVE nor NDEP discussed visibility improvement in the context of the benefits to all of the impacted Class I areas.

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[3] Our cost estimates for SCR at RG are also lower than the BART strategies proposed by North Dakota for EGUs at the Leland Olds, Stanton, and MR Young facilities (provided in Appendix E to our comments).

[4] Appendix E to our comments contains proposals to reduce NOx, SO_2, and PM_{10}, either individually, or in combination. While it may be relevant to cite cost/ton of pollutant in terms of the specific pollutant removed, it is not necessary to categorize the cost per dv of improvement because that parameter is not pollutant-specific. A dv of improvement due to reducing NO_x is no different from a dv of improvement due to reducing SO_2 or PM_{10}.

[5] RG 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.

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 RG 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, the Oregon Department of Environmental Quality (ODEQ) has recently posted on its website[6] a proposal to require under the BART program that the Boardman power plant install a dry scrubber and SCR. As part of its BART determination, ODEQ evaluated the benefits of various control strategies on all 14 of the Class I areas within 300 km of the plant. The following is an excerpt from comments we sent to ODEQ in January 2009:

> The BART Guidelines represent an attempt to create a workable approach to estimating visibility impairment. As such, they require several assumptions, simplifications, and shortcuts about when visibility is impaired in a Class I area, and how much impairment is occurring. The Guidelines do not attempt to address the geographic extent of the impairment, but assume that all Class I areas are created equal, and that there is no difference between widespread impacts in a Class I area and isolated impacts in a Class I area. To address the problem of geographic extent, we have been looking at the cumulative impacts of a source on all Class I areas affected, as well as the cumulative benefits from reducing emissions. While there are certainly more sophisticated approaches to this problem, we believe that this is the most practical, especially when considering the modeling techniques and information available. In this case, we applied this cumulative approach to the Boardman analysis and found that the cumulative impact from the baseline condition on visibility in the 14 Class I areas is 29.7 dv, with a total of 2,367 "days" of impaired visibility across the 14 Class I areas.

We note that ODEQ used a similar approach in its analyses.

NDEP has effectively ignored the other Class I areas where RG 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 RG. We request that NVE present data showing the improvement that would result from application of the ROFA/combustion control plus SCR scenarios. We would be pleased to work with NDEP to further develop this approach.

<u>Comments on BART Determinations for Fort Churchill, Mohave, and Tracy EGUs</u>

In general, we are pleased that NDEP has chosen BART controls that are more stringent than those proposed by the sources. (Those BART determinations for NO_X are summarized in Appendix F.) However, as we evaluated those NDEP determinations, we observed that there were some apparent discrepancies between the levels of control that the sources said were achievable by a given control strategy and the level of control assumed by NDEP in its determination. For example, the table below presents the NOx

[6] http://www.deq.state.or.us/aq/haze/pge.htm

limits used by the sources as they evaluated the control technologies and fuels determined by NDEP to represent BART.

Comparisons between Source and NDEP NOx Limits

Source	Unit	BART Control Technology	Source Estimate	NDEP Limit
Ft. Churchill	Unit #1	LNB+FGR	0.14	0.20
Ft. Churchill	Unit #2	LNB+FGR	0.14	0.16
Reid Gardner	Unit #1	ROFA + Rotamix	0.16	0.20
Reid Gardner	Unit #2	ROFA + Rotamix	0.16	0.20
Reid Gardner	Unit #3	ROFA + Rotamix	0.20	0.28
Mohave	Unit #1	LNB+OFA	0.10	0.15
Mohave	Unit #2	LNB+OFA	0.10	0.15
Tracy	Unit #1	LNB+FGR	0.16	0.15
Tracy	Unit #2	LNB+FGR	0.16	0.12
Tracy	Unit #3	LNB+FGR	0.13	0.19

We suggest that NDEP include explanations as to how it arrived at its BART limits and why they differed from the emission rates used by the sources in evaluating those control strategies. (There also appear to be some discrepancies among the Tracy Unit #3 emission rates, control efficiencies, and visibility improvements presented by the source and discussed and adopted by NDEP.)

As we suggested above, we believe that greater emphasis should be placed upon the degree of visibility improvement that could be achieved in this program designed for that specific purpose. It follows that, if it is cost-effective to spend $10 million per dv to apply Low-NO_x Burners plus Flue Gas recirculation at Tracy Unit #3, then application of that same criterion to the other proposals would result in determinations that lower emission rates could be achieved. We also suggest that, if NDEP were to consider the cumulative benefits that cold be achieved at this $10 million/dv benchmark, the degree of emission reductions would be still greater.