United States Department of the Interior

NATIONAL PARK SERVICE
Air Resources Division
P.O. Box 25287
Denver, CO 80225-0287

TRANSMITTED VIA ELECTRONIC MAIL - NO HARDCOPY TO FOLLOW

N3615 (2350)

March 27, 2014

Thomas Webb
U. S. EPA, Region 9
Air Division (AIR-2)
75 Hawthorne Street
San Francisco, California 94105

EPA Docket ID: EPA-R09-OAR-2013-0588

Dear Mr. Webb:

The National Park Service (NPS) has reviewed the Environmental Protection Agency (EPA)'s proposed "Promulgation of Air Quality Implementation Plans; Arizona; Regional Haze and Interstate Visibility Transport Federal Implementation Plan" published in the Federal Register on February 18, 2014. We commend EPA Region 9's efforts over three Federal Implementation Plans to reduce visibility impacts from electric utilities and industrial sources in Arizona to Class I national parks and wilderness areas. Facilities reviewed in this proposal impact Bandelier, Capital Reef, Grand Canyon, Mesa Verde, Petrified Forest, Saguaro and Zion National Parks and Chiricahua National Monument.

We agree with EPA's proposals for Best Available Retrofit Technology (BART) for sulfur dioxide (SO_2) for the Hayden Smelter and the Miami Smelter and for SO_2 and nitrogen oxides (NO_x) for Chemical Lime Nelson Plant Kilns 1 and 2. For Sundt Generating Station Unit 4, we agree with the BART Alternative to permit the boiler for natural gas only. However, for reasons detailed in the enclosed comments, we believe that NO_x BART should be Selective Catalytic Reduction and that, for consistency with previous decisions, EPA should to demonstrate through modeling that the Alternative is better than BART.

We commend EPA for evaluating additional control measures that are reasonable in this first planning period. We agree with EPA's proposals that Phoenix Cement and CalPortland Cement install Selective Non-Catalytic Reductions for NO_x controls for reasonable progress. However, we disagree that an annual emissions cap would be equivalent to installation of controls because an annual production limit would not prevent short-term visibility impacts. We disagree with EPA's conclusion that it is not reasonable to require controls for Cholla Unit 1 and Springerville

Units 1 and 2 in this planning period. We ask that EPA reconsider this proposed decision in light of the concerns detailed in the enclosure.

The Regional Haze Program is a critically important program for reducing visibility impacts to our Class I areas in keeping with the direction of the Clean Air Act. We know that you too recognize the importance of this program. We appreciate that opportunity to work closely with EPA Region 9 and Arizona Department of Environmental Quality to improve visibility in our national parks. If you have questions, please call Don Shepherd at (303) 969-2075.

Sincerely,

Patricia Seven for

Susan Johnson
Chief, Policy, Planning, and Permit Review Branch

Enclosure

cc: Eric Massey, Director
Division of Air Quality
Department of Environmental Quality
1110 West Washington Street
Phoenix, Arizona 85007

National Park Service Comments on EPA Proposed Federal Implementation Plan for Arizona
March 26, 2014

General Comments

Selective Catalytic Reduction (SCR) for Electric Generating Units (EGUs)
We agree with EPA's use of a design emission rate of 0.050 lb/mmBtu (annual average) for control effectiveness of SCR.

SCR Catalyst Cost is unsupported
EPA has overestimated SCR catalyst cost at $8,000/m^3. Instead, "Catalyst unit price has remained low in the last 4-5 years, with new catalyst requiring a cost of approximately $5,000/cubic meter."[1] Furthermore, EPA's catalyst cost estimate does not consider the use of cheaper, regenerated catalyst. We used the $5,500/m^3 value used by EPA R8 for its recent Wyoming FIP.[2]

Urea costs are inconsistent and unsupported
For Cholla Unit 1, Sundt Units 1 – 3, and Springerville Units 1 & 2, EPA assumed that Selective Non-catalytic Reduction (SNCR) would use urea @ $500/ton (50% solution). For all other analyses [Sundt Unit 4 and SCR at all EGUs, EPA assumed that urea costs $400/ton (50% solution)]. We adjusted the cost of urea to $450/ton to be consistent with EPA R8 in its recent Wyoming FIP. (Current fundamentals and wholesale prices suggest a fair spot market retail cost around $525[/ton]…")[3]

SCR Cost estimates
For SCR, we used an approach similar to that used by EPA Region 8 for Colstrip in Montana[4] rather than relying on IPM alone as EPA Region 9 did. Use of IPM to estimate capital costs and the EPA Control Cost Manual (CCM) to estimate operating costs allows more flexibility (e.g., use of 29% aqueous solution of anhydrous ammonia @) 600/ton[1] instead of urea) than IPM, provides greater transparency than IPM, and is more "faithful" to the BART Guidelines which recommend use of the CCM to the greatest extent practicable.

Cumulative benefits

---

[1] Current Capital Cost and Cost-effectiveness of Power Plant Emissions Control Technologies, J. Edward Cichanowicz, Prepared for Utility Air Regulatory Group, July 2013
[2] Federal Register, Vol. 79, p 5032. 2014.
[3] "Retail fertilizer prices rise, but global market eases," Weekly Fertilizer Review, Published on: Mar 10, 2014
[4] Federal Register, Vol. 77, p 57864. 2012 "We relied on a number of resources to assess the cost of compliance for the control technologies under consideration. In accordance with the BART Guidelines (70 FR 39166), and in order to maintain and improve consistency, in all cases we sought to align our cost methodologies with the EPA CCM. However, to ensure that our methods also reflect the most recent cost levels seen in the marketplace, we also relied on a set of cost calculations developed for the Integrated Planning Model (IPM) version 4.10. These IPM cost calculations are based on databases of actual control project costs and account for project specifics such as coal type, boiler type, and reduction efficiency. The IPM cost calculations reflect the recent increase in costs in the five years preceding 2009 that is largely attributed to international competition. Finally, our costs were also informed by cost analyses submitted by the sources, including in some cases vendor data."

We commend EPA for including the cumulative visibility impacts and improvements that result from the control scenarios evaluated. The EGUs evaluated here are unusual because they impact from ten to 15 Class I areas within 300 km, and thus deserve analyses that recognize this cumulative sensitivity.

Reasonable cost-effectiveness

Although EPA has not explicitly stated its threshold for "reasonable cost-effectiveness," we understand that EPA typically uses $5,000/ton and 0.5 dv. However, EPA R9 and several states have used higher cost-effectiveness thresholds. For example, Oregon DEQ established a cost/ton threshold of $7,300/ton based upon the premise that improving visibility in multiple Class I areas warrants a higher cost/ton than where only one Class I area is affected. In their BART proposal for the San Juan Generating Station, New Mexico used a range from $5,946/ton to $7,398/ton, Colorado and New York used $5,500/ton, and Wisconsin used $7,000 - $10,000/ton as its BART threshold. In evaluating addition of SCR at the Four Corners Power Plant (FCPP), EPA R9 stated:

> EPA considers its revised cost-effectiveness estimates of $2,515 - $3,163/ton of NOx removed to be more accurate and representative of the actual cost of compliance. However, even if EPA had decided to accept APS's worst-case cost estimates of $4,887 – $6,170/ton of NOx removed, EPA considers that estimate to be cost effective for the purpose of proposing an 80% reduction in NOx, achievable by installing and operating SCR as BART at FCPP.

North Dakota Department of Health established a threshold of $7,300 for incremental cost effectiveness.

While we have commended EPA for its presentation of cumulative visibility impacts and cumulative visibility benefits of reducing emissions, we also ask that EPA work with us to develop a consistent and transparent method for evaluating this information. It is clear that EPA is trying to relate costs and visibility improvement, and this should be a primary consideration for this visibility program.

Data Warehouse

BART decisions are similar to Best Available Control Technology (BACT) where BACT determinations are made on a case-by-case basis but rely heavily upon preceding BACT determinations to establish norms for such factors as control efficiency and cost-effectiveness. We have compiled data on almost one hundred BART determinations for EGUs and believe that this data can likewise be used to develop norms for cost-effectiveness in terms of cost/deciview of visibility improvement. For example, our initial compilation (Appendix A attached) of state BART determinations for reducing NO_X from EGUs indicates that $14 million/dv represents an average value, and $34 million/dv a maximum for cost-effectiveness based upon the Class I area with the maximum visibility improvement.[5] We believe that $14 million/dv represents a good indication of the value states have placed upon reducing NO_X to improve visibility.[6] It then follows that, where multiple Class I areas are involved, this $14 million/dv should be "shared" by applying it to the cumulative cost/deciview benefit. In other words, if it is cost-effective to spend $14 million/yr to improve visibility by one dv in one Class I area, it would be just as cost-

[5] Because most states did not evaluate cumulative benefits, we must rely on the maximum improvements, for which we have a robust data set.

[6] The comparable value for SO_2 is $18 million/dv.

effective to spend $14 million/yr to improve visibility by half a deciview in two Class I areas, and so on.

Tucson Electric Power Sundt Generating Station Unit 4

The Sundt Generating Station is an electric utility power plant located in Tucson, Arizona, operated by Tucson Electric Power (TEP). The plant consists of four steam electric boilers and three stationary combustion turbines for a total net generating capacity of approximately 500 MW. Sundt Unit 4 is a steam electric boiler that was manufactured in 1964 and placed into operation around 1967. Unit 4 is a dry bottom, wall-fired boiler with a maximum gross capacity of 130 MW when firing coal. Originally designed to fire natural gas and fuel oil, Sundt Unit 4 was converted to also be able to fire coal in the early 1980s as a result of an order issued by the Department of Energy. The unit now fires both coal and natural gas. As part of the coal conversion, the unit was equipped with a fabric filter for particulate matter control. Unit 4 was upgraded in 1999 with low-NO_X burners (LNB) and overfire air (OFA) designed to meet Phase II Acid Rain Program requirements. At present, Unit 4 operates with no SO_2 control equipment. We agree with EPA that Sundt Unit 4 is eligible for and subject to BART.

Ten Class I areas are within 300 km of Sundt, with Saguaro NP the closest at 17 km. The highest baseline visibility impact of Sundt Unit 4 is 3.4 dv at Saguaro. According to EPA, the cumulative sum of visibility impacts over all the Class I areas is 6.6 dv.

We agree with EPA's conclusion that permitting Sundt Unit 4 for natural gas only is a better alternative than EPA's BART proposal for NO_X. However we have several concerns with EPA's costs analyses used to propose BART. EPA's estimates of the cost-effectiveness of Selective Catalytic Reduction (SCR) of $5,176/ton, and therefore its incremental cost-effectiveness over Selective Non Catalytic Reduction (SNCR) of $6,174/ton, are erroneously high. One possible reason for EPA's overestimation is use of the maximum allowable retrofit factor—1.5—proposed by TEP's consultant (Burns & McDonnell—B&M) in the capital cost component of the IPM model, combined with addition of a second retrofit cost of $1.5 million for the air preheater. As a result, EPA's has estimated a Total Capital Investment (TCI) of $347/kW, which exceeds the range of "real-world" costs EPA Region 8 cited[7] in its June 10, 2013 FIP proposal for Wyoming.

We question the basis for the two retrofit cost factors because supporting information was not provided. For example, EPA Region 8 visited the four-unit Colstrip power plant in Montana before concluding that a retrofit factor of "1" was appropriate. Once such a site visit is conducted, retrofit factors should be developed for each element of the cost analysis[8].

Another example of a proper evaluation of retrofit costs is provided by Sargent & Lundy's (S&L) "Constructability Review" (which EPA Region 9 has) for addition of SCR at Navajo Generating Station (NGS). NGS consists of three EGUs with the middle unit constrained by a

[7] Five industry studies conducted between 2002 and 2007 have reported the installed unit capital cost of SCRs, or the costs actually incurred by owners, to range from $79/kW to $316/kW (2010 dollars).
[8] Pages 59-62 of William M. Vatavuk's book, Estimating Costs of Air Pollution Control

coal conveyor passing through. Even so, S&L estimated that construction effort would be only 25% greater for Unit 2 than for the other two units.

Correcting for EPA's double-counting of retrofit costs by elimination of the $1.5 million air preheater retrofit cost results in about a $1.9 million reduction in TCI down to $332/kW. It is possible that a rigorous evaluation of the assumed maximum 1.5 retrofit factor would significantly reduce costs even further, but we used that value for this analysis.

Application of these corrections to EPA's analysis of SCR yields cost-effectiveness @ $4,814/ton, and its incremental cost-effectiveness over SNCR decreases to $5,494/ton. (Due to the higher urea cost, the cost-effectiveness of SNCR increased to $3,483/ton. Our analyses can be found in Appendix B.1.)

We estimate that addition of SCR would result in a capital cost of $49.4 million and an annual cost of $5.9 million, with cost-effectiveness of $4,979/ton. (Our analyses can be found in Appendix B.2.)

Considering that ten Class I areas are within 300 km of Sundt, it becomes clear that SCR is BART for Sundt #4 because:

- Average cost-effectiveness is less than $5,000/ton and less than the values established by several states and EPA.
- Incremental cost-effectiveness ($5,757/ton) is less than the average cost-effectiveness values established by several states and EPA. Incremental cost-effectiveness is also less than the corresponding $7,300/ton value established by North Dakota.
- Even at Saguaro National Park, the most-impacted Class I area, both the corrected EPA cost analysis and our analysis show that EPA's typical 0.5 dv threshold for visibility improvement is met (0.78 dv) at a cost less than EPA's typical $5,000/ton cost threshold.
- Both the cost/dv values for maximum ($7.6 million/dv) and cumulative ($3.7 million/dv) benefits are well below the $14 million/dv average we have seen accepted nationwide for NO_X.

Instead, EPA has first determined that BART for Sundt #4 is 0.36 lb/mmBtu on a 30-day boiler-operating-day (BOD) rolling average, versus the presumptive BART limit of 0.23 lb/mmBtu for this type of boiler and fuel, and then proposed a BART Alternative based upon this unsupported limit. While we can accept the proposed BART Alternative (0.25 lb/mmBtu on a 30-day BOD rolling average) based upon a complete switch to natural gas firing, we believe that EPA must correct its BART analysis to avoid setting harmful precedents. Finally, once EPA determines that BART is based upon SCR at 0.05 lb/mmBtu, it must show that a higher NO_X limit is justified by significantly lower emissions of SO_2 and particulate. To demonstrate that the Alternative is truly "better-than-BART," EPA must model the revised BART versus its BART Alternative. For example, in its proposed SIP revision for Apache Generating Station, Arizona modeled BART and the natural gas alternative to BART to demonstrate the alternative is better than BART.[9]

[9] Arizona State Implementation Plan Revision to the Arizona Regional Haze Plan for Arizona Electric Power Cooperative, Incorporated, Apache Generating Station, proposed February 2014.

Chemical Lime Nelson Plant Kilns 1 and 2

The lime manufacturing equipment consists of two lime rotary kilns (Kiln 1 and Kiln 2) and auxiliary equipment necessary for receiving crushed limestone, processing it through the lime kilns, and processing the lime kiln product.

Nine Class I areas are within 300 km of the Nelson Lime Plant, with the Grand Canyon the closest at 24 km. The highest baseline visibility impact from the Nelson Plant is 1.79 dv at Grand Canyon NP and the cumulative sum of visibility impacts over all the Class I areas is 3.34 dv.

SO_2 BART: The greatest improvement from Dry Sorbent Injection (DSI) is 0.2 dv, occurring at the Grand Canyon; the cumulative improvement is 0.6 dv. The maximum and cumulative improvements from switching to lower sulfur fuel are roughly half of these amounts. EPA concludes,

1. "…we consider DSI and lower sulfur fuel to both be cost-effective control options, with average cost-effectiveness values of approximately $800/ton and $4,000/ton, respectively."
2. "While visibility improvement by itself could support either DSI or lower sulfur fuel as BART, lower sulfur fuel is favored by its much lower average cost-effectiveness at $819–856/ton compared to over $4000 for DSI."
3. "We consider both DSI and use of lower sulfur fuel to be cost-effective, but note that the most stringent option, DSI, is considerably less cost-effective than the use of lower sulfur fuel, with an incremental cost-effectiveness, relative to lower sulfur fuel, of approximately $9,000/ton. As a result, although DSI is the most stringent control option, the visibility benefit it achieves is not large, and is achieved at a very high incremental cost relative to the next most stringent control option. Based on this information, we propose to find that BART for SO_2 is the use of a lower sulfur fuel blend."

We agree with EPA's conclusion, primarily because it is generally prudent to first reduce process emissions before adding emission controls, and we generally support moves to cleaner fuels. Once the fuel switch at the Nelson plant is implemented, it may be appropriate to revisit additional emission reduction measures.

NO_X BART: The maximum visibility improvement due to SNCR is 0.58 dv, and cumulative improvement is 0.85 dv. These improvements yield a visibility cost-effectiveness of $1.4 million/dv using the maximum, and $0.9 million/dv using the cumulative improvement. We agree with EPA's conclusion that "These visibility improvements support the choice of SNCR as BART for NO_X."

ASARCO Hayden Smelter

The ASARCO Hayden Smelter is a batch-process copper smelter in Gila County, Arizona. Four converter units are subject to BART. Twelve Class I areas are within 300 km of the Hayden Smelter, with Galiuro WA and Superstition WA the closest at 49 km. The highest baseline visibility impact is 1.7 dv at Superstition WA. Baseline visibility impacts at each of the twelve areas exceed 0.5 dv, and the cumulative visibility impacts over all the Class I areas is 12.1 dv.

SO_2 BART: In the current method of operation, thousands of tons of SO_2 from the converter units are vented to the atmosphere with no pollution control. EPA estimates the annual cost of constructing and operating a second double-contact acid plant to control SO_2 emissions at 98.8 percent efficiency is about $872 per ton of SO_2 removed. This would control about 20,341 tpy of SO_2 emissions; the resulting visibility improvement would be1.5 dv at Superstition, and nearly the same at Galiuro. Eleven of the Class I areas improve by at least 0.5 dv, and the cumulative improvement is 10.3 dv. We agree with EPA that "The large visibility improvement at many Class I Areas supports the choice of a new acid plant as BART for SO_2."

Freeport-McMoRan Miami Smelter

The Miami Smelter is a batch-process copper smelter in Gila County, Arizona. Four converter units are subject to BART. Twelve Class I areas are within 300 km of the Miami Smelter with the Gila WA nearest at 55 km. The baseline visibility impacts are 0.70 dv or less at all Class I areas except at Superstition WA where the visibility impact is 3.6 dv. The cumulative sum of visibility impacts at all areas within 300 km is 8.2 dv.

SO_2 BART: EPA proposes to require construction of a secondary capture system for the converters, consistent with the requirements of MACT QQQ, and an SO_2 control efficiency of 99.7 percent, 30-day rolling average, on all SO_2 captured by the primary and secondary capture systems.

EPA estimated cost-effectiveness using a capital cost of $47,850,000 and estimated the cost-effectiveness of installing and operating a secondary capture system would be $990 to $2,474 per ton of SO_2 removed. (This range reflects the uncertainty in the quantity of SO_2 emissions that are currently not captured.) The resulting maximum visibility improvement ranges from a low of 0.41 dv to a high of 1.06 dv at Superstition WA. The cumulative improvement ranges from 1.7 to 4.3 dv. EPA proposes that BART for SO_2 from the converters is construction of a secondary capture system (i.e., construction of hooding and ventilation systems to capture escaped SO_2 emissions) and ducting the emissions to existing controls. Specifically, EPA is proposing the following as BART for SO_2 from the converters:

- Construction of a secondary capture system consistent with the requirements of MACT QQQ as a work practice standard.
- An SO_2 control efficiency of 99.7 percent, 30-day rolling average, on all SO_2 captured by the primary and secondary capture systems.
- Compliance with the SO_2 BART limit may be verified either through the use of SO_2 CEMS before and after controls or by using post-control CEMS and acid production rates. A limit of
- 4.06 lbs SO_2 emissions per tons of sulfuric acid production is equivalent to 99.7 percent control.

We agree with EPA's proposal.

Proposed Reasonable Progress Determinations

EPA conducted an extensive reasonable progress analysis of NO_X point sources that resulted in proposed determinations for nine sources and proposed controls on two sources (Kiln 4 of the

Phoenix Cement Clarkdale Plant and Kiln 4 of the CalPortland Cement Rillito Plant) consistent with SNCR as a control technology. EPA is also taking comment on the possibility of requiring a rolling 12-month cap on NO_X emissions in lieu of a lb/ton emission limit. For Phoenix Cement, this cap would be 947 tpy and apply to Kiln 4. For CalPortland, this cap would be 2,082 tpy and apply to Kilns 1–4.

Phoenix Cement Clarkdale Plant Kiln 4

This facility consists of one precalciner kiln, which currently uses LNB for NO_X control. There are twelve Class I areas within 300 km of the Clarkdale Plant, with Sycamore Canyon WA the closest at 10 km, where the baseline visibility impact is 5.2 dv. The cumulative sum of visibility impacts over all the Class I areas is 7.5 dv. EPA estimated a total annual cost for SNCR of approximately $940,000 per year. SNCR is estimated to reduce emissions at the kiln by 810 tpy at a cost of $1,142/ton, based on baseline emissions of 1,620 tpy and a 50 percent SNCR control efficiency. The maximum visibility improvement due to SNCR is 1.9 dv at Sycamore Canyon WA, and the cumulative improvement is 3.0 dv. We agree with EPA's proposal that NOx BART is SNCR.

CalPortland Cement (CPCC) Rillito Plant Kilns 1–4

The facility consists of three long dry kilns (Kilns 1–3) and one precalciner kiln (Kiln 4). There are twelve Class I areas within 300 km of the Rillito Plant, with Saguaro National Park the closest at 8 km, where the baseline visibility impact is 1.3 dv. The cumulative sum of visibility impacts over all the Class I areas is 3.9 dv. Due to the significant differences between long dry kilns and precalciner kilns, EPA separately analyzed Kilns 1–3 and Kiln 4.

Rillito Plant Kilns 1–3 have not operated since 2008 due to economic conditions. However, CPCC retains the ability to start using these kilns again at any time. Therefore, EPA conducted an analysis of the kilns using pre-2008 emission levels. EPA estimated that installation of SNCR with Mixing Air Technology on Kilns 1–3 would reduce emissions at each kiln by 182 tpy at a cost of $5,603/ton reduced, based on an annualized cost of approximately $1 million per year and 30-percent control efficiency for SNCR. The maximum visibility improvement due to SNCR on Kilns 1–3 is 0.22 dv at the eastern unit of Saguaro NP, and the cumulative visibility improvement is 0.7 dv.

We disagree with EPA's assumption that these long, dry-process kilns cannot reduce emissions by more than 30% by applying Mixing Air Technology and SNCR. For example, Lafarge North America Cement is adding SNCR to the five long, dry-process kilns at its Alpena, MI plant to reduce NO_X by 35% - 40%. (PA DEP estimated that SNCR could reduce NO_X emissions by 35% from the long, dry-process kilns at the CEMEX/Wampum and Keystone plants.) Even if SNCR would reduce NO_X by only 35% from these kilns, that could reduce cost-effectiveness to less than EPA's $5,000/ton threshold, reduce total emissions from these kilns by 90 ton/year, and increase the visibility improvement.

EPA has cited the lack of emissions from Kilns 1–3 over the last five years and the relatively high cost of controls ($5,603/ton) to propose that requiring controls for these units is not

reasonable at this time. While we disagree with EPA's technical analysis, we agree that controls are not justified for kilns that may not operate again. However, we believe that these kilns should be reevaluated before restarting.

Rillito Plant Kiln 4
EPA estimated a total annual cost for SNCR of approximately $1.1 million per year. SNCR is estimated to reduce emissions by 1,041 tpy at a cost of $1,047/ton reduced, based on baseline emissions of 2,082 tons per year and a 50 percent SNCR control efficiency. We believe that EPA's estimate of 50% NO_X control efficiency is supported by estimates of 50% (St. Mary's Cement, Charlevoix, MI) to 60% (Lehigh Cement Company/Evansville, PA) NO_X reduction by SNCR on similar kilns. The maximum visibility improvement due to SNCR on Kiln 4 is 0.24 dv at the eastern unit of Saguaro NP and the cumulative visibility improvement is 0.8 dv. The cumulative visibility improvement from SNCR on all four kilns would be about 1.5 dv. We agree with EPA's proposal that NOx BART is SNCR.

Cement plant emission caps

EPA is soliciting comments on an annual NO_X emission cap for Phoenix Cement Kiln 4 and Cal Portland Cement that would allow the facilities to comply either by installing controls (equivalent to SNCR) or by limiting production. We disagree with an annual cap because limiting production is unacceptable unless the limit is on daily emissions rather than annual emissions. Visibility is a short-term air quality related value and must be regulated as such. Relying upon an annual average emission limit does not provide any relief from the short-term impacts that could impair visitor experience. While EPA's proposal might be appropriate in addressing annual impacts (e.g., acid deposition), it is inappropriate and inconsistent with the purpose of the regional haze program. Instead, because EPA has determined that it is appropriate for these cement plants to reduce their visibility impacts, EPA should not, at the same time, provide an alternative that does not limit short term emissions. Many cement plants (e.g., Ash Grove and Holcim in MT, LaFarge in MI and WA, St. Mary's in MI, CEMEX and Holcim in CO) farther from Class I areas are installing SNCR under the regional haze rule and EPA should not exempt these two plants from similar requirements.

APS Cholla Unit 1

The Cholla Generating Station is an electric utility power plant located 39 km west of Petrified Forest National Park (NP) and operated by Arizona Public Service (APS). The plant consists of four steam electric boilers with a total generating capacity of 995 MW. Cholla Unit 1 is a tangentially-fired boiler with a maximum capacity of 114 MW and currently employs LNB with separated overfire air (SOFA) for NO_X control. EPA determined BART for Units 2- 4 to be SCR.

13 Class I areas are within 300 km of Cholla. The highest baseline visibility impact of Cholla Unit 1 is 3.4 dv at Petrified Forest NP. According to EPA, the cumulative sum of visibility impacts over all the Class I areas is 11.4 dv.

EPA's estimates of SCR cost-effectiveness @ $5,313/ton, and therefore its incremental cost-effectiveness over SNCR of $6,307/ton, are erroneously high. Application of the corrections discussed above in our General Comments to EPA's analysis of SCR yields cost-effectiveness @

$5,263/ton, and its incremental cost-effectiveness over SNCR increases to $6,390/ton. (Due the lower urea cost, the cost-effectiveness of SNCR decreased to $3,487/ton. Our analyses can be found in Appendix C.)

We estimate that addition of SCR would result in a capital cost of $30.2 million and an annual cost of $3.8 million with cost-effectiveness of $4,353/ton. (Our analyses can be found in Appendix D.)

Considering the 13 Class I areas are within 300 km of Cholla, it becomes clear that SCR is BART for Cholla Unit 1 because:

- Average cost-effectiveness ($4,353/ton) is less than the values established by several states and EPA.
- Incremental cost-effectiveness ($6,390/ton) is less than the average cost-effectiveness values established by several states and EPA. Incremental cost-effectiveness is also less than the corresponding ($7,300/ton) value established by North Dakota.
- The $5.5 million/dv value for cumulative benefits (0.7 dv) is well below the $14 million/dv average for NO_X controls we have seen accepted nationwide.

Instead, "EPA proposes to determine that it is not reasonable to require additional controls on this facility at this time. The costs for both SNCR and SCR are relatively high in light of the relatively small anticipated visibility benefits of the controls. However, this decision should be revisited in future planning periods." In effect, EPA is proposing to allow this EGU to emit NO_X at more than half-again the presumptive BART limit (0.15 lb/mmBtu) and continue to contribute to visibility impairment at ten Class I areas on the premise that Arizona DEQ will revisit this issue sometime in the future.

We disagree that the "costs for both SNCR and SCR are relatively high in light of the relatively small anticipated visibility benefits of the controls." Compared to determinations by EPA and other states for other EGUs, the cost-effectiveness for both SNCR and SCR are reasonable. When one considers the cumulative benefits across 13 Class I areas, none of which is has been shown to meet its Uniform Rate of Progress goal, it is incumbent upon EPA to take all reasonable measures to meet that goal.

Tucson Electric Power Springerville Plant

The Springerville Plant is an electric utility power plant located 79 km southeast of Petrified Forest National Park (NP) and operated by Tucson Electric Power (TEP). Springerville Units 1 & 2 are tangentially-fired boilers, each with a maximum capacity of 425 MW and currently employ LNB with close-coupled overfire Air (CCOFA) for NO_X control.

15 Class I areas are within 300 km of the Springerville Plant. The highest baseline visibility impact of Springerville Units 1 & 2 combined is 4.39 dv at Gila Wilderness Area. (Petrified Forest NP has the second-highest at 3.63 dv.). According to EPA, the cumulative sum of visibility impacts over all the Class I areas is 20.8 dv.

EPA's estimates of SCR cost-effectiveness @ $6,829/ton for Unit #1 and $6,085/ton for Unit #2 are erroneously high, and therefore the incremental cost-effectiveness over SNCR of $8,606/ton

and $7,416/ton, respectively, are also high. Application of the corrections discussed in our General Comments to EPA's analysis of SCR yields cost-effectiveness for Unit 1 @ $6,683/ton, and its incremental cost-effectiveness over SNCR decreases to $8,541/ton. (Due the lower urea cost, the cost-effectiveness of SNCR decreased to $4,059/ton.) For Unit 2, application of these corrections to EPA's analysis of SCR yields cost-effectiveness @ $5,963/ton, and its incremental cost-effectiveness over SNCR decreases to $7,389/ton. (Due the lower urea cost, the cost-effectiveness of SNCR decreased to $3,885/ton.) Our analyses can be found in Appendix C.)

For Unit 1, we estimate that addition of SCR would result in a capital cost of $85.9 million and an annual cost of $10.6 million with cost-effectiveness of $6,377/ton. For Unit 2, we estimate that addition of SCR would result in a capital cost of $86.2 million and an annual cost of $10.7 million with cost-effectiveness of $5,688/ton. (Our analyses can be found in Appendix E.)

Considering the 15 Class I areas are within 300 km of Springerville, it becomes clear that SCR is BART for Springerville Units 1 & 2because:

- Average cost-effectiveness ($5,700 - $6,400/ton) is less than the values established by several states and EPA.
- Incremental cost-effectiveness is less than the average cost-effectiveness values established by several states and EPA. Incremental cost-effectiveness is also less than the corresponding value established by North Dakota.
- The $12.5 million/dv value for cumulative benefits (1.7 dv) is well below the $14 million/dv average for NO_X controls we have seen accepted nationwide.

Instead, "EPA proposes to determine that it is not reasonable to require additional controls at Springerville Units 1 and 2 at this time. While the cost per ton for SNCR may be reasonable, the projected visibility benefits are relatively small (0.18 dv at the most affected area). The projected visibility benefits of SCR are larger (0.41 dv at the most affected area), but we do not consider them sufficient to warrant the relatively high cost of controls for purposes of RP in this planning period. However, these units should be considered for additional NO_X controls in future planning periods."

We disagree that the "costs for both SNCR and SCR are relatively high in light of the relatively small anticipated visibility benefits of the controls." Compared to determinations by EPA and other states for other EGUs, the cost-effectiveness for both SNCR and SCR are reasonable. When one considers the cumulative benefits across 13 Class I areas, none of which is has been shown to meet its Uniform Rate of Progress goal, it is incumbent upon EPA to take all reasonable measures to meet that goal.

Meeting the Uniform Rate of Progress (URP)

EPA considers it unlikely that all of Arizona's Class I areas will meet the URP during this planning period, even with the additional controls required in EPA's Regional Haze FIPs. Therefore, EPA must demonstrate that it is not reasonable to provide for rates of progress consistent with the URP for this planning period, based upon the four RP factors. Given that this demonstration must be based on the same four factors as the initial RP analysis, EPA proposes to find that the extensive reasonable progress analysis underlying its actions on the Arizona SIP,

and the reasonable progress analysis found in this proposal are sufficient to make this demonstration.

We agree with EPA that it is unlikely that all of Arizona's Class I areas will meet the URP during this planning period. However, a contributing factor is that neither the State nor EPA has adequately addressed emissions from the RP sources. Although EPA has repeatedly stated that certain control measures are reasonably cost-effective, EPA goes on to reject those control options due to insufficient visibility improvement. Instead, EPA points to its proposals to require additional NO_X controls on two cement kilns (which it also suggests may not need to add controls at all) as satisfying its obligations. A fundamental principle of the Regional Haze Rule is the recognition that visibility impairment is the result of a multitude of sources contributing to an aggregate problem. This problem cannot be solved by dis-aggregating its components such that each is deemed to not be a contributor. The EGU sources reviewed for reasonable progress (Cholla Unit 1 and Springerville Units 1 & 2) account for over 32 deciviews of impairment at Class I areas in the region, and controls which we have shown to be cost-effective could reduce emissions by over 4,400 tpy and reduce visibility impacts by 2.6 dv at a cost of $25 million/year. By failing to propose these strategies now, EPA is not fulfilling its obligation to show that it has taken all reasonable measures to make reasonable progress at this time.