



Source Specific Federal Implementation Plan  
for Implementing Best Available Retrofit  
Technology for Four Corners Power Plant:  
Navajo Nation

Response to Comments for Proposal and  
Supplemental Proposal

U. S. Environmental Protection Agency  
Region 9  
Air Division  
San Francisco, CA 94105

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## Acronyms and Abbreviations

### **Pollutants**

CO <sub>2</sub>	Carbon dioxide
GHG	Green House Gas
H <sub>2</sub> SO <sub>4</sub>	Sulfuric acid
NO <sub>x</sub>	Nitrogen oxides
PM	Particulate matter
PM <sub>10</sub>	Particulate matter less than 10 micrometers
PM <sub>2.5</sub>	Particulate matter less than 2.5 micrometers
SO <sub>2</sub>	Sulfur dioxide
SO <sub>3</sub>	Sulfur trioxide

### **Units**

Btu	British thermal unit
kW	Kilowatt
kW-hr	Kilowatt-hour
lb	Pound
MMBtu	Million British thermal units
MW	Megawatt
MWh	Megawatt hour
ppb	Part per billion
TBtu	Trillion British thermal units
tpy	Tons per year

### **Acronyms and Abbreviations**

ADEQ	Arizona Department of Environmental Quality
ANPR	Advance Notice of Proposed Rulemaking
APA	Administrative Procedure Act
APS	Arizona Public Service
BACT	Best Available Control Technology
BART	Best Available Retrofit Technology
BAU	Business as usual

## Acronyms and Abbreviations

BOD	Boiler Operating Day
CAA	Clean Air Act (42 U.S.C. 7401 - 7671q)
CAIR	Clean Air Act Interstate Rule
CAMD	Clean Air Markets Division (EPA)
CBI	Confidential Business Information
CCW	Coal Combustion Waste
CEMS	Continuous emissions monitoring system
CFR	<i>Code of Federal Regulations</i>
CO	Colorado
COMS	Continuous opacity monitoring system
COPD	Chronic obstructive pulmonary disease
COS	Combustion optimization systems
CRF	Capital Recovery Factor
DC Circuit	Federal Court of Appeals for the District of Columbia Circuit
DREF	Desert Rock Energy Facility
DOE	Department of Energy
DOI	Department of the Interior
dv	Deciview
EIS	Environmental Impact Statement
EGU	Electric generating unit
ELGs	Effluent limitation guidelines
EPA	U.S. Environmental Protection Agency
EPRI	Electric Power Research Institute
ESA	Endangered Species Act
ESP	Wet membrane electrostatic precipitator
FCPP	Four Corners Power Plant
FERC	Federal Energy Regulatory Commission
FIP	Federal Implementation Plan
FLM	Federal Land Manager
FR	<i>Federal Register</i>
fRH	Relative humidity adjustment factor

## Acronyms and Abbreviations

HERT	High Energy Reagent Technology
IWAQM	Interagency Workgroup on Air Quality Modeling
LNB	Low NO <sub>x</sub> burner
MACT	Maximum Achievable Control Technology
MATS	Mercury and Air Toxics Standards
MRR	Mandatory Reporting Rule
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NGS	Navajo Generating Station
NM	New Mexico
NMED	New Mexico Environment Department
NNEPA	Navajo Nation Environmental Protection Agency
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NREL	National Renewal Energy Laboratory
NSPS	New Source Performance Standard
NSR	New Source Review
OAR	Office of Air and Radiation (EPA)
OMB	Office of Management and Budget
OFA	Overfire air
PSD	Prevention of Significant Deterioration
RAVI BART	Reasonably Attributable Visibility Impairment Best Available Retrofit Technology
RCRA	Resource Conservation and Recovery Act
RHR	Regional Haze Rule
RIA	Regulatory Impact Analysis
ROFA	Rotating Overfire Air
RTC	Response to Comments
SCE	Southern California Edison
SCR	Selective catalytic reduction

## Acronyms and Abbreviations

SIP	State Implementation Plan
SJGS	San Juan Generating Station
SNCR	Selective non-catalytic reduction
TAG	Technical Assistance Guidance
TAR	Tribal Authority Rule
TIP	Tribal Implementation Plan
TSD	Technical Support Document
U.S.C.	<i>United States Code</i>
UARG	Utility Air Regulatory Group
U.S.	United States
VOCs	Volatile Organic Compounds
WRAP	Western Regional Air Partnership

## **1.0 Introduction**

### ***1.1 Background***

On October 19, 2010, the U.S. Environmental Protection Agency (EPA or “we”) proposed a source-specific Federal Implementation Plan (FIP) requiring the Four Corners Power Plant (FCPP), located on the Navajo Nation, to achieve emissions reductions required by the Clean Air Act's (CAA's) Best Available Retrofit Technology (BART) provision.<sup>1</sup> On November 24, 2010, Arizona Public Service (APS) acting on behalf of FCPP's owners submitted a letter to EPA offering an alternative to reduce visibility-impairing pollution. The EPA supplemented the October 2010 BART proposal with its technical evaluation of APS's alternative. In a February 25, 2011 supplemental proposal, we proposed to find that an alternative emissions control strategy would achieve more progress than EPA's BART proposal towards achieving visibility improvements in the surrounding Class I areas.<sup>2</sup>

### ***1.2 The Commenters***

In the October 2010 proposal, EPA stated that public comments were to be submitted by December 20, 2010. As a result of APS's alternative and our supplemental proposal, the due date for public comments was subsequently extended to May 2, 2011.

The EPA held four public hearings on the proposed BART determination and supplemental proposal in the Four Corners area on March 29, 30, and 31, 2011. In all, 90 oral testimonies were presented at the public hearings. The oral testimony is discussed further in Section 2.1 of this document

We received nearly 13,000 written comments. Of these, over 12,800 comments came from private citizens who submitted substantively similar comments. These comments are discussed further in Section 2.2 of this document.

We received an additional 110 unique written comments (not including duplicates, requests for extension of the public comment period, or requests for additional hearings). These unique comments also do not include letters unrelated to the rulemaking. The comments can be broken down by general type as follows: 78 from private citizens, 8 from environmental advocacy groups, 4 from the owners of FCPP, 5 from state/local government entities, 4 from public interest advocacy groups, 2 from tribes, 4 from utility industry associations, 3 from federal agencies, 1 from a U.S. Senator, and 1 from the operator of the Navajo Mine. These comments are listed at the end of this section. The list of comments also includes an entry for all the written comments submitted at the public hearings, which are not included in the preceding totals. The comments are summarized by topic in Sections 3.0 through 10.0 of this document.

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<sup>1</sup> The BART determination was proposed on October 19, 2010 in the *Federal Register*, Volume 75, beginning on page 64,221 (75 FR 64221, October 19, 2010).

<sup>2</sup> 76 FR 10530, February 25, 2011.

### ***1.3 Organization of This Document***

After this introductory section, this document includes nine additional sections as follows:

- Section 2.0 – Oral Testimony at the Public Hearing and Mass Comment Campaigns
- Section 3.0 – Comments on Factor One – Cost of Controls
- Section 4.0 – Comments on Factor Two – Economic, Energy, and Non-Air Quality Environmental Impacts
- Section 5.0 – Comments on Factor Three – Existing Controls at FCPP
- Section 6.0 – Comments on Factor Four – Remaining Useful Life of FCPP
- Section 7.0 – Comments on Factor Five – Anticipated Visibility Improvements
- Section 8.0 – Comments on BART Determinations
- Section 9.0 – Comments on APS’s Alternative Proposal and EPA’s Supplemental Proposal
- Section 10.0 – Other Comments



## LIST OF WRITTEN COMMENTS

Document Id <sup>3</sup> EPA-R09-OAR- 2010-0683-XXXX	Title	Type of Commenter	Notes
0067	Colorado-based organizations	Group of Environmental Advocacy Groups	Request for additional hearing in Durango, CO
0068	Edward Z. Fox, Vice President and Chief Sustainability Officer, Arizona Public Service	Co-owners of FCPP	Request for comment period extension
0069	Stephen B. Etsitty, Executive Director, Navajo Nation Environmental Protection Agency	Tribal Agency	Request for additional hearings and workshops
0071	Richard M. Hayslip, Associate General Manager, Salt River Project	Co-owners of FCPP	Request for comment period extension
0072	Erik Bakken, Manager, Environmental Services and Land Management, Tucson Electric Power Company	Co-owners of FCPP	Request for comment period extension
0073	Wild Earth Guardians	Environmental Advocacy Group	
0075	Edward Z. Fox, Vice President and Chief Sustainability Officer, Arizona Public Service Company	Co-owners of FCPP	Alternative proposal

<sup>3</sup> Document ID identifies written comments found in Docket No. EPA-R09-OAR-2010-0683 by document number.

## LIST OF WRITTEN COMMENTS

Document Id <sup>3</sup> EPA-R09-OAR- 2010-0683-XXXX	Title	Type of Commenter	Notes
0082	Patrick Themig, Vice President, PNM Resources, Inc.	Co-owners of FCPP	Request for comment period extension
0083	Chris Foran, Steering Committee Representative, Montezuma Climate Action Network	Environmental Advocacy Group	Duplicate of 0146
0084	Annika Bergen	Private Citizen	
0085	Charles A. Haley	Private Citizen	
0086	Lair Carlson, Publisher Cell Door Magazine	Private Citizen	
0087	Irene Hamilton	Private Citizen	
0088	Ed Mosimann	Private Citizen	
0089	Zachary Katz, Orien McGlamery, Linda P. Sency, Kathy Brown, Deb Campbell	Private Citizen	
0091	Martha Evers	Private Citizen	
0092	Brian Hoffman	Private Citizen	
0093	Phyllis Hollenbeck	Private Citizen	
0094	Jodi Foran, Past-president; League of Women Voters of Montezuma County	Public Interest Advocacy Group	
0095	Stephanie Kodish, National Parks Conservation Association	Environmental Advocacy Group	
0105	Michael Rendon, Mayor, City of Durango, Colorado	State/Local Government	
0106	Kellie C. Hotter, Chair, La Plata County Board of County Commissioners	State/Local Government	

## LIST OF WRITTEN COMMENTS

Document Id <sup>3</sup> EPA-R09-OAR- 2010-0683-XXXX	Title	Type of Commenter	Notes
0107	Robert Ukeiley, Law Office of Robert Ukeiley	Private Citizen	
0108	Wallace L. White, Commissioner, La Plata County Board of County Commissioners	State/Local Government	
0112	League of Women Voters of Montezuma County	Public Interest Advocacy Group	
0113	Paul Tourangeau, Director, Air Pollution Control Division, Colorado Department of Public Health and Environment	State/Local Government	
0116	Ravi Grover	Private Citizen	
0117	Paul Nazaryk, Environmental Regulatory Affairs, BHP Billiton	Operator of Navajo Mine	
0118	Anonymous	Private Citizen	
0119	Anonymous	Private Citizen	
0122	Margaret Ackerman	Private Citizen	
0123	Dan Barnes	Private Citizen	
0124	Larry Berger	Private Citizen	
0125	William Botsford	Private Citizen	
0126	Linda Bunk	Private Citizen	
0127	Laird Carlson	Private Citizen	
0128	Bill Carver	Private Citizen	
0129	Burt Coleman and Dell Manners	Private Citizen	
0130	Patty Cordova, LWVCO President	Private Citizen	
0131	Jerry and Julie Crockford	Private Citizen	

## LIST OF WRITTEN COMMENTS

Document Id <sup>3</sup> EPA-R09-OAR- 2010-0683-XXXX	Title	Type of Commenter	Notes
0132	Geraldine Duffy	Private Citizen	
0133	Barbara Garlick	Private Citizen	
0134	Bruce A. Garlick	Private Citizen	
0135	Joe Griffith and Dianne Donovan	Private Citizen	
0136	Ana Hale	Private Citizen	
0137	Charles A. Haley	Private Citizen	
0138	Irene Hamilton	Private Citizen	
0139	Wes and Pat Hartman	Private Citizen	
0140	Jill and Rich Hoehlein	Private Citizen	
0141	Kristine Johnson	Private Citizen	
0142	John Larry	Private Citizen	Unrelated to the rulemaking.
0143	Stephanie Huss, President, League of Women Voters of La Plata County	Public Interest Advocacy Group	
0144	Ed and Julie Ward Lehner	Private Citizen	
0145	Claire May	Private Citizen	
0146	Chris Foran, Steering Committee Representative, Montezuma Climate Action Network	Environmental Advocacy Group	
0147	Ed Mosimann	Private Citizen	
0148	Lynne Murison	Private Citizen	
0149	Harry Riegle	Private Citizen	
0150	Sean Babington, Office of Senator Michael Bennet	U.S. Senator	

## LIST OF WRITTEN COMMENTS

Document Id <sup>3</sup> EPA-R09-OAR- 2010-0683-XXXX	Title	Type of Commenter	Notes
0151	Francis Slater	Private Citizen	
0152	Brenda Jarrell, Air Quality Program Manager, Southern Ute Indian Tribe	Tribe	
0153	Elaine Spence	Private Citizen	
0154	Dan Tobin	Private Citizen	
0155	Brian von Dedenroth	Private Citizen	
0156	Bob Waggoner	Private Citizen	
0157	Joe Ward	Private Citizen	
0158	D.J. Webb	Private Citizen	
0159	Richard E. White	Private Citizen	
0160	Richard White	Private Citizen	
0161	Janet Wilson	Private Citizen	
0162	Zita Xavier	Private Citizen	
0163	Vincent H. Yazzie	Private Citizen	
0164	Vincent H. Yazzie	Private Citizen	
0165	Owen M. Lopez, McCune Foundation	Private Citizen	
0166	D. House	Private Citizen	
0167	Christopher Lish	Private Citizen	
0168	Arie Hoekstra, Vice President, Generation, Tucson Electric Power	Co-owner of FCPP	
0169	A. Gwen Eklund, Consulting Business Manager, WEST Associates	Utility Industry Association	

## LIST OF WRITTEN COMMENTS

Document Id <sup>3</sup> EPA-R09-OAR- 2010-0683-XXXX	Title	Type of Commenter	Notes
0170	Brian Abel and Patricia Padian	Private Citizen	
0171	Dell Manners	Private Citizen	
0172	Montezuma-Cortez School	Private Citizen	
0173	Ann Perkins-Parrott	Private Citizen	
0174	Richard M. Hayslip, Associate General Manager, Salt River Project	Co-owner of FCPP	
0175	Corbin L. Newman, Jr., Regional Forester, USFS	Federal Agency	
0176	Edward Z. Fox, Vice President and Chief Sustainability Officer, Arizona Public Service Company	Co-owner of FCPP	
0177	Edward Z. Fox, Vice President and Chief Sustainability Officer, Arizona Public Service Company	Co-owner of FCPP	
0178	Laura McHenry	Private Citizen	
0179	Patrick Themig, Vice President, Generation, Public Service Company of New Mexico	Co-owner of FCPP	
0180	Brynn Johns	Private Citizen	
0181	Michelle Reott	Private Citizen	
0182	Mike Eisenfeld, New Mexico Energy Coordinator, San Juan Citizens Alliance	Environmental Advocacy Group	
0183	Pamela Campos, Attorney, Environmental Defense Fund	Environmental Advocacy Group	
0184	Jeremy Nichols, Climate and Energy Program Director, WildEarth Guardians	Environmental Advocacy Group	

## LIST OF WRITTEN COMMENTS

Document Id <sup>3</sup> EPA-R09-OAR- 2010-0683-XXXX	Title	Type of Commenter	Notes
0185	Aaron Flynn, Counsel to Arizona Public Service Company, Central Arizona Water Conservation District, and Salt River Project Agricultural Improvement and Power District	Co-owner of FCPP	
0186	Erin and Fred Bird	Private Citizen	
0187	Aaron Flynn, Utility Air Regulatory Group	Utility Industry Association	
0188	Heidi Keshet	Private Citizen	
0189	R. Frank (and 682 others)	Private Citizen	Mass Campaign
0190	All Written Comments Received during March 29-31, 2011 Public Hearings and Open Houses	Range of commenters	
0191	League of Women Voters of Montezuma County	Public Interest Advocacy Group	Duplicate of 0112
0192	Kathy and Jim Merrill	Private Citizen	
0193	Post Cards	Private Citizen	Mass Campaign
0194	Don Hancock, Steering Committee Chairperson, Coalition for Clean Affordable Energy (CCAEE)	Environmental Advocacy Group	
0195	Lau Ackerman	Private Citizen	
0196	Mass EPA Card Campaign	Private Citizen	Mass Campaign
0197	Larry Berger	Private Citizen	
0198	Jackie Candelaria	Private Citizen	
0199	Laurie Carpino	Private Citizen	

## LIST OF WRITTEN COMMENTS

Document Id <sup>3</sup> EPA-R09-OAR- 2010-0683-XXXX	Title	Type of Commenter	Notes
0200	John W. Suthers, Colorado Attorney General, Colorado Department of Public Health and Environment (CDPHE)	State/Local Government	
0201	John Culver	Private Citizen	
0202	Clint McKnight	Private Citizen	
0203	Mass Email Campaign	Private Citizen	Mass Campaign
0204	Mass Mail Campaign	Private Citizen	Mass Campaign
0205	Mass Mail Campaign	Private Citizen	Mass Campaign
0206	Mass Mail Campaign	Private Citizen	Mass Campaign
0207	Mass Mail Campaign	Private Citizen	Mass Campaign
0208	Evelyn Ramey	Private Citizen	
0209	Dave Rich	Private Citizen	
0210	Bruce E. and Suzzanne D. Rodman	Private Citizen	
0211	Roxanne Rogers	Private Citizen	
0212	Mass Email Campaign	Private Citizen	Mass Campaign
0213	Shan and Regina Wells	Private Citizen	
0214	Elizabeth M. Wheeler	Private Citizen	
0215	Mass Email Campaign	Private Citizen	
0216	Vincent H. Yazzie	Private Citizen	
0218	Jeremy Nichols, Climate and Energy Program Director, WildEarth Guardians	Environmental Advocacy Group	Attachment to 0184
0223	President Shelly, Navajo Nation	Tribe	



## LIST OF WRITTEN COMMENTS

Document Id <sup>3</sup> EPA-R09-OAR- 2010-0683-XXXX	Title	Type of Commenter	Notes
0224	Alletta Belin, Counselor to the Deputy Secretary, U.S. Department of the Interior	Federal Agency	Transmits National Park Service (NPS) comments

## 2.0 Oral Testimony at the Public Hearings and Mass Comment Campaigns

### 2.1 Oral Testimony at the Public Hearings

The EPA held four public hearings in the Four Corners area on March 29, 30, and 31, 2011. In conjunction with each hearing (generally before the hearing), EPA conducted an information session in which EPA experts explained the BART proposal and better-than-BART supplemental proposal for FCPP to interested attendees with the aid of illustrative posters. An interpreter for speakers of Diné, the Navajo language, was present for three of the information sessions and public hearings.

In all, a total of 90 oral testimonies were presented at the four hearings, although several persons spoke at more than one hearing and two persons gave separate testimony on behalf of two different entities at a single hearing. Most speakers spoke as private citizens, but there were also representatives of the interested industries (the co-owners of FCPP and operator of the Navajo Mine), environmental advocacy groups, public interest advocacy groups, and local government. The location and time of each public hearing and information session are given below, along with the number and types of speakers at each hearing.

### PUBLIC HEARINGS AND INFORMATION SESSIONS

Date	Venue (with Transcript Docket Number)	Time		Commenters
		Info Session	Public Hearing	
March 29	Phil L. Thomas Performing Arts Center Shiprock, New Mexico (EPA-R09-OAR-2010-0683-0227)	3 – 6 p.m.	7 – 9 p.m.	Private citizens – 16 Industry – 1 Environmental – 2
March 30	Nenahnezad Chapter House Fruitland, New Mexico (EPA-R09-OAR-2010-0683-0225)	9 a.m. – 1 p.m. (concurrent)		Private citizens – 10 Industry – 1 Local government (Chapters) – 2
March 30	San Juan College Farmington, New Mexico (EPA-R09-OAR-2010-0683-0226)	3 – 5 p.m.	6 – 9 p.m.	Private citizens – 25 Industry – 3 Environmental – 2
March 31	Fort Lewis College Durango, Colorado (EPA-R09-OAR-2010-0683-0228)	3 – 5 p.m.	6 – 9 p.m.	Private citizens – 21 Public interest – 2 Environmental – 4 Local government (County) – 1

The comments presented in oral testimony at the public hearings are summarized below, with the exception of comments from entities that submitted written comments which duplicated their oral testimony. For example, APS and the San Juan Citizens Alliance submitted extensive written, technical comments that are summarized in the other sections of this document; their oral comments on the same topics are not included in this section. The transcripts from and the materials presented by EPA during these hearings are also available in the docket.<sup>4</sup>

**Comment:**

The majority of commenters favored the supplemental proposal or more stringent requirements for FCPP because the commenters consider visibility and air quality in the Four Corners region to be generally poor. A few argued that FCPP should be shut down rather than being retrofit with controls. On the other hand, several commenters noted that FCPP and the Navajo Mine provide many jobs in the area and that their payments to the Navajo Nation make up a large portion of the Nation's revenues. These commenters cautioned that EPA must carefully balance the environmental benefit of any requirements for FCPP with the potential adverse impacts to the Navajo Nation and the region that would ensue were FCPP to close as a result of EPA regulation.

Many commenters favor stringent controls on FCPP because they assert that emissions from FCPP represent a public health issue. These commenters indicated that these emissions are to blame for health problems in the area, such as respiratory disease and cancer, which many argue have become more prevalent in recent years. The commenters often said that the health of succeeding generations should be an important consideration. However, a few commenters questioned that FCPP's emissions are causing such health effects. A number of commenters on both sides of this issue requested that health studies be undertaken to determine the health impacts of FCPP emissions.

Many speakers spoke in favor of stringent controls on FCPP because of the haze that is very common in the area, believing that it is due to FCPP. Some commenters indicated that the haze diminishes the beauty of the area, which is a quality of life issue for residents as well as an economic issue because of the importance of tourism to the economy of the area.

Several commenters support stringent controls because they argue that emissions from FCPP are having negative impacts on the land and water in the area, as well as the air. Some expressed fear that emissions from the plant, including mercury and other toxic compounds, are harming ecosystems in the area, including rare and endangered plant species, endangered fish species, pollinators, and amphibians. Some living near to the plant assert that it is responsible for killing native plant species that they have depended on for their livestock, and has harmed traditional dry land farming. A number of Navajo commenters stated that pollution of the air, water, and land is contrary to Navajo religious beliefs and cultural traditions.

A number of commenters favor stringent controls on FCPP as a first step in a transition away from coal-fired power plants to renewable energy sources. Commenters enumerated many problems with coal as an energy source, including emissions of air pollutants (SO<sub>2</sub>, NO<sub>x</sub>, PM,

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<sup>4</sup> See Document numbers 0109, 0111, and 0225 – 0228 in EPA-R09-OAR-2010-0683.

mercury and other toxic compounds, acid gases, and Green House Gases (GHGs)), use of large amounts of water for cooling, and production of large amounts of ash or coal combustion waste (CCW). Several noted that New Mexico and the Four Corners area are ideally suited for solar and wind energy projects. Some commenters stated that a transition to renewable energy could economically benefit the Navajo Nation.

**Response:**

*Protection of human health and the environment is EPA's mission, and forms the basis for many Agency actions, including establishing the National Ambient Air Quality Standards (NAAQS), and promulgation of regulations such as the New Source Performance Standards (NSPS) and the National Emission Standards for Hazardous Air Pollutants (NESHAP). In addition to Clean Air Act requirements to protect human health, in the 1977 Clean Air Act Amendments, Congress also declared as a national goal the prevention of any future, and the remedying of any existing, impairment of visibility in mandatory class I Federal areas which impairment results from manmade air pollution (See CAA §169A). In 1999, EPA issued the final Regional Haze Rule (RHR), which included the requirement for facilities of a certain age to install the Best Available Retrofit Technology (BART) to reduce emissions of visibility impairing pollutants. Therefore, the focus of implementation plans developed under the RHR, is to improve visibility at National Parks and Wilderness Areas. EPA agrees that visibility-impairing pollutants can impact human and ecosystem health. Emissions of hazardous air pollutants such as mercury are not visibility-impairing pollutants, and as a result are beyond the scope of our BART analysis. EPA agrees that health studies may provide useful information, however, these studies are beyond the scope of a BART analysis. Emissions of hazardous air pollutants (HAPs) from various source categories are addressed generally through National Emission Standards for Hazardous Air Pollutants (NESHAPs) and EPA addresses mercury emissions from power plants specifically in the final Mercury and Air Toxics (MATS) Rule which was published in the Federal Register on February 16, 2012 (77 FR 9304).*

*EPA is aware of the contribution of FCPP and the Navajo Mine to the economy of the Navajo Nation and the Four Corners region. At the request of the Navajo Nation, pursuant to EPA's customary practice of engaging in extensive and meaningful consultation with tribes, EPA commissioned an analysis to estimate the potential adverse impacts to the Navajo Nation of APS's option to retire Units 1 – 3 and will provide the report to the Navajo Nation by letter as a follow-up to our consultation. EPA did not rely on this analysis in our final determination.*

*Regarding comments in favor of transitioning from coal to renewable energy, the RHR establishes a five step process EPA must follow when performing a case-by-case BART determination. Although EPA agrees that transitioning to renewable energy is a worthwhile goal, the BART Guidelines<sup>5</sup> state that under " Step 1: How do I identify all available retrofit emission control techniques?", "[EPA does] not consider BART as a requirement to redesign the source when considering available control alternatives" (see specifically 70 FR at 39164).*

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<sup>5</sup> See "Regional Haze Regulations and Guidelines for Best Available Retrofit Technology (BART) Determinations", 70 FR 39104, July 6, 2005, in the docket for this rulemaking.

### **Comment:**

Some commenters asserted the presence of FCPP and several other power plants in and around the Navajo Nation represent an environmental and economic justice issue. These commenters pointed out that the electricity from FCPP goes to distant cities, while the pollution from the plant affects the local area and many communities in the surrounding area are without electricity. They noted that many in the Navajo Nation live in poverty and their youth have limited opportunities, while the companies that own and operate FCPP and the Navajo Mine have reaped large profits. Some expressed frustration with the leaders of the Navajo Nation, who they asserted have not protected the interests of the local population.

Some of these commenters stated that APS should recognize that FCPP will ultimately have to shut down and begin to transition to renewable energy sources. The commenters stated that because it has profited so much from FCPP, APS has a corporate responsibility to facilitate a just transition for the local area to a renewable energy economy.

### **Response:**

*In establishing BART requirements for FCPP in this final rulemaking, EPA will be increasing the level of environmental protection for all affected populations by requiring substantial NO<sub>x</sub> emission reductions. Thus, EPA does not expect any disproportionately high and adverse human health or environmental effects on any population, including any minority or low-income population from our final action.*

*The first step of the BART determination process involves identification of all available retrofit technologies. As described in the 2005 Regional Haze Rule, redesign of the source is not considered a requirement when examining available control technologies (70 FR 39104). As an example, a coal-fired unit would not be required to consider construction of a natural gas-fired turbine; while it is an inherently less polluting technology, it would require a redesign of the source. A transition of FCPP to use of renewable energy sources would require a similar redesign of the FCPP units, and as a result is outside of EPA's authority under the RHR. The Department of Interior has contracted with the Department of Energy's National Renewable Energy Laboratory, however, to conduct a phased study on the Navajo Generating Station (NGS). DOI intends that Phase 2 of this study will examine the potential of long-term energy production options for NGS, and may include such options as renewable sources. Although the focus of this study is NGS and not FCPP, because NGS is also located on the Navajo Nation, results of this study may be relevant to the FCPP area.*

### **Comment:**

Some commenters expressed concern related to the ash generated by FCPP. Some of these indicated that the ash from the facility is unsecured and blows over the nearby area when it is dry and is washed into the San Juan River when it rains. Some of these commenters blamed the windblown ash for killing local vegetation in the area. Other commenters refuted these claims.

A few speakers raised issues regarding the storage of coal combustion wastes (CCW) at FCPP. In the most extensive such comments, one environmental advocacy group commenter supported selective catalytic reduction (SCR) controls at FCPP, but asked that EPA also work to concurrently address the CCW (fly ash, scrubber sludge and bottom ash) being generated at the facility. The commenter stated that SCR technology will increase the nitrogen and ammonia content of the CCW, as well as the pH, very significantly, and possibly increase the quantity of CCW generated by FCPP, which currently stands at 1.5 million tons per year. The commenter noted that some of this material is used and recycled as synthetic gypsum, but the majority is highly toxic and includes pollutants such as lead, arsenic, mercury, cadmium, chromium, and selenium.

According to the commenter, the facility has historically disposed of CCW in temporary ash ponds on site and also returned it to the Navajo Mine, where BHP used it as minefill. The commenter stated that the on-site ash ponds are on about 550 acres directly adjacent to Chaco Wash, located on the escarpment directly above the wash, which runs due north approximately 1 mile into the San Juan River. The commenter noted that by some estimates, there are tens of millions of tons of CCW, and perhaps billions of tons, stored in these ash ponds; it is perhaps the largest storage of toxic CCW in the nation. The commenter asserted that these ash ponds pose a significant threat, as evidenced by the 2008 failure of the coal ash ponds at the Tennessee Valley Authority's Kingston Fossil Plant, where a 40-acre plant released over one billion gallons of toxic CCW into two separate rivers. Like the Tennessee Valley Authority plant, according to the information and belief of the commenter, FCPP has no emergency preparedness plan for cleanup of the coal ponds should they breach, and there is no bond for decommissioning these ash ponds.

The commenter stated it is extremely important for the owners of FCPP to address the liability of decommissioning of Units 1 through 3 and these ash ponds as part of their decommissioning process. The commenter asked who is going to pay for the cleanup – APS and the ratepayers, Southern California Edison, the Navajo Nation, or the federal taxpayers?

The commenter asked EPA to support the production of an environmental impact statement (EIS) to evaluate, among other things, the cost, methodology and liability for cleanup of these ash ponds, as well as an assessment for a bond or a surety from APS for full CCW storage needs going forward should Units 4 and 5 remain open under the current plan. The commenter pointed out that there is a mechanism for getting this done in that the Navajo Nation recently approved the lease renewal for FCPP, and that lease renewal is subject to review by DOI and will be subject to NEPA, which requires an EIS. The commenter requested that EPA support production of an EIS for this, as well as act as a cooperating agency in this process.

**Response:**

*Comments regarding the environmental issues associated with CCW are beyond the scope of the BART analysis.*

*On June 21, 2010, EPA proposed and solicited comments on two regulatory options for establishing national standards for management of CCW (75 FR 35127). Options considered in*

*this proposal include regulating CCW as a hazardous waste under Subtitle C of the Resource Conservation and Recovery Act (RCRA), or establishing new national criteria under the non-hazardous solid waste requirements in RCRA Subtitle D. In addition, under the Clean Water Act, EPA has authority to establish effluent limitation guidelines (ELGs), which are national standards for water pollution reductions developed on an industry-by-industry basis. As part of a November 8, 2010 consent decree, EPA agreed to revise the ELGs for Steam Electric Power Generation to address wastewater discharges from CCW storage. Per the consent decree, these updated ELGs must be proposed by July 23, 2012 and finalized by January 31, 2014.*

*As noted in the Technical Support Document (TSD)<sup>6</sup> for our October 19, 2010 proposal, EPA determined that the impact of SCR on fly ash is smaller than the impact of other NO<sub>x</sub> control technologies under consideration (in particular low NO<sub>x</sub> burners) on future salability of fly ash.*

*As the commenter notes, a lease renewal for FCPP was signed by the Navajo Nation in March 2011. This renewal is subject to DOI's review and approval process, which will result in the publication of an EIS. EPA Region 9 will be a cooperating agency in this process.*

**Comment:**

A commenter representing the operator of the Navajo Mine, BHP Billiton, noted that EPA's informational posters state that the company has pledged that there will be no layoffs at the mine if the supplemental proposal is implemented. The commenter clarified that the reduced coal consumption by FCPP associated with closure of Units 1 – 3 will necessitate a reduction in the workforce at the mine, but that the company stated that this reduction can be accomplished through retirement and attrition without layoffs. The commenter projected that the employment at the mine ultimately will be reduced by 100 to 200 positions.

**Response:**

*EPA thanks the commenter for the clarification that the mine will not lay off employees if Units 1 – 3 close, but that reduced coal consumption by FCPP associated with the closure of Units 1 – 3 is likely to result in a workforce reduction through retirement and attrition.*

**Comment:**

A few commenters stated that EPA should conduct a BART determination for SO<sub>2</sub> and reduce these emissions from FCPP to further improve visibility and reduce acid deposition. The commenters indicated that acid deposition damages ecosystems and degrades Native American ruins in the area. One commenter asserted that EPA should carry out a BART determination for CO<sub>2</sub> emissions from FCPP because this is the primary GHG.

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<sup>6</sup> "FCPP Proposal – Technical Support Document", October 6, 2010, Document No. EPA-R09-OAR-2010-0683-0002.

**Response:**

*EPA disagrees with this comment. As noted in the 2007 FIP for FCPP,<sup>7</sup> the SO<sub>2</sub> emission reductions established by the FIP are close to or the equivalent of BART for this source. Therefore, at the present time, EPA is exercising its discretion under 40 Code of Federal Regulations (CFR) part 49.11 to find that it is neither necessary or appropriate at this time to undertake a BART determination for SO<sub>2</sub> for FCPP given the timing of the substantial SO<sub>2</sub> reductions that resulted from the 2007 FIP.*

*Regarding the commenter's concern about green house gas (GHG) emissions, GHGs are not visibility-impairing pollutants and are not addressed in this action as they are beyond the scope of the BART requirements in the RHR.*

*As a general matter, EPA continues to develop several regulatory initiatives to address these. For example, the GHG Mandatory Reporting Rule (MRR)<sup>8</sup> requires reporting of emissions of six GHGs from multiple industrial source categories, and the GHG Tailoring Rule,<sup>9</sup> establishes emission thresholds that define when new and existing industrial facilities must obtain permits. As part of the GHG Tailoring Rule implementation process, the initial phase will extend to those sources and projects that are already considered major sources for pollutants other than GHG. As a Title V major source of emissions, the Four Corners Power Plant is subject to the Title V program and has a Part 71 operating permit.<sup>10</sup> As a result, it will be subject to Title V requirements for GHG. EPA also entered into two proposed settlement agreements on December 23, 2010 that will include development of GHG emission standards for new and modified coal-fired power plants.*

**Comment:**

One commenter questioned EPA's development of baseline values using computers. The commenter stated that computer simulation technology is not accurate enough for many uses at this time.

**Response:**

*EPA disagrees with this comment. Computer-based visibility modeling plays an important role in informing many of the policy decisions associated with implementation of the RHR. The ability to predict how changes in air pollutant emission rates will affect visibility at Class I areas is critical in determining the control measures that are necessary to meet national visibility goals. As described in the 1999 RHR, although the national visibility goal was established by the 1977 Clean Air Act Amendments, EPA deferred action on regional haze until*

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<sup>7</sup>See "Source Specific Federal Implementation Plan for the Navajo Nation: Four Corners Power Plant", 72 FR 25698, May 7, 2007, in the docket for this rulemaking.

<sup>8</sup> See "Mandatory Reporting of Greenhouse Gases", 74 FR 56260, October 30, 2009, in the docket for this rulemaking.

<sup>9</sup> See "Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule", 75 FR 31514, June 3, 2010, in the docket for this rulemaking.

<sup>10</sup> "TSD ref [101] FCPP Permits", Document No. EPA-R09-OAR-2010-0683-0057.



*monitoring techniques, modeling capabilities, and the understanding of the pollutants affecting visibility improved. In the final rule for the 1999 Regional Haze regulations<sup>11</sup>, EPA notes that the National Academy of Sciences concluded that “current scientific knowledge is adequate and control technologies are available for taking regulatory action to improve and protect visibility”. As described in the 2004 RHR proposal<sup>12</sup> and the final 2005 RHR<sup>13</sup>, determining visibility impacts on an individual source-specific basis involves long-range transport and diffusion modeling, as well as determining the impacts of atmospheric chemical transformations. The CALPUFF dispersion model is incorporated into 40 CFR Part 51, Appendix W “Guideline on Air Quality Models” and is the approved model that is the best suited to address each of these challenges.*

**Comment:**

A representative of one of the co-owners of FCPP stated that EPA’s BART determination for FCPP should be consistent with the determinations that have been issued by states that are implementing the Regional Haze Program. The commenter indicated that states have not determined SCR to be BART. The remainder of the issues raised in this commenter’s oral testimony were also included in the company’s written comments and are summarized in the other sections of this document.

**Response:**

*EPA disagrees with this comment for at least 2 reasons. BART determinations are conducted on a case-by-case basis, taking into consideration the statutory factors required in a BART analysis under Section 169A(g)(1) of the CAA, i.e., the costs of compliance, the energy and nonair quality environmental impacts of compliance, any existing pollution control technology in use at the source, the remaining useful life of the source, and the degree of improvement in visibility which may reasonably be anticipated to result from the use of such technology, as relevant to each source that is subject to BART. As such, the CAA does not require State agencies, in developing its State Implementation Plans (SIPs), or EPA in implementing FIPs, to ensure that its BART determinations are consistent with BART determinations issued by other States. EPA’s BART determination for FCPP was a case-by-case analysis that considered the statutory factors required by the CAA and as outlined in the BART Guidelines. EPA provided the analysis for each factor and the rationale for our BART determination requiring an 80% reduction in plant-wide NO<sub>x</sub> emissions from FCPP in the TSD for our October 19, 2010 proposal. Second, the commenter is not correct in its statement that no state has determined SCR to be BART. The Colorado Department of Public Health and Environment required SCR as BART on Hayden Station Units 1 and 2.<sup>14</sup>*

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<sup>11</sup> See “Regional Haze Regulations”, 64 FR 35714, July 1, 1999, in the docket for this rulemaking.

<sup>12</sup> See “Regional Haze Regulations and Guidelines for Best Available Retrofit Technology (BART) Determinations” (proposed rule), 69 FR 25184, May 5, 2004, in the docket for this rulemaking.

<sup>13</sup> See “Regional Haze Regulations and Guidelines for Best Available Retrofit Technology (BART) Determinations”, 70 FR 39104, July 6, 2005, in the docket for this rulemaking

<sup>14</sup> See “Hayden BART Final.pdf” in the docket for this rulemaking, also available at <http://www.cdphe.state.co.us/ap/regionalhaze.html>.

## 2.2 *Mass Comment Campaigns*

We received many comments from private citizens inspired by mass comment campaigns. Most of these commenters submitted the templates provided by the sponsoring organizations without change, but others customized the templates to some degree but without providing additional substance.

### **Comments:**

Comment 0189 represents an example of 682 postcards EPA received from the organization Diné CARE at the Farmington, New Mexico public hearing, by mail, and by email. Most postcards contained personalized hand-written comments but the comments did not provide additional substance. These postcards were not posted to the electronic docket, but are part of the record for this rulemaking and are retained in paper form in the EPA's office. The postcard reads as follows:

I support U.S. Environmental Protection Agency (EPA) plan to install the Best Available Retrofit Technology (BART) air pollution controls on Four Corners Power Plant (FCPP). (Docket #EPA-R09-OAR-2010-0683). FCPP's emissions are responsible for increased heart and respiratory diseases. I want implementation of the most stringent pollution control technologically available, and transition to Renewable Energy solution.

Comment 0196 includes 115 additional postcards submitted by Diné CARE containing the printed text above, most with personalized hand-written comments but the comments did not provide additional substance. In addition, Comment 0193 represents an example of 46 postcards with the same printed text (most with personalized, non-substantive hand-written additions) received pursuant to an effort by the Sierra Club.

Comment 0203 represents a mass comment campaign organized by the National Parks Conservation Association, which was submitted essentially verbatim by 9,312 commenters. The comment reads as follows:

Dear Lee,

As someone who is proud of our country's national parks, I am writing to thank you for your recent steps to reduce the air pollution from the Four Corners Power Plant--and also to urge you to do better. I ask that you protect the people and parks of the Southwest region by requiring the Four Corners plant to emit less pollution. Without meaningful reductions in air pollution, Four Corners Power Plant will continue to obscure the views that make these parks icons of the western landscape.

I support the agency's decision to propose the retirement of units 1, 2, and 3 and the pollution control technology--Selective Catalytic Reduction--as a cost effective way to significantly cut down on haze pollution from the other two coal

units. I urge EPA to lower its proposed numeric limits on nitrogen oxides and particulate matter pollution, add limits for ammonia and sulfuric acid pollution, and require compliance with these limits within three years in its final decision. These limits would mean healthier air for us all, better views of our magnificent national parks, and a stronger tourism economy. Your decision will be inhaled by neighboring communities and park visitors for the life of the plant.

Please don't miss this opportunity to protect our people and parks by adequately cleaning up the Four Corners Power Plant now.

Please work hard to protect one of my favorite places. We cannot let our natural treasures be compromised.

Thank you for considering my request.

Comments 0116, 0203, 0204, and 0205 include an additional 204 comments that were submitted via the National Parks Conservation Association campaign, most incorporating some or all of the same points. Many of these added personal observations. However, of the four comments included in Comment 0204, two did not support EPA's proposed actions, and two were unrelated to this rulemaking.

Comment 0212 represents a mass comment campaign organized by the Sierra Club. Four different versions of the campaign letter were submitted, with some variations to address different areas in the Four Corners region.

One of the versions of the Sierra Club campaign email was submitted largely without change by 1,218 commenters and reads as follows:

Dear EPA Administrator Blumenfeld,

I support the EPA's proposed rule on Best Available Retrofit Technology (BART) for regional haze at the Four Corner's Power Plant. The diverse communities of the Four Corners deserve cleaner air and a sustainable energy future that can only be achieved by cleaning up dirty coal plants like the Four Corners Power Plant. Thank you for helping everyone breathe easier by considering the two proposals at hand, both of which will help to reduce emissions from the plant by installing selective catalytic reduction controls.

By outlining a plan to justly transition Four Corners off coal as soon as reasonably possible, we can bring a green economic boom to the region. I ask that these further and necessary retrofits be made to reduce dangerous pollution in the area. I am asking for the most stringent reduction in emissions to come out of these proposals. The haze in the National Parks that are within 300 kilometers (180 miles) of FCPP will see a significant improvement in visibility as a result of this BART. It is important that we protect these precious and irreplaceable public areas including Mesa Verde National Park just north of the plant. There are also

many sacred Navajo sites in the vicinity that need to be considered here as well. Tourism is a large economic contributor in the 4 Corners, and it is imperative that we clean up this haze in order to preserve this sector.

The implementation of pollution controls in the form of Selective Catalytic Reduction (SCR) will reduce Nitrous Oxide (NOx) pollution by 80-90%. NOx pollution will be reduced by 16,000 tons per year, per the 2010 New Mexico Environmental Department report. NOx pollution has been shown to have direct negative health impacts. EPA includes 13 different health effects: adult and infant premature mortality, chronic bronchitis, heart attack, acute bronchitis, upper and lower respiratory symptoms, aggravation of existing asthmas, and hospital admissions and or emergency room visits for COPD, pneumonia, asthma, and cardiovascular diseases.

A U.S. Geological Survey study found that people living in Shiprock are more than 5 times as likely to be seen at Indian Health Services for respiratory complaints as are residents of other nearby communities.

Overall, we want the best plan to reduce emissions in the area and one that also looks towards a transition to renewable energy in the near future.

Knowing the health, environmental and economic benefits of clean air, I am asking for the most stringent reduction in emissions possible.

The second version of the Sierra Club campaign email was submitted essentially verbatim by 341 commenters. This version reads as follows:

Dear EPA Region 9 Administrator Blumenfeld,

I support the EPA's proposed rule on Best Available Retrofit Technology (BART) for regional haze at the Four Corner's Power Plant.

The diverse communities of the Four Corners deserve cleaner air and a sustainable energy future that can only be achieved by cleaning up dirty coal plants like the Four Corners Power Plant. Thank you for helping everyone breathe easier by considering proposals that will help to reduce emissions from the plant by installing air pollution controls.

I want these retrofits to be made to reduce dangerous pollution in the area. Nitrogen oxide pollution has been shown to have direct negative health impacts including adult and infant premature mortality, chronic and acute bronchitis, heart attack, upper and lower respiratory symptoms, aggravation of existing asthma, increased hospital and emergency room visits, pneumonia, asthma, and cardiovascular diseases.

A U.S. Geological Survey study found that people living in Shiprock, NM are more than five times as likely to be seen at Indian Health Services for respiratory complaints as are residents of other nearby communities.

Lowered emissions will help lessen these impacts on our community health and also our natural places. Tourism is a large economic contributor in New Mexico, and it is imperative that we clean up this haze in order to preserve this sector.

The haze in the national parks that are within 180 miles of FCPP will see a significant improvement in visibility with retrofit technology implemented. It is important that we protect these precious and irreplaceable public areas like Bandelier National Monument near Los Alamos, Pecos Wilderness near Santa Fe, Wheeler Wilderness near Taos and San Pedro Parks near Cuba.

Knowing the health, environmental and economic benefits of clean air, I am asking for the most stringent reduction in emissions possible.

The third version of the Sierra Club campaign email was submitted largely without change by 184 commenters and reads as follows:

Dear EPA Region 9 Administrator Blumenfeld,

I support the EPA's proposed rule on Best Available Retrofit Technology (BART) for regional haze at the Four Corners Power Plant. A reduction in air pollution from the Four Corners Power Plant will protect the health of people living in Utah and preserve the many national parks in our area.

I want these retrofits to be made to reduce dangerous pollution in the area. Nitrogen oxide pollution has been shown to have direct negative health impacts including adult and infant premature mortality, chronic and acute bronchitis, heart attack, upper and lower respiratory symptoms, aggravation of existing asthma, increased hospital and emergency room visits, pneumonia, asthma, and cardiovascular diseases.

Lowered emissions will help lessen these impacts on our community health and also our natural places.

The haze in the national parks that are within 180 miles of FCPP will see a significant improvement in visibility with retrofit technology implemented. It is important that we protect these precious and irreplaceable public areas like Bryce Canyon National Park, Canyonlands National Park, Monument Valley Navajo Tribal Park, and Arches National Park.

Knowing the health, environmental and economic benefits of clean air, I am asking for the most stringent reduction in emissions possible.

The diverse communities of the Four Corners deserve cleaner air and a sustainable energy future that can only be achieved by cleaning up dirty coal plants like the Four Corners Power Plant. Thank you for helping everyone breathe easier by considering proposals that will help to reduce emissions from the plant by installing air pollution controls.

The fourth version of the Sierra Club campaign email was submitted essentially verbatim by 77 commenters. Version 4 reads as follows:

Dear EPA Region 9 Administrator Blumenfeld,

I support the EPA's proposed rule on Best Available Retrofit Technology (BART) for regional haze at the Four Corner's Power Plant.

Coloradans deserve cleaner air and a sustainable energy future that can only be achieved by cleaning up dirty coal plants like the Four Corners Power Plant. Thank you for helping everyone breathe easier by considering proposals that will help to reduce emissions from the plant by installing air pollution controls.

I want these retrofits to be made to reduce dangerous pollution in the area by 80-90% of the biggest source of smog causing Nitrogen oxide in the nation. Nitrogen oxide pollution has been shown to have direct negative health impacts including adult and infant premature mortality, chronic and acute bronchitis, heart attack, upper and lower respiratory symptoms, aggravation of existing asthma, increased hospital and emergency room visits, pneumonia, asthma, and cardiovascular diseases.

Lowered emissions will help lessen these impacts on our community health and also our natural places. Tourism is a large economic contributor in Colorado, and it is imperative that we clean up this haze in order to preserve this sector.

The haze in the national parks that are within 180 miles of FCPP will see a significant improvement in visibility with retrofit technology implemented. It is important that we protect these precious and irreplaceable public areas like Mesa Verde National Park and the Weminuche Wilderness.

Knowing the health, environmental and economic benefits of clean air, I am asking for the most stringent reduction in emissions possible.

Comment 0206 includes an additional 27 comments that were submitted via the Sierra Club campaign, most incorporating some or all of the same points. Some of these commenters described personal experience with worsening air pollution in the region, and others expressed concern about negative impacts resulting from the use of coal to generate electricity.

Comment 0215 represents a mass email campaign sponsored by WildEarth Guardians, which was submitted essentially verbatim by 637 commenters. The comment reads as follows:

The Four Corners Power Plant poses significant threats to public health and welfare. I urge you to do more to protect the Four Corners region from the harmful impacts of its air pollution.

Please use your discretion to consider alternative air pollution control strategies that better protect the environment. Wind and solar are both plentiful in the Four Corners region. Importantly, these energy sources do not poison waters, create smog, or foul the air quality in our most treasured National Parks and Wilderness Areas.

You have the discretion to do more than require retrofits. You have the discretion to power the Four Corners Power Plant past coal.

The opportunities for a healthy environment are enormous in the Four Corners. Please help make this a reality. For the future of our communities, our wild lands, and the Western United States, please consider alternatives to coal.

Comment 0207 includes an additional 27 comments that were submitted via the WildEarth Guardians campaign, most incorporating some or all of the same points. Several of these commenters expressed concern about the negative effects of using coal as an energy source, and some included personal experiences with air pollution in the area. However, one of the commenters expressed support for retrofitting FCPP, indicating that alternative energy sources cannot meet our energy needs today.

**Response:**

*EPA agrees with commenters that SCR is BART for FCPP and we are finalizing our proposal as such. EPA also agrees with commenters that the proposed and final NO<sub>x</sub> emission limit proposed will reduce haze and improve visibility in the Four Corners region and for the broader Colorado Plateau. EPA is also giving the owners of FCPP the option to implement the alternative emission control strategy in lieu of BART that will result in greater emission reductions of NO<sub>x</sub> and other air pollutants.*

*Regarding comments on public health, EPA notes that the same pollutants that impair visibility are a concern for human health; therefore reducing the NO<sub>x</sub> emissions contributing to haze should also improve air quality generally in this area.*

*While many commenters expressed a desire for EPA to encourage a transition to renewable energy technologies such as wind and solar power, the ability to require such a transition is beyond the scope of this rulemaking. As described in a previous response, EPA does*

*not consider BART as a requirement to redesign a source when considering available control alternatives (see specifically 70 FR 39164).<sup>15</sup>*

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<sup>15</sup> See “Regional Haze Regulations and Guidelines for Best Available Retrofit Technology (BART) Determinations”, 70 FR 39104, July 6, 2005, in the docket for this rulemaking



## 3.0 Comments on Factor One – Cost of Controls

### 3.1 Comments on the Analysis of the Cost of SCR at FCPP

#### Comment:

Some of the owners of FCPP (0168, 0174, 0176/0177, 0185), the Navajo Nation (0223), and a utility industry association (0187) stated that in analyzing the cost of SCR at FCPP, EPA improperly reworked and reduced the SCR cost estimates submitted for FCPP by eliminating line item costs that are not explicitly included in the *EPA Control Cost Manual* (citing 75 FR 64227). According to the commenters, the BART rules make clear that the cost analysis should take into account any site-specific design or other conditions that affect the cost of a particular BART technology option (often citing 70 FR 39166). In addition, the commenters generally stated that the significance of considering site-specific cost information was emphasized in the D.C. Circuit's *American Corn Growers* decision, where the court observed that each of the statutory factors in any BART determination, specifically including the cost of the technology, must be addressed "on a source-by-source basis." *Am. Corn Growers Ass'n v. EPA*, 291 F.3d 1, 6 (D.C. Cir. 2002). Two of the commenters (0176/0177, 0187) indicated that this principle is further affirmed in the BART rules, which state that "one or more of the available control options may be eliminated from consideration because they are demonstrated to be technically infeasible or to have unacceptable energy, cost, or non-air quality environmental impacts on a case-by-case (or site-specific) basis" (citing 70 FR 39164). Three of the commenters (0185, 0187, 0223) noted that the BART rules make the nonbinding nature of the *EPA Control Cost Manual* clear (citing 70 FR 39127 and footnote 15).

Two of the commenters (0168, 0176/0177) defended the SCR cost estimate submitted for FCPP, noting that the estimate was prepared by B&V, an engineering firm with extensive experience with the installation and operation of pollution control equipment. The commenters noted that B&V performed a detailed analysis of the FCPP units and considered site-specific conditions that preclude the use of the general ratios or other factors that can be derived from the *EPA Control Cost Manual*. According to the commenters, B&V followed the *EPA Control Cost Manual* to estimate annual costs, but also followed accepted guidelines for control technology analyses by using actual SCR retrofit data from facilities with over 10,000 MW of generation for which B&V completed the designs. One of these commenters (0176/0177) indicated that the prices used in the cost analysis were based on quotes from equipment vendors that reflected current pricing.

Since issuance of the Advanced Notice of Proposed Rulemaking (ANPR) for the FCPP FIP rulemaking, one of the commenters (0176/0177) commissioned B&V to review its cost assumptions and EPA's cost-related comments in the ANPR, and the commenter submitted a copy of B&V's report with its comments. According to this B&V report, the costs of SCR systems at FCPP are further escalated due to the complex constructability issue resulting from the constrained site arrangements. The report further notes that extensive modifications to

existing ductwork and boiler steel would be required and provides specific examples where the *EPA Control Cost Manual* does not account for the site-specific costs of installing SCR.<sup>16</sup>

This commenter (0176/0177) indicated that as a further check on the cost estimates, the commenter retained the Shaw Group to conduct an independent review of the cost assumptions and EPA's comments in the ANPR, and the commenter also submitted this report. The Shaw Group's report notes that the background section of the *EPA Control Cost Manual* states that the Manual is not suitable for use with Electric Generating Units (EGUs) because of differences in accounting for utility sources. This report also states that the results of the *EPA Control Cost Manual* are relatively generic, and that customizing the analysis with industrial sources of information may lead to a more accurate estimate.

The commenter (0176/0177) noted that EPA stated in the proposed FIP that it "has generally accepted the costs estimates APS submitted," but has "eliminated any line item costs that are not explicitly included in the *EPA Control Cost Manual*" (citing 75 FR 64227). The commenter asserted that EPA provided no justification for excluding these costs, and that no justification for doing so exists.

The commenter (0176/0177) concluded that the analyses conducted by B&V and the Shaw Group are sound, and the Shaw Group's report confirms that the inclusion of these types of costs is entirely appropriate. According to the commenter, it is improper and unlawful for EPA to eliminate consideration of these site-specific cost factors. The commenter asserted that because the proposed BART FIP rule is fundamentally inconsistent in this respect with EPA's own rules and with the CAA, as construed by the D.C. Circuit in *American Corn Growers*, and because EPA has found the submitted cost estimates "generally accept[able]" (citing 75 FR 64227) without providing any sound or lawful rationale for rejecting or revising those estimates, there is no basis for EPA not to use those estimates.

Another of the commenters (0185) concluded that a BART determination cannot properly be made until EPA accepts or conducts a cost analysis, such as the one presented by APS, that complies with the law. A third commenter (0187) concluded that EPA's proposed cost analysis is inconsistent with the D.C. Circuit's decision in *American Corn Growers* and with the governing rules and is therefore unlawful. The Navajo Nation (0223) concluded that EPA's compliance costs are inaccurate and flawed.

**Response:**

*EPA disagrees with the comment that EPA improperly reworked and reduced the SCR cost estimates. EPA used a hybrid approach for our cost analysis that relied primarily on the cost estimates provided by APS, but also followed the BART Guidelines, that state "[i]n order to maintain and improve consistency, cost estimates should be based on the QAQPS Control Cost*

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<sup>16</sup> EPA notes that this report was considered and discussed in the TSD for our proposed rulemaking, and was included in our docket. The revised cost estimates submitted to EPA subsequent to our ANPR were actually lower than the cost estimates submitted prior to our ANPR.

*Manual, where possible”<sup>17</sup>, to determine whether APS included cost estimates for services or equipment associated with SCR that were either not needed (e.g., mitigation for increased sulfuric acid emissions or catalyst disposal), or not allowed under the EPA Control Cost Manual (e.g., owner’s costs). We note that the EPA cost estimate presented in the TSD (\$718 million total for Units 1 – 5) is 18% lower than the highest B&V cost estimate and less than 0.6% lower than the most recent B&V cost estimate APS submitted to EPA in 2010.*

*The cost analysis we presented in the TSD<sup>18</sup> and supporting documents<sup>19</sup> for our October 2010 proposed BART determination was based on the cost estimate updates prepared by B&V for APS dated August 19, 2008 and submitted by letter dated March 16, 2009.<sup>20</sup> In the TSD (see page 30), we explain that APS submitted an additional, more refined update to the cost estimates by letter dated April 22, 2010, but that submittal was labeled as Confidential Business Information. On September 9, 2010, APS confirmed that it did not consider this B&V report to be confidential and EPA included this updated cost analysis in our docket<sup>21</sup> and discussed it in our TSD. We noted in our TSD that the revised cost estimates for SCR submitted by APS in 2010 (\$722 million total for Units 1 – 5) were lower for all units compared to the cost estimates submitted by APS in March 2009 (\$874 million total for Units 1 – 5).*

*Our SCR cost analysis relied primarily on the highest cost estimates submitted by APS (dated August 19, 2008 and submitted March 16, 2009). EPA accepted all site-specific costs provided by APS cost categories (e.g., purchased equipment, installation) that are typically included in a cost estimate conducted in accordance with the EPA Control Cost Manual, and only excluded line item costs that are not explicitly included in the EPA Control Cost Manual or in a limited number of cases where EPA determined alternative costs were more appropriate or where APS did not provide sufficient explanation to justify different costs (e.g., costs of catalysts, interest rates). Therefore, we disagree with the commenters’ assertion that our cost analysis did not take into account the site-specific cost information supplied by APS. We again note that the EPA cost estimate presented in the TSD (\$718 million total for Units 1 – 5) is only 18% lower than the highest B&V cost estimate and less than 0.6% lower than the most recent B&V cost estimate APS submitted to EPA in 2010.*

*Our detailed, line-by-line analysis was included in the docket<sup>22</sup> for this proposed rulemaking and provided an explanation for why we retained, modified, or rejected each line item in the SCR cost estimate for each of the five units at FCPP.*

*For example, APS provided site-specific estimates for individual components of the SCR system, while the equations in EPA Control Cost Manual yield overall system costs. In the TSD for our proposed rulemaking, we generally accepted the component costs estimated by B&V, including such items as costly new preheaters and new induced draft and forced draft fans that are not included in the EPA Control Cost Manual equations but were deemed by B&V to be*

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<sup>17</sup> The OAQPS Control Cost Manual is now called the EPA Control Cost Manual. The EPA Control Cost Manual is available from the following website: <http://www.epa.gov/ttn/catc1/products.html#cccinfo>.

<sup>18</sup> “TSD Proposal – Technical Support Document 10-6-10”, Document No. EPA-R09-OAR-2010-0683-0002.

<sup>19</sup> “TSD ref [40] Four Corners SCR Cost Analysis (EPA) 8-26-10”, Document No. EPA-R09-OAR-2010-0683-0033.

<sup>20</sup> “APS Submission to EPA 3-2009 plus attachments”, Document No. EPA-R09-OAR-2010-0683-0015.

<sup>21</sup> “TSD ref [42] NOx Compliance Study”, Document No. EPA-R09-OAR-2010-0683-0034.

<sup>22</sup> “TSD ref [40] Four Corners SCR Cost Analysis (EPA) 8-26-10”, Document No. EPA-R09-OAR-2010-0683-0033.

necessary at FCPP due to retrofit considerations. However, we did not include the costs included for variable frequency drives for the new fans, which are not required for SCR, or the costs for unspecified “miscellaneous equipment.” The cost estimate did not provide information documenting the need for these line items or otherwise justifying their inclusion.

In addition, we used the EPA Control Cost Manual equations and a catalyst cost estimate provided by a vendor of ultra low-oxidation catalysts to estimate the cost of the initial catalyst (included under total capital costs) and replacement catalyst (included under total annual costs) for our revised costs. This vendor cost was substantially less than the cost estimated by B&V for the catalyst. In addition, typically, the vendor cost includes the disposal of the spent catalyst; therefore, the catalyst disposal cost was not included as a separate line item in our revised costs although it was included as an annual cost in the B&V cost estimate. We also applied what we believe is a more realistic tax rate of 6 percent, rather than the 10 percent in the B&V estimate. The state of New Mexico does not impose a sales tax; rather, New Mexico applies a gross receipts tax on businesses and services in New Mexico.<sup>23</sup> New Mexico reports that this tax varies throughout the state from 5.125% to 8.6875%. EPA’s use of a 6% tax rate is generally consistent with the tax rate the New Mexico Environment Department (NMED) applies in its emission control cost estimates of 6.2% to account for the gross receipts tax.<sup>24</sup>

Using Units 4 and 5 (which had identical cost estimates in the 2008 B&V estimates) as examples, other notable line items in the estimated Total Capital Investment in the APS submittal that we did not include in our cost analysis are “owners costs”, “side effect mitigation”, and “lost revenue”:

- “Owners cost” was described by the commenters as typical expenditures that an owner will experience during an air quality control retrofit project, such as costs for project development, financing, project management, plant startup/construction support, and taxes/advisory fees/legal. The commenters calculated these costs at 3 percent of the Total Direct Cost for the units. As such, these estimates do not truly represent a site-specific consideration of such costs. The commenters did not provide any documentation specific to FCPP or SCR. In addition, such costs are not included in the EPA Control Cost Manual. Therefore we exclude this cost of \$5.6 million in our revised cost estimate.
- “Side effect mitigation” was referred by the commenters as additional measures included to reduce emissions of SO<sub>3</sub> at a cost of \$7 million. However, EPA calculated catalyst cost based on the use of an ultra low oxidation catalyst, so we do not agree that such side effect mitigation measures are needed.
- “Lost revenue” of \$14.4 million was estimated by the commenters for an “extended outage.” APS did not provide sufficient information for EPA to determine that SCR equipment could not be installed during scheduled outages and we excluded this cost in our revised cost estimate.

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<sup>23</sup> <http://www.tax.newmexico.gov/All-Taxes/Pages/Gross-Receipts-Tax.aspx>.

<sup>24</sup> Personal communication between Elizabeth Bisbey-Kuehn, NMED and Anita Lee, EPA Region 9. September 2, 2011. See “Memo to file 9-2-11 voicemail from NMED.docx” in the docket for this final rulemaking.

*It should be noted that in the revised cost estimates submitted by APS in 2010, B&V no longer included side effect mitigation and significantly reduced estimated taxes and lost revenue. For Unit 4 the total for these three cost elements fell from about \$37.8 million to only \$4.3 million in the 2010 APS submittal. The updated Total Capital Investment estimates for Units 4 and 5 in the 2010 submittal averaged about \$212.5 million, which is slightly lower than our revised cost estimate of \$217.7 million for each unit.<sup>25</sup> The refined Total Capital Investment estimates in the 2010 submittal for Units 1-3 remained slightly higher (about 2 to 7 percent) than our revised cost estimates based on the 2009 submittal. The general agreement between the 2010 B&V refined cost estimates and EPA's cost estimates suggests that our BART determination would not be substantially different if we had relied instead solely on B&V's 2010 cost estimates for FCPP because the cost effectiveness values would be similar.*

*In terms of annual cost estimates, the difference between the APS submittals (2009 and 2010) and our revised cost estimates is larger. The annual costs for Units 4 and 5 in the 2009 APS submittal are nearly twice the amount of EPA's revised cost estimate even though our revised capital cost estimate is only 18 percent less than the B&V estimate.*

*The large difference in annual costs results mainly from differing assumptions used in the "capital recovery" estimates, which account for over three fourths of the overall difference between APS and EPA estimated annual costs. Capital recovery reflects the effective annual cost to the facility of borrowing the capital to pay for the SCR system. This element of annual cost is the product of the Total Capital Investment and the Capital Recovery Factor (CRF). The CRF, in turn, is calculated using a formula based on the assumed interest rate and equipment life.*

*In its cost estimates for APS, B&V assumed an interest rate of 15% and an equipment life of 20 years. While we also assumed an equipment life of 20 years, we based our CRF on an interest rate of 7%. The 15% interest rate used by APS to calculate capital recovery for the SCR installation is too high. For cost analyses related to government regulations, an appropriate "social" interest (discount) rate should be used. The latest real interest rate for cost effectiveness analyses published by the Office of Management and Budget (OMB) is 2.8% for a 20 year period (Revised January 2008). EPA calculated capital recoveries using 3% and 7% interest rates in determining cost effectiveness for the Regulatory Impact Analysis (RIA) for the Guidelines for BART Determinations under the Regional Haze regulations.<sup>26</sup> Therefore, we used a conservative approach to calculate the capital recovery in our revised cost analysis using an interest rate of 7% and an equipment life of 20 years.*

*The APS submittal provided no justification for what appears to be an inflated interest rate (15%) in this period of historically low rates, and our interest rate of 7% is appropriately conservative for this cost analysis and consistent with the most conservative interest rate used in the RIA for the BART Guidelines. The other major contributors to the difference in annual cost*

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<sup>25</sup> "APS Submission to EPA 4-22-10 plus Attachments", Document No. EPA-R09-OAR-2010-0683-0016. In the 2010 APS submittal, B&V prepared separate estimates for Units 4 and 5 for the first time. Certain common equipment that would be shared by the two units was included in the capital costs for Unit 4, with the result that Total Capital Investment was estimated at about \$223.8 million and \$201.3 million for Units 4 and 5, respectively.

<sup>26</sup> Regulatory Impact Analysis for the Final Clean Air Visibility Rule or the Guidelines for Best Available Retrofit Technology (BART) Determinations Under the Regional Haze Regulations, EPA-0452/R-05-004, June 2005.

*estimates between the APS 2009 submittal and our revised cost estimate are maintenance labor and materials (8% of the difference), costs related to catalyst replacement (13%), and the difference between estimates of Total Capital Investment (also a factor in determining annual capital recovery – 16%).*

*The difference between estimates of maintenance labor and materials is primarily related to the method of calculation, but is also affected by the difference in capital cost estimates. In our revised cost estimate, we applied the methodology specified in the EPA Control Cost Manual which determines this annual cost as 1.5% of the Total Capital Investment. In the 2009 APS submittal, this cost element is estimated as 3% of Total Direct Costs (a subset of Total Capital Investment). APS did not provide sufficient information to justify its estimate that maintenance labor and materials would be 3% of Total Direct Costs.*

*As previously discussed, we determined the cost of initial catalyst and replacement catalyst based on the EPA Control Cost Manual methodology and a quote from a vendor for ultra low-oxidation catalyst that included spent catalyst disposal. The cost estimate prepared by B&V for the 2009 APS submittal included a significantly higher catalyst cost, used a different methodology for determining the annual cost of catalyst replacement, and included a separate cost for catalyst disposal. Again, APS did not provide sufficient information to justify the assumption that costs for spent catalyst disposal would be separate from the catalyst cost.*

*As noted above, in 2010 APS submitted an updated, refined cost estimate prepared by B&V. As discussed, this submittal included estimates of Total Capital Investment for Units 4 and 5 that were, on average, lower than our revised cost estimate for these units. Despite this fact, the average annual cost estimated by B&V for these two units (\$41.8 million) exceeded our estimate (\$28.4 million) by 45%. This difference is entirely due to the CRF used in the B&V calculations, which was again based on an assumed interest rate of 15%.<sup>27</sup> As explained previously, the interest rate that we used in our calculations (7%) is in itself conservative and is more appropriate for these calculations than the high rate used by APS/B&V.*

*In addition, we disagree with the commenters' assertion that our analysis is not consistent with the D.C. Circuit's American Corn Growers decision. As noted, we incorporated site-specific cost information provided by APS where documented and justified. In addition, we*

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<sup>27</sup> In the 2010 submittal for Units 4 and 5, B&V very significantly reduced the estimate for maintenance labor and materials and somewhat reduced the estimate for catalyst replacement and spent catalyst disposal. Although this estimate included some line items not included in their earlier estimate or our cost estimate (such as yearly emissions testing and fly ash sampling and analysis), the total of all annual costs other than capital recovery was less than our estimate for this class of costs. Thus, for Units 4 and 5 the entire excess annual cost in the 2010 submittal can be ascribed to the CRF and the interest rate used to calculate it. For Units 1-3, the estimates of annual costs submitted by APS in 2010 exceed our estimates by from 65 to 73% even though their Total Capital Investment estimates exceed ours by only 2 to 7%. While the CRF, with its high underlying interest rate, is the predominant cause for the differences between these annual cost estimates, it is not the sole cause. Because Total Capital Investment is a factor in the calculation of capital recovery, the slightly higher estimates are a small factor for Units 1-3. In addition, the non-capital recovery annual costs estimated for these units in the 2010 submittal continue to exceed our estimates, primarily due to maintenance labor and materials and catalyst replacement and disposal costs (which were not reduced from the 2009 submittal for these units). Nevertheless, the value of the CRF accounts for over three quarters of the difference between the estimate of total annual costs in the 2010 APS submittal and our estimate.

do not agree that use of the EPA Control Cost Manual alone necessarily constitutes a failure to conduct a cost analysis on a source-specific basis. The costing methodology in the EPA Control Cost Manual requires as input certain source-specific design characteristics and, therefore, the results are a source-specific estimate of costs.

Regarding the Shaw Group report's comment on the statement in the EPA Control Cost Manual about its suitability for use with EGUs, we believe that the text of the Manual was improperly taken out of context. The relevant text of the EPA Control Cost Manual<sup>28</sup> reads as follows:

... this Manual does not directly address the controls needed to control air pollution at electrical generating units (EGUs) because of the differences in accounting for utility sources. Electrical utilities generally employ the Electric Power Research Institute (EPRI) Technical Assistance Guidance (TAG) as the basis for their cost estimation processes.<sup>1</sup>

<sup>1</sup>This does not mean that this Manual is an inappropriate resource for utilities. In fact, many power plant permit applications use the Manual to develop their costs. However, comparisons between utilities and across the industry generally employ a process called "levelized costing" that is different from the methodology used here.

Thus, the full text of the Manual indicates that it is an appropriate resource for utilities, and that many power plant permit applications have used the EPA Control Cost Manual to develop their costs. In any case, we generally used equipment and labor costs provided in the APS cost estimate, except for those line items that we believed to be unjustified or unreasonable.

### **Comment:**

One of the owners of FCPP (0174) stated that EPA's discussion of costs associated with BART determinations for other Western power plants is misleading (citing page 32 of the TSD for EPA's proposed BART determination for FCPP). According to the commenter, EPA provides a number of examples of cost estimates developed by other Western power plants for installation of SCRs, but does not mention that in most of those cases, the permitting authorities rejected SCR and proposed combustion controls as BART. Furthermore, the commenter indicated that because none of those power plants have installed SCRs, the referenced estimates are not based on actual construction and operating costs.

### **Response:**

EPA disagrees with the commenter that our discussion of estimated costs in Table 16 of our TSD was misleading. Recent BART determinations have proposed and/or finalized SCR (San

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<sup>28</sup> "EPA Air Pollution Control Cost Manual", Sixth Edition, Document No. EPA/452/B-02-001, January 2002. Pg. 1-3. Available at <http://www.epa.gov/tncatc1/products.html#cccinfo>

*Juan Generating Station Units 1 – 4, Naughton Unit 3, Jim Bridger Units 1 and 2) or selective non-catalytic reduction (SNCR) (M.R. Young Units 1 and 2, Centralia Units 1 and 2).<sup>29</sup> EPA determined that the comparisons of these SCR costs are appropriate because they are based on recent BART cost estimates submitted by the power plants.*

*The commenter is correct in noting that the SCR cost effectiveness estimates included in the TSD represented cost estimates rather than actual construction and operating costs. The table was meant to compare the estimated cost effectiveness values for FCPP with other recent SCR BART cost estimates provided by coal-fired electric generating facilities in the Western United States, and was not intended to show the final cost effectiveness of actual SCR installations. EPA notes that actual construction and operating costs for these facilities are not yet available, and will not be available until these BART determinations are finalized and facilities have completed installation of its BART controls.*

**Comment:**

One of the owners of FCPP (0176/0177) noted that EPA selected combustion controls as presumptive BART for EGUs like FCPP because those controls are “more cost effective than post-combustion controls such as SCRs” (citing 70 FR 39134). According to the commenter, EPA’s analysis at that time for setting presumptive BART limits found that the cost effectiveness of combustion controls averaged less than \$600 per ton of NO<sub>x</sub> removed, while SCR averaged more than \$1,600 per ton.

The commenter’s (0176/0177) most recent cost analysis estimated that the average cost effectiveness of combustion controls for the five units at FCPP would range from \$524 to \$1,735 per ton of NO<sub>x</sub> removed, while the average cost effectiveness of SCR would range from \$4,215 to \$5,283 per ton. The commenter also noted that EPA’s estimate of average cost effectiveness for SCR at FCPP ranged from \$2,515 to \$3,163 per ton. The commenter stated that, at the low end, only the estimate of the average cost effectiveness of combustion controls is in line with EPA’s estimates of cost-effective controls, while the estimate of average cost effectiveness of SCR is significantly higher. Another one of FCPP’s owners (0168) also made this last point.

The commenter (0176/0177) asserted that there is no basis for EPA to depart from its own rules by concluding that SCR is BART for FCPP when this technology is many times more expensive than the EPA-determined cost effective level of controls for presumptive BART and costs far more than the levels EPA rejected as cost-ineffective for presumptive BART. The commenter contended that EPA’s disregard for its own cost effectiveness determination in the BART rules renders the concept and importance of the “cost effectiveness” BART factor meaningless.

**Response:**

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<sup>29</sup> See 76 FR 52388, August 22, 2011; 77 FR 33022, June 4, 2012; 77 FR 20894, April 6, 2012; 77 FR 30473, May 23, 2012



*EPA disagrees with this comment. Although the commenters argue that the BART Guidelines established a threshold for cost effectiveness against which future BART determinations must compare, the BART Guidelines did not establish a cost effectiveness threshold for all BART determinations. In developing the presumptive NO<sub>x</sub> limits for BART in 2005, EPA did not set the cost effectiveness values estimated for combustion controls as the threshold for determining whether a given control technology was or was not cost effective. If EPA had intended the cost effectiveness values estimated in 2005 to represent a threshold for BART, it is reasonable to assume that the BART Guidelines would have included those cost effectiveness values as thresholds in Appendix Y, and would have required future cost estimates to be presented in 2005 dollars to appropriately compare against those thresholds. The BART Guidelines do not set a numerical definition for “cost effective”, and the analysis of presumptive limits uses cost effectiveness as a means to broadly compare control technologies, not as a threshold for rejecting controls for an individual unit or facility that exceed the average cost effectiveness of combustion controls.*

*Additionally, a comparison of the average cost effectiveness estimates in the 2005 BART Guidelines against our cost effectiveness estimates for FCPP is not an “apples to apples” comparison. The technical support documentation for the 2005 BART Guidelines<sup>30</sup> indicate that cost effectiveness of controls was not determined based on site-specific cost estimates developed for each BART-eligible facility; rather cost estimates were determined using assumptions for capital and annual costs per kilowatt (kW)<sup>31</sup> or kilowatt-hour (kW-hr), and then scaled according to boiler size. The supporting information for the 2005 BART Guidelines estimate SCR costs for Units 4 and 5 at FCPP (capital cost = \$64 million, total annual cost = \$11 million) that are comparable to SCR cost estimates that were generated by NPS using the EPA Control Cost Manual (capital cost = \$53 million, total annual cost = \$10 million<sup>32</sup>). The same commenters have previously dismissed the NPS SCR cost estimates based on the EPA Control Cost Manual as being too low because it does not include site-specific costs.<sup>33</sup> The commenter appears to be selectively choosing to accept the EPA Control Cost Manual in one case (cost effectiveness of presumptive controls to serve as a bright line threshold), and reject it in another (cost effectiveness of post-combustion controls at FCPP): on one hand, the commenter rejected the EPA Control Cost Manual in favor of its own site-specific cost estimates because the EPA Control Cost Manual is unrealistically low, and on the other hand, the commenter uses the*

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<sup>30</sup> The technical supporting information is included in the docket for the final rulemaking for the BART Guidelines (EPA-HQ-OAR-2002-0076) and includes several documents supporting the presumptive NO<sub>x</sub> limits finalized in the BART Guidelines: (1) “Technical Support Document – Methodology for Developing BART NO<sub>x</sub> Presumptive Limits” dated June 15, 2005 (document no. EPA-HQ-OAR-2002-0076-0445), and (2) “Technical Support Document for BART NO<sub>x</sub> limits for Electric Generating Units Excel Spreadsheet”, dated June 15, 2005 (document no. EPA-HQ-OAR-2002-0076-0446).

<sup>31</sup> In the 2005 BART presumptive limit analysis, EPA estimated capital cost assuming SCR cost = \$100/kW.

<sup>32</sup> See Table 9 in the October 2010 TSD for the proposed BART determination for FCPP. In its comments on the ANPR, NPS revised its cost estimates for SCR on Units 4 and 5 to \$114 million (capital cost) and \$18 million (total annual cost) – see Table 12 in the TSD for the proposed BART determination. Document no. EPA-R09-OAR-2010-0683-0002.

<sup>33</sup> In the ANPRM, in addition to reporting APS’s cost estimates and EPA’s revisions to APS’s cost estimates, for reference, EPA also reported cost estimate analysis conducted by NPS and provided to EPA during consultations with the FLMs prior to our ANPRM. APS and other entities provided comments to EPA on the NPS cost estimates reported in the ANPRM, see document titled “Comments on ANPRM 09 0598 APS Comments and Exhibits” document ID number EPA-R09-OAR-2009-0598-0195.

*unrealistically low value from the EPA Control Cost Manual as a threshold to reject post-combustion controls because its site-specific cost estimates are higher. In short, the commenter's recommendation to use generalized cost estimates from the 2005 BART Guidelines as a bright line threshold for comparison with site-specific 2010 cost estimates is inconsistent with its own criticisms of the EPA Control Cost Manual.*

*EPA notes that the average cost effectiveness of combustion controls cited by the commenters in the development of the 2005 presumptive NO<sub>x</sub> limits (less than \$600 per ton) was calculated from national total annual costs divided by the national reductions expected from combustion controls. In the same technical documentation for the 2005 presumptive NO<sub>x</sub> limits, if considered unit by unit at each BART-eligible facility, the average cost effectiveness of combustion controls was estimated to be \$1,790 per ton (nearly three times higher than average cost effectiveness calculated from total national annual costs and total national NO<sub>x</sub> reductions), with a very large range of \$100 per ton to \$70,000 per ton, indicating that despite using combustion controls to set presumptive NO<sub>x</sub> limits, combustion controls will not be cost effective for all facilities – highlighting the need for site-specific 5-factor analyses in determining BART.*

*If, in assessing our BART determination for FCPP, EPA relied strictly on the cost effectiveness values in the 2005 BART Guidelines, as suggested by commenters, the Excel Spreadsheet provided as technical support to the presumptive NO<sub>x</sub> limits suggests cost effectiveness of combustion controls on Unit 5 at FCPP to be \$1,716 per ton, SCR to be just over \$1,000 per ton on Units 4 and 5, and ROFA to be over \$500 per ton. These estimates are strongly dependent on the assumed efficiency of the control technology, but if taken at face value, suggest that of the three options, ROFA would be most cost effective at FCPP, SCR is second most cost effective, and combustion controls are the least cost effective. It is notable that B&V, in its BART analysis conducted for FCPP, excluded ROFA for Units 4 and 5 because it has not been demonstrated on large units, thus leaving SCR as the most cost effective control for Unit 5 at FCPP according to the 2005 BART Guidelines.*

### **Comment:**

A number of commenters, including owners of FCPP (0168, 0174, 0176/0177) and a utility association (0169), stated that EPA's BART analysis for FCPP was inconsistent with its own regulations in that it failed to consider control costs as a function of visibility improvement. These commenters (0168.1, 0169.1, 0174, 0176/0177) typically stated that EPA's BART determination for FCPP must consider the cost effectiveness of control technology options in terms of dollars per deciview-improved.

Some of the commenters (0174, 0176/0177) pointed out that the *American Corn Growers* decision indicates that the CAA requires the consideration of control cost to include the degree of improvement in visibility that would result from control. *American Corn Growers*, 291 F3d at 6-7. One commenter (0176/0177) added that the BART rules encourage the use of a dollars-per-deciview-improved metric in addition to the dollars-per-ton-reduced metric (citing 70 FR 39170).

This commenter (0176/0177) indicated that this is an important measure of cost effectiveness which EPA failed to consider. The commenter stressed that before EPA proceeds further with this rulemaking, it must analyze the average and incremental cost effectiveness of the full range of control options on not only a dollar-per-ton-reduced but also a dollar-per-deciview-improved basis.

**Response:**

*The BART Guidelines require that cost effectiveness be calculated in terms of annualized dollars per ton of pollutant removed, or \$/ton.<sup>34</sup> The commenters are correct in that the BART Guidelines list the \$/deciview ratio as an additional cost effectiveness metric that can be employed along with \$/ton for use in a BART evaluation. However, the use of this metric further implies that additional thresholds or notions of acceptability, separate from the \$/ton metric, would need to be developed for BART determinations. We have not used this metric for BART purposes because (1) it is unnecessary in judging the cost effectiveness of BART, (2) it complicates the BART analysis, and (3) it is difficult to judge. In particular, the \$/deciview metric has not been widely used and is not well-understood as a comparative tool. In our experience, \$/deciview values tend to be very large because the metric is based on impacts at one Class I area on one day and does not take into account the number of affected Class I areas or the number of days of improvement that result from controlling emissions. In addition, the use of the \$/deciview suggests a level of precision in the CALPUFF model that may not be warranted. As a result, the \$/deciview can be misleading. We conclude that it is sufficient to analyze the cost effectiveness of potential BART controls using \$/ton, in conjunction with an assessment of the modeled visibility benefits of the BART control.*

*EPA considered cost of controls by discussing the total capital costs, annual costs, and \$/ton of NO<sub>x</sub> pollution reduced. Additionally, in response to comments received on our proposal, EPA included calculations and consideration of incremental cost effectiveness (see Section 3.2 of the Response to Comments document in the docket for this final rulemaking). EPA considered visibility impacts by discussing the deciview improvement resulting from controls, as well as the percent change in improvement. EPA determined that these metrics are sufficient in completing our five-factor analysis for FCPP.*

**Comment:**

One environmental advocacy group (0182) who favors assessing cumulative visibility impact and benefit across multiple Class I areas (see Section 7.0) argued that it is a more accurate depiction of costs to use a dollars-per-deciview-improved on a cumulative basis than to use a cost/ton basis standing alone. The commenter asserted that this metric provides a mechanism to ascribe meaningful value to pollution controls that would benefit numerous Class I areas.

**Response:**

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<sup>34</sup> 70 FR 39167

*EPA disagrees with the commenter that a \$/dv or \$/cumulative dv metric is a more accurate depiction of costs than the \$/ton metric. While a \$/dv metric and a \$/cumulative dv metric may provide some useful information to assess how pollution controls would benefit numerous Class I areas, as described in the response to the previous comment on use of the \$/dv metric, the BART Guidelines do not require consideration of \$/dv as a mandatory metric in a BART analysis. EPA considered cost of controls by discussing the total capital costs, annual costs, \$/ton, and incremental \$/ton (See Section 3.2), and considered visibility impacts by discussing the individual and cumulative deciview improvement resulting from SCR, as well as the percent change in improvement.*

**Comment:**

One commenter (0117), who stated that BART must be determined in the context of reasonable progress rather than in isolation (see Section 10.0 for more on the commenter's legal arguments), stated that the cost effectiveness metric used by EPA (i.e., \$/ton of NO<sub>x</sub> reduced) does not satisfy the statutory requirement to consider the cost to comply with the Regional Haze program because it does not include compliance costs related to requirements for reasonable progress.

**Response:**

*Congress identified BART as a key measure for ensuring reasonable progress. We disagree that BART must be determined in the context of reasonable progress. If anything, reasonable progress depends on BART. Because the Class I areas affected by emissions from FCPP are not achieving the glidepath, it is important that states, tribes, and EPA require reasonable measures to be implemented to ensure that progress is made towards the national visibility goal. The BART Guidelines specify that the cost of controls be estimated by identifying the emission units being controlled, defining the design parameters for emission controls, and developing a cost estimate based on those design parameters using the EPA Control Cost Manual while taking into account any site-specific design or other conditions that affect the cost of a particular BART control option. The BART Guidelines do not require the BART costs of compliance to consider costs associated with reasonable progress.*

*EPA disagrees that there is a statutory requirement for a BART analysis to consider the cost to comply with the Regional Haze program as a whole. In the Regional Haze provisions of the Clean Air Act (§169A – Visibility Protection for Federal Class I Areas), Section 169A(g) defines the determination of reasonable progress (§169A(g)(1)), separately from the determination of BART (§169A(g)(2)). In determining reasonable progress, the costs of compliance for a source subject to such requirements must be considered, and in determining BART, the costs of compliance from the use of such technology must be considered. Because the definitions for determining reasonable progress and BART are mutually exclusive, the statute does not require a cost analysis for a BART determination to include costs associated with reasonable progress.*

## **Comment:**

The Navajo Nation (0223) stated that EPA should analyze the affordability of controls under the supplemental proposal. The commenter noted that APS did not provide cost information for its proposed alternative, and EPA did not perform a detailed cost analysis. The commenter stated that EPA should perform a detailed analysis, rather than an approximation, of the cost of compliance for installing SCR on Units 4 and 5, including a consideration of the impacts of closing Units 1 – 3. The commenter suggested that line item costs should be provided for Units 4 and 5, taking into account the change in business structure and the demand for construction, labor, market, and material costs. The commenter cautioned that EPA and NPS should not use “outdated” sources that may underestimate compliance costs (see the comments above on the original cost analysis for BART) for this analysis or analyses for NGS or other coal-fired plants in the region that contribute to regional economies.

## **Response:**

*EPA disagrees with the commenter that we should perform a detailed cost analysis of the alternative emission control strategy, put forth in the supplemental proposal. APS did not provide any indication to EPA that the costs of installing SCR on only Units 4 and 5 under the alternative emission control strategy would significantly differ from the costs to install SCR on only Units 4 and 5 under BART.*

*EPA does not agree that the affordability (as a business decision for the owners) of the supplemental proposal for APS and other owners must be analyzed. Because APS, on behalf of all owners, suggested to EPA this BART Alternative<sup>35</sup>, EPA has no reason to believe that APS or the other owners may not be able to afford this option. Additionally, the affordability of installing controls is not a required element of a cost analysis for BART in the BART Guidelines, but may be considered in selecting the “best” alternative if “There may be unusual circumstances that justify taking into consideration the conditions of the plant and the economic effects of requiring the use of a given control technology”.<sup>36</sup> EPA conducted an affordability analysis for our proposed BART determination to assess whether the cost to produce electricity at FCPP would remain competitive compared to the market costs to purchase power if SCR were required on Units 1 – 5 at FCPP. The goal of this analysis was to determine whether our proposed BART determination would force FCPP to close entirely and thus create a significant adverse impact to the Navajo Nation. However, as stated previously, this analysis is not specifically required under the BART Guidelines.*

*The Navajo Nation requested that EPA provide an analysis of potential adverse impacts to the Navajo Nation of APS’s proposal to close Units 1 – 3 as an alternative emission control strategy to BART. EPA notes that the RHR, in assessing an alternative measure in lieu of BART (40 CFR 51.308(e)(2)) requires several elements in the alternative plan (e.g., demonstration that the alternative will achieve greater reasonable progress than BART, and that reductions are surplus to the baseline date of the SIP), but does not require an analysis of the cost of the alternative plan.*

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<sup>35</sup> “Signed Letter from APS to EPA 11-24-10”, Document No. EPA-R09-OAR-2010-0683-0078.

<sup>36</sup> See BART Guidelines, July 6, 2005, at 70 FR 39171.

*Although, an impact analysis of the alternative emission control strategy was not required under the Regional Haze Rule, as requested by the Navajo Nation and as part of EPA's customary practice of engaging in extensive and meaningful consultation with tribes and tribal authorities with regard to relevant Agency actions, EPA commissioned an analysis of the potential impact to the Navajo Nation of APS's option to close Units 1 – 3. The report will be provided to President Shelly by letter as a follow-up to our consultation with the Navajo Nation.*

*EPA also disagrees with the commenter that our cost analysis relies on “outdated” sources and may underestimate compliance costs. As discussed above, EPA has determined that the cost analysis conducted for our October 2010 BART proposal is conservative because it relies on the highest cost estimates submitted by APS, and reasonable because it incorporates the site-specific costs estimated by B&V for APS while also considering the allowed line item costs in the EPA Control Cost Manual. As noted above, our cost estimate is 18% lower than the highest B&V cost estimate submitted by APS in 2009, and less than 0.6% lower than the most recent cost B&V cost estimated submitted by APS in 2010. Therefore, reliance solely on APS's most recent cost estimate in lieu of the EPA's cost estimate presented in our proposed rulemaking would not result in substantive changes to our BART determination.*

### **3.2 Comments on Top-Down Analysis Versus Incremental Cost Effectiveness**

#### **Comment:**

A number of commenters, including owners of FCPP (0168, 0174, 0176/0177, 0179, 0185), the Navajo Nation (0223), and a utility industry association (0187), asserted that EPA's BART analysis was inconsistent with its own regulations in that it used a top-down analytic approach and failed to conduct an incremental cost evaluation. These commenters typically noted that the BART rules establish that both average cost effectiveness and incremental cost effectiveness are to be used in the evaluation of BART (often citing 70 FR 39127, 39167-68).

Some of these commenters (0168, 0176/0177, 0179, 0185, 0187) added that a top-down approach, which EPA uses for Best Available Control Technology (BACT) analyses, is inappropriate for a BART analysis. One of the commenters (0176/0177) noted that BACT requires the maximum degree of emissions reductions from new sources and major modifications, taking into account various statutory factors established for the Prevention of Significant Deterioration (PSD) program. The commenter indicated that for purposes of BACT, a top-down analysis (while not required by the CAA) may have some justification because new sources may more easily accommodate stringent control options. However, because BART applies only to retrofits of existing sources (i.e., not to new facility construction), the commenter argued that the most stringent controls may not be appropriate or cost effective for such existing sources. Accordingly, the commenter asserted that a top-down methodology that is designed to achieve maximum stringency and that fails to make a cost effectiveness comparison with less stringent control options cannot be appropriate in the BART setting. The commenter added that because a top-down cost assessment methodology is inconsistent with the BART rules and the

nature and purposes of the BART program, EPA must abandon this approach and instead apply the incremental cost effectiveness analysis described in the BART rules.

Another of the commenters (0187) stated that absent an incremental cost-effectiveness analysis, EPA has no basis for concluding that SCR is a cost-effective control or that it is BART for FCPP. A third commenter (0185) stated that given that EPA has failed to conduct an incremental cost-effectiveness assessment, its proposed BART determination must be rejected.

The Navajo Nation (0223) indicated that in using the top-down analysis, EPA failed to carry out the five-factor analysis for each of the technically feasible retrofit technologies as required by the BART Guidelines (citing 40 CFR part 51, Appendix Y, section I.F.2.c), including current combustion control technology which the BART Guidelines identify as presumptive BART (citing section IV.D.5). The commenter stated that by only analyzing a single technology which it chose in advance, EPA's analysis was clearly arbitrary and not in compliance with its own regulations. The commenter concluded that EPA's compliance cost analysis was fatally flawed.

**Response:**

*EPA disagrees with these comments. In the preamble to the final BART Guidelines, EPA discusses two options presented in the 2001 proposal and 2004 re-proposal of the guidelines for evaluating ranked control technology options (See discussion at 70 FR 39130). Under the first option, States would use a sequential process for conducting the analysis, beginning with a complete evaluation of the most stringent control option. The process described is a top-down approach analogous to the analysis we used in our proposed BART determination for FCPP. If the analysis shows no outstanding issues regarding cost or energy and non-air quality environmental impacts, the analysis is ended and the top level of technically-feasible controls is identified as the "best system of continuous emission reduction". The preamble describes an alternative decision-making approach that begins by evaluating the least stringent control technology (bottom-up approach) where the State would then consider the additional emissions reductions, costs, and other effects of successively more stringent control options. In the final guidelines, EPA decided that States should retain the discretion to evaluate control options in whatever order they choose, so long as the State explains its analysis of the CAA factors. Therefore, in conducting our BART determination for FCPP, EPA's top-down approach for assessing the five factors was consistent with the discretion allowed under the BART Guidelines. EPA additionally notes that the TSD for our proposed rulemaking included analyses of the costs, non-air impacts, and visibility improvements associated with combustion controls at FCPP (the level of control APS determined to be BART at FCPP), but that there is no requirement for a five-factor analysis on all potentially available control options if the top down approach is used and the top level of technically-feasible controls is selected (70 FR at 39130).*

**Comment:**

One of the owners of FCPP (0176/0177) who alleged that the BART rules require an analysis (see above) and provided an analysis comparing the costs of combustion controls to the

costs of SCR. According to the commenter's analysis, the incremental cost effectiveness of moving from combustion controls to SCR ranges from \$6,553 to \$8,605 per ton of NO<sub>x</sub> reduced for the five units at FCPP. This commenter and another FCPP owner (0168) asserted that this "extraordinarily high" incremental cost highlights the fact that combustion controls, not SCR, satisfy the cost effectiveness test applied by EPA in adopting the presumptive BART limits in the BART rules.

**Response:**

*EPA agrees that the BART Guidelines recommend consideration of both average and incremental cost effectiveness, however, EPA disagrees with the commenter that the incremental cost effectiveness should be a comparison between combustion controls and SCR for this particular facility. As discussed at length in the TSD for our proposed BART determination for FCPP, EPA has determined that combustion controls (burner modifications and overfire air, including ROFA) will not be effective at significantly reducing emissions at Four Corners due to inherent design and physical limitations of the boilers. Therefore, in estimating incremental cost, it is inappropriate to include combustion controls in the analysis for this particular facility. To respond to this comment, EPA conducted an incremental cost effectiveness analysis and included it in our docket for this final rulemaking.<sup>37</sup> Based on our incremental cost analysis, EPA has determined that the incremental cost of SCR compared to the next most stringent option is reasonable and does not support the commenter's conclusion that SCR is not BART for FCPP.*

*The BART Guidelines recommend two types of cost effectiveness calculations – average cost effectiveness and incremental cost effectiveness. Although there are no bright line thresholds for determining the acceptability of average and incremental cost effectiveness estimates, average cost effectiveness is the most commonly reported cost metric when comparing controls for BART and BACT determinations. Therefore, we focused on average cost effectiveness in our October 2010 BART analysis. However, we agree with commenters that the BART Guidelines do recommend consideration of both average and incremental cost effectiveness, therefore, we calculated incremental cost effectiveness using the methodology described in the BART Guidelines (see 70 FR 39167 – 39168), such that incremental cost effectiveness comparisons focus on the dominant alternatives that are identified by generating a "least-cost envelope" graphical plot. The BART Guidelines describes the least-cost envelope to represent the set of options that should be dominant in the choice of a specific option based on total annualized cost and expected emission reductions.*

*Based on the least-cost envelopes for Units 1 – 5 of the control technologies APS determined to be feasible at FCPP, the following NO<sub>x</sub> controls are the dominant options that form the least cost envelope: combustion optimization systems (COS), Low NO<sub>x</sub> burner (LNB), LNB+Overfire Air (OFA), LNB+OFA plus high energy reagent technology (LNB+OFA+HERT), ROTAMIX+ROFA, and SCR on Units 1 and 2; COS, LNB+OFA, LNB+OFA+HERT, SCR on Unit 3; and COS, LNB+OFA, SNCR+LNB+OFA, SCR on Units 4 and 5. The least cost envelope methodology thus excludes from consideration the technologies that fall outside of this least cost envelope. The incremental cost effectiveness for all options and for all dominant options is shown in the "Incremental cost.xlsx" spreadsheet included in the docket. Using the cost and*

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<sup>37</sup> See "Incremental cost.xlsx", in the docket for this final rulemaking.



*emission reduction estimates provided by B&V for APS, the incremental cost of SCR when considering all options and only the dominant options are comparable and ranges from approximately \$5,500/ton to \$18,000/ton. Incremental cost of SCR is lower on Units 4 and 5, and highest on Units 1, 2, and 3. This methodology already excludes the technologies APS determined were technically infeasible (technical feasibility was determined before the cost effectiveness determination) and also excludes technologies determined inferior from the least cost envelope plot. However, as discussed at length in the TSD for our proposed BART determination for FCPP, EPA has determined that combustion controls (burner modifications and overfire air, including ROFA) will not be effective at Four Corners, particularly on Units 1 – 3, due to inherent design and physical limitations of the boilers. Therefore, in estimating incremental cost, it is inappropriate to include an infeasible control technology in the analysis. If we exclude the control technologies that EPA has determined to be ineffective at FCPP, SNCR (without combustion controls) is the next most stringent alternative after SCR. The incremental cost of moving from SNCR to SCR ranges from \$3,500/ton to \$5,800/ton using cost and emission reduction estimates provided by APS. If we use the EPA’s revised cost estimate for SCR and EPA’s proposed NO<sub>x</sub> control efficiency of 80%, the incremental cost from SNCR to SCR ranges from \$2,500/ton to \$3,300/ton.*

*Based on our incremental cost analysis, EPA has determined that the incremental cost of SCR compared to selective non-catalytic reduction (SNCR), the next most stringent option (\$2,500 per ton to \$3,300 per ton), is reasonable and does not support the commenter’s conclusion that SCR is not BART for FCPP.*

### **3.3 Other Comments on Factor One**

#### **Comment:**

One public interest advocacy group (0112) agreed with EPA’s elimination of LNB technology from BART consideration based on the TSD discussion which concluded that since FCPP has had limited success in retrofitting Unit 2 with LNB technology, FCPP was unlikely to achieve significant NO<sub>x</sub> reductions by retrofitting any of its boilers with LNB technology.

In contrast, one of the owners of FCPP (0176/0177) asserted that EPA’s determination that “combustion controls are not likely to be effective control technologies at FCPP” (citing 75 FR 64226) was based on superficial analysis and was mistaken. The commenter cited Exhibit J to its comments on the ANPR,<sup>38</sup> which contains a detailed analysis of the use of LNB and OFA on FCPP’s units. According to the commenter, this analysis confirms that the use of advanced combustion controls on the five units at FCPP will reduce plant-wide NO<sub>x</sub> emissions by 34 percent.

#### **Response:**

*EPA disagrees with the commenter that Exhibit J of APS’s comments on the ANPR confirm that advanced combustion controls on all five units at FCPP will reduce plant-wide NO<sub>x</sub>*

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<sup>38</sup> This document can be found in the docket for the ANPR, “Comments on ANPRM 09 0598 APS Comments and Exhibits”, Document No. EPA-R09-OAR-2009-0598-0195.

emissions by 34%. Although APS makes that statement in its May 2, 2011 comment letter on the 2010 BART proposal, in its separate May 2, 2011 comment letter on the 2011 Supplemental proposal, APS explains that further reductions in the NO<sub>x</sub> emission limit for Units 4 and 5 is not appropriate for several reasons, including:

*As discussed in EPA's Supplemental Proposal, there are site-specific operational constraints at the Plant which will compromise its ability to comply with a lower emissions level, such as the high ash-content of the coal and the "cell-burner" configuration of the boiler. The Supplemental Proposal acknowledges that the cell-burner configuration in Units 4 and 5 is not conducive to the application of advanced combustion controls, typically employed prior to post-combustion processes such as SCR. Therefore, all the desired emission reductions must be achieved with the SCR alone, which limits the maximum achievable NO<sub>x</sub> reduction.*

*In this comment, APS contends that EPA's conclusion, that advanced combustion controls will not be effective at significantly reducing NO<sub>x</sub> emissions at FCPP, is accurate. Because of its conflicting statements, it is unclear to EPA whether APS believes advanced combustion controls will or will not be effective at FCPP. As outlined in the TSD for our 2010 BART proposal, EPA concludes that advanced combustion controls will not be effective at significantly reducing NO<sub>x</sub> emissions at FCPP, and therefore, our final BART determination requiring an 80% reduction in NO<sub>x</sub> is based on the application of only SCR.*

### **Comment:**

One private citizen (0107) stated that EPA must consider the use of supplemental steam from a concentrating solar power facility in determining BART for FCPP. The commenter attached numerous articles that describe this technology, and indicated that these articles establish that the technology is a viable option to reduce pollution from FCPP.

### **Response:**

*EPA disagrees with this comment that supplemental steam from a concentrating solar power facility is an appropriate technology to consider in order to reduce pollution from FCPP. The supplemental steam generated from a solar facility is intended to offset some of the fuel required to generate electricity. EPA does not have authority through BART to redefine a source, nor is it feasible for a solar concentrating facility to offset enough fuel use to reduce NO<sub>x</sub> emissions from coal combustion by 80% without the use of significant land area.*

*In 2010, EPA issued a PSD pre-construction permit to the City of Victorville, in the desert portion of southeastern California, to construct Victorville 2: a 563 megawatt (MW) natural-gas fired combined cycle power plant with a 250 acre solar thermal array to provide 50 MW to the total electrical generation from the 268 MW steam turbine<sup>39</sup>. In order to offset NO<sub>x</sub>*

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<sup>39</sup> See "PSD Permit Application April - 2007" or "Ambient Air Quality Impact Report", Document No. EPA-R09-OAR-2008-0406-0001 or EPA-R09-OAR-2008-0406-0016. In 2011, EPA issued a PSD permit to a nearly identical 563 MW (net) natural gas fired combined cycle power plant with a 251 acre concentration solar facility to provide a

*emissions by 80% at FCPP using supplemental steam from a concentration solar facility, we assume that the solar facility would need to provide 80% of the power at FCPP, or nearly 1,650 MW. Using the ratio of solar field acreage to electricity production (acres/MW) from Victorville 2 and a similar facility in Palmdale, California, we infer that approximately 8,250 acres (nearly 13 square miles) might be required to produce 1,650 MW of power. Even if EPA had authority to require FCPP to reduce emissions by implementing a concentrating solar facility, the land area and cost would likely prohibit substantial contributions from solar power to the total electricity generation from FCPP at this time. However, because EPA's final BART determination is an emissions limitation, rather than a technology requirement, and although EPA does not have authority to require this technology, APS may consider this technology, or others, in developing its plan to cost-effectively comply with EPA's final BART emission limit for NO<sub>x</sub>.*

**Comment:**

One commenter at a public hearing submitted written material (0190) describing “fuel lean gas reburn” technology, which the commenter stated should be considered in the BART determination for FCPP. These materials indicate that this technology reduces NO<sub>x</sub> emissions by 30 to 45 percent. In his oral testimony, the commenter added that the ammonia used in SCR systems is a hazardous material, which he would not like to see introduced into the area. He also stated that the RHR allows a long period of time to meet the visibility improvement goals, and he stated the use of fuel lean gas reburn technology in conjunction with combustion controls would be appropriate at this time.

**Response:**

*EPA disagrees with this comment. Fuel lean gas reburn technology was discussed in the TSD for our proposed BART determination. Table 3 of the TSD included natural gas reburn as an available NO<sub>x</sub> control option that B&V determined to be technically infeasible because the technology has not been used in similar type or size facilities. However, even if this technology was determined to be technically feasible, it ranked as a mid-range technology in terms of control efficiency (65% control only when combined with LNB). Because EPA's proposed BART determination is a NO<sub>x</sub> emission limit rather than a specific technology requirement, in complying with BART, APS may consider implementing a combination of other technologies in lieu of SCR provided the alternative can meet the NO<sub>x</sub> limit specified in the final FIP. In the absence of feasible control technologies that are capable of achieving 80% or greater reduction in NO<sub>x</sub> emissions, EPA assessed the cost of controls assuming SCR would be used to comply with the BART limit.*

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maximum of 50 MW to electric generation from the steam turbine to the City of Palmdale for the Palmdale Hybrid Power Project in California. See “Initial PSD Palmdale Permit Application” or “Fact Sheet and Ambient Air Quality Impact Report for the Proposed PHPP PSD Permit (SE-09-01)”, Document No. EPA-R09-OAR-2011-0560-0002 or Document No. EPA-R09-OAR-2011-0560-0004.

## **4.0 Comments on Factor Two – Economic, Energy, and Non-Air Quality Environmental Impacts**

### ***4.1 Comments on Economic Impacts***

#### **4.1.1 General Comments on Economic Impacts**

##### **Comment:**

In virtually identical comments submitted prior to the supplemental proposal, one public interest advocacy group (0094) and one environmental group (0146) offered comments on both FCPP and NGS stating that EPA’s analysis of historical and expected costs of electricity from FCPP neglect to include public health costs related to air pollution and the negative impacts to tourism resulting from loss of visibility. The commenters concluded that the cost-effectiveness metric used to determine BART at both plants must account for health costs related to poor air quality. The commenters requested that EPA consider economic costs on impacted communities and Class I federal areas for not “cleaning up” both facilities.

Two private citizens who submitted written comments at a public hearing (0190) similarly indicated that environmental and health costs related to FCPP should be considered along with energy costs. One private citizen (0181) also claimed that pollution from FCPP has impacted the region’s economic health because of costs the Four Corners region has sustained.

##### **Response:**

*EPA disagrees with the comment that the cost-effectiveness of BART must account for public health costs associated with poor air quality. Neither Section 169A of the Clean Air Act, nor the BART Guidelines, require that BART analyses include or quantify benefits to health or tourism. As discussed previously, although not required by the BART Guidelines, EPA did conduct an affordability analysis in our proposed BART determination to estimate whether the installation and operation of SCR on Units 1 – 5 at FCPP would render the cost to produce electricity at FCPP un-competitive compared to the cost to purchase electricity on the open market. Although a quantitative analysis of the health and tourism benefits is beyond the scope of what is required under BART EPA agrees with commenters that emission reductions achieved to improve visibility will also improve air quality. Improved air quality, in turn, affects public health and may enhance tourism in the area.*

*EPA notes that even if we had quantified the benefits to health and tourism, such an analysis would not likely have altered the outcome of our BART determination.*

##### **Comment:**

The Navajo Nation (0223), one federal agency (0224), and two of the owners of FCPP (0168, 0176/0177) stated that EPA must consider the collateral economic effects on the Navajo Nation and the surrounding communities of its BART determination. One of these commenters (0176/0177) noted that the BART rules permit broad economic effects to be considered in determining the appropriate control technology and emissions limitations (citing 70 FR 39169 and the June 2007 *Reasonable Progress Guidance*, page 5-1<sup>40</sup>). Another of the commenters (0223) stated that the BART Guidelines (citing 40 CFR Part 51, Appendix Y, sections IV.D.4.h.5 and IV.E.3) and EPA's federal trust responsibility (see related comments in Section 10.0) provide authority for considering the economic impacts to the Navajo Nation in the BART determination for FCPP.

The Navajo Nation (0223) provided background on the substantial economic interest that the Navajo Nation has in the continued operation of FCPP. The commenter noted that the Navajo reservation has little economic development and that the Navajo people who live there are among the poorest in the United States, with 42 percent of Navajo individuals living below the federal poverty line. The commenter indicated that FCPP is located on Navajo land pursuant to a lease agreement with the Navajo Nation, as is its coal supplier, the Navajo Mine; together these entities provide income to the Navajo Nation that contributes substantially to the Nation's economic viability and its sustainability as an independent sovereign:

- FCPP employs 586 people, 72 percent of whom are members of the Navajo Nation, with an annual payroll of \$41 million.
- The Navajo Mine employs 357 employees, 87 percent of whom are Navajo tribal members, with salary and benefits that exceed \$41 million.
- The Navajo Mine paid royalties and taxes to the Navajo Nation of approximately \$45.9 million in 2008.
- Together, those employed at FCPP and the Navajo Mine make up about 3 percent of the total Navajo Nation employed workforce, which is very important on the Navajo Nation where unemployment has hovered just below 50 percent for years.
- In 2008, the combined income derived from FCPP and NGS and the mines that supply them totaled approximately \$93.9 million, or about 55 percent of the Navajo Nation's General Funds Budget.

The Navajo Nation (0223) added that this resource extraction-based economy is the result of a conscious effort of the United States from the 1950s to develop the Nation's coal resources, often for the benefit of other parties (such as the non-Navajo communities of Phoenix and Tucson in southern Arizona who directly benefit from power allocated from NGS to pump water for the Central Arizona Project). The commenter asserted that for the federal government, through any agency, to now threaten the livelihood of the Nation by destroying the resource economy it created clearly violates the federal trust responsibility to the Navajo Nation. The commenter also stated that the Nation has already suffered the ripple effects of one EPA rulemaking that, through the imposition of financially untenable emissions controls, resulted in

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<sup>40</sup> See "Guidance for Setting Reasonable Progress Goals Under the Regional Haze Program", June 1, 2007, in the docket for this rulemaking.

the closure of the Mohave Generating Station, and as a consequence, the closure of the Black Mesa Mine. According to the commenter, if FCPP and the Navajo Mine were to close as the result of the imposition of cost-prohibitive emission controls, the resulting revenue and job losses would be cataclysmic for the Navajo Nation.

The Navajo Nation (0223) alleged that EPA gave virtually no consideration in its BART analysis to the potential impacts on the Navajo Nation. According to the commenter, EPA casually dismissed a real likelihood of disastrous economic impacts to the Navajo Nation by claiming that there is no “definitive information” that FCPP would close if SCR is made BART for FCPP and relying solely on its own economic analysis to conclude that FCPP “is expected to remain competitive.” The commenter asserted that as the Nation’s trustee, EPA failed to properly balance the gravity of the potential harm to the Nation should FCPP come to a different business decision regarding the future competitiveness of FCPP with the imposition of SCR. The commenter stated that where there is a great deal of uncertainty for FCPP because of other issues, e.g. ongoing lease renewal processes and needed changes in ownership structure of FCPP, EPA’s failure to weigh the impact of imposing SCR in that context is particularly troubling.

The Navajo Nation (0223) stated that EPA should have analyzed in detail the potential economic impacts to the Navajo Nation should EPA require the installation of costly control technologies that the commenter asserted exceed the requirements of the RHR. The commenter concluded that contrary to its trust responsibility, the RHR, and the BART Guidelines, EPA failed to factor into its BART analysis the true potential economic impacts of imposing SCR on FCPP, and failed to appropriately defer to the Navajo Nation’s reasonable wish to phase in SCR in a more conservative and cost-effective approach.

The Navajo Nation (0223) also pointed out that there are three coal-fired power plants located on or near the Navajo Nation (FCPP, NGS, and San Juan Generating Station (SJGS)) that are all subject to simultaneous BART rulemaking. The commenter indicated that all three power plants and the coal mines that supply them contribute to the Navajo Nation’s economy and regional economic dynamics, and that there are additional emissions sources (major and minor) contributing in varying percentages to emissions in the region. The commenter asserted that all these sources should be considered in crafting the BART FIP for FCPP, where the tribal and regional economic impacts must be balanced with the degree of visibility improvement that would meet reasonable progress.

Another of the commenters (0176/0177) gave an overview of the Navajo Nation’s comments on the ANPR for FCPP, particularly the importance of FCPP and the associated coal mine to the economy of the Navajo Nation and the significant impact on the Navajo economy if FCPP were to close as the result of the imposition cost-prohibitive emission controls. The commenter indicated that a BART determination requiring SCR at FCPP may make Units 1-3 uneconomical and force closure, and the same may be true for Units 4 and 5 depending on the disposition of Southern California Edison’s interest in those units.

The commenter (0176/0177) asserted that EPA must consider and respond to these potential impacts of its BART determination; EPA cannot simply dismiss this issue because “it has received no definitive information that FCPP intends to shut down or curtail operations”

(citing 75 FR 64227). The commenter stated that the economic role that FCPP plays in the region and with the Navajo Nation magnifies the importance of striking the right balance in a BART determination – especially given that the BART determination is about visibility and not about protecting public health.

The federal agency commenter (0224) noted that EPA’s current affordability analysis focuses primarily on increased costs to rate payers and the companies’ profitability, and stated that the analysis needs to incorporate the loss in revenue, jobs, and royalties resulting from the closure of Units 1-3 under the supplemental proposal. The commenter added that all key decision-making federal agencies must remain vigilant when making decisions that impact Navajo tribal trust resources and the economic well-being of the Navajo Nation.

Two private citizens who submitted written comments at a public hearing (0190) also expressed concern that additional regulation of FCPP could have negative economic impacts on the Navajo community.

**Response:**

*EPA agrees with commenters that the operation of FCPP and the Navajo Mine contribute significantly to the economy of the Navajo Nation and the Four Corners Region. However, we disagree with commenters that EPA casually dismissed the possibility of plant closure. It is not EPA’s intention to cause FCPP to shut down (nor is it within our regulatory authority under the RHR to require shutdown or to redesign of the source for BART). As expressed in comments from the Navajo Nation to our Advanced Notice of Proposed Rulemaking<sup>41</sup>, EPA understands that the Navajo Nation’s primary concern regarding the BART determination is the potential for FCPP closure. For this reason, EPA conducted an affordability analysis not typically included in a BART five-factor analysis in order to assess whether requiring SCR on all five units at FCPP would result in full closure of the power plant.*

*The assessment compared the cost of power from FCPP if SCR were required on all five units, to the estimated cost of replacement power, assuming the owners of FCPP were to decide to close the entire plant rather than make the SCR investment. The model was designed to answer the question as to which future alternative results in lower power costs: a) power produced at FCPP after installation of SCR, or b) replacing the power from FCPP with the appropriate amount of wholesale power purchases. If the model results suggested that it would be less costly for the owners to purchase replacement power on the open market than generate power itself after installing and operating SCR on all five units, then EPA would have taken that result, along with subsequent impacts to the Navajo Nation, into consideration in our proposed rulemaking. However, as discussed in the TSD for our proposed BART determination, the model results suggested that even if the owners of FCPP installed and operated SCR on all five units, it could still produce power at a lower cost than the cost to purchase replacement wholesale power on the open market.<sup>42</sup> Thus, EPA concluded in our proposed BART determination that requiring*

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<sup>41</sup> Comment letter from President Joe Shirley, Jr. dated March 1, 2010 in the docket for the ANPR: EPA-R09-OAR-2009-0583-0209.

<sup>42</sup> “FCPP Proposal – Technical Support Document 10-6-10”, Document No. EPA-R09-OAR-2010-0683-0002, “TSD Appendix B: Economic Analysis (EPA) of Proposed BART Determination on FCPP Final Report”,

*SCR as BART on all five units would not likely result in plant closure. EPA recognizes that market conditions for power on the wholesale market are highly variable and will likely differ now, or at any time in the future, compared to conditions that existed at the time of our proposed BART determination. However, no information was provided by the commenter to change our conclusion in the analysis we conducted for the proposed rulemaking that suggests installation of SCR on all five units would not likely result in plant closure.*

*EPA recognizes the importance of the power plants and the mines that fuel them as they relate to the economic well-being of the Navajo Nation. EPA understands the importance of quantifying potential impacts to the Nation of closures of one or more units at FCPP. At the request of the Navajo Nation, as part of EPA's customary practice of engaging in extensive and meaningful consultation with tribes and tribal authorities with regard to relevant Agency actions, EPA commissioned an analysis to estimate potential adverse impacts on the Navajo Nation of the optional BART Alternative. The analysis will be provided to President Shelly by letter as a follow-up to our consultation with the Navajo Nation.*

*With respect to the suggestion that an EPA rulemaking resulted in closure of the Mohave Generating Station several years ago, EPA would like to clarify that Mohave's closure was not the result of an EPA rulemaking. Rather, the owners of Mohave Generating Station entered into a Consent Decree with several environmental groups, including the Grand Canyon Trust, Sierra Club, and the National Parks Conservation Association. That Consent Decree required Mohave's owners to install pollution controls to reduce emissions of SO<sub>2</sub> and PM from the facility. The Consent Decree required installation of the pollution controls by the end of 2005. The decision by the owners of Mohave appears to have been shaped by numerous complex factors. EPA was not involved in the decision-making process or the regulatory proceedings surrounding it. The Mohave Generating Station used coal that was mixed with water and conveyed as slurry in a pipeline. The water to make the slurry was drawn from the N aquifer from the Hopi Reservation. EPA understands that a contract to use the water from the N aquifer expired in 2005 and was not renewed. The lack of a reliable source of water for the coal slurry likely contributed to the decision by the owners of the Mohave Generating Station to discontinue operations at the end of 2005. Furthermore, it is EPA's understanding that in 2006, Salt River Project (SRP), a co-owner of Mohave, sought to form a new ownership group to restart Mohave, including to install the new air pollution controls required by the Consent Decree as well as develop a new water supply system for the coal mine, however, SRP ended its efforts to restart Mohave because it could not negotiate its intended purchase of Southern California Edison's share of Mohave in time to restart by 2011.<sup>43</sup> Therefore, although EPA understands that the Navajo Nation and Hopi Tribe experienced adverse impacts from the closure of Mohave Generating Station in 2005, the closure and the failed efforts to restart Mohave are not attributable to, or the result of, EPA rulemakings.*

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Document No. EPA-R09-OAR-2010-0683-0005, "TSD ref [49] Economic Analysis of Proposed EPA Bart Determination on FCPP\_09-18-10 RATES.xlsx", Document No. EPA EPA-R09-OAR-2010-0683-0005-0040.

<sup>43</sup> See February 6, 2007 Media Advisory from SRP: "SRP Ceases Effort to Restart Mohave Generating Station; Concludes that Timeline Delays would Render the Facility Economically Unfeasible", and article in Power Engineering Magazine: <http://www.power-eng.com/articles/print/volume-111/issue-3/departments/startup/srp-decision-seen-as-ending-mohave-re-start.html>



**Comment:**

The Navajo Nation (0223) asserted that EPA failed to consult with the Nation prior to publishing the supplemental proposal and failed in its trust responsibility to consider the potential adverse impacts of the option to close Units 1 – 3. While conceding that the supplemental proposal is less likely to result in closure of the entire FCPP, the commenter noted that Units 1 – 3 represent 27 percent of the capacity of the plant and closing these units will affect the Navajo Nation’s tax revenues and jobs, and will affect production at the Navajo Mine as well. According to the commenter, in public hearings held in Farmington, NM, FCPP has reported that as a result of closing Units 1 – 3, it expects 190 to 200 jobs to be lost in the next 3 to 4 years due to attrition at FCPP, an expected \$5 million reduction in the possessory interest tax paid annually to the Nation, and a 30 percent reduced demand for coal at Navajo Mine. The commenter also stated that at the Navajo Mine, 150 to 200 jobs are expected to be lost over the next 3 years as a result of the reduced demand from closure of Units 1 – 3 at FCPP, with a resulting \$10 million reduction in annual coal royalties to the Navajo Nation.

The commenter (0223) stated that as the Navajo Nation’s trustee, and in determining a “better than BART” alternative, EPA nonetheless retains its obligation to analyze potential adverse impacts to the Navajo Nation. The commenter argued that EPA is violating its trust responsibility in not adequately assessing these impacts for a plant operating on Navajo Nation land and burning Navajo coal, especially where EPA must assume the Nation’s duties to its tribal members in making this determination in lieu of the Nation.

**Response:**

*A timeline of correspondence and consultation with the Navajo Nation and other tribes for EPA actions on FCPP and Navajo Generating Station is included in the docket for the final rulemaking.<sup>44</sup> EPA notes that the Regional Administrator of EPA Region 9 called President Joe Shirley on February 9, 2011 to inform him of EPA’s Supplemental Proposal. However, government-to-government consultation with the Navajo Nation on FCPP did not occur until May 19, 2011, with additional consultation occurring on June 13, 2012, prior to issuing our final rulemaking. The Navajo Nation raised concerns about the potential adverse impacts of the BART Alternative and requested that EPA conduct an analysis to estimate these impacts.*

*Although the RHR does not require a cost analysis of a BART alternative, at the request of the Navajo Nation and as part of EPA’s customary practice of engaging in extensive and meaningful consultation with tribes and tribal authorities with regard to relevant Agency actions, EPA commissioned an additional analysis to estimate potential adverse impacts on the Navajo Nation of the BART Alternative with respect to coal and power plant-related revenues. The report will be provided to President Shelly by letter as a follow-up to our consultation with the Navajo Nation.*

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<sup>44</sup> See document titled: “Timeline of all tribal consultations on BART.docx” in the docket for this final rulemaking.

**Comment:**

One environmental advocacy group (0182) commented that in rigorously addressing visibility-related pollutants, the Navajo Nation, New Mexico, the intermountain west, and the Colorado plateau stand to reap significant benefits and avoid serious consequences because such emissions have far-reaching impacts on local economies. The commenter noted that tourism is critical to the economy of the Navajo Nation, New Mexico, and the Four Corners region, and that many national parks and landmarks are impacted by FCPP. The commenter pointed out that visibility in such areas has been degraded, and that poor visibility affects park visitation and length of stays.

One public interest advocacy group (0143) similarly noted that national parks and monuments, wilderness areas, forests, and local culture bring tremendous economic benefit to the Four Corners region, and that residents rely on tourism and the region's natural resources for long-term economic growth and sustainability. The commenter added that oil and gas development, over-grazing, and prolonged drought combined with coal-fired power plant pollution have resulted in a continuing degradation of air quality and its impact on the soil and vegetation. This commenter supported reducing pollution for FCPP through implementing the supplemental proposal.

The environmental advocacy group (0182) also stated that installation of pollution controls creates short-term construction employment and permanent operations and management positions. Thus, the commenter asserted that installation of additional and upgraded pollution controls will result in jobs and revenue for the Navajo Nation and its citizens.

**Response:**

*EPA agrees that tourism is important to the economy of the Four Corners region, however, the economic benefits of tourism and the benefits of short-term construction employment associated with installation of air pollution controls are outside the scope of the BART analysis. The BART Guidelines require consideration of the costs of compliance, and do not similarly require an analysis of the economic benefits resulting from BART controls. The model used by EPA was developed to address the future comparative cost of power from FCPP with SCR against the wholesale power market to determine if FCPP would remain competitive if SCR were required as BART.*

**Comment:**

One owner of FCPP (0168) stated that EPA's proposal to require SCR at FCPP presents significant challenges and risks and, with regard to their resource planning, handicaps their ability to cost-effectively respond to changing conditions. The commenter pointed out that implementation of the BART proposal would require the commenter to make a significant capital investment in FCPP, which could only be recovered through long-term operation of the plant. According to the commenter, this would have the effect of locking FCPP into the commenter's generation portfolio for a considerable period or risk stranding those investments.

The commenter indicated that this loss of flexibility would hamper the commenter's ability to respond to future scenarios and likely preclude it from reacting to the following possible developments:

- Changes in the economic viability of coal resources due to the increasing costs of environmental regulations, including carbon limits.
- Changes in the acceptance of coal resources by state utility commissions.
- Low, sustained natural gas prices, which would favor natural gas resources over coal.
- Reduced demand for coal resources due to increases in renewable generation capacity and/or reductions in customer load due to energy efficiency and demand response programs.
- Advances in emission control technology.

The commenter (0168) asserted that this loss in flexibility and the risk it represents is completely unnecessary given that the Regional Haze program is intended to make gradual reductions in emissions over a decades-long period of time. The commenter stated that EPA should therefore recognize combustion controls as BART for FCPP and evaluate further reductions, such as installation of SCR, if it is shown to be justified in subsequent planning periods. (See more on this comment in Section 10.0.)

**Response:**

*EPA appreciates the perspectives shared in this comment, but we disagree that our five-factor BART analysis should consider the potential loss of an owner's flexibility to respond to possible future economic or regulatory scenarios. EPA cannot give substantial consideration in our BART analysis to external factors that are of uncertain magnitude and that may or may not occur. EPA further notes that the RHR allows for the development of BART alternatives that achieve greater reasonable progress than BART and EPA appreciates the fact that the owners of FCPP put forth an alternative that gives them more flexibility and results in greater emission reductions at FCPP.*

*EPA acknowledges that other potential environmental regulations or public policies may emerge which could also have an impact on the competitiveness of FCPP and that, should these new regulations or policies emerge, will require the plant owners to assess the economic impact to plant's competitiveness. However, the impacts studied in this analysis were limited in scope to determining likely effects from the proposed BART determination exclusively.*

#### **4.1.2 Comments on EPA's Economic Analysis**

**Comment:**

One public interest advocacy group (0112) concurred with the EPA's analysis that the potential increase to APS rate payers as a result of SCR is expected to be less than 5 percent, as described in the TSD. The commenter also stated support for EPA's analyses related to the

increase in electricity generation costs of SCR compared to estimated costs to purchase electricity in the wholesale market. The commenter asserted that EPA estimates are reasonable and that the average increase in the cost of generation at FCPP as a result of SCR implementation would be 22 percent, or \$0.0074/kWh, as stated in the TSD.

One of the owners of FCPP (0176/0177) stated that installation of BART controls would increase its average residential customer monthly bills by \$5.10 (3.8 percent) and larger industrial customer monthly bills by \$17,400 (6.4 percent). (We believe that the commenter was referring to SCR, although the commenter asserted that BART should be combustion controls.) The commenter also indicated that installing SCR and baghouses on Units 1–3 would increase the cost of electricity production on a \$/MWh basis by more than 50 percent which, in conjunction with other market and regulatory uncertainties, may make the units uneconomic. The commenter further stated that retrofitting SCR on Units 4 and 5 would raise the cost of generation at those units by more than 25 percent, and there is a reasonable possibility that such a cost increase would threaten the economic viability of those units.

Another one of the owners of FCPP Units 4 and 5 (0168), who also has ownership interest in NGS and SJGS, stated that if SCR were determined to be BART for all these power plants, the commenter would be facing approximately \$322 million in capital expenses over the next 5 years. The commenter indicated that such expenditures would increase the commenter's rates by 4 to 6 percent, which would be significant in its market area of Tucson because its economy is fragile and has endured an 8 percent rate increase (not adjusted for inflation) since 1992. The commenter stated that the Tucson area is struggling through difficult economic circumstances, and significantly higher electricity rates will place an enormous economic hardship on its customers and make any recovery more difficult for the community.

**Response:**

*EPA agrees with the first commenter (0112) that based upon our analysis the potential increase to APS rate payers as a result of SCR is expected to be less than 5 percent.*

*EPA cannot compare the estimated residential and industrial rate increase claimed by the second and third commenters with our analysis because the commenters did not provide information for us to evaluate their conclusions.*

*However, EPA notes that the installation of baghouses on Units 1-3 is no longer relevant because EPA has determined that it is not necessary or appropriate at this time to set new PM limits for Units 1 – 3. This is because EPA is finalizing this BART determination to allow APS to comply with either BART or the BART alternative, which involves the optional closure of Units 1 – 3, and as a backstop, if APS does not close Units 1 – 3, the MATS rule, which sets a filterable PM emission limit of 0.03 lb/MMBtu, is now final and would apply to those units.*

*While the commenter's suggested increase in the cost of power from Units 4 and 5 as a result of SCR (25% increase) is reasonably consistent with the results of the EPA analysis (22%) with respect to the power cost impact of SCR on all five FCPP units, it must be noted that the original EPA analysis did not evaluate SCR on Units 4 and 5 exclusively. Without evaluating the*

*modeling conducted by the commenter, it is not possible to compare the commenter's modeling results with the model from the EPA's proposed BART determination.*

*In order to provide a more complete response to the commenter's point regarding costs specific to Units 4 and 5, however, EPA re-ran the same model used in our proposed BART determination to assess the impact of SCR for only Units 4 and 5.<sup>45</sup> The model assumes that Units 1-3 are closed, and as such, it produces no power and does not impact total plant economics. This iteration of the model reported a 25-year net present value incremental cost of 14% for only Units 4 and 5. The difference in the EPA model between the 22% cost increase for all five units versus the 14% cost increase for only Units 4 and 5 is due to the fact that while the estimated capital costs and incremental operating costs for Units 1-3 account for 36 percent and 39 percent of the total modeled incremental capital and operating cost respectively for the entire plant, those three units account for only 27 percent of installed plant capacity. Thus, the "per unit" cost associated with Units 1-3 is significantly higher than Units 4 and 5.*

### **Comment:**

One of the owners of FCPP (0174) noted that based on the analysis performed in support of EPA's BART proposal for FCPP, EPA concluded that even if SCR is determined to be BART, the cost of generating power at FCPP would be less than the cost of purchasing power on the wholesale market, and that therefore a requirement to install SCR would not lead to closure of the plant. The commenter expressed the following concerns with the analysis:

- The analysis focuses on APS and Southern California Edison, and not on the other owners of FCPP. The use of "return on rate" based methodology would not apply to organizations of the commenter's type (public power) because it is not an investor-owned utility.
- Each of the FCPP owners has unique costs related to the plant and their own generation, transmission, and distribution costs. Therefore there are a multitude of company-specific factors that would impact a given owner's decision to invest additional capital in the plant for emission controls, none of which were specifically factored into the EPA analysis.
- The EPA analysis did not attempt to determine the impact of different assumptions, such as an uncertainty with the future price of coal, on the conclusions of the economic analysis. The "small difference" that EPA estimates between FCPP with SCR installed and cost of purchasing power to replace FCPP generation suggests that a small change in an underlying assumption (return on rate, coal price, carbon pricing, etc.) could result in economic results that show SCR to be a higher cost option than purchasing power.
- The EPA's analysis did not examine different "payback periods," but instead relied on a payback period of 25 years, which may be inappropriate because the useful life of the plant is far from certain. The remaining useful life of FCPP is dependent on many other factors – both political and regulatory in nature (citing comments by Commenter 0176/0177; see Section 6). Shorter payback periods should have been analyzed to determine the effect of this assumption on the conclusions of the analysis because a

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<sup>45</sup> See "Analysis of UNITS 4 & 5 SCR ONLY.xlsx" in the docket for this final rulemaking.

reduced payback period could result in FCPP power (with SCR costs included) exceeding wholesale market costs.

- The EPA should recognize that there is a real risk that one or more owners may decide not to invest in SCRs, which would force the shutdown of FCPP unless another owner could be found in a timely manner. The shutdown of FCPP would have significant adverse economic consequences on the Navajo Nation.
- If EPA were to consider these economic challenges and uncertainties in conjunction with the other BART statutory factors, EPA would conclude that combustion control should be determined to be BART for FCPP because it provides a cost-effective means to achieve visibility improvement in the first planning period. EPA can evaluate whether additional NO<sub>x</sub> reductions are warranted in subsequent planning periods, which is consistent with the RHR and would provide the FCPP owners with time to address the uncertainties facing the plant before making significant capital investment for SCR.

**Response:**

*EPA provided an analysis for our BART determination to assess whether the cost to produce electricity at FCPP would remain competitive compared to the market costs to purchase power if SCR were required on Units 1 – 5 at FCPP.*

*The commenter is correct that EPA calculated rate impacts for only two of the four investor-owned utilities that own FCPP and excluded others, including an owner that operates as a publicly-owned utility. The analysis estimating the increase in electricity generation costs is applicable to all owners of FCPP, and the rate impact analysis provided in the model was not intended to capture the rate impacts of all owners. APS and Southern California Edison (SCE) were selected because their combined ownership shares account for nearly 75% of the plant's output. In addition to our expectation that the utilities with the largest ownership share in FCPP would generally experience greater ratepayer impacts from capital expenditure projects like SCR installation, we also assumed that ratepayers of investor-owned utilities would likely experience larger economic impacts than public power customers due to the fundamental difference between their respective approaches to setting rates. Specifically, rates for public power utilities, in contrast to investor-owned utilities, do not include recovery for a margin above cost allowed as part of a regulated rate of return. Thus, all other variables being equal, one would expect the same capital investment to result in a larger rate impact for customers of investor-owned utilities than for customers of public power entities. Therefore, EPA continues to believe that our analysis of ratepayer impacts for only APS and SCE are appropriately conservative to demonstrate worst-case impacts to ratepayers.*

*EPA agrees with the commenter that there are many company-specific factors and a wide range of economic assumptions that would impact a given owner's decision to invest in SCR. Although many of those factors were outside the focus of the modeling because they were either unrelated to BART or were related to regulatory uncertainties in the future, Energy Strategies included a qualitative discussion in Appendix B to the TSD regarding decision variables that EPA assumed each owner must consider before making capital expenditures. Additionally, EPA*

*notes that the use of low, medium and high future projected prices for the Palo Verde Index represents a sensitivity analysis for the market comparison.*

*With respect to the “payback period” referenced by the commenter, the analysis for the proposed BART determination did not identify “payback periods.” Rather, the commenter appears to be referring to the 25-year period utilized for the discounted cash flow calculations within the model. EPA does not disagree with the commenter’s stated concern that shorter plant life, and thus shorter discounting periods, would yield different economic results. However, EPA disagrees with commenters that a shorter useful life should be considered in the analysis unless there is an enforceable obligation on APS to cease operations on a given date.*

### **Comment:**

One private citizen commenter (0180) provided comments on EPA’s economic analysis, which are summarized below:

- The report of the economic analysis appears to be inconsistent in that in numerous places (e.g., page 5) it shows the business as usual (BAU) and LNB cases to be less expensive than all other cases, while on page 20 it states that the 25-year non-discounted costs for the SCR case were lower than both the BAU and LNB/OFA cases.
- The market cases do not incorporate the impact of removing FCPP generation from the marketplace. Specifically, the shutdown of FCPP would, first, result in a lack of generation capacity in the market and affect the market price and, second, as the lack of base loaded generation was made up by natural gas fired combined cycle plants that are currently run to meet peak load, the increased need for natural gas may strain pipeline capacity and cause the price of natural gas to rise.
- The report of the analysis states that, “although new capital expense has not been considered in the BAU case, if it were and especially if the addition were to occur early in the time horizon envisioned in the economic model, the cost of the BAU case could increase materially with respect to other cases.” This statement is invalid, as new capital deployment would be required in any case regardless of whether SCR or LNB are installed.
- The report says on page 8, “It is reasonable to assume that the parties that rely on the continued operations of the mines and plants could be reasonably expected to make an economic decision and negotiate new leases that allow the plant to operate economically.” The commenter states that EPA seems to be unaware of the Mohave Generating Station, which serves as a counter-example to the statement in the report.

### **Response:**

*In the first bullet above, the commenter correctly identifies a discrepancy with the summary of the analysis. The impact report, included as Appendix B to the TSD<sup>46</sup> for the*

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<sup>46</sup> See Document titled “TSD Appendix B: Economic Analysis (EPA) of Proposed BART Determination on FCPP\_Final Report. EPA-R09-OAR-2010-0683-0005.

*proposed rulemaking, on page 20 incorrectly states that the incremental cost in the SCR case is lower than the LNB case, as well as all market cases. On page 20, under “Discussion of Modeling Results,” the final bullet should read, “As modeled, the SCR Case over 25-years returns a lower incremental, non-discounted cost per megawatt-hour than all market cases”. This incorrect statement in the summary of the impact report regarding incremental cost comparison between SCR and LNB was a summary statement written by Energy Strategies but was not directly relied upon by EPA in our TSD.*

*The commenter correctly points out that the analysis discussed in the report does not include the potential impacts, and associated Market Case costs, that could result in reaction to a shutdown of all units FCPP. The commenter suggests that a more complete approach to modeling the cost of the Market Case would include such variables as the cost of new base loaded gas-fired generation (in the marketplace or perhaps owned by the current FCPP owners) and the potential for such new gas generation to influence commodity natural gas pricing in the region. The result of including these additional costs in the Market Cases would be to increase the estimated cost to purchase power on the wholesale market. Thus, the Market Cases presented in the analysis that accompanied EPA’s TSD were conservatively low, and inclusion of the market-related impacts, as suggested by the commenter, would result in higher market values, thereby providing a larger “competitive cushion” for the installation of SCR at FCPP.*

*As noted by the commenter in the third bullet above, the report incorrectly states, “although new capital expense has not been considered in the BAU case, if it were and especially if the addition were to occur early in the time horizon envisioned in the model, the cost of the BAU case could increase materially with respect to other cases.” The statement should read, “...the cost of the BAU case could increase materially with respect to the Market Cases.” As the BAU case may or may not increase in cost due to future business as usual-related capital investment, the commenter is correct in suggesting that all retrofit cases (LNB and SCR) would have the same relative impact due to BAU investments. The potential for BAU investments to alter the comparative economics in the model are thus in relation to the Market Cases. However, commenters have not provided information to suggest that new capital expenses should be modeled in the BAU case, therefore, the commenter’s correction is well taken, but does not affect the validity of the modeling conducted for the TSD.*

*Contrary to the commenter’s statement in the fourth bullet above, EPA is aware of the regulatory and investment decision history surrounding the closure of the Mohave Generating Station. (For a detailed discussion related to the shutdown of Mohave Generating Station, please see our response above in Section 4.1.1).*

**Comment:**

Three private citizens (0119, 0128, 0201) disagreed with industry that costs are too high. One of the commenters stated that the reform measures are both reasonable and economically feasible. Another private citizen (0140) stated that APS should be responsible for the clean-up.

**Response:**



*We agree with the commenters that SCR is a reasonable, cost effective control technology for reducing emissions of NO<sub>x</sub> from FCPP.*

**Comment:**

One private citizen (0163/0164/0216) commented that the Navajo Nation previously stated that both the power plant and the Navajo Mine would close if SCR is required. The commenter took issue, noting that EPA indicated that FCPP electricity cost will still be market competitive with SCR. The commenter stated that the economic analysis (and other analyses) incorrectly used sub-bituminous coal heating values, rather than bituminous coal values, resulting in a “flawed and incorrect way to improve the health and visibility to the Four Corners area and Class I areas.” The commenter also contended that the EPA’s analysis stated that FCPP uses bituminous coal, although the APS BART analysis was based on sub-bituminous coal.

**Response:**

*EPA disagrees with this comment. With respect to the modeling of incremental costs associated with those cases where FCPP operations continue (i.e. BAU, LNB/OFA, and SCR), the type of coal burned and associated heat content were not germane to the analysis. The underlying costs of operation, including fuel quantity and heat content, as they flow through the summary economic statistics, are taken as-is from APS filings to the Federal Energy Regulatory Commission and were not modified with respect to the type of coal consumed.*

*This comment regarding coal classification is addressed further in Section 10.*

## ***4.2 Comments on Energy and Non-Air Quality Environmental Impacts***

**Comment:**

One private citizen (0180) stated that no consideration was given to the effect of removing FCPP generation from the grid. According to the commenter, the events of February 2, 2011 show there are times when gas-fired generation cannot replace coal-fired generation because there is not enough gas transportation capacity.

**Response:**

*EPA disagrees with the commenter that we should consider the effect of removing FCPP generation from the grid. As stated elsewhere in this document, it is not EPA’s intention, nor is it within our regulatory authority, to require closure or require a redefinition of the source, in order to comply with the BART requirement of the RHR. EPA notes that in our proposed BART determination EPA included an analysis to determine whether the installation and operation of SCR would increase the cost of power from FCPP such that it would no longer be competitive to the forecasted price of power in the western wholesale market. Thus, based on this analysis, EPA*

*determined that the installation and operation of SCR on Units 1 – 5 at FCPP should not force FCPP to close, thus the comment that EPA consider the effect of removing FCPP generation from the grid is not relevant. Furthermore, the owners of FCPP did not provide evidence that the installation of SCR would cause FCPP to close.*

*EPA also notes that APS proposed to purchase the shares of Units 4 and 5 currently owned by Southern California Edison in order close Units 1 – 3 (of which APS is sole owner) and install SCR on Units 4 and 5 as an alternative to BART. APS is currently seeking approval from the Arizona Corporation Commission, the California Public Utilities Commission, and the Federal Energy Regulatory Commission to implement its proposal<sup>47</sup>. Decisions on investing in pollution controls or shutting down units are made by the owners in conjunction with their oversight boards or public utility commissions.*

**Comment:**

Thirty-seven private citizens (0085, 0086, 0088, 0089, 0091, 0122, 0124, 0125, 0127, 0128, 0135, 0136, 0137, 0140, 0147, 0148, 0149, 0151, 0153, 0154, 0155, 0156, 0158, 0159, 0160, 0161, 0162, 0166, 0170, 0171, 0181, 0188, 0197, 0199, 0208, 0211, 0213) and two private citizens who submitted written comments at a public hearing (0190) stated that FCPP causes significant threats to public health due to its effects on air quality. Another private citizen (0186) implied the same concern, and is unwilling to trade a healthy environment for jobs or economic growth. In contrast, one private citizen who submitted a written comment at a public hearing (0190) questioned whether the haze contributes to health issues in the region.

A number of environmental and public interest advocacy groups (0143, 0182, 0183, 0190, 0194) provided comments on health and ecosystem impacts of the pollutants emitted by FCPP. These comments are summarized below.

One group of environmental advocacy groups (0182) stated that visibility-causing pollutants have far-reaching impacts on local economies, human health, and the well-being of waterways, soils, plants, and wildlife – in other words, an entire population and ecosystems. The commenter asserted that decreasing these pollutants will benefit all of these important areas of concern; failing to do so will cause or continue adverse impacts. The commenter’s thoughts on the economic impacts of these pollutants are summarized in Section 4.1.1 above.

Regarding health impacts, the commenter (0182) noted that the same pollutants that contribute to visibility impairment also harm public health – the fine particulates that cause regional haze can cause decreased lung function, aggravate asthma, and premature death in people with heart or lung disease. The commenter added that NO<sub>x</sub> and volatile organic compounds (VOCs) can also be precursors to ground-level ozone, or smog, which is associated with respiratory diseases, asthma attacks, and decreased lung function. According to the commenter, ozone concentrations in parks in the Four Corners region approach the current health standards, and likely violate anticipated lower standards. The commenter stated that ozone levels

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<sup>47</sup> On March 22, 2012, the California Public Utilities Commission approved the sale of SCE’s share of FCPP to APS. On April 18, 2012, the Arizona Corporation Commission approved APS’s purchase of SCE’s share of FCPP.

in many parts of New Mexico, Colorado, and Utah are already in the range of ozone levels deemed to be harmful to human health.

The commenter (0182) asserted that according to EPA figures, the total annual cost of implementing the RHR will range from \$1.4 – 1.5 billion, but in 2015 enforcement of the RHR will provide health benefits valued at \$8.4 – \$9.8 billion annually – preventing 1,600 premature deaths, 2,200 non-fatal heart attacks, 960 hospital admissions, and over 1 million lost school and work days every year. The commenter noted that although the RHR was designed to provide redress for visibility impairment, the BART Guidelines expressly provide for the consideration of non-air quality environmental impacts, which includes the environmental impact on human health.

The same commenter (0182) also contended that consideration of non-air quality impacts extends to impacts on wildlife and habitat as well as natural and cultural heritage. According to the commenter, the same haze-causing emissions also harm terrestrial and aquatic plants and animals, soil health, and water bodies by contributing to acid rain, ozone formation, and nitrogen deposition. The commenter cited EPA sources that allegedly indicate that nitrogen deposition in the Rocky Mountain National Park is at twice the critical load that the ecosystem can tolerate; that acid rain acidifies water bodies, contributes to tree damage at high altitudes, and accelerates decay of irreplaceable buildings, statues, and sculptures that are part of our nation's cultural heritage; and that ground-level ozone interferes with the ability of sensitive plants to produce and store food, damages the leaves of trees and other plants, and reduces forest growth and crop yields.

With these health and environmental considerations in mind, in addition to visibility and economic considerations discussed in other sections of this document, the commenter (0182) urged the EPA to finalize more stringent BART determinations for FCPP. The commenter's suggestions for BART also are discussed in other sections of this document.

An environmental advocacy group (0183) made similar comments regarding health and ecosystem impacts. The commenter noted that FCPP is a very large emitter of NO<sub>x</sub>, which contributes to ozone formation. According to the commenter, the area around FCPP is subject to atmospheric thermal inversions in the winter months, and some counties have been experiencing ozone concentrations in excess of the EPA's proposed range for the 8-hour ozone NAAQS. The commenter cited the incidence of asthma and other respiratory diseases and noted that such sensitive populations are particularly susceptible to the effects of ozone. In addition, the commenter pointed out that ozone causes injury and damage to plants. The commenter added that NO<sub>x</sub> emissions contribute to nitrate deposition which can disrupt natural systems. Based on these points, the commenter argued that EPA must consider reducing the NO<sub>x</sub> limit in both the proposed BART determination and the supplemental proposal.

This commenter (0183) stated that FCPP's PM emission rate is one of the top 10 point sources of PM in the American West. The commenter contended that EPA has stated that airborne PM is linked to serious health effects, even at concentrations currently allowed by the NAAQS.<sup>48</sup> The commenter also stated that black carbon (a type of PM) is the most powerful

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<sup>48</sup> citing <http://www.epa.gov/nheerl/research/pm/>

climate forcing agent known, and that it has recently been determined to be the second or third largest climate forcing agent. The commenter noted approvingly that the supplemental proposal would provide additional PM reductions through the retirement of Units 1 – 3.

The commenter (0183) noted that FCPP is a significant source of mercury emissions and provided information on the health and ecosystem effects of mercury, as well as on the deposition of mercury and the levels of mercury found in the Four Corners area. In addition, the commenter stated that FCPP emits more than 16 million tons per year (tpy) of CO<sub>2</sub>, and that such emissions contribute significantly to climate change which is likely to result in increasing temperatures and increase drought in the Southwest. The commenter noted with approval that the supplemental proposal would reduce emissions of both mercury and CO<sub>2</sub>.

One public interest advocacy group (0143) also discussed the health impacts associated with emissions from FCPP. The commenter indicated that the emission reductions associated with the supplemental proposal would work toward improving health and environmental justice for people in the Four Corners area, including a large Native American population. The commenter stated that health care costs resulting from coal-fired power plant pollution are significant for the local economy, quoting figures from a study by Abt Associates estimating the health impacts and associated costs in the area. The commenter also indicated that prevailing winds carry pollutants from FCPP to La Plata County, CO, and that early findings from a new mercury-monitoring project indicate that a significant amount of mercury arrives under dry condition via wind at two monitors in southwest Colorado. Although the sources of the mercury have not been verified, the commenter noted that coal-fired power plants are known to be a major contributor of mercury to the atmosphere and that FCPP is reported to release more than 1,400 pounds of mercury per year. The commenter stated that known pollutants from coal-fired power plants contribute negatively to health, vegetation, and soil impacts. The commenter also pointed out that NO<sub>x</sub> emissions (of which FCPP is a large source) along with the Four Corners' abundant sunshine create ground-level ozone and that if EPA lowers the ozone NAAQS, La Plata County could be in nonattainment. While praising EPA's supplemental proposal as a good first step, the commenter urged EPA to expand the region's reliance on lower carbon and water efficient energy sources, adding that federal programs are available to assist tribes to evaluate and install renewable sources of energy.

Another environmental advocacy group (0194) also quoted figures from the Abt Associates study on the health impacts of emissions from power plants in the region. The commenter supported the proposed measures to reduce NO<sub>x</sub> emissions, but noted that the proposal did not address GHGs. The commenter encouraged EPA to take timely action to help transition energy production away from fossil fuels to clean energy sources, adding that New Mexico has abundant solar, wind, and geothermal energy resources.

One environmental advocacy group that spoke at a public hearing also submitted written material (0190) asking EPA and APS to consider what they would do if FCPP was located in their communities. The commenter supported a transition to renewable energy that will keep jobs in the area and clean up the air in the Four Corners region. The commenter made the following points:

- A formal Health Impact Assessment should be conducted by independent experts before EPA's final decision to answer such questions as whether shutting down Units 1 – 3 is sufficient to protect local health, and what health impacts would result from delaying pollution controls on Units 4 and 5 until 2018.
- The acceptable limit of pollution from FCPP is no more than would be allowed in the wealthiest, most privileged communities in the United States; that is, the decision should be made considering health equity.
- The spiritual aspect of the air, the earth, and water of Mother Earth must be taken into consideration because to the Navajo people, clean air, water, and land are not commodities to be bargained with, but are sacred elements of life to be protected at all costs.

**Response:**

*EPA agrees that there are potential benefits to human health and the environment from reducing the emissions of NO<sub>x</sub>. Quantifying health benefits is not within the scope of the BART five factor analysis required under the Clean Air Act (§169A(g)), which specifies that in determining BART, the State (or Administrator) “shall take into consideration the costs of compliance, the energy and nonair quality environmental impacts of compliance, any existing pollution control technology in use at the source, the remaining useful life of the source, and the degree of improvement in visibility which may reasonably be anticipated to result from the use of such technology”. The BART Guidelines provides additional information on how to analyze “non-air quality environmental impacts, and focuses on adverse environmental impacts associated with control technologies, i.e., generation of solid or hazardous wastes and discharges of polluted water, that have the potential to affect the selection or elimination of a control alternative (see 70 FR at 39169). Thus, although the BART Guidelines do state that relative environmental impacts (both positive and negative) of alternatives can be compared with each other, they state that “if you propose to adopt the most stringent alternative, then it is not necessary to perform this analysis of environmental impacts for the entire list of technologies”. EPA agrees with commenters that controlling pollutant emissions may have co-benefits for reducing ozone production and acid deposition, EPA does not interpret the BART Guidelines to require quantification of human health or environmental co-benefits in determining BART, particularly if the most stringent BART option is finalized. Similarly, EPA does not interpret the BART guidelines to require human health or environmental assessments of alternative compliance strategies as long as we have determined that the alternative strategy achieves better progress towards the national visibility goal.*

**Comment:**

The Navajo Nation (0223) recognized that human exposure to environmental hazards is an important factor in assessing impacts of FCPP (and NGS and SJGS) and for framing a rule to meet the regional haze requirements of the CAA, and anticipated that within each implementation phase of the RHR there will be integration of health assessments and studies which are interrelated to the goal of promoting a strong economy and healthy environment and

are vital to the sovereignty of the Navajo Nation. The commenter encouraged EPA to pursue health studies in collaboration with the Navajo Nation to study local risks associated with exposure to criteria pollutants, indoor air pollutants, and other contributing air pollutants, from which improved public health and effective rulemakings under the CAA may be achieved.

In addition, the commenter (0223) noted that EPA has stated that BART determinations will improve public health in addition to improving visibility in the region, and the commenter anticipated that EPA will take the same stance in the forthcoming NGS proposed rule. On that issue the commenter provided the following comments:

- Very little public health data is available in the Four Corners region and on the Navajo and Hopi reservations to establish a meaningful public health baseline.
- A meaningful public health baseline is critical to measuring the impacts to public health for any BART option, or any other pending or future EPA rule making.
- The available research literature (Morris 1990, Robin 1995, Bunnell 2010) all conclude that poor indoor air quality is a significant risk factor impacting the public health of Navajos, especially those Navajos who heat their homes with non-optimal heating devices.
- The EPA should generate and collect more public health research/data that characterizes the actual public health impacts attributed to the emissions from the FCPP and NGS; and actual public health impacts attributed to other emission sources.

**Response:**

*Assessing human exposure and quantifying health benefits are outside the scope of the requirements of the Regional Haze Rule. EPA sets National Ambient Air Quality Standards (NAAQS) to establish levels of air quality that are protective of public health, including the health of sensitive populations, for a number of pollutants including particulate matter. These "sensitive" populations include asthmatics, children, and the elderly. At this time the Navajo Nation is not identified as out of attainment with any of the NAAQS. However, EPA recognizes that there are significant concerns about risk and exposure to air pollutants on the Navajo Nation and EPA will continue discussions with the Navajo Nation and will involve other federal agencies, as appropriate, to help address these concerns.*

**Comment:**

The Navajo Nation (0223) stated that EPA has failed to consider the non-air impacts associated with transportation and storage of ammonia for the proposed SCR technology. The commenter alleged that EPA took a "safe approach" by hypothesizing the use of urea as the SCR reagent as proposed by APS, and considered only the impacts to air quality from increased truck traffic in the area from transportation of urea (not the risks associated with accidental releases and spills). The commenter also noted that EPA did not assess the potential risks associated with the transportation, storage, handling, and accidental release of anhydrous ammonia or aqueous ammonia, which are typical reagents used in SCR. The commenter asserted that because

anhydrous ammonia and aqueous ammonia above 20 percent are considered acutely hazardous and accidental releases are reportable to local, state, and federal agencies, EPA should conduct an extensive study of the risks associated with the use of these potential SCR reagents based on the size of the plant and its location both by proximity to Navajo communities and residents and to the nearest feasible rail line. The commenter indicated that transport and storage of anhydrous ammonia would require development of a Risk Management Plan and Process Safety Management plan by both the plant and the transfer facility at the rail line. The commenter added that trucking of ammonia would be across Navajo land, potentially putting Navajo communities at risk, and would generate air emissions of NO<sub>x</sub>, CO, VOC, and PM<sub>10</sub>. The commenter concluded that these risks and associated costs should have been analyzed in EPA's BART analysis as part of factor two, considering EPA's trust responsibility to the Navajo People.

**Response:**

*EPA disagrees with the comment that we chose the "safe approach" by analyzing for the use of urea instead of anhydrous ammonia. APS has consistently indicated that it would use urea if SCR were required as BART, providing estimated costs for urea as the reagent and for urea storage and handling equipment. Our approach was appropriate in light of the plans submitted by the facility. Accordingly, the study did not evaluate any risks associated with spills or releases of urea because urea is not classified as a hazardous or toxic substance under any federal environmental program. Such spills or releases are not reportable incidents under emergency management requirements.*

*EPA further notes that the results of a study to evaluate the potential risks associated with increased emissions to transport urea to FCPP was included in the TSD for the proposed rulemaking as Appendix A and can be found in the docket for the rulemaking, Document No. EPA-R09-OAR-2010-0683-0004. This study included an analysis of the estimated increase in air pollutant emissions (both criteria pollutants and hazardous air pollutants) resulting from the increased truck traffic necessary to transport urea to FCPP for use by the SCR system. EPA also summarized these in the TSD for our proposed rulemaking.*

*Based on the study included as Appendix A to the TSD, EPA determined that the adverse impacts associated with the use of SCR at FCPP, using urea as planned by the facility, are extremely low. This is particularly true in light of the very large reductions in emissions of NO<sub>x</sub> (over 33,000 tpy) and concomitant improvements in air quality that would be achieved. In addition, it should be noted that under the supplemental proposal, NO<sub>x</sub> emissions will be reduced by a greater amount, and less urea will have to be transported to the facility due to the closure of Units 1-3.*

*Although EPA has concluded, based on indications from APS that it intends to use urea for SCR, that it is most appropriate to consider the impacts of urea and not anhydrous ammonia, we note that ammonia is one of the most used chemical commodities in the United States, with large amounts transported annually by train, truck, and barge. Most ammonia is used as a fertilizer, including anhydrous ammonia for direct application.<sup>49</sup>*

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<sup>49</sup> See <http://minerals.usgs.gov/minerals/pubs/commodity/nitrogen/mcs-2011-nitro.pdf>.

*If APS instead chose to transport and store anhydrous ammonia rather than urea, the commenter is correct that the transport and storage of anhydrous ammonia would require development of a Risk Management Plan and Process Safety Management plan by both the power plant and the transfer facility at the rail line. For the transfer facility, these are normal costs of doing business and the associated costs would be included in the cost of anhydrous ammonia as delivered to the facility. Similarly, the cost to the facility is a known cost of using anhydrous ammonia which must be weighed in the decision of which SCR reagent to use at any given facility. In any case, the costs of complying with these programs would likely be a small fraction of the total costs related to the use of SCR at a facility.*

**Comment:**

One private citizen (0163/0164/0216) submitted a study of coal combustion and respiratory health near Shiprock, NM which primarily addresses the impact on indoor air of coal combustion inside homes for warmth. The commenter cited information in the report to support his assertion that at a site located 2 km from FCPP, the concentration of trace metals in the outdoor air was equivalent to the concentration inside where there was a broken stove leaking coal exhaust. According to the commenter, people living 2 km around the power plant might have to be evacuated because outdoor air is equivalent to inside a home with a leaking stove.

Two private citizens (0149, 0158) expressed concern about open storage of fly ash at FCPP, which they stated contain toxic heavy metals.

**Response:**

*Any near-plant exposure to trace metals as particulate matter is more likely to be a result of fugitive emissions of fly ash or coal dust from power plants than from exposure to the stack exhaust. The stacks at FCPP release the exhaust at a high elevation for the purpose of preventing excessive concentration of pollutants in the immediate vicinity of the plant.<sup>50</sup> Trace constituents of coal can become emitted as HAPs when the coal is combusted; therefore the dust generated from handling coal should also be expected to contain trace metals. In the stack exhaust, many HAPs exist as, or are associated with, particulate matter (PM). EPA has recently promulgated a final rule regulating HAPs from coal fired electric generating units in the MATS rule. FCPP is required to comply with the MATS rule. The MATS rule sets emission limits for PM from units like those operating at FCPP. In general, PM and HAPs that are removed from the exhaust by a control device become fly ash, thus, it is reasonable to expect fly ash to also contain HAPs. Many coal fired utilities need to upgrade their PM controls to remove the HAPs from the exhaust gas to meet the MATS emission limits. However, it is likely that the existing baghouses on Units 4 and 5 already provide adequate emissions control to meet the PM concentration limit in the MATS rule. Because the baghouse and scrubbers are removing HAPs from the exhaust gas from Units 4 and 5, we would anticipate that HAPs will end up in the fly ash and scrubber waste at FCPP.*

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<sup>50</sup> EPA Good Engineering Practice (GEP) <http://www.epa.gov/scram001/guidance/guide/gep.pdf>



*Although the windblown fly ash and coal dust from FCPP are likely to contain HAPs, EPA does not have any data regarding the specific concentrations of HAPs around FCPP. The concentration of the HAPs indoors from a leaking coal fired stove would likely be at a significantly higher concentration than in any windblown ash or dust. The emissions from a leaking coal fired stove are entirely uncontrolled while more than 99% of the PM in FCPP stack exhaust is removed by the baghouses for Units 4 and 5. Further, the HAPs emissions from a leaking indoor stove would likely be substantially more concentrated than the stack emissions from FCPP because the HAPS are emitted into a relatively small volume of air relative to the stack emissions from FCPP.*

*To address the fly ash and coal dust emissions at FCPP, EPA promulgated a FIP in May 2007 that required FCPP to ensure that opacity from its fly ash and coal dust material handling and storage operations never exceeded 20% opacity. Imposing an opacity limit and requiring a dust control plan are reasonable approaches for assuring adequate control of these emissions. Although EPA has the authority to impose such a requirement under the TAR as necessary or appropriate, EPA's 2007 FIP did not provide an adequate justification that the opacity limit was necessary or appropriate. When APS petitioned for judicial review of this opacity limit provision, EPA determined that we had not provided an adequate justification for the provision. Therefore, EPA requested the 10<sup>th</sup> Circuit Court of Appeals to remand the 20% opacity limit for material handling operations to EPA for a fuller explanation and justification. At the time, EPA indicated that it would provide this additional basis for the regulation in a later rulemaking.*

*In this rule, EPA is now finalizing a requirement for FCPP to ensure that opacity from its material handling operations does not exceed 20%. This limitation is necessary or appropriate to limit PM emissions from fly ash and coal dust material handling and storage operations. The necessity of limiting these PM emissions is to protect the NAAQS, may also provide a surrogate for limiting HAPs. EPA's action to protect the NAAQS by limiting PM emissions, enforceable through establishing a 20% opacity limitation on fly ash and coal handling and storage operations, is widely supported by comments on our proposal. Moreover, such a limitation is consistent with requirements for dust-generating activities in neighboring Arizona.<sup>51</sup> For more details on EPA's justification for including an opacity limit see our response in Section 10.*

**Comment:**

One public advocacy group (0112) stated that EPA should strongly assert to the management of FCPP that they have a responsibility to improve on public health effects as well as visibility impacts. According to the commenter, the operator of FCPP has been asserting at public meetings and with the media that the EPA proposals for FCPP are only about visibility and have no relationship to public health. The commenter stated that this is a misleading assertion by the company.

**Response:**

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<sup>51</sup> For example, see Maricopa County Air Quality Department Rule 310: Fugitive Dust from Dust-Generating Operations that sets an opacity limit of 20%. See [http://www.maricopa.gov/aq/divisions/planning\\_analysis/AdoptedRules.aspx](http://www.maricopa.gov/aq/divisions/planning_analysis/AdoptedRules.aspx)

*As previously mentioned, the RHR is meant to address visibility impacts at nearby National Parks and Wilderness areas. However, reductions in NO<sub>x</sub> and PM emissions from FCPP can also improve air quality and reduce health impacts.*

**Comment:**

One public advocacy group (0112) disagreed with the statement in the TSD that impacts to water quality will not be considered because FCPP is not a zero water pollutant discharge site. The commenter indicated that FCPP holds a 1993 NPDES Permit No. NM0000019, which is still in force based on an EPA Region 9 Administrative Extension granted on or about April 6, 2006. The commenter asserted, therefore, that it is imperative to consider water quality impacts.

The commenter (0112) added that EPA has missed an opportunity to reduce the waste of 13.3 million gallons of water per day, which is currently used by FCPP for cooling steam condensers and not returned to the San Juan River system. The commenter stated that the use of closed system dry cooling towers at FCPP would greatly reduce water use. According to the commenter, the withdrawal of such large quantities of water from tributaries of the Colorado River has contributed to the need for large federal salt removal expenditures costing many millions of dollars from 1976 to the present.

**Response:**

*EPA disagrees with the commenter that it is imperative to consider water quality impacts of BART controls for NO<sub>x</sub>. In our TSD, under Factor 3 – Energy and non-air quality environmental impacts, we explain that APS did not consider impacts to water quality in its analysis because FCPP has not been identified as a facility that is not allowed to discharge water (i.e., as stated by the commenter and in our TSD, FCPP is not a zero water pollutant discharge site). In other words, FCPP does discharge water, as evidenced by its Clean Water Act NPDES permit that is currently under an administrative extension that regulates its discharges to Morgan Lake and its cooling water intake. As such, water quality impacts related to the cooling system at FCPP is regulated by EPA under a different authority (Clean Water Act) than the Regional Haze and BART Requirements (Clean Air Act). The BART Guidelines cite several examples of a non-air quality environmental impact, e.g., water availability may affect feasibility and cost of wet scrubbers, or wet scrubber (for controlling SO<sub>2</sub>) may affect water quality and land use. The installation and operation of SCR would not significantly affect water quality or water discharges from FCPP.*

*This rule is not requiring increased water consumption associated with SO<sub>2</sub> control because EPA found that the SO<sub>2</sub> controls from the previous rulemaking in 2007 (72 FR 25698, May 7, 2007) are adequate. If EPA was requiring scrubbers that increased water consumption it would be considered under the non-air quality related environmental impacts.*

*EPA also disagrees with the commenter that EPA has missed an opportunity to reduce water use at FCPP for its cooling system. EPA does not have authority under the RHR to require*

*retrofit of its cooling water system. EPA notes that a transition from a wet cooling system to a dry cooling system requires energy, reducing the energy efficiency of the power plant. EPA further notes that the alternative emission control scenario, which allows APS the option to close Units 1 – 3 in lieu of complying with BART, would reduce water use by 6,000 acre-feet per year, as described in our Supplemental Proposal.*

## 5.0 Comments on Factor Three – Existing Controls at FCPP

### **Comment:**

One of the owners of FCPP (0176/0177) agreed with EPA's summary of the existing controls at the plant, but noted that the proposed FIP is only the most recent action in a long line of regulatory and voluntary efforts to reduce emissions of pollutants that impact visibility, including SO<sub>2</sub>, NO<sub>x</sub>, and PM emissions. The commenter asserted that FCPP has a strong history of retrofitting pollution controls and recounted the facility's history of installing these controls and reducing emissions.

### **Response:**

*EPA agrees that there have been numerous installations of pollution controls over the several decades that FCPP has been in operation. The most recent voluntary effort by FCPP increased the SO<sub>2</sub> removal from its long-term level of 72% removal to 88% removal. This was accomplished before the end of 2004 and became effective as a regulatory requirement in June 2007. The improvement in SO<sub>2</sub> removal resulted in a decrease of over 22,000 tons of SO<sub>2</sub> per year since that time.*

## 6.0 Comments on Factor Four – Remaining Useful Life of FCPP

### Comment:

One of the owners of FCPP (0176/0177) noted that the BART rules state that the normal amortization period (20 years for NO<sub>x</sub> control devices) is appropriate in applying the remaining-useful-life BART if the plant's "remaining useful life will clearly exceed" that amortization period (citing 70 FR 39169). The commenter asserted, however, that as a result of substantial uncertainty related to multiple factors, it is not at all clear that the plant's remaining useful life is at least 20 years. Thus, the commenter asserted that EPA must give proper consideration in its analyses to the possibility of a shorter useful life for FCPP. Moreover, according to the commenter, one factor that should not be allowed to shorten the useful life under the BART rules is the choice of BART itself – EPA cannot use a 20-year amortization period to justify a specified technology (e.g., SCR) if the application of the technology would be so costly as to make the facility uneconomical and shorten its useful life (citing 70 FR 39164, 39171). The commenter made the following arguments related to the possibility of a shorter useful life at FCPP:

- The excessive cost of SCR will dramatically increase the energy costs of the plant, potentially making it uneconomical. The installation of SCR on Units 1–3, including bag house retrofitting, would increase the cost of electricity production on a \$/MWh basis by more than 50 percent which, in conjunction with other market and regulatory uncertainties, may make the units uneconomic. Retrofitting SCR on Units 4 and 5 would raise the cost of generation at those units by more than 25 percent, and there is a reasonable possibility that such a cost increase would threaten the economic viability of those units.
- The proposed "phase-in schedule" for SCRs may force closure of units because APS will not have certainty by the compliance deadline that the lease will be extended or that SCE's ownership share will have been successfully transitioned. Numerous approvals must be obtained to allow any of the units at FCPP to continue to operate, including Units 4 and 5; securing each of these approvals takes time and presents risk. In particular, APS must obtain federal grants of right-of-way from DOI pursuant to 25 U.S.C. 323, which constitute "federal actions" that are likely to trigger review under the National Environmental Policy Act, possibly taking several years. Thus, APS would have to make significant capital expenditures on Units 1 – 3 before obtaining the needed approvals, and would instead close the units.
- The proposed FIP would require retrofitting BART controls on Units 1 – 3 much sooner than the time allowed under the Regional Haze regulations, which is 5 years. This is unreasonable in that APS must allow time for a final decision to be made on the proposed SCE transaction before making the substantial capital expenditures to retrofit Units 1 – 3. A requirement to install SCR and baghouses on those three units in such a short time would likely lead to increased engineering and installation costs. APS needs the flexibility of 5 full years to install SCR.

- Emerging environmental laws and regulations present cost and operational uncertainty that may shorten FCPP’s useful life. These include potential new GHG laws and regulations, a Maximum Achievable Control Technology (MACT) standard for EGUs, new ash-handling requirements, and new requirements for cooling water intake structures.

Another of the FCPP owners (0174) cited the comments above to argue that EPA’s economic analysis should have considered shorter “payback periods” because a reduced payback period could result in FCPP power (with SCR costs included) exceeding wholesale market costs.

**Response:**

*EPA disagrees with commenters that we must consider a shorter useful life because of uncertainty related the factors cited by the commenter. It is inappropriate to consider a useful life shorter than 20 years based solely on a possibility of shut down. EPA further notes that in its FCPP cost analysis on behalf of APS, B&V stated “the remaining useful life of Units 1 through 5 was at least 20 years”.<sup>52</sup> In our proposed BART determination, EPA described the analysis conducted to examine the competitiveness of FCPP compared to purchasing power on the open market if SCR were required on all five units at FCPP and determined that if SCR were applied on all units at FCPP, the cost to produce electricity at FCPP would still be lower than the cost to purchase power on the open market. Unless there is an enforceable obligation for APS to cease operations on a given date or unless APS convincingly demonstrates that controls (rather than uncertainly associated with future requirements) will cause facility closure, the default 20 year amortization period represents the appropriate period for the remaining useful life.*

*In our proposed BART determination for FCPP, EPA proposed a PM emission limit for Units 1 – 3 that can be achieved through the installation of any of four different PM control options. EPA did not prescribe which PM control APS must use to comply with the proposed limit. Wet membrane electrostatic precipitators (ESPs) represented the least costly option, while baghouses represented the most costly option. At the time of our BART proposal, the Mercury and Air Toxics Standard (MATS Rule) for electric utility steam generating units had not yet been proposed, nor had APS suggested its alternative emission control strategy to close Units 1 – 3 in lieu of complying with BART for NO<sub>x</sub>. Because the MATS rule is now final<sup>53</sup>, and EPA is finalizing the option to allow APS to either comply with the alternative emission control strategy or BART, EPA is not taking action at this time on our proposal to set new PM limits for Units 1 – 3. Therefore, the comment that installation of baghouses in addition to SCR on Units 1-3 will increase the cost of power by approximately 50 percent is not relevant.*

*While the commenter’s suggested increase in the cost of power from Units 4 and 5 as a result of SCR (25 percent increase) is reasonably consistent with the results of the EPA analysis (22 percent) with respect to the power cost impact of SCR on all five FCPP units, it must be noted that the original EPA analysis did not evaluate SCR on Units 4 and 5 exclusively. For more information on cost of SCR on units 4 and 5 see our response above in Section 4.1.2.*

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<sup>52</sup> See B&V Engineering Analysis for Units 1 – 5 at FCPP dated December 2007. Document number 0011 in docket for proposed rulemaking: EPA-R09-OAR-2010-0683.

<sup>53</sup> 77 FR 9304, February 16, 2012.

*EPA agrees that the phased-in schedule for installation of SCRs on Unit 1 – 3 for BART, which was added in the supplemental proposal, may have allowed only 2 years for engineering and installation of these pollution controls from the date by which APS intends to make its decision on continuing operation or shutting the units down by 2014. EPA is changing the schedule for SCR installation by requiring the SCRs for either Unit 4 or 5 to be installed within 4 years of the effective date of this rule and the remaining Units (Units 1-3 and the either 4 or 5) within 5 years of the effective date.*

*With respect to the “payback period” referenced by the commenter, EPA’s analysis did not identify “payback periods.” Rather, the commenter appears to be referring to the 25-year period utilized for the discounted cash flow calculations within the model. Nevertheless, EPA does not disagree with the commenter’s stated concern that shorter plant life (as may be precipitated by other possible emerging regulations unrelated to Regional Haze), and thus shorter discounting periods, would yield different economic results. However, EPA disagrees with commenters that a shorter useful life should be considered in the economic analysis because consideration of other regulations are outside the scope of the Regional Haze BART analysis.*

**Comment:**

One industry commenter (0117) stated that EPA, rather than evaluate APS’s supplemental proposal as an alternative emission control strategy, should instead “re-determine” BART for each of the five units at FCPP based on the APS-proposed shutdown scenario for Units 1 – 3. The commenter noted that consideration of the shortened remaining useful lives of Units 1 – 3 could result in a determination that BART for these units is no additional control prior to shutdown, while consideration of the remaining useful lives of Units 4 and 5 would not be heavily weighted since they are not to be shut down in the near term. The commenter concluded that a “better-than-BART” control strategy does not seem to be necessary for determining the appropriate requirements for FCPP under the APS-proposed shutdown scenario; instead, a BART determination for each unit with appropriate weighting of the statutory factors appears to present a logical and less-burdensome means of applying section 169A(b)(2) of the CAA to FCPP.

**Response:**

*EPA disagrees with the commenter’s suggestion that APS’s supplemental proposal should be evaluated in terms of a BART-redetermination rather than in terms of its current status as a “better-than-BART” alternative measure. EPA has met its obligation under 40 CFR 51.308(e)(1) by performing a BART determination for FCPP in accordance with 40 CFR 51, Appendix Y (Guidelines for BART Determinations Under the RHR). We do not consider a re-determination of BART that takes into account APS’s supplemental proposal the most appropriate method for evaluating APS’ proposal in light of the “alternative measure” provisions contained in 40 CFR 51.308(e)(2) and (3). The 2006 RHR (71 FR 60612) specifically established the procedures described in 40 CFR 51.308(e)(2) and (3) for scenarios involving programs that may make greater reasonable progress than source-by-source BART. These*

*provisions were specifically included to allow for the flexibility to consider alternative measures such as the one proposed by APS, and EPA considers it the most appropriate method for evaluating APS's supplemental proposal.*

**Comment:**

One industry commenter (0117) discussed the “remaining useful life” statutory factor, noting that under the BART Guidelines remaining useful life is ignored in the majority of BART determinations (citing 40 CFR part 51, Appendix Y, section IV.D.4.k), which the commenter alleged is inappropriate. According to the commenter, Congress designated the remaining useful life of the source as an important consideration because it did not want to impose the burdens of control technology retrofits on sources that were more than 15 years old at the time the statute was enacted. Given that it is now 34 years after the BART requirements were enacted, the commenter stated that the “remaining useful life” statutory factor should weigh heavily in BART determinations for older sources such as FCPP, instead of being ignored. See Section 10.0 for more on this commenter’s legal interpretation of the Regional Haze requirements.

**Response:**

*EPA disagrees with the commenter that we ignored the “remaining useful life” statutory factor in our BART decision. EPA considered this factor in our BART analysis (see pages 42-43 of the TSD). As discussed in the TSD the remaining useful life of an EGU subject to BART is determined by the utility. EPA cannot arbitrarily decide that an EGU has less useful life when it is not within our BART rulemaking authority to require closure of an EGU. If a utility used a shorter useful life than one that would allow the full amortization of any necessary pollution controls, EPA would take that into account in the cost analysis, provided that there was an enforceable obligation that the EGU would cease operation by that time.*

**Comment:**

One private citizen (0163/0164/0216) stated that it appears that APS is trying to keep its workers from telling the truth about metal fatigue problems and major corrosion problems at FCPP. The commenter noted that fly ash has sulfur in it which, when mixed with water, forms sulfuric acid which can corrode iron pipe. The commenter included a newspaper article profiling a manager at the plant which recounted an incident in which a pipeline transporting fly ash and water at the plant burst. The commenter was apparently questioning whether the remaining useful life of the plant is as much as 20 years as assumed in the BART analysis.

Another private citizen (0144) simply stated that FCPP has lived beyond its usefulness.

**Response:**

*As mentioned in the previous comment, in general, the utility determines the appropriate useful life of their EGUs subject to BART. Unless there is an enforceable obligation for APS to*



*cease operations on a given date or unless APS convincingly demonstrates that controls (rather than uncertainly associated with future requirements) will cause facility closure, the default 20 year amortization period represents the appropriate period for the remaining useful life.*

## 7.0 Comments on Factor Five – Anticipated Visibility Improvements

### Comment:

One of the owners of FCPP (0176/0177) presented information on visibility conditions on the Colorado Plateau and the role of NO<sub>x</sub> emissions in Western visibility impairment. The commenter noted that SO<sub>2</sub> and NO<sub>x</sub> emissions have been decreasing in recent years and cited a status report prepared by the Western Regional Air Partnership (WRAP) stating that (1) visibility has been improving at the Class I areas on the Colorado Plateau, (2) fire is the dominant contributor to haze on the 20 percent worst visibility days, (3) the sulfate contribution to haze is steadily decreasing, and (4) significant improvement can be seen on the 20 percent best visibility days. The commenter also presented information that purported to show that whether averaged over the haziest 20 percent of days, the clearest 20 percent of days, or all days, power plant NO<sub>x</sub> emissions contribute less than 1.5 percent to the light extinction at Mesa Verde National Park. Another of the FCPP owners (0168) cited this comment and emphasized this last point. A utility industry association (0169) also presented information to show that less than 1.5 percent of light extinction at Mesa Verde National Park is the result of power plant NO<sub>x</sub> emissions.

Another commenter (0223) questioned EPA's assertion that that NO<sub>x</sub> and PM from FCPP are significant contributors to visibility impairment in the numerous mandatory Class I areas surrounding FCPP (citing 75 FR 64221), stating that coal-fired power plants, including FCPP, are relatively small contributors to regional haze in the surrounding Class I Areas. According to the commenter, the WRAP has concluded that visibility impairment caused by PM and attributable to all stationary sources is probably less than 2 percent, and that stationary source NO<sub>x</sub> emissions probably cause between 2 and 5 percent of the visibility impairment on the Colorado Plateau.

In contrast, the comments of an environmental advocacy group (0182) included a quote from EPA's Section 110 proposed rule for the San Juan Generating Station stating, "NO<sub>x</sub> and SO<sub>2</sub> are significant contributors to visibility impairment in and around New Mexico. As the Four Corners Task Force notes, '[r]eduction of NO<sub>x</sub> is particularly important to improve visibility at Mesa Verde National Park.... [V]isibility has degraded at Mesa Verde over the past decade, and the portion of degradation due to nitrate has increased....'".

### Response:

*EPA modeling of FCPP showed visibility impacts from 1.2 to 6.0 deciviews, depending on the Class I area, with the sum of impacts at all sixteen Class I areas totaling 43 deciviews. This is a significant contribution to visibility impairment. Even if an individual source category appears small by itself, the many segments of the emissions inventory together cause significant visibility impairment and must be addressed in order to make progress towards the national goal of remedying visibility impairment from manmade pollution. Section 169A of the Clean Air Act requires BART determinations on BART-eligible EGUs regardless of trends or ambient visibility conditions. Application of BART is one means by which we can ensure that downward emission*

*and visibility impairment trends continue. EPA identifies stationary sources as an important category to evaluate in a BART analysis.*

**Comment:**

Three of the owners of FCPP (0168, 0174, 0176/0177, 0179), a group of owners (0185), the Navajo Nation (0223), and two utility industry associations (0169, 0187) argued that EPA's use of Interagency Workgroup on Air Quality Modeling (IWAQM) Phase II default background ammonia values is not appropriate. In extensive comments drawing heavily on a report by Dr. Ivar Tombach that was appended to the comments, one of the owners of FCPP (0176/0177) argued the following:

- Actual field measurements show lower ammonia concentrations than used by EPA.
- The EPA is mistaken in its assumption that background ammonia concentrations along the path of the plant's plume determine nitrate concentrations and their contribution to haze at the receptor site.
- The EPA's "corroborating" approach of "back-calculating" ammonia is flawed because it erroneously assumes that the ammonia associated with measured sulfate and nitrate would all be available to react with FCPP emissions, whereas in reality those measurements reflect emissions from many sources.
- The EPA's analysis of nitrate predictions as a check on the ammonia values used is also flawed because it erroneously assumes that the resulting measured nitrate levels are solely due to FCPP emissions, whereas in reality they reflect emissions from many sources. A comparable analysis using the EPA ammonia value shows substantial and "physically impossible" overpredictions of nitrate.
- The sensitivity analysis carried out for APS of the alternate ammonia concentrations in the CALPUFF model demonstrates that the ammonia values AECOM used in its modeling are valid and correct.

One of the utility industry associations (0187) and the group of FCPP owners (0185) similarly stated that for EPA to reject the body of direct measurements of ammonia concentration in the FCPP region, it must provide substantial scientific justification, which it has not done. These commenters also stated that EPA's supplemental sensitivity analysis was flawed because it consists almost entirely of modeling conducted using the "discredited" back-calculation method, which the commenter alleged is as insufficient for this purpose as it was for setting the background ammonia levels directly. The commenters concluded that the use of IWAQM values invalidates EPA's BART modeling and the BART determination based upon it. Other of the FCPP owners (0168, 0179) stated that APS provided ample justification for using its proposed lower background ammonia levels and successfully refuted EPA's arguments for using IWAQM default value. Accordingly, the commenters requested that EPA accept the visibility modeling using the lower variable background ammonia values, which will significantly reduce the visibility benefits ascribed to SCR.

Another utility industry association (0169) stated that several measurement programs on the Colorado Plateau show that actual ammonia values in Class I areas near FCPP are significantly lower than the IWAQM default value, indicating that these values typically range from 0.1 to 0.6 ppb.<sup>54</sup> The commenter noted that ammonia concentrations are lowest during the cold season when the visibility impacts of NO<sub>x</sub> emissions are the highest. Accordingly, the commenter asserted that using a single ammonia value throughout the year is not scientifically valid and should be replaced with seasonally variable values. The commenter stated that modeling with “valid, accurate” ammonia values will show significantly lower visibility changes resulting from SCR at FCPP.

The Navajo Nation (0223) expressed concern regarding discrepancies between EPA and APS modeling inputs, given the commenter’s understanding that APS obtained advance EPA approval for its modeling protocols. The commenter expressed a preference for using recorded data wherever possible and noted difficulties associated with estimating background ammonia levels and the CALPUFF model, citing the discussion in the initial proposal (75 FR 64226) and the associated TSD for our proposed BART determination (pages 70-72). The commenter argued that EPA’s use of various sensitivity analyses in support of the use of the IWAQM default and then corroborating with revised background ammonia data further complicates the modeling protocols. The commenter alleged that this approach is fundamentally flawed. Some commenters stated that EPA had earlier agreed to lower ammonia concentrations, and so should not be using the higher IWAQM value now.

A utility industry association (0169) speculated that cost effectiveness in terms of dollars per deciview improved resulting from retrofitting FCPP with SCR (based on modeling using CALPUFF version 6.4 and “valid” background ammonia values) would be an order of magnitude higher than the \$17 million per deciview benchmark that the commenter ascribed to EPA’s TSD. Accordingly, the commenter asserted that SCR cannot be justified as BART at FCPP.

In contrast, one public interest advocacy group (0112) concurred with EPA’s back-calculation method for ammonia background levels (citing the TSD, page 60). The commenter added that the requests to EPA from other commenters for additional ammonia monitoring data are unrealistic in today’s budget environment. The commenter agreed with EPA’s statement in the TSD that initiation of a new monitoring program would be a much larger undertaking than the analysis procedures described in the BART Guidelines.

**Response:**

*EPA disagrees with commenter objections to the background ammonia concentrations used in our modeling. Our use of the 1 ppb IWAQM Phase II default background ammonia*

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<sup>54</sup> The commenter (0169.1) cited “Baseline ambient gaseous ammonia concentrations in the Four Corners area and eastern Oklahoma, USA” by Mark E. Sather, Johnson Matthew, Nghia Nguyen, et al., *Journal of Environmental Monitoring*, Vol. 10 (2008), pp. 1319-1325; Ammonia measurement data provided by Dr. Jeff Collett of Colorado State University; and “Measurements of Ambient Background Ammonia on the Colorado Plateau and Visibility Modeling Implications,” I. Tombach and R. Paine, contributors, Report by Salt River Project, Phoenix, Arizona, September 2010.

value is appropriate. Most of the objections have already been discussed in EPA's TSD for the proposal; and several of them concern the "back-calculation" method that we used only as corroboration for the 1 ppb results we principally relied on. Also, even if the lower ammonia concentrations urged by some commenters were accepted, EPA's sensitivity modeling results provided in the TSD for our proposed BART determination showed the visibility benefits would still support EPA's BART determination. EPA also provided the results of modeling runs that used the lower ammonia background concentrations recommended by some commenters (see TSD Table 37). The visibility benefits of the proposed NO<sub>x</sub> controls for BART are substantial under all ammonia scenarios, including the lower background ammonia concentrations recommended by commenters. For 12 Class I areas, modeling even with those lower backgrounds showed benefits of 0.5 dv or more, an amount recognized in the BART Guidelines as significant (e.g. at 70 FR 39120).

The lack of measurements of ammonia and ammonium in the Class I areas of concern requires that EPA estimate background ammonia concentrations by some method, considering available data and approaches. As discussed in the BART proposal and its accompanying TSD, EPA understands that there is no single accepted method for estimating the background concentration of ammonia, and that any method will have advantages and disadvantages. The lack of consensus on a method was a factor in EPA's decision to rely on the 1 part per billion (ppb) default value in IWAQM, as was the fact that IWAQM is the only available guidance on this issue. In summary, there is insufficient monitoring information available to use a different value, or to support any seasonally varying values.

On issue (1), field measurements cited by the commenters were not performed in the Four Corners area, nor at the Class I areas near FCPP, so they do not necessarily give appropriate ammonia background concentrations for modeling of FCPP. In addition, the studies provide only gaseous ammonia (NH<sub>3</sub>) and not ammonium (NH<sub>4</sub>) that has reacted with SO<sub>2</sub> or NO<sub>x</sub> emissions. For purposes of assessing FCPP impacts relative to natural background, per the BART Guidelines, both ammonia and ammonium should be assumed to be available to interact with emissions from FCPP. The ammonia-only measurements cited by the commenters underestimate the available ammonia. Finally, as discussed in the TSD, field measurements in the Four Corners area showed ammonia measurements ranging from 1.0 ppb to 1.5 ppb, and sometimes as high as 3.5 ppb.<sup>55</sup> This provides some additional support for the 1 ppb used by EPA.

On issue (2), in using a 1 ppb background EPA did not rely on an assumption about the importance of background ammonia along the path of the plume, as claimed by the commenters. The 1 ppb background is representative of areas in the west under existing EPA guidance, in the IWAQM document. The commenters' objection is based on the rapidity of the nitrate-nitric acid equilibrium, which they state implies that ammonium nitrate can only be estimated using ammonia measurements right at the Class I area, and not the ammonia that occurs earlier along the plume's path to the area. EPA's TSD for the proposed rulemaking did state (TSD p.62) that the Federal Land Managers partly relied on this assumption as one of the rationales for the back-calculation method, discussed below; EPA also expressed support for the idea that the

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<sup>55</sup> Mark E. Sather *et al.*, 2008. "Baseline ambient gaseous ammonia concentrations in the Four Corners area and eastern Oklahoma, USA". *Journal of Environmental Monitoring*, 2008, 10, 1319-1325, DOI: 10.1039/b807984f

*method can be viewed as a 24-hour temporal integration, not just a spatial integration over the plume path, and that this aspect can be viewed as desirable for the 24-hour average visibility estimate that CALPUFF provides (TSD pp.71-72). This plausibility argument applies despite the rapid nitrate-nitric acid equilibrium cited by the commenters, and in any case was not relied on by EPA in using the 1 ppb default ammonia background.*

*As the commenters stated under issue (3), EPA used a back-calculation ammonia estimation method as an alternative that provides some corroboration for the 1 ppb IWAQM method, and which is more fully explained in the TSD for the proposal. Essentially, it uses measured particulate ammonium sulfate and nitrate to estimate the amount of ammonia that must have been present to form those ammonia compounds. The commenters object that the method assumes that all the calculated ammonia is available to interact with the FCPP plume as background ammonia. However, this assumption is reasonable for the single-source CALPUFF modeling performed under the BART Guidelines. It estimates ammonia concentrations that would be monitored at the Class I area if only this single source existed; it includes ammonia that is currently in the form of ammonium because of interaction with other sources' emissions. It remains true that some portion of the calculated ammonia would in reality not be available for FCPP, because it arrives at the monitor from a different direction than FCPP's pollutant plume; on the other hand, the data would also include directions contributing below-average ammonia, reducing that effect.*

*In addition, the back-calculated ammonia is based on measurements only of particulate ammonium, the form associated with measured sulfate and nitrate; it does not include any gaseous ammonia that may also be present. In this sense, the back-calculated ammonia is a lower bound on the ammonia that may be available to interact with source emissions; that is, the method may underestimate ammonia concentrations. This possible underestimation tends to offset possible overestimation discussed above.*

*EPA does not claim that the back-calculation method is dispositive; it incorporates various assumptions and imperfections that make clear it is only an estimate. However, it is based on real measured data at Class I areas, and has some counterbalancing tendencies for over- and under-estimation. After weighing various lines of argument about the back-calculation method, EPA disagrees with the commenters who recommended that it be rejected altogether. The method provides a useful estimate of ammonia for BART modeling, by providing concentrations representative of the high values that would be observed at the Class I areas in the absence of other sources. On balance, EPA believes the back-calculation provides a reasonable corroborating method for selecting the appropriate ammonia background to use.*

*In issue (4) the commenters claim that the assumption of full availability to FCPP of the back-calculated ammonia invalidates EPA's comparison of monitored nitrate levels with those modeled using the back-calculated ammonia (TSD p.73). As just discussed for issue (3), EPA disagrees that the assumption is invalid for corroboration of single-source BART assessment modeling. For single-source BART modeling, on balance, it is reasonable to assume all the ammonia is available to the source, given the counterbalancing tendencies for over- and underestimation inherent in the back-calculation method discussed above. In any case, this method mainly provided corroboration for the results from using the 1 ppb ammonia default. The*

*related issue (5) about “physically impossible” nitrate over-predictions does not account for the fact that any model evaluation is expected to have under- and over-predictions, depending on the meteorological conditions and the geographic location modeled, as well as on the location of the monitor used for comparison. While consistent over-prediction in a full model performance evaluation would indeed raise concerns over its validity, as EPA stated, our nitrate comparison was not intended as a model performance evaluation, but rather as a “rough check” for the back-calculation corroboratory method (TSD p.73). EPA found that the modeled and monitored values, for both the maximum values and the 98th percentiles, were generally in agreement.*

*Finally, contrary to the commenter’s assertion, EPA did not receive a modeling protocol in advance of modeling by APS’s contractor. EPA disagrees with commenters that EPA committed to use the same ammonia concentrations used by APS’s contractor in our own modeling analysis for our BART determination.*

**Comment:**

Three of the owners of FCPP (0168, 0176/0177, 0179) and a utility industry association (0169) asserted that CALPUFF version 5.8 used in the EPA’s BART analysis is outdated. Some of these commenters stated that past EPA statements make clear that the BART analysis should be based on the best application currently available to predict visibility impacts (citing 70 FR 39121-23). Because of enhancements to the model’s chemistry, the commenters stated that CALPUFF version 6.4 represents the best application that is currently available. A number of the commenters mentioned a December 2010 meeting between the CALPUFF developer and the FLMs where the FLMs reportedly supported an expedited review and approval of CALPUFF version 6.4.

One of these commenters (0168) stated that it is extremely concerning that EPA would impose a requirement costing a facility hundreds of millions of dollars based on results from the “regulatory version” of a model when a newer, more accurate version of the model is available. Another of the commenters (0179) stated that EPA should re-run its FCPP visibility modeling using CALPUFF version 6.4 and the seasonally adjusted background ammonia levels developed by APS’s modeling contractor or accept the APS modeling analysis using these tools. A third commenter (0169) similarly indicated that EPA should revise its BART analysis using actual measured background ammonia values and CALPUFF version 6.4.

Another of these commenters (0176/0177) presented the results of comparison tests purported to show that version 6.4 produced results that more closely matched measured values than did version 5.8. (The commenter appended the report of these comparison tests to the comments.) This commenter (0176/0177) also presented the results (APS comment, attached Exhibit F) of comparative modeling carried out for FCPP using CALPUFF versions 5.8 and 6.4, and three different background ammonia levels (IWAQM default, CMAQ model-derived, and the AECOM values). This modeling showed that the predicted visibility impacts (in terms of  $\Delta v$ ) decline significantly from CALPUFF version 5.8 to version 6.4 for all three background ammonia values used in the model runs.

The commenter concluded that the emission limitations specified in the proposed FIP will not result in any perceptible visibility improvements at any of the 16 Class I areas in the Four Corners region. [Two of the other owners of FCPP (0168, 0179) and a utility industry association (0169) also stated this conclusion.] The commenter stressed that this is not a surprising result given that studies have shown that power plant NO<sub>x</sub> emissions comprise a *de minimis* contribution to the observed visibility conditions as Mesa Verde National Park.

The commenter (0176/0177) added that these results are confirmed by a multi-year regional air quality study carried out for the Four Corners Air Quality Task Force by Environ, which concluded in August 2009. This study used the CAMx model and predicted even less visibility improvement at Mesa Verde from the application of SCR at FCPP and nearby San Juan Generating Station than did AECOM's modeling with CALPUFF version 6.4 using the AECOM values for background ammonia concentrations. Another of the owners of FCPP (0168) also cited this as confirming evidence.

Using the modeling results based on CALPUFF version 6.4 and the AECOM background ammonia concentrations, and its own control cost analysis, the commenter (0176/0177) calculated the cost effectiveness of combustion controls and SCR in terms of dollars per dv improved at Mesa Verde. According to the commenter, the cost effectiveness of advanced combustion controls would be about \$64 million per dv and SCR would be about \$365 million per dv. The commenter stated that in its TSD, EPA indicated that \$17 million per deciview is a reasonable benchmark for a cost-effective BART control technology. Based on this cost effectiveness metric, the commenter concluded that advance combustion controls constitute BART for FCPP.

Another owner of FCPP (0174) stated that the version of CALPUFF used by EPA has a tendency to over-predict nitrate concentrations, which is compounded by EPA's use of what the commenter asserted are overestimated ammonia background values. The commenter stated that this combination of errors results in a significant over-prediction of visibility improvements for more stringent NO<sub>x</sub> BART control options. Further, the commenter stated that this disproportionately affects the incremental visibility benefits predicted for SCR over LNB compared to LNB over baseline. The commenter supported the related comments submitted by Commenter 0176/0177 and stated that the modeling results submitted by that commenter should be used to determine BART.

In contrast, one federal agency (0175) was generally supportive of the modeling methods employed by EPA with the regulatory approved version 5.8 of the CALPUFF modeling system. This commenter noted that in email correspondence dated December 22, 2010 from Mr. Robert Paine to Mr. Scott Bohning, there is a specific reference to a meeting held between Mr. Joe Scire and the FLMs regarding CALPUFF version 6.4, indicating that the FLMs were "pleased to receive this presentation and will be working to 'expedite' the review and implementation for this improved version of CALPUFF." The commenter stated for the record that its agency was not represented at the December 10, 2010 meeting and has not officially endorsed or committed to expediting the review and implementation of this version of the CALPUFF system. Moreover, it remains the commenter's position that until this version has undergone a scientific peer review,



model code review, and more rigorous performance evaluation than presented, this version should not be used for regulatory purposes.

**Response:**

*EPA disagrees with the commenters that any new CALPUFF version should be used for the BART determination. EPA relied on version 5.8 of CALPUFF because it is the EPA-approved version in accordance with the Guideline on Air Quality Models (“GAQM”, 40 CFR 51, Appendix W, section 6.2.1.e); EPA updated the specific version to be used for regulatory purposes on June 29, 2007, including minor revisions as of that date; the approved CALPUFF modeling system includes CALPUFF version 5.8, level 070623, and CALMET version 5.8 level 070623. CALPUFF version 5.8 has been thoroughly tested and evaluated, and has been shown to perform consistent with the initially promulgated version from 2003 in the analytical situations it has been approved for. Any other version would be considered an “alternative model”, subject to the provisions of GAQM section 3.2.2(b), requiring full model documentation, peer-review, and performance evaluation. No such information for the later CALPUFF versions that meet the requirements of section 3.2.2(b) has been submitted to or approved by EPA. Experience has shown that when the full evaluation procedure is not followed, errors that are not immediately apparent can be introduced along with new model features. For example, changes introduced to CALMET to improve simulation of over-water convective mixing heights caused their periodic collapse to zero, even over land, so that CALPUFF concentration estimates were no longer reliable.*

*In addition, the latest version of CALPUFF, 6.4, incorporates a detailed treatment of chemistry. EPA’s promulgation of CALPUFF (68 FR 18440, April 15, 2003) as a “preferred” model approved it for use in analyses of Prevention of Significant Deterioration increment consumption and for complex wind situations, neither of which involve chemical transformations. For visibility impact analyses, which do involve chemical transformations, CALPUFF is considered a “screening” model, rather than a “preferred” model; this “screening” status is also described in the preamble to the BART Guidelines (at 70 FR 39123, July 6, 2005). The change to CALPUFF 6.4 is not a simple model update to address bug fixes, but a significant change in the model science that requires its own rulemaking with public notice and comment.*

*Furthermore, it should be noted that the US Forest Service and EPA review of CALPUFF version 6.4 results for a limited set of BART applications showed that differences in its results from those of version 5.8 are driven by two input assumptions and not associated with the chemistry changes in 6.4. Use of the so-called “full” ammonia limiting method and finer horizontal grid resolution are the primary drivers in the predicted differences in modeled visibility impacts between the model versions. These input assumptions have been previously reviewed by EPA and the FLMs and have been rejected based on lack of documentation, inadequate peer review, and lack of technical justification and validation.*

*EPA intends to conduct a comprehensive evaluation of the latest CALPUFF version along with other “chemistry” air quality models in consultation with the Federal Land Managers, including a full statistical performance evaluation, verification of its scientific basis, determination of whether the underlying science has been incorporated into the modeling system correctly, and*

*evaluation of the effect on the regulatory framework for its use, including in New Source Review permitting. CALPUFF version 5.8 has already gone through this comprehensive evaluation process and remains the EPA-approved version, and is thus the appropriate version for EPA's BART determination for FCPP.*

**Comment:**

The Navajo Nation (0223) expressed concern about the accuracy of CALPUFF based on a 2010 study that concluded that the closure of Mojave Generating Station had resulted in no perceptible visibility improvement in Grand Canyon National Park, despite predictions based on CALPUFF modeling that visibility in the park would improve.<sup>56</sup> According to the commenter, the study's authors concluded that their results raise questions about the reliability of CALPUFF. The commenter found this uncertainly alarming given that CALPUFF is the model used for the FCPP BART analysis and the significant economic impacts that the commenter alleged the BART determination could have on the Navajo Nation if FCPP were to shut down rather than install emission controls. (See Section 4.1 for the comments on potential economic impact.)

**Response:**

*As discussed in the response to the previous comment, EPA affirms that the regulatory version of CALPUFF is the correct model to use for this BART determination.*

*The study cited by the commenters raises issues that should be considered as EPA revisits visibility modeling in consultation with the Federal Land Managers. It found significant decreases in sulfate and nitrate concentrations after the closure of the Mojave Generating Station, but little improvement in associated visibility impairment. The authors tried to eliminate other possible causes for this; however, they state "This is partially explained by fluctuation in other aerosols masking the drop in sulfate. It is also possible that the sulfate change is too small relative to natural daily variation in visibility conditions to have a significant impact. ... Our results indicate that other components of visibility, in particular coarse mass and nitrate, changed in GCNP after the closure. ... These difficulties are indicative of a larger problem encountered when attempting to conduct inference on a calculated parameter (like deciviews) which is itself a function of many stochastic processes, each governed by a unique set of anthropogenic and natural factors." While not downplaying the quality and importance of this work, CALPUFF 5.8 is adequate for BART determinations; regulatory use of later versions must await their full EPA evaluation.*

**Comment:**

One federal agency (0175) sought clarification of the nature of the comparison between the APS BART alternative CALPUFF modeling and the EPA BART modeling that was presented in Table 8 in the supplemental proposal (citing 76 FR 10538-39). The commenter

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<sup>56</sup> The commenter cited "Effect of Coal-fired Power Generation on Visibility in a Nearby National Park," 44 *Atmospheric Environment* 2524, Jonathan Terhorst and Mark Berkman, 2010.

noted that correspondence from APS AECOM to EPA Region 9 staff dated December 23, 2010 indicates that the “model combinations are CALPUFF v5.8 and also v6.4 with two sets of ammonia backgrounds...” The commenter wished to make certain that the data presented in Table 8 is a direct comparison of modeling results using the APS BART alternative proposal to the October 19, 2010 EPA BART modeling using CALPUFF version 5.8 and is not a combination of version 5.8 and version 6.4 of CALPUFF.

**Response:**

*To clarify, although APS provided documentation modeling results using both CALPUFF versions, the EPA proposals and technical support documents presented only results from version 5.8, the approved regulatory model.*

**Comment:**

Some commenters (0168, 0174, 0176/0177, 0179, 0185, 0187) argued against the visibility metrics that EPA introduced in the BART proposal. These comments are summarized below.

One of the owners of FCPP (0176/0177) argued that the new visibility metrics proposed in the ANPR are inappropriate and unsupported, and should be discarded. The commenter noted that none of the metrics (percent improvement in dv impacts, cumulative changes in dv, and dv impacts scaled by the geographic area of the affected Class I area) are addressed in the BART rules, and posited that their introduction into the BART process is intended to inflate the estimated visibility benefits of the control options at FCPP. In addition, the commenter noted that these metrics do not appear to have been subjected to peer review or public comment independent of this rulemaking, as would be normal for what the commenter stated to be a critical change to a defined regulatory process.

Regarding the percent improvement metric, the commenter (0176/0177) stated that these values (unlike values of the haze index in dv) have no consistent relationship to the human perception of haze changes and no consistent relationship to changes in ambient visibility-impairing particle concentrations. As a result, the commenter asserted that this metric is not appropriate and must be rejected. For similar reasons, a utility industry association commenter (0187) and a group of FCPP owners (0185) asserted that the percent improvement metric does not provide useful information for assessing visibility improvement and EPA cannot legitimately rely on this method in making a BART determination.

Similarly, one of the owners of FCPP (0176/0177) contended that cumulative change in dv is not an appropriate metric to describe visibility improvement and should be withdrawn. The commenter made the following points:

- The peak impact from a source occurs at different times in different Class I areas because a facility’s emissions cannot result in peak concentrations in all directions at once. Thus, this metric really does not represent a cumulative regional impact of the source (and

hence the benefit of controls); rather it simply produces a mathematical summation of the peak impacts occurring at different times at various Class I areas.

- The value of the total depends in part of the number of Class I areas included in the analysis. This raises questions regarding the utility of the CALPUFF model when Class I areas are at distances where the accuracy of CALPUFF is in question. The BART rule notes that uncertainties in model performance increase at distances greater than 200 km from the source (citing 70 FR 39125-26), and 10 of the 16 Class I areas evaluated for FCPP are located more than 200 km from the plant. These 10 areas show some of the highest modeled visibility improvements, and it is likely that these predictions are overstated.
- It is inappropriate to add improvements over all Class I areas. A 0.5 dv improvement in one Class I area and a 0.5 dv improvement in another area does not result in a 1 dv improvement – the improvement is a 0.5 dv improvement, which occurs in two different locations. Any one observer would experience only a 0.5 dv improvement; he or she can only experience the visibility improvement in the Class I area being visited. Adding improvements across Class I areas flies in the face of the basic science of visibility perception thresholds.

The utility industry association (0187), one FCPP owner (0179), and a group of FCPP owners (0185) also argued against use of the cumulative impact metric, which they asserted dramatically overstates projected visibility improvements. These commenters claimed that the cumulative approach contradicts the BART rules, which state that it is appropriate to model impacts at the nearest Class I area and other nearby Class I areas “to determine whether effects at those [other] areas may be greater than at the nearest Class I area,” and that “[i]f the highest modeled effects are observed at the nearest Class I area, you may choose not to analyze the other Class I areas further” (citing 70 FR 39170). The commenters concluded from this that the BART rules envisage a visibility analysis that is focused on visibility impacts in the most impacted area, not all areas. The commenters added that cumulative impact is inappropriate because no individual will perceive impacts in more than one Class I area at a time. The commenters also said this approach arbitrarily inflates the benefit that might be associated with emissions limitations at a single source, illustrating this point by noting that this method would yield different results if a Class I area were divided into two or more areas – increasing the benefit simply by increasing the number of areas. One of these commenters (0187) also pointed out that this approach would equate a small, imperceptible benefit summed over more than one area with a much larger, humanly perceptible improvement in a single area, which the commenter stated are not equivalent.

Two other owners of FCPP (0168, 0174) voiced general support for the comments on visibility metrics submitted by Commenter 0176/0177.

Conversely, one environmental advocacy group commenter supported the use of a cumulative impact analysis. The commenter asserted that the cumulative impact of a source’s emissions on visibility, as well as the cumulative benefit of emission reductions, is a necessary consideration as part of the fifth step in the BART analysis, particularly in cases such as FCPP where the source causes or contributes to visibility impairment at a significant number of Class I

areas. The commenter stated that failing to account for a source's cumulative impairment and the cumulative pollution control benefit would result in a failure to acknowledge the regional approach to reducing haze.

**Response:**

*EPA believes that it is important to consider the visibility impact on multiple Class I areas. The goal of the visibility program is to remedy visibility impairment at all Class I areas. CAA 169A (a)(1). One approach to account for the benefits to all affected Class I areas is the cumulative "total dv" metric. However, there is no EPA approved cumulative metric to account for visibility impacts at multiple Class I areas. EPA relied on the modeled impacts and benefits at each Class I area individually, the number of Class I areas affected, and also considered, but did not specifically rely on, the sum of visibility impacts and benefits across all sixteen Class I areas.*

*The comments about the visibility metrics have largely already been addressed by EPA in the TSD for our proposed BART determination (pp.61-63 and pp. 67-68), which also explained that EPA did not rely on any alternative visibility metrics in the BART determination. The comments on this issue are therefore moot, but we will briefly summarize the issues, which are discussed more fully in the TSD.*

*As for the percent deciview visibility improvements that some commenters objected to, EPA refers the commenters to the proposal TSD, which explains what it represents for visibility impacts (TSD for proposed BART determination, p.62). EPA understands, and is confident that the commenters understand, the difference between absolute numbers and percentages. In brief, the percent improvement for a particular area and control scenario shows only the relative improvement in the impact of FCPP alone, and not improvements in overall visibility impairment. A given absolute deciview improvement translates into a large percent improvement at an area having only a small FCPP impact in the first place, and a small percent improvement at an area having a large FCPP baseline impact. EPA notes that the BART Guidelines do mention percent improvement as a legitimate metric.<sup>57</sup> EPA considered this information qualitatively, but arrived at conclusions about the degree of visibility improvement in terms of deciviews, in accordance with the BART Guidelines (75 FR 64229, and TSD p.76).*

*Finally, EPA disagrees with the commenters that EPA is restricted to considering only impacts at the single nearest Class I area, or the single Class I area with the highest impacts. A somewhat fuller excerpt from the commenters' citation of 70 FR 39162 is: "One important element of the protocol is in establishing the receptors that will be used in the model. ... you may choose not to analyze the other Class I areas any further as additional analyses might be unwarranted." When read in context, this language in the BART Guidelines is clearly meant to provide a common sense approach to streamlining a complex and difficult modeling exercise where "an analysis may add a significant resource burden to a State." 70 FR at 39126. While the BART Guidelines indicate that a detailed analysis of the visibility impacts at each area in a cluster of Class I areas may not be necessary, this is not because the visibility impacts at Class I*

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<sup>57</sup> 70 FR 39170 "Comparison thresholds can be used in a number of ways in evaluating visibility improvement (e.g. ... a threshold representing an x percent change in improvement)."

*areas other than the most impacted are irrelevant but rather because the visibility benefits at the most impacted Class I area alone may be sufficient to justify the selection of the most stringent control technology as BART. Where, as here, the benefits of controls have been modeled for a number of surrounding areas and consideration of these benefits is useful in determining the appropriate level of controls, EPA does not agree that these benefits should be ignored.*

**Comment:**

Two commenters (0174, 0187) questioned EPA's use of 0.5 dv as the threshold of a humanly perceptible change in visibility (citing 75 FR 64228). One of the commenters (0187) cited scientific literature, while the second (0174) cited the report by Dr. Ivar Tombach that is attached to Comment 0176/0177. The latter commenter (0174) added that the establishment of a specific deciview threshold as a "bright line" to define whether a certain control will be imposed as BART is contrary to the intent of the BART rules and the objectives of the Regional Haze program, which require EPA to consider the cost of each control option in relation to the associated visibility benefit.

One of the owners of FCPP (0176/0177) expressed the belief that application of SCR at FCPP would result in no perceptible visibility improvement and therefore cannot be BART. The commenter based this conclusion on modeling results discussed previously in this section. Based on these results, the commenter stated that the changes in visibility that would result from combustion controls and SCR are all humanly imperceptible, as is the difference between combustion controls and SCR – thus, there is no basis for concluding that SCR constitutes BART. *Am. Corn Growers*, 491 F.3d at 7 (rejecting EPA's position, as reflected in the original BART rules, that allowed for the possibility "that a source may be forced to spend millions of dollars for a new technology that will have no appreciable effect on haze in any Class I area.").

**Response:**

*EPA disagrees with the commenters that the visibility benefit from the proposed BART controls is too small to warrant requiring the controls; in addition, EPA is not using a perceptibility threshold in this BART determination. EPA agrees that thresholds should not be considered a "bright line" in making BART decisions. In the BART Guidelines, EPA described 1 dv as the threshold for an impact that "causes" visibility impairment, and 0.5 dv as a threshold for an impact that "contributes" to visibility impairment, for determining whether a source is subject to BART, though States were accorded discretion to use different thresholds (70 FR 39118, July 6, 2005; also 39120-39121). These thresholds do not apply to BART determinations for sources have been found subject to BART; States or EPA could consider visibility impacts less than 0.5 dv to warrant BART controls. To the extent that the comment is questioning the BART eligibility of FCPP, EPA has already established that FCPP is BART eligible and the commenter did not provide evidence to the contrary.*

*Even if the commenters are correct that 0.5 dv change is not perceptible, EPA noted that "[e]ven though the visibility improvement from an individual source may not be perceptible, it should still be considered in setting BART because the contribution to haze may be significant*

*relative to other source contributions in the Class I area. Thus, we disagree that the degree of improvement should be contingent upon perceptibility. Failing to consider less-than-perceptible contributions to visibility impairment would ignore the CAA's intent to have BART requirements apply to sources that contribute to, as well as cause, such impairment." (70 FR 39129)*

*That is, impacts smaller than this to contribute to impairment. Conversely, an improvement of 0.5 dv or less contributes to improvement in visibility impairment. As stated in the proposal, the modeled improvements in visibility are large enough to warrant requiring the proposed BART controls. While the actual improvements may be larger, from 0.6 to 2.8 deciviews, even an improvement of 0.5 dv is a contribution toward improving visibility, especially when the benefits at multiple Class I areas are considered. In conjunction with improvements from other sources, this will help toward the Clean Air Act goal of remedying manmade visibility impairment.*

**Comment:**

One environmental advocacy group commenter (0182) stated that EPA underestimated visibility improvement from installing NO<sub>x</sub> controls because it overestimates the production of sulfuric acid by the SCR and underestimated the amount of sulfuric acid removed downstream of the SCR. The commenter cited reports attached to the comments (0182) to argue that sulfuric acid does not limit SCR NO<sub>x</sub> control efficiency. The commenter also states that modeling shows that greater NO<sub>x</sub> removal rates are not offset by sulfuric acid emissions but instead yield greater visibility improvements than those proposed by EPA. The commenter argues that there will be a significant visibility benefit from increasing the SCR NO<sub>x</sub> efficiency from 80 percent to 90 percent and therefore concludes that a higher level of NO<sub>x</sub> control than 80 percent should be determined BART.

**Response:**

*EPA disagrees with the comment that we overstated the production of sulfuric acid from the SCR catalyst and underestimated the amount of sulfuric acid removed downstream of the SCR. In the TSD for our proposed BART determination, we estimated sulfuric acid emissions using the EPRI methodology and provided detailed explanations for all of the assumptions we applied as well as a discussion to compare measured and calculated values of sulfuric acid emissions from the Navajo Generating Station (see TSD p.55-59, 64-65, and 68). While we fully acknowledge and understand that the generalized EPRI methodology does not precisely represent true sulfuric acid emissions for a given facility, this method is a commonly used calculation methodology for estimating sulfuric acid emissions under a future operating scenario involving SCR. The assumptions we applied in estimating sulfuric acid emissions after the installation and operation of SCR using the EPRI methodology were justified and appropriate.*

*EPA assumed in our BART proposal a 3+1 system (4 layers of catalyst) would achieve 80% NO<sub>x</sub> removal. Greater reduction efficiencies would likely require an additional layer of catalyst, which would likely increase sulfuric acid emissions. Based on the SO<sub>2</sub> to SO<sub>3</sub> conversion rate guarantee we received from Hitachi for its CX series catalyst (ultra-low*

conversion) of 0.167% per layer, the use of an additional catalyst layer would equal 5 layers of catalyst and a 0.835% conversion rate. EPA is not aware of SCR systems that use 5 layers of catalyst, and the addition of a 5<sup>th</sup> layer would certainly affect the cost and operation of the unit. Although EPA agrees that the modeling referenced by the commenters appears to indicate greater visibility improvement from an SCR system achieving 90% removal compared to 80% removal despite higher sulfuric acid emissions<sup>58</sup>, EPA does not agree that this requires EPA to determine that 90% control be determined BART. In Section 8.1 of this document, we respond to the comment that the emission limitation for BART should be based on 90% control with SCR rather than 80% control with SCR. Based on the rationale outlined in that response, EPA determined that 80% control, achievable with SCR, is appropriate for BART for FCPP.

**Comment:**

One of the owners of FCPP (0176/0177) submitted the results of additional modeling and concluded that the proposed alternative strategy would result in greater visibility improvements in the Class I areas surrounding FCPP than would the proposed BART FIP; however, the commenter continued to disagree that the improvement would be humanly perceptible. According to the commenter, the commenter's additional visibility modeling using "valid background ammonia values and the revised CALPUFF model" show that none of the modeled NO<sub>x</sub> emission reduction strategies at FCPP will result in humanly perceptible improvement in visibility in the 16 surrounding Class I areas. The commenter indicated that highest predicted visibility improvement (change in deciview) by applying SCR, compared to baseline emissions, is 0.28 dv, while the incremental improvement in dv resulting from application of advanced combustion control technology and SCR is predicted to be 0.21 dv. Because both these numbers are well below the EPA-threshold for human perception of 1.0 dv, SCR does not constitute BART for the Plant.

**Response:**

*EPA agrees with the commenter that the alternative emission control strategy (of shutting down units 1, 2, and 3, and placing SCR on units 4 and 5) may "result in greater visibility improvement at the surrounding Class I areas" (EPA's supplemental proposal, 76 FR 10532, February 25, 2011). However, as discussed in the response to another comment, EPA does not agree that the visibility improvement from the original or alternative NO<sub>x</sub> reduction strategies would be imperceptible; EPA anticipates the improvements from either strategy would be perceptible.*

**Comment:**

One of the owners of FCPP (0176/0177) stated that EPA's TSD Table 21 (TSD p.44) mischaracterized the measured visibility impairment at nearby Class I areas as 10<sup>th</sup> and 90<sup>th</sup>

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<sup>58</sup> EPA notes that the baghouses on Units 4 and 5 are assumed to provide a significant amount of control of sulfuric acid emissions, therefore, such slight increases in sulfuric acid emissions would not be expected on units that are not equipped with baghouses.



percentile deciview values, whereas the figures actually represent the average of deciviews on the best and worst 20% of days, respectively. The commenter also pointed to contradictory statements in the TSD (pp.46-47) about the maximum relative humidity used in the relative humidity adjustment factor ( $f(RH)$ ) that accounts for the effect of water on particle size growth: the TSD states that the IMPROVE equation uses a maximum humidity of 98%, whereas IMPROVE and the RHR actually use 95%.

**Response:**

*EPA agrees with the commenter that in Table 21 of the TSD, we incorrectly identified the measured values as the 10<sup>th</sup> and 90<sup>th</sup> percentile deciview impairment, rather than the average deciview impairment on the best and worst 20% days. However, Table 21 was presented only for background informational purposes and the values in that Table were not germane to nor relied upon in our BART determination. EPA relied on Tables 36 – 39 to assess the anticipated visibility improvement from controls under the final factor of the BART analysis. Even though mislabeled, Table 21 does give a correct impression of the magnitude of visibility impairment. The 98% humidity maximum is a value from an earlier guidance document; the value in the Regional Haze guidance<sup>59</sup> and correctly used in EPA’s modeling was 95%. EPA also notes that this maximum (RHMAX in the input for the CALPOST post-processor) is not directly used in the visibility calculation method (MVISBK=6 in CALPOST) that was relied upon, and therefore was adequate for the BART determination modeling.*

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<sup>59</sup> “Guidance for Estimating Natural Visibility Conditions Under the Regional Haze Rule”, EPA-454/B-03-005, EPA 2003, p.A-3.

## 8.0 Comments on BART Determinations

### 8.1 Comments on the Proposed BART Determination for NO<sub>x</sub>

#### Comment:

A number of commenters, including owners of FCPP (0168, 0174, 0176/0177, 0179, 0185), the Navajo Nation (0223), and a utility industry association (0187), asserted that EPA's BART analysis was inconsistent with its own regulations in that it did not give proper weight to the "presumptive BART" limits for NO<sub>x</sub> that it established for EGUs through notice-and-comment rulemaking (generally citing 70 FR 39104, July 6, 2005). The commenters noted that these presumptive BART limits are based on the use of combustion controls, and that EPA had considered and rejected establishing presumptive BART limits based on SCR.

In the most extensive comments on this topic, one of the commenters (0176/0177) made the following points. The other commenters (0168, 0174, 0179, 0185, 0187, 0223) presented arguments similar to some or all of these points.

- In establishing presumptive BART limits for NO<sub>x</sub> emissions from EGUs, EPA concluded that combustion control-based presumptive limits "are extremely likely to be appropriate for all greater than 750 MW power plants subject to BART" (a category that includes FCPP), that they are "highly cost-effective controls," and that they "would result in significant improvements in visibility and help to ensure reasonable progress toward the national visibility goal (citing 70 FR 39131). Additionally, EPA has made clear that "the presumptions represent a reasonable estimate of a stringent case BART..." (citing 71 FR 60612, 60619, Oct. 13, 2006).
- The EPA was not correct in stating in the proposal that in setting presumptive BART limits, it "did not consider the question of what more stringent control technologies might be appropriately determined to be BART" (citing 75 FR 64226). Rather, EPA's 2005 rules were clear that the Agency had considered – and rejected – establishing presumptive BART limits based on SCR (citing 70 FR 39136). Thus, EPA established through rulemaking that SCR is not an appropriate basis for presumptive BART limits and that combustion controls should generally be deemed BART.
- In this context, a BART analysis must begin with and take into account the presumptive BART limits and EPA's rationale for setting them. If a source is able to meet the limit through the application of combustion controls, there should be an exceedingly strong presumption that such controls constitute BART. This principle was further supported in EPA guidance to the states, where EPA generally directs authorities to "require such utility boilers to meet the [presumptive BART] limits..." and to consider requiring technologies other than combustion controls only when combustion controls cannot meet the presumptive limit (citing 70 FR 39171-72).
- In effect, the EPA's analytical approach disregarded the presumptive limits entirely. By using a top-down approach in which it started its analysis by evaluating SCR and then

determined that SCR is BART for FCPP, EPA never undertook an assessment of the combustion control technologies that EPA deemed, through notice-and-comment rulemaking, to constitute presumptive BART. (See Section 3.2 for additional comments on the use of the top-down approach.)

- In its BART analysis, APS has demonstrated that each unit at FCPP can meet the presumptive BART limits through the application of advanced combustion control technologies. Therefore, EPA thus must make an exceedingly compelling case for SCR as BART if it intends to proceed with the proposed BART determination, which it has not done. To the contrary, it has done little more than to conclude that SCR is acceptable as BART based on an unexamined and arbitrary assumption that other technologies are not.
- Under the BART rules, a deviation from presumptive BART, either upwards or downwards, is authorized if an alternative control level is justified based on “careful consideration of the statutory factors” (citing 70 FR 39131). However, EPA did not carefully consider the BART factors and then conclude that an alternative to presumptive BART limits is appropriate. Instead, EPA dismissed the presumptive BART limits before even considering the BART factors.
- The EPA appears to have adopted a new standard for deviations from presumptive BART, stating that presumptive BART controls are required “unless there are source-specific circumstances that would justify a different conclusion” (citing 75 FR 64226). Using this new standard, EPA dismissed presumptive BART prior to undertaking any BART factor analysis and argued for post-combustion controls on the grounds that FCPP “is the largest source of NO<sub>x</sub> emissions in the United States and ... is surrounded by 16 mandatory Class I areas” (citing 75 FR 64226). Rather than using an analysis of the BART factors to support a non-presumptive BART limit, EPA dismissed presumptive BART outright, based on factors not referenced anywhere in the BART rules.

**Response:**

*EPA disagrees with the commenters’ assertions that we did not give sufficient weight to presumptive BART NO<sub>x</sub> limits, or that the BART determination for FCPP was performed in a manner inconsistent with the RHR.*

*As noted in other responses in this document, the presumptive NO<sub>x</sub> limits established in the BART Guidelines are determined to be cost effective and appropriate for most units. The establishment of presumptive BART limits, and the corresponding technology upon which those limits are based upon, does not preclude states or EPA from setting limits that differ from those presumptions. Indeed, the five statutory factors enumerated in the BART Guidelines provide the mechanism for establishing different requirements. EPA’s site-specific five-factor analysis for FCPP demonstrates that, in considering the expected remaining useful life of FCPP and the existing controls, SCR is cost effective, results in the most visibility improvement of all feasible control technologies, and does not cause energy or non-air quality environmental impacts that warrant its elimination as the top control option. As a result, regardless of the appropriateness of SCR as a control technology for most units on a national scale, or the extent to which EPA considered SCR in establishing the presumptive limits, the site-specific five-factor analysis*

*performed for FCPP justifies a different NO<sub>x</sub> BART limit than the presumptive NO<sub>x</sub> BART limit. We note the RHR states:*

*States, as a general matter, must require owners and operators of greater than 750 MW power plants to meet these BART emission limits. We are establishing these requirements based on the consideration of certain factors discussed below. Although we believe that these requirements are extremely likely to be appropriate for all greater than 750 MW power plants subject to BART, a State may establish different requirements if the State can demonstrate that an alternative determination is justified based on a consideration of the five statutory factors.*

*The RHR also states:*

*If, upon examination of an individual EGU, a State determines that a different emission limit is appropriate based upon its analysis of the five factors, then the State may apply a more or less stringent limit.*

*Therefore, the presumptive emission limits in the BART Guidelines are rebuttable. The presumptive emission limits apply to power plants with a total generating capacity of 750 MW or greater insofar as these sources are required to adopt emission limits at least as stringent as the presumptive limits, unless after considering the five statutory factors, the State determines that the presumptive emission limits are not appropriate. Moreover, the RHR and BART Guidelines do not exempt states from a five factor BART analysis, and that BART analysis may result in a determination of BART emission limits that are more or less stringent than the presumptive emission limits for subject to BART sources. The RHR states:*

*For each source subject to BART, 40 CFR 51.308(e)(1)(ii)(A) requires that States identify the level of control representing BART after considering the factors set out in CAA section 169A(g), as follows:*

*States must identify the best system of continuous emission control technology for each source subject to BART taking into account the technology available, the costs of compliance, the energy and non-air quality 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 that may be expected from available control technology.*

*EPA disagrees with commenters' assertions that we disregarded presumptive NO<sub>x</sub> BART limits entirely, and that we failed to evaluate combustion controls in any substantive manner. Although we do not rely upon the numerical values of the presumptive NO<sub>x</sub> limits listed in the BART Guidelines, the technological basis for presumptive NO<sub>x</sub> BART limits, such as the use of combustion control technology, boiler type, and coal type, were considered in the site-specific five-factor analysis. Combustion control technology was specifically considered as a potential retrofit technology, and costs and visibility improvements associated with combustion controls*

were calculated and included in the TSD in order to provide a comparison to other NO<sub>x</sub> control technologies. As a result, presumptive BART was not disregarded or dismissed during the NO<sub>x</sub> BART determination process.

*In addition, EPA disagrees that the rule directs authorities to consider non-combustion control technology only when presumptive limits cannot be met using combustion control technology. While a BART determination deviating from presumptive BART must be supported by the results of the five-factor analysis, the rule does not restrict the ability of States (or in this case, EPA) to initiate a five-factor analysis. Although the inability of a boiler to meet presumptive NO<sub>x</sub> BART limits through the use of combustion control technology is described as one circumstance in which a non-combustion control BART determination may be considered (70 FR 39172), it does not preclude consideration of other circumstances, nor is it identified as a qualifying threshold for performing a five-factor analysis, as commenters suggest.*

**Comment:**

One of the owners of FCPP (0176/0177) stated that an agency is required to follow its own rules, and that failure to do so makes its action unlawful and subject to vacatur, citing *Way of Life Television Network, Inc. v. FCC*, 593 F.2d 1356, 1359 (D.C. Cir. 1979) (“[A]n agency’s failure to follow its own regulations is fatal to the deviant action.”) The commenter asserted that in this case, EPA must develop and use a BART evaluation methodology that properly accounts for the presumptive BART limits (see above), an incremental cost effectiveness assessment (see Section 3.2), an analysis of control costs as a function of visibility improvement (see Section 3.3), and site-specific cost information (see Section 3.1) to develop lawful BART limits for FCPP.

**Response:**

*EPA disagrees that we have not followed our own rules in performing the NO<sub>x</sub> BART determination for FCPP. We address the commenter’s specific concerns as follows:*

- *Presumptive BART limits - As noted in responses above to comments on the presumptive NO<sub>x</sub> limit and the cost effectiveness of the presumptive NO<sub>x</sub> limit, while we did not propose that BART for FCPP was satisfied with the presumptive NO<sub>x</sub> BART limits, the site-specific five-factor analysis we performed did account for the technological basis for presumptive NO<sub>x</sub> BART limits, such as the use of combustion control technology, boiler type, and coal type, and also examined the ability of combustion control technology to meet the numerical presumptive NO<sub>x</sub> BART limits.*
- *Incremental cost effectiveness assessment - As described in the comment responses written in Section 3.2, we agree with commenters that the BART Guidelines do recommend consideration of incremental cost effectiveness and our BART analysis performed such an assessment in accordance with the methodology described in the BART Guidelines.*

- *Analysis of control costs as a function of visibility improvement – As described in the comment responses written in Section 3.1, although \$/deciview is discussed as an example of one element that may be considered when determining cost of compliance, we do not regard it as a mandatory metric under the five-factor analysis. We considered several other metrics, including total capital costs, annual costs, \$/ton, and incremental \$/ton, and do not regard \$/deciview as a useful metric to inform our decision at this time.*
- *Site specific cost information – As described in the comment responses written in Section 3.1, we disagree with the commenters’ assertion that our cost analysis did not take into account the site-specific cost information supplied by APS. As part of the line-by-line analysis we performed (described in Section 3.1 responses) on the cost estimates provided by APS, we ultimately incorporated most of the APS cost estimates in our final SCR cost estimate. Our detailed, line-by-line analysis is included in the docket for this rulemaking and provides an explanation for why we retained, modified, or rejected each line item in the SCR cost estimate for each of the five units at FCPP.*

**Comment:**

Two of the owners of FCPP (0168, 0176/0177) and the Navajo Nation (0223) asserted that advanced combustion controls constitute BART for FCPP because such controls will result in meaningful emission reductions and will contribute to reasonable progress toward visibility improvement.

One of these commenters (0176/0177) noted that EPA has “determined that combustion controls are not likely to be effective control technologies at FCPP” (citing 75 FR 64226). The commenter alleged that EPA’s determination is based on superficial analysis and is mistaken. This commenter (0176/0177) cited Exhibit J to its comments on the ANPR,<sup>60</sup> which contains a detailed analysis of the use of LNB and OFA on FCPP’s units. According to the commenter, this analysis confirms that the use of advanced combustion controls on the five units at FCPP will reduce plantwide NO<sub>x</sub> emissions by 34 percent and, for those units that are subject to presumptive BART limits, the reductions more than satisfy the presumptive limits in the BART rules.

Two of the commenters (0168, 0176/0177) added that considering that neither SCR nor advanced combustion controls will produce humanly perceptible visibility improvements in the nearby Class I areas (see the commenters’ comments in Section 7.0) these NO<sub>x</sub> emission reductions must constitute BART. The commenters indicated that this is true given that the reductions meet presumptive BART and will make a contribution to reasonable progress toward the national visibility goal. One of the commenters (0176/0177) added that this conclusion is reinforced by the cost differential between the technologies and the other BART factors discussed in the commenter’s comments elsewhere in this document.

The Navajo Nation (0223) stated that a phased approach to emissions controls at FCPP, beginning with combustion controls, is fully consistent with both the CAA and the RHR, and is

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<sup>60</sup> See item 11 from collection of documents titled “Comments on ANPRM 09 0598 APS Comments and Exhibits”, Document No. EPA-R09-OAR-2009-0598-0195.

the approach that the EPA should take as a prudent trustee of the Navajo Nation. According to the commenter, installing LNB and OFA as a first step in a phased approach to BART for the FCPP (and NGS) would:

- Be consistent with the presumptive BART limits established in the BART Guidelines.
- Result in a more clearly fact driven process, by allowing all interested parties to review *recorded*, not simply modeled, results at the next review phase.
- Aid in the resolution of disputes over the costs to install the emission control options under consideration by providing the opportunity to review the actual costs incurred by FCPP to install LNB and OFA. (The commenter noted that NGS completed installation of LNB/OFA this year.)
- Provide a reasonable timeframe in which to resolve outstanding lease and ownership issues that affect the productive life of FCPP (Factor 4).

This commenter (0223) added that the BART component of the CAA and RHR was meant to provide for a measured response to emissions from aging power plants; thus, requiring the most expensive controls is inconsistent with the law and regulations governing the BART process. The commenter also emphasized that requiring a power plant over which EPA has exclusive jurisdiction to bear a greater regulatory burden than similarly situated plants regulated by the states is contrary to the purposes of the Act, the RHR, and to the economic interests of the Navajo Nation.

**Response:**

*As noted in the responses to comments in Section 3.3, EPA disagrees with the comment that Exhibit J of APS's comments on the ANPR confirm that advanced combustion controls on all five units at FCPP will reduce plant-wide NO<sub>x</sub> emissions by 34%. APS has provided conflicting information regarding whether or not advanced combustion controls will be effective at significantly reducing NO<sub>x</sub> emissions at FCPP. As outlined in the TSD for our 2010 BART proposal, based on an independent report by Andover Technology Partners dated April 5, 2004<sup>61</sup>, we have concluded that combustion controls will in fact not be effective at significantly reducing NO<sub>x</sub> emissions at FCPP. Furthermore, independent of whether or not advanced combustion controls will allow the FCPP units to achieve presumptive NO<sub>x</sub> BART limits, EPA disagrees with the commenter's assertion that a unit's ability to meet presumptive BART precludes a more stringent BART determination. As noted in a previous response to comment in this section, while the inability of a boiler to meet presumptive NO<sub>x</sub> BART limits through the use of combustion control technology is described as one circumstance in which a non-combustion control BART determination may be considered (70 FR 39172), it is not identified as a qualifying threshold for performing a five-factor BART determination.*

*EPA disagrees that SCR will not produce humanly perceptible impacts. As noted in responses to comment in Section 7, visibility modeling performed by EPA of the impacts of SCR installation at FCPP indicates visibility impacts from 1.2 to 6.0 deciviews, depending on the Class I area (based upon IWAQM Phase 2 background ammonia value of 1 ppb). If low*

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<sup>61</sup>See Document No. EPA-R09-OAR-2010-0683-0059.

*ammonia background values are used as recommended by some commenters, visibility impacts range from 0.8 to 3.2 deciviews. Although the lower range of these less conservative modeling results fall below the 1.0 deciview value commonly cited as the threshold for human perceptibility, the range of impacts is not negligible.*

*EPA does agree with certain aspects of the Navajo Nation's comments regarding a phased implementation strategy to attaining national visibility goals. In 40 CFR 51.308(f), States are required to revise their regional haze implementation plans every ten years, which is a process that involves evaluating their ability to attain reasonable progress goals and potentially updating their long-term strategy for regional haze. The periodic revision requirement described in 40 CFR 51.308(f), however, does not extend to the implementation plan for BART requirements. The phased approach described by the Navajo Nation has certain benefits, and a phased approach is incorporated into the alternative emission control strategy.*

### **Comment:**

Two federal agencies (0175, 0224)) and two groups of environmental advocacy groups (0095, 0182) argued that the NO<sub>x</sub> emission limit for the units at FCPP should be 0.05 lb/MMBtu based on the capabilities of SCR. Another environmental advocacy group (0183) stated that EPA should reexamine the basis for determining the NO<sub>x</sub> limit and consider tighter NO<sub>x</sub> controls, but did not specify what that tighter limit should be. The comments of the federal agencies are summarized below, followed by those of the environmental advocacy groups.

The federal agency commenters (0175, 0224) stated that, given that BART is meant to achieve the best possible emissions reductions, EPA should not base its emission limits on the “minimum reduction expected from SCR, estimated by Hitachi Power Systems America” (citing the TSD for our proposed BART determination) because real-world application of SCR indicates that lower NO<sub>x</sub> emission limits are routinely reached. Regarding the emission limits for Units 4 and 5, the commenters noted that of the 20 cell burners with SCR in 2010, 12 had lower NO<sub>x</sub> limits than proposed by EPA for FCPP, with 3 EGUs at less than 0.06 lb/MMBtu. Based on this information, the original APS BART analysis of SCR at 0.06 lb/MMBtu (annual and 24-hour average), and the “common knowledge” that SCR can achieve at least 90 percent reduction, the commenters concluded that the installation of SCR at FCPP is capable of reducing annual NO<sub>x</sub> emissions by 90 percent to 0.05 lb/MMBtu on an annual average basis.

One of the federal agency commenters (0224) specifically refuted the additional rationale provided by EPA in the supplemental proposal for its 80 percent SCR efficiency estimate:

- The EPA took into account the degradation of the SCR catalyst over its lifetime and calculated the emission limit to reflect the capability of the catalyst just prior to its replacement on a 3-year cycle. According to the commenter (0224), modern SCRs are typically designed with one or two spare catalyst layers to facilitate catalyst management and account for catalyst degradation over time; the issue cited by EPA is not a technical limitation on SCR, but is simply a cost item to be accounted for in the proper design and operation of the SCR.



- The EPA stated that pursuing NO<sub>x</sub> control efficiencies of greater than 80 percent on Units 4 and 5 is limited by formation of H<sub>2</sub>SO<sub>4</sub> from the SCR catalyst because the additional layers of catalyst needed to increase NO<sub>x</sub> control efficiency would increase emissions of H<sub>2</sub>SO<sub>4</sub>, most affecting nearby Mesa Verde National Park. The commenter (0224) gave the following reasons why this argument is incorrect. (Commenter 0175 also made similar points.)
  - The EPA’s statement “the presence of additional catalyst would result in higher emissions of sulfuric acid” is unsupported. The EPA used the EPRI method for estimating H<sub>2</sub>SO<sub>4</sub> emissions. The only factor in the EPRI method that is related to the SCR and affects H<sub>2</sub>SO<sub>4</sub> generated by the catalyst is the catalyst oxidation rate, not the volume, area, or number of catalyst layers as implied by EPA.
  - The EPA statement that “Minimizing the formation of primary SO<sub>3</sub>/H<sub>2</sub>SO<sub>4</sub> in the catalyst bed is most important for visibility improvement at Mesa Verde National Park, the closest Class I area to FCPP” is unsupported.
    - The EPA’s modeling results in the October 2010 TSD show that even with increases in sulfate emissions from SCR installation, visibility improves at Mesa Verde National Park and every other national park.
    - The EPA appears to have assumed that at least one additional catalyst layer would have to be added to the two layers assumed by APS, thus increasing H<sub>2</sub>SO<sub>4</sub> emissions by 50 percent, but application of EPA’s Control Cost Manual method for estimating SCR catalyst volume indicates that increasing NO<sub>x</sub> removal efficiency from 80 to 90 percent would require only a 14 percent increase in catalyst volume. If one assumes that H<sub>2</sub>SO<sub>4</sub> emissions are directly related to catalyst volume, a 14 percent increase in catalyst volume would mean an increase in sulfate emissions of 0.3 lb/hr, which is highly unlikely to have any appreciable impact upon visibility when compared to the much greater NO<sub>x</sub> reductions. To verify the potential visibility impact, EPA should model the 90 percent NO<sub>x</sub> reduction scenario with its increased sulfate emissions.
- The EPA stated that the high ash content (approximately 25 percent) of the coal burned at FCPP may adversely affect the capability of SCR to reach the highest end of the control efficiency range without the use of additional layers of catalyst or more frequent catalyst replacement. According to the commenter, this is not consistent with previous EPA proposals for SCR emissions limits at facilities that use coal with similar ash content. For Desert Rock power plant with coal at 23.4 percent ash, EPA issued a permit limiting annual NO<sub>x</sub> emissions to 0.0385 lb/MMBtu, and EPA has recently proposed NO<sub>x</sub> BART at 0.05 lb/MMBtu (30-day rolling average) at the nearby San Juan Generating Station which burns local coal with 21.3 percent ash. Unless the FCCP ash contains some unusual catalyst poison, the 25 percent ash content is not a technical feasibility issue that would affect SCR effectiveness, but is a matter of proper SCR design, operation, and maintenance.

This federal agency commenter (0224) also stated that NO<sub>x</sub> BART for Units 1-3 should be 0.05 lb/MMBtu on an annual basis. The commenter noted that unsuccessful attempts to reduce NO<sub>x</sub> emissions at FCPP with combustion controls occurred over a decade ago when this

technology was not as fully developed as now, and pointed out that APS's BART analysis concluded that such controls are technically feasible and would reduce NO<sub>x</sub> emissions significantly. The commenter evaluated Clean Air Markets Division (CAMD) data for 2000 - 2009 and found 33 dry-bottom, wall-fired boilers with NO<sub>x</sub> emissions rates similar to FCPP Units 1-3 (0.6 - 0.8 lb/MMBtu) that had been reduced to 0.4 lb/MMBtu or less by application of modern combustion controls. The commenter asserted that because the typical approach is to first reduce NO<sub>x</sub> emissions by combustion controls before adding SCR, these real-world CAMD data support the belief that using combustion controls and SCR could reduce NO<sub>x</sub> at FCPP Units 1-3 to 0.05 lb/MMBtu on an annual basis.

One group of environmental advocacy groups (0182) made similar arguments in asserting that a lower NO<sub>x</sub> limit is technically feasible and legally required as BART for FCPP. To support this assertion, the commenter drew heavily on an attachment containing comments prepared by Dr. Phyllis Fox<sup>62</sup> This comment summary includes the comments presented by Commenter 0182; the reader may refer to the attachment (0182) for greater detail. Commenters also argued that emission limits should be based on a rolling average of 30 successive boiler operating days.

The commenter (0182) argued that neither the BART proposal nor the supplemental proposal represents the emission reduction capabilities of BART and thus fail to satisfy the CAA. The commenter asserted that a lower limit of 0.05 lb/MMBtu for NO<sub>x</sub> over a 30-day rolling average at each FCPP unit is technically feasible based on a combination of combustion controls (LNB and OFA) and a 90-percent-efficient SCR.

The commenter (0182) noted that the definition of BART at 40 CFR 51.301 is "an emission limitation based on the degree of reduction achievable through the application of the best system of continuous emission reduction...." The commenter asserted that EPA picked 80 percent NO<sub>x</sub> removal because it was the minimum level of control estimated by Hitachi (citing TSD pages 31 and 87), but selecting the lower end of a range quoted by a single vendor when the EPA only asked for 80 percent removal efficiency does not satisfy the minimum statutory requirements of BART.

The commenter (0182) also stated the EPA indicated that 80 percent removal is appropriate because it provides the operator a margin of safety. However, the commenter stated the definition of BART does not anticipate a margin of safety, asserting that arbitrarily adjusting down the emission reduction that can be achieved by SCR from 90 percent to 80 percent violates the requirement that BART emission limits be set based on the best removal system operated at the optimal efficiency to eliminate visibility impairment.

The commenter (0182) asserted that modern SCRs are routinely designed and operated to achieve 90 percent NO<sub>x</sub> control and that based on this well-accepted industry standard, NO<sub>x</sub> control of at least 90 percent is BART. The commenter noted that the BART Guidelines at 40 CFR part 51, Appendix Y state, "In general, a commercially available control option will be presumed applicable if it has been used on the same or a similar source type."

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<sup>62</sup> See item (2) in collection of documents titled "Public Comment\_8 Environmental Groups (Barth)\_Letter 5-2-11". EPA-R09-OAR-2010-0683-0182.

The commenter (0182) also contended that LNB and OFA are feasible for all five units at FCPP. The commenter rejected EPA's statement that it would be difficult to retrofit Units 4 and 5 with modern LNB technology (citing 76 FR 10534) and pointed out that the operator of FCPP has stated that the combination of LNB and OFA is technically feasible for these units. The commenter indicated that the use of LNB/OFA on Units 1-5 would reduce NO<sub>x</sub> emissions by 27 to 46 percent, making SCR with a removal efficiency of 90 percent sufficient to satisfy a 0.05 lb/MMBtu NO<sub>x</sub> limit.

The commenter (0182) argued that a 0.05 lb/MMBtu limit is consistent with EPA's determinations elsewhere, such as for the San Juan Generating Station (proposed limit of 0.05 lbs/MMBtu, 30-day rolling average) and for Desert Rock (final permit limit of 0.035 lbs/MMBtu, 365-day rolling average). According to the commenter, an EPA-issued permit containing a lower NO<sub>x</sub> limit creates a presumption of technical feasibility for purposes of BART – the BART Guidelines at 40 CFR part 51, Appendix Y state that “if there is a permit requiring the application of a certain technology or emission limit to be achieved for such technology, this usually is sufficient justification for you to assume the technical feasibility of that technology or emission limit.”

According to the commenter (0182), EPA asserted that lower NO<sub>x</sub> limits were not feasible for two reasons: (1) excessive formation of sulfuric acid mist, and (2) high ash content in the FCPP coal supply. The commenter asserted that the formation of sulfuric acid mist is not expected to be as high as claimed by EPA, and that independent air dispersion modeling established that the actual formation of sulfuric acid mist does not cause a significant level of visibility impairment in any case (citing an attached report by Andrew Gray<sup>63</sup>). The commenter added that the ash content of FCPP's coal (25%) is not significantly higher than other coals where EPA imposed a lower NO<sub>x</sub> limit, such as at the San Juan Generating Station. The commenter concluded that a lower BART limit is technically feasible and legally required.

In “preliminary” comments submitted prior to the supplemental proposal, a similar group of environmental advocacy groups (0095) suggested NO<sub>x</sub> limits of 0.05 lb/MMBtu on a 30-day rolling average measured using continuous emission monitoring system (CEMS), with compliance in 2014. The commenter added that the BART determination should include a provision that FCPP may forego BART implementation at any unit if it agrees to retire that unit prior to the deadline for BART implementation. The commenter requested that these limits be published for comment in any *Federal Register* notice published to take comment on the FCPP alternative BART proposal.

Another environmental advocacy group (0183) argued that EPA should reexamine its basis for determining NO<sub>x</sub> BART, believing that SCR likely can achieve greater than 80 percent efficiency (EPA's assumed efficiency) and a lower emission rate at FCPP. The commenter noted that the BART analysis submitted by the facility found SCR with approximately 90 percent removal efficiency to be feasible, resulting in an emission rate of 0.06 lb/MMBtu for Units 2 – 5. The commenter stated that EPA should reexamine its consideration of catalyst life, H<sub>2</sub>SO<sub>4</sub>

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<sup>63</sup> See item (5) in collection of documents titled “Public Comment\_8 Environmental Groups (Barth)\_Letter 5-2-11”. EPA-R09-OAR-2010-0683-0182.

formation, and ash content of the coal by comparing its assumptions with other coal-fired power plants with similar parameters, and should establish a rigorous NO<sub>x</sub> limit reflecting BART.

**Response:**

*EPA disagrees with the commenter's assertion that emission limits associated with BART must meet the lowest emission rate achieved with that technology at any coal-fired power plant. The Regional Haze Regulations at 40 CFR §51.308(e)(1)(ii)(A) state that:*

*The determination of BART must be based on an analysis of the best system of continuous emission control technology available and associated emission reductions achievable for each BART-eligible source that is subject to BART . . .*

*Additionally, the BART Guidelines state that: “[i]n assessing the capability of the control alternative, latitude exists to consider special circumstances pertinent to the specific source under review, or regarding the prior application of the control alternative”, (70 FR at 39166) and that “[t]o complete the BART process, you must establish enforceable emission limits that reflect the BART requirements . . .” (70 FR at 39172). The five-factor BART analysis described in the Guidelines is a case-by-case analysis that considers site specific factors in assessing the best technology for continuous emission controls. After a technology is determined as BART, the BART Guidelines require establishment of an emission limit that reflects the BART requirements, but does not specify that the emission limit must represent the maximum level of control achieved by the technology selected as BART. The BART Guidelines and the RHR do not preclude selection of the maximum level of control achieved by a given technology as BART, however, the emission limit set to reflect BART must be achievable by the specific source and should be determined based on consideration of site-specific factors. Therefore, limits set as BACT during PSD review (e.g., Desert Rock), or emission rates achieved from the operation of individual facilities under an emissions trading program (e.g., Clean Air Act Interstate Rule (CAIR)) may provide important information, but should not be construed to automatically represent the most appropriate BART limit representative of a given technology for a given facility.*

*While some commenters asserted that combustion controls would be feasible upstream of SCR to further reduce NO<sub>x</sub> emissions to meet a limit of 0.05 lb/MMBtu, in its comment letter, the National Park Service agreed with EPA that the addition of combustion controls such as OFA may “not (be) worth the small incremental reduction in NO<sub>x</sub> emissions”, based on its review of the CAMD database showing that of the 35 cell burner boilers, only eight had combustion controls, and that two cell burner boilers at Hatsfield Ferry were retrofit with OFA in 2001 and 2003 with minimal NO<sub>x</sub> reductions.<sup>64</sup> As discussed in the TSD for our proposed BART determination, because additional combustion controls at FCPP would not achieve significant reductions in NO<sub>x</sub> and may cause operability issues for the boilers, EPA determined that SCR, without the addition of new combustion controls, is BART for FCPP.*

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<sup>64</sup> See page 1 of the attachment (titled “National Park Service Comments on EPA's February 25, 2011 BART Proposal for the Four Corners Power Plant, April 22, 2011 AS REVISED MAY 17, 2011”) to document titled “DOI Resubmission of Comments on EPA BART Four Corners Navajo Nation\_7-11-11”, EPA-R09-OAR-2010-0683-0224.

*A consortium of several environmental organizations (0182) argued that a 30-day rolling average emission limit of 0.05 lb/MMBtu should be determined BART for FCPP, based on a final report written by Dr. Phyllis Fox.<sup>65</sup> In Table 10 – CAMD Maximum Rolling Averages (2006 – 2010) Calendar-Day Basis of her final report, Dr. Fox argued that because 3 of the 20 best performing units achieved a maximum 30-day calendar average emission rate of 0.05 lb/MMBtu (rounded to 1 decimal place), that 0.05 lb/MMBtu is the appropriate BART limit for FCPP. As stated above, EPA disagrees that an emission limit set in association with a BART determination must represent the lowest achieved emission rate from the best performing unit using that technology. EPA further notes that the maximum 30-day calendar average emission rates for the 17 other top performing units listed in Table 10 of the commenter’s report exhibited significant variability (0.056 – 1.1 lb/MMBtu), even though the annual average emission rates listed are all below 0.07 lb/MMBtu.*

*In its comments, NPS provided examples of 3 cell burner boilers currently equipped with SCR: Cardinal Units 1 and 2 and Belevs Creek Unit 1. In the context of an annual average limit, however, examination of the 30-day calendar average emission rates is also informative. Based on NO<sub>x</sub> data from the Clean Air Markets Division (CAMD), EPA notes that over 2009 – 2011 (January – June 2011), NO<sub>x</sub> emissions from Cardinal Unit 1 showed an increasing trend, with minimum 30-day calendar average NO<sub>x</sub> emission rates increasing from 0.025 to 0.033 to 0.043 lb/MMBtu in 2009, 2010, and 2011, and maximum 30-day calendar average NO<sub>x</sub> emission rates increasing from 0.049<sup>66</sup> to 0.052 to 0.065 lb/MMBtu in 2009, 2010, and 2011.<sup>67</sup> The CAMD data show that Cardinal Unit 2 had numerous days of non-operation during 2009 – 2011, so 30-day calendar average values were generally higher. However, if we exclude 30-day calendar averages that were clearly affected by nearly a full month of non-operation<sup>68</sup>, Cardinal Unit 2 shows a similar pattern as Unit 1, with an increasing trend in minimum (0.021, 0.043, 0.051 lb/MMBtu) and maximum 30-day calendar averages over 2009 – 2011 (0.056, 0.074, 0.076 lb/MMBtu). Belevs Creek 1 also showed a similar pattern of generally increasing minimum (0.027, 0.040 and 0.041 lb/MMBtu) and maximum (0.078, 0.099, 0.094 lb/MMBtu) 30-day calendar average emission rates over 2009 – 2011, with the highest maximum 30-day average in 2010 of 0.0989 lb/MMBtu. Although commenters are correct in stating that the best performing units can achieve 30-day rolling emission rates of 0.05 lb/MMBtu or lower, CAMD data show significant variability in emission rates, both over time for a given unit, and between the best performing units. Some of this variability may be related to catalyst aging, or may be related to the participation of these units in trading programs (therefore these units operate without an absolute limit on individual boilers). Regardless of the cause of this variability, EPA notes that significant variability over a 30-day average, even among the best performing units, does exist, and EPA disagrees that an emission limit set in association with a BART determination must*

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<sup>65</sup> See items (2 and 3) in collection of documents titled “Public Comment\_8 Environmental Groups (Barth)\_Letter 5-2-11”. EPA-R09-OAR-2010-0683-0182.

<sup>66</sup> For Cardinal Unit 1, to be more indicative of normal operation, EPA excluded the monthly emission rate from May 2009 of 0.085 because it represented just one day of partial operation during the month of May. Unit 1 was not operated for the remainder of May 2009.

<sup>67</sup> See tab titled “with SCR” in spreadsheet titled “Cellburners CAMD CAIR.xlsx” in docket for this final rulemaking.

<sup>68</sup> For Cardinal Unit 2, to be more indicative of normal operation, EPA excluded the monthly emission rate from March and November in 2009, and April in 2011.

represent the lowest rate achieved on 30-day rolling average basis from the best performing unit using that technology.

*Commenters recommended that EPA set the 30-day rolling average limit based on a boiler operating day (BOD), which would serve to average out emission spikes better than a calendar average (especially spikes that are caused by a single operating day experiencing shutdown in a calendar month), suggesting that higher limits to accommodate these emission spikes are not needed. Commenters assert that extreme values in the 30-day calendar averages reported by CAMD, in particular, those that are controlled by a very limited number of operating hours in a calendar month, will be dampened by application of the 30-BOD rolling average, but we note that significant variability still exists despite the application of a 30-BOD rolling average. EPA agrees that the emission limit should be based on a 30 BOD for the BART alternative option identified in the supplemental proposal. The 30-calendar-day average was inadvertently carried over from the original proposal. We do find that the 30-calendar-day average for the plant-wide average NO<sub>x</sub> BART determination is the appropriate approach for this limit. All hours of operation of all of the units go into this plant-wide average and it is appropriate to base this on a rolling 30-calendar-day basis.*

*Over the 2009 – 2010 period examined in Exhibit 14 to item 2 of comment number 0182, the 30-BOD rolling averages calculated by Dr. Fox for Cardinal Unit 3 shows a range of 0.028 lb/MMBtu to 0.065 lb/MMBtu, with reported 1-year (2010) and 2-year (2009 – 2010) averages of 0.048 lb/MMBtu. The 30-BOD rolling averages for Cardinal Unit 3 also show a general increasing trend in actual emission rates over the two year period of 2009 – 2010. For Havana Unit 9, which commenters cited as the best performing unit achieving a 30 calendar day rolling average of 0.05 lb/MMBtu in 2010 and a 365-day rolling calendar average of 0.036 lb/MMBtu, Dr. Fox calculated 30-BOD rolling averages over 2006 – 2010 that exhibited a significant range of 0.022 to 0.067 lb/MMBtu. NO<sub>x</sub> emission rates over 2006 to early 2009 appear to exhibit seasonal variability that may be related to active operator management of the SCR system (lower emission rates during the summer ozone season and higher emission rates during the non-ozone season). However, over 2009 – 2010, this seasonality was not shown but the general increasing trend over that 2-year period is still exhibited. Although EPA agrees that using the definition of BOD in calculating 30-day rolling averages will help to dampen emission spikes associated with startup or shutdown events, significant variability still occurs, and steady increases in actual emission rates are exhibited and may be associated with catalyst aging. Even when Dr. Fox calculated 30-BOD rolling averages for Cardinal Unit 3, where the high value for the maximum 30-day calendar average resulted from one partial day of operation in April 2010, Cardinal Unit 3 would not have consistently met an emission limit of 0.05 lb/MMBtu over 2009 – 2010. EPA disagrees with commenters that 0.05 lb/MMBtu achieved as a 30-calendar day average at Havana Unit 9 and Parish Unit 8 is representative and appropriate to apply automatically as a BART limit for any unit for which SCR was determined to be BART.*

*EPA examined the most recent CAMD emission rate data for 12 cell burner boilers currently operating with SCR<sup>69</sup> over 2009 – June 2011. Table 1 summarizes the NO<sub>x</sub> emission rates (in lb/MMBtu) and the percent reduction in NO<sub>x</sub> when the SCR was operated for the lowest*

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<sup>69</sup> See tab titled “with SCR” in spreadsheet titled “Cellburners CAMD CAIR.xlsx” in docket for this final rulemaking.

achieved monthly calendar averages and the highest achieved monthly calendar averages to show the range in variability within each year and compared across 2009 – 2011. EPA did not exclude any monthly calendar averages from the minimum and maximum analyses shown in Table 1. In order to determine what might be an appropriate % reduction to represent all cell burner boilers currently using SCR, we calculate the average % reduction from the highest emission rate achieved over all 12 units. As stated above, the 30-day rolling limit must be set to accommodate the highest emission rate expected over the life of the catalyst. The percent reduction achieved from the monthly calendar average emission rate over 2009 – June 2011 from the 12 units ranged from 48% to 90%, with an average value of 78%. The percent reduction associated with the lowest emission rates achieved over 2009 – June 2011 are on par with the percent reductions cited by commenters as the “common knowledge” capabilities of SCR.

*Table 1: NO<sub>x</sub> Emission Rates (lb/MMBtu) and Percent NO<sub>x</sub> Reductions from Cell Burner Boilers with SCR over January 2009 – June 2011*

Facility (State)	Unit	Lowest Emission Rate and Highest % Reduction						Highest Emission Rate and Lowest % Reduction					
		2009		2010		2011		2009		2010		2011	
		Rate	Reduc	Rate	Reduc	Rate	Reduc	Rate	Reduc	Rate	Reduc	Rate	Reduc
Alcoa (IN)	4	0.088	79%	0.080	81%	0.085	80%	0.161	62%	0.173	59%	0.115	73%
Monroe (MI)	3	0.048	90%	0.052	89%	0.065	86%	0.124	73%	0.146	69%	0.208	55%
Monroe (MI)	4	0.058	88%	0.053	89%	0.070	85%	0.248	48%	0.134	72%	0.157	67%
Belews (NC)	1	0.027	95%	0.040	93%	0.041	92%	0.078	85%	0.099	81%	0.094	82%
Belews (NC)	2	0.024	94%	0.033	92%	0.032	92%	0.064	85%	0.061	86%	0.063	85%
Cardinal (OH)	1	0.025	95%	0.033	94%	0.043	92%	0.085	83%	0.052	90%	0.065	87%
Cardinal (OH)	2	0.021	96%	0.043	93%	0.051	91%	0.206	65%	0.074	87%	0.076	87%
Gavin (OH)	1	0.065	91%	0.071	90%	0.072	90%	0.105	85%	0.122	83%	0.083	88%
Gavin (OH)	2	0.063	93%	0.068	92%	0.071	92%	0.099	88%	0.102	88%	0.099	89%
Musk-ingum (OH)	5	0.049	92%	0.048	92%	0.051	91%	0.188	69%	0.149	75%	0.088	85%
Cumberland (TN)	1	0.060	91%	0.069	89%	0.060	91%	0.135	79%	0.129	80%	0.102	84%
Amos (WV)	3	0.041	94%	0.045	94%	0.052	93%	0.185	74%	0.090	87%	0.107	85%

*Commenters claim that emissions of sulfuric acid mist and the high ash content of coal used by FCPP, and considerations of catalyst life are not barriers to achieving higher NO<sub>x</sub> reduction efficiencies than proposed by EPA. EPA disagrees with comments that our statement*

*regarding the impact of additional layers of catalyst on increasing sulfuric acid emissions is unsupported. EPA understands from our correspondence with Hitachi Power Systems America that each layer of catalyst used results in an incremental increase in the conversion rate of SO<sub>2</sub> to SO<sub>3</sub>. The EPRI method used for calculating sulfuric acid requires the input of a SCR catalyst oxidation rate. This oxidation rate varies depending on catalyst type and number of layers used. For the ultra low SO<sub>2</sub> to SO<sub>3</sub> oxidation catalysts offered by Hitachi, each layer contributed roughly 0.167% conversion, with 3 layers totaling 0.5%. The use of an additional layer, such as in a 3+1 system, would thus increase the conversion rate to nearly 0.7% when all 4 catalyst layers are in operation. Further NO<sub>x</sub> reductions achieved from the addition of a 5<sup>th</sup> layer of catalyst would likely exacerbate pluggage and back-pressure concerns related to the ash content of the coal and also may affect cost and operation of the unit. Commenters have not submitted information to refute this.*

*The ash content of coal has an important effect on the effectiveness of SCR because high ash content in coal can cause pluggage and catalyst erosion and thus reduce available catalyst area and activity for NO<sub>x</sub> reduction. Based on coal quality information provided by the Energy Information Administration within the U.S. Department of Energy's Office of Coal, Nuclear, Electric and Alternate Fuels<sup>70</sup>, the coal ash content of coal burned at FCPP (20.34%)<sup>71</sup> is significantly higher (see Table 2) than the ash content of coals burned by the 11<sup>72</sup> cell burner boiler units operating with SCR at 7 different facilities, as well as the Parish facility (Unit 5 is reported in CAMD to be a wet-bottom wall-fired boiler) cited by commenters (0182) as being one of the best performing units. EPA could not locate ash content of coal burned at the Havana facility (Unit 9 is reported in CAMD to be a wet-bottom wall-fired boiler) in Illinois in the EIA report. EPA notes that only four other facilities, in addition to FCPP, were reported in the EIA to burn coal with ash content greater than 20%: San Juan Generating Station (SJGS) in New Mexico, San Miguel in Texas, Nucla in Colorado, and North Branch in West Virginia. None of those facilities currently have SCR installed on their boilers, however, Region 6 recently finalized a FIP for SJGS with a limit of 0.05 lb/MMBtu, representing an 83% reduction in NO<sub>x</sub> emissions. The emission limit EPA Region 6 set for SJGS is lower than the limit we set for FCPP because SJGS uses a different boiler type than FCPP and modern combustion controls have already been installed and have reduced NO<sub>x</sub> emissions at SJGS by 29 - 33%.<sup>73</sup> EPA has determined that because Units 4 and 5 at FCPP are cell burner boilers, modern combustion controls would not significantly reduce NO<sub>x</sub> emissions from FCPP. Even though the emission limit differs, the reduction efficiency from the installation and operation of SCR at FCPP and SJGS are generally consistent, particularly when considering the similarly high ash content of coal (>20%) used at both facilities. In 2008, EPA Region 9 issued a pre-construction Prevention of Significant Deterioration (PSD) permit to allow construction of a new coal-fired power plant*

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<sup>70</sup> "Cost and Quality of Fuels for Electric Utility Plants 2001". Energy Information Administration, Office of Coal, Nuclear, Electric, and Alternative Fuels, US Department of Energy, March 2004. DOE/EIA-0191(01), included in the docket for this final rulemaking.

<sup>71</sup> APS reports the ash content of coal burned at FCPP as approximately 25%, as stated in the TSD for our proposed BART determination (EPA-R09-OAR-2010-0683-0002).

<sup>72</sup> EPA could not locate information in the EIA report on the Alcoa Allowance Management Inc Facility in Indiana.

<sup>73</sup> See page 4-3 of report titled "PNM BART Report for SJGS\_final to PNM\_June 18, 2007.pdf" in the docket for this final rulemaking. Pre-consent decree emission rates on Units 1 – 4 at SJGS ranged from 0.42 – 0.45 lb/MMBtu. Post-consent decree emission limits for those units were 0.30 lb/MMBtu.



on the Navajo Nation, known as the Desert Rock Energy Facility (Desert Rock).<sup>74</sup> If constructed, Desert Rock would have used the same coal as FCPP from the BHP Navajo Mine and the final PSD permit set a NO<sub>x</sub> limit of 0.05 lb/MMBtu (on a rolling 365-day average). Commenters argue that if Desert Rock was required to meet a limit of 0.05 lb/MMBtu using the same coal as FCPP, the ash content should not hinder FCPP from achieving similarly low NO<sub>x</sub> emission rates. EPA notes that if constructed,<sup>75</sup> Desert Rock would have been a new, state-of-the-art facility specifically designed with boiler characteristics, combustion controls, and post-combustion controls to meet the Best Available Control Technology (BACT) requirements for numerous criteria and non-criteria pollutants. FCPP is an existing, over 40-year-old power plant. The Regional Haze Rule requires a case-by-case BART (best available retrofit determination), which need not be equivalent to BACT for new facilities.

Table 2: Ash Content of Coals Burned at Various Facilities using SCR

Facility Name	Owner <sup>76</sup>	State	Ash Content
<b>Monroe</b>	Detroit Edison	Michigan	6.3%
<b>Belews Creek</b>	Duke Power	North Carolina	12.23%
<b>Cardinal</b>	Cardinal Operating Company	Ohio	11.56%
<b>Gavin</b>	Ohio Power Company	Ohio	11.3%
<b>Muskingum</b>	Ohio Power Company	Ohio	11.54%
<b>Cumberland</b>	Tennessee Valley Authority	Tennessee	9.42%
<b>Amos</b>	Appalachian Power	West Virginia	11.93%
<b>HL&amp;P Parish</b>	Reliant	Texas	5.28%

Based on the significant 30-calendar-day average variability exhibited by the top performing units in Table 10 of comment number 0182, and the variability in 30-calendar-day average and the 2009 – June 2011 30-calendar-day average % NO<sub>x</sub> reduction of 78% exhibited by 12 cell burner boilers equipped with SCR, EPA continues to affirm that a limit representing an 80% reduction in NO<sub>x</sub> emissions reflects what is achievable using the technology determined as BART for FCPP.

Commenters further argue that many of the best-performing units operate without permitted emission limits under an emission trading program and therefore have no incentive to optimize SCR operation because they do not need to comply with an emission limit. EPA disagrees with that statement and notes that units that operate under a regional NO<sub>x</sub> trading program have a financial incentive to reduce emissions to the greatest economic extent possible in order to sell those emission offsets to units that cannot meet the emission cap established by the trading program.

<sup>74</sup> <http://www.epa.gov/region9/air/permit/desert-rock/>

<sup>75</sup> Desert Rock has not been constructed. EPA requested a voluntary remand of the Desert Rock PSD permit in 2009 to incorporate new applicable requirements. The developers of Desert Rock have not yet submitted a revised PSD application to EPA.

<sup>76</sup> As reported in the EIA Report (March 2004), included in the docket for this final rulemaking.

## Annual Average Limit

*In our Supplemental Proposal, EPA requested comment on setting a lower NO<sub>x</sub> limit over a longer averaging time to account for catalyst degradation over time. In its comments, NPS recommended an emission limit of 0.05 lb/MMBtu or lower, on an annual average. NPS cited three examples of cell burner boilers achieving annual average NO<sub>x</sub> emission rates less than 0.06 lb/MMBtu and greater than 90% NO<sub>x</sub> removal: Cardinal Units 1 and 2, and Belews Creek Unit 1. EPA agrees with NPS that over a 2-year average, NO<sub>x</sub> emissions from Cardinal Unit 1 averaged 0.036 lb/MMBtu (2009 – 2010), however, as discussed above, these three units showed a general increasing trend in NO<sub>x</sub> emission rates over time and the highest 30-day calendar average in 2011 of 0.065 lb/MMBtu was over 1.8 times greater than the 2-year average NO<sub>x</sub> emission rate achieved by Cardinal Unit 1. For Cardinal Unit 2, the maximum 30-day calendar average in 2011 was nearly 1.8 times higher than the 2-year average of 0.043 lb/MMBtu (2009 – 2010), and for Belews Creek 1 the highest maximum 30-day average in 2010 of 0.0989 lb/MMBtu that was nearly 2.2 times higher than the 2-year average of 0.045 lb/MMBtu (2009 – 2010). The emission rate data from the three units cited by NPS suggest that 30-day average emissions for these three units were roughly two times higher than the 2-year annual average emission rates.*

*Data provided by Dr. Fox in Table 10 of comment number 0182 shows that 9 of the top 20 performing units with SCR met an emission rate of 0.05 lb/MMBtu or better over a 365-day calendar average. The remaining units ranged from 0.055 – 0.069 lb/MMBtu over a 365-day calendar average. Based on our review of the most recently available CAMD data from 12 cell burner boilers currently equipped with SCR, the % NO<sub>x</sub> reduction exhibited over a nearly 3 year average (2009 – June 2011) ranges from 73 – 92%, with an average % NO<sub>x</sub> reduction of 87%.<sup>77</sup> EPA agrees with commenters that NO<sub>x</sub> emission limits over a longer averaging time can be lower than emission limits over a shorter averaging time. However, in its comment letter on the Supplemental Proposal, APS stated that it opposed any further lowering of the NO<sub>x</sub> emission limit for several reasons, including cost of compliance and potential operational problems. Although not specifically stated by APS, EPA infers that APS's opposition to a lower limit includes opposition to a lower limit over a longer averaging time. Additionally, APS stated that, based on statistical analysis it has conducted, it believes there may be potential compliance problems with the 30-day rolling average period, in particular, if two malfunction events occurred close together towards the end of the catalyst replacement cycle. Therefore, APS stated a 90-day rolling averaging would be needed to reasonably assure continuous compliance with the proposed emission limit in the Supplemental Proposal. APS did not include its statistical analysis in its comments on the Supplemental Proposal, and, for the reasons stated above and supported by the emission rates and control efficiencies from other cell burner boilers with SCR (Table 1), EPA has determined a 30 calendar-day rolling average is appropriate for the final NO<sub>x</sub> limit for BART. Under the alternative emission control strategy we based the limit on 30-BOD average. In addition, although EPA agrees with commenters that setting a lower emission limit over a longer averaging time is supported by a review of emission data from other facilities, we do not have enough information specific to Units 4 and 5 at FCPP to set a different limit over a longer averaging time, nor is it necessary to supplement the short-term limit (30-day*

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<sup>77</sup> See summary tab in "Cellburners CAMD CAIR.xlsx" spreadsheet in the docket for this rulemaking.

*rolling average) EPA is setting in our final action with an additional limit over a longer averaging time.*

**Comment:**

One of the owners of FCPP (0176/0177) stated a willingness to support a NO<sub>x</sub> emission limit of 0.098 lb/MMBtu for Units 4 and 5 under the alternative proposal, but only in the context of an alternative emission reduction strategy that includes resolution of the related issues. The commenter asserted that issues with the cell-burner configuration of these units, the high-ash coal that is burned, and the increase in H<sub>2</sub>SO<sub>4</sub> emissions that would occur at increased NO<sub>x</sub> efficiency preclude any further tightening of the NO<sub>x</sub> limit. The commenter recommended that compliance with the emission limit be determined on a 90-day rolling average basis, instead of the proposed 30-day rolling average. The commenter strongly opposed any plantwide NO<sub>x</sub> limit more stringent than 0.11 lb/MMBtu in a traditional BART FIP.

The Navajo Nation (0223) similarly endorsed the proposed 80 percent reduction in NO<sub>x</sub> emissions from Units 4 and 5, with a limit of 0.098 lb/MMBtu, under the supplemental proposal, based on the site-specific parameters at FCPP. The commenter also cautioned that any reduction in this standard must be evaluated carefully, because additional catalyst layers would be required which could result in increased ammonia slip and H<sub>2</sub>SO<sub>4</sub> emissions contributing to visibility impairment, increased compliance costs, and operational difficulties. The commenter noted that selection of the catalyst will be critical for the operation and performance of the SCR system.

**Response:**

*EPA agrees that the appropriate limit for Units 4 and 5 under the alternative strategy is 0.098 lb/MMBtu (over a rolling average of 30 successive boiler operating days) for the reasons aforementioned. The final rule reflects this limit.*

**Comment:**

In virtually identical comments that addressed both FCPP and NGS submitted prior to the supplemental proposal, one public interest advocacy group (0094) and one environmental advocacy group (0146) requested that EPA implement the most stringent air pollution control measures, specifically SCR, as BART for these plants in order to improve visibility in the Class I areas to the greatest extent possible. The commenters noted that FCPP and NGS are two of the biggest sources of NO<sub>x</sub> on the Colorado Plateau, and stated that they should not be allowed to be permitted polluters and impair visibility throughout the region.

In later comments, the public interest advocacy group (0112) took the position that SCR is BART for FCPP. The commenter opposes any attempt to substitute SNCR for SCR as BART, which the commenter indicated the owner of SJGS is trying to do.

One private citizen (0160) also urged EPA to require FCPP to install SCR controls at all five of the plants units.

**Response:**

*EPA agrees with these comments and the final BART rule and the BART alternative require SCR at emission levels for NO<sub>x</sub> that will be achievable over the 3 year period between scheduled maintenance for these EGUs.*

**Comment:**

One environmental advocacy group (0182) asserted that EPA failed to consider data sources critical to ensuring a thorough analysis and adequate NO<sub>x</sub> BART determination. To support this assertion, the commenter drew heavily on an attachment containing comments prepared by Dr. Phyllis Fox (0182). This comment summary includes the comments presented by Commenter 0182; the reader may refer to the attachment (0182) for greater detail.

The commenter (0182) noted that EPA's BART Guidelines require permitting agencies to "consider recent regulatory decisions and performance data (e.g., manufacturer's data, engineering estimates and the experience of other sources) when identifying an emissions performance level or levels to evaluate" (citing 40 CFR part 51, Appendix Y). The commenter stated that there are numerous examples of SIP and permit limits set below the FCPP NO<sub>x</sub> limit:

- Texas SIP emission limits under a cap and trade program of 0.033 lb/MMBtu for the Dallas/Fort Worth ozone nonattainment area and 0.050 lb/MMBtu for the Houston/Galveston ozone nonattainment area for wall-fired boilers burning coal and 0.045 lb/MMBtu for tangential-fired boilers burning coal.
- Vendor guarantees that SCR at the limits of 0.03 lb NO<sub>x</sub>/MMBtu at Texas Parish's four units is achievable, which were the basis for the Texas SIP limits above.
- The permit limits for Desert Rock, requiring the facility to achieve a NO<sub>x</sub> limit of 0.035 lb/MMBtu on a 365-day rolling average basis.
- Ten other similar facilities identified in Comment 0182 with permit or other instruments establishing limits of 0.05 lb/MMBtu or better on a 30- or 365-day rolling average.

The commenter (0182) also stated that EPA should have evaluated performance data, specifically the information available in the CAMD database that compiles CEMS data. The commenter indicated that this information must be understood in the context of the regulatory programs prompting its collection, which do not require the technology performs to its reasonable capability. The commenter asserted that while this information in itself does not establish a BART limit, evaluation of this information helps to determine a BART floor.

**Response:**

*EPA agrees with the commenter that the BART Guidelines state that agencies “should consider recent regulatory decisions and performance data . . . when identifying an emissions performance level or levels to evaluate”. However, the BART Guidelines further state that “[i]n assessing the capability of the control alternative, latitude exists to consider special circumstances pertinent to the specific source under review”, but the agency “should explain the basis for choosing the alternate level (or range) of control in the BART analysis”. See 70 FR at 39166, July 6, 2005. We discuss in the TSD for our proposed BART determination and in our Supplemental Proposal for the alternative emission control strategy our rationale for proposing a limit of 0.11 lb/MMBtu on a plant-wide basis as BART and 0.098 lb/MMBtu for Units 4 and 5 as part of the alternative emission control strategy, based on our determination that the installation of combustion controls is not likely to result in significant NO<sub>x</sub> reductions without potential operational challenges to the boilers because of inherent limitations associated with the boiler design. Our final NO<sub>x</sub> limit for BART and for Units 4 and 5 under the alternative emission control strategy is discussed in further detail in this section of this RTC, in response to the comment that the BART limit should be 0.05 lb/MMBtu, or at least lower than 0.11 lb/MMBtu. In that response, we also discuss emission levels reported to CAMD for several cell burner boilers at different facilities. As reflected in presumptive NO<sub>x</sub> limits in the BART Guidelines, different types of boilers are expected to achieve different levels of NO<sub>x</sub> control. Thus, comparing emission limits achieved by different boilers is not an “apples to apples” comparison.*

*The commenter is correct in stating that compliance with the Texas SIP emission limits of 0.033 lb/MMBtu for the Dallas/Fort Worth ozone nonattainment area and 0.050 lb/MMBtu for the Houston/Galveston ozone nonattainment area for wall-fired boilers burning coal and 0.045 lb/MMBtu for tangential-fired boilers burning coal is achieved through a cap and trade program. See Texas Administrative Code Chapter 117 requirements for combustion control at major utility electric generation sources, e.g., Rules 117.1210 and 117.1220.<sup>78</sup> This type of cap and trade program offers much greater flexibility at meeting the standards (because units that do not, by themselves, meet the emission standard can demonstrate compliance with the standard by purchasing equivalent emission credits from units that perform better than the standard) compared to an explicit permit limit for a single unit, which must be met by that specific unit continuously for the life of the facility. Therefore, comparing the system cap emission limits set in the Texas SIP and a plant-wide or unit specific emission limit under BART for units at FCPP, which include cell burner boilers, is misleading.*

*Although the commenter notes that vendor guarantees of 0.03 lb/MMBtu for the Parish units were demonstrated on Parish Unit 8 in August – November 2006, where Unit 8 was run at 0.03 lb/MMBtu, then at 0.035 lb/MMBtu, EPA notes, and the commenter acknowledges, that the Parish units do not normally and consistently achieve the vendor guarantee of 0.03 lb/MMBtu. Parish Unit 8 typically achieves 0.044 lb/MMBtu, and other coal-fired units at Parish typically achieve closer to or above 0.05 lb/MMBtu. EPA further notes that the coal-fired units at Parish (units 5 – 8), equipped with advanced LNB+OFA systems, e.g., based on CAMD data from 2001 and 2002<sup>79</sup>, typically achieved 0.14 – 0.18 lb/MMbtu. Following installation with SCR, a vendor guarantee of 0.03 lb/MMBtu represents a 79 – 83% reduction in NO<sub>x</sub> emissions. Based on more*

<sup>78</sup> See [http://info.sos.state.tx.us/pls/pub/readtac\\$ext.ViewTAC?tac\\_view=5&ti=30&pt=1&ch=117&sch=C](http://info.sos.state.tx.us/pls/pub/readtac$ext.ViewTAC?tac_view=5&ti=30&pt=1&ch=117&sch=C)

<sup>79</sup> See “WA Parish CAMD monthly 2001-2010.xlsx” in the docket for this final rulemaking.

typical emission rates of around 0.05 lb/MMBtu from the Parish Units 5 – 8, the percent NO<sub>x</sub> reduction ranges from approximately 64 – 72%. Thus, our final NO<sub>x</sub> limit for FCPP based on an 80% reduction from SCR alone is comparable to the vendor guaranteed NO<sub>x</sub> reductions for Parish and exceeds the NO<sub>x</sub> reductions typically achieved at the Parish facility.

*The commenter further cites the BACT determination and limit for NO<sub>x</sub> in the final PSD permit issued by EPA Region 9 to the Desert Rock Energy Facility (DREF) as a lower limit than the one proposed and finalized as BART for FCPP. If constructed, DREF would have used coal from the same mine as FCPP, thus commenters generally argue that emission limits set for DREF should be achievable at FCPP as well. EPA notes that DREF was permitted as a new, greenfield facility using the most advanced boiler design and air pollution control equipment to meet the BACT requirements under the PSD program. EPA Region 9 requested a voluntary remand of the DREF permit to address issues related to other pollutants (greenhouse gases and PM<sub>2.5</sub>), therefore the final permit issued by Region 9 to DREF is not valid, and DREF has not, and cannot, commence construction. Thus, the NO<sub>x</sub> emission limits set for DREF, in particular, the 365-day rolling average limit of 0.035 lb/MMBtu, have not been achieved or demonstrated in practice on the high ash coal from the Navajo Mine. Furthermore, EPA disagrees that the emission limits set as BART necessarily must reflect limits set as BACT.*

*As stated in responses to other comments in this section, EPA disagrees with the assertion that emission limits associated with BART must meet the lowest emission rate achieved at any coal-fired power plant. The Regional Haze Regulations at 40 CFR §51.308(e)(1)(ii)(A) state that:*

*The determination of BART must be based on an analysis of the best system of continuous emission control technology available and associated emission reductions achievable for each BART-eligible source that is subject to BART . . .*

*Additionally, the BART Guidelines state that: “To complete the BART process, you must establish enforceable emission limits that reflect the BART requirements . . .”. See 70 FR 39172, July 6, 2005. The five-factor BART analysis described in the Guidelines is a case-by-case analysis that considers site specific factors in assessing the best technology for continuous emission controls. After a technology is determined as BART, the BART Guidelines require establishment of an emission limit that reflects the BART requirements, but does not specify that the emission limit must represent the maximum level of control achieved by the technology selected as BART. The BART Guidelines and the RHR do not preclude selection of the maximum level of control achieved by a given technology as BART, however, the emission limit set to reflect BART must be achievable by the specific source and should be determined based on consideration of site-specific factors. Therefore, limits set as BACT during PSD review (e.g., Desert Rock), or emission rates achieved from the operation of individual facilities under an emissions trading program (e.g., Texas SIP) may provide important information, but should not be construed to automatically represent a ceiling for BART limits representative of a given technology.*

**Comment:**

One of the owners of FCPP (0176/0177) opposed EPA's proposal to "phase in" NO<sub>x</sub> controls at FCPP under a traditional BART FIP, commencing 3 years from the date the FIP becomes effective. The commenter asserted that this proposal does not afford adequate time to properly design, engineer, and construct the controls before the compliance deadline because the proposal would give APS only 2 years after the approval or disapproval of the proposed transaction with Southern California Edison to achieve full compliance with the new emission limit. The commenter argued this schedule would be very nearly impossible to meet because of the scale and complications involved in this large and expensive engineering project. See related comments in Section 6.0. Another FCPP owner (0168) expressed support for Commenter 0176/0177 on this issue. This commenter stated that the proposed phase-in is burdensome and unnecessary, and that the FCPP owners should be afforded the flexibility to schedule construction of BART controls within 5 years as is typically allowed.

**Response:**

*EPA revised the BART compliance date for one 750 MW unit (either Unit 4 or 5) to within 4 years from the effective date of this final rule, and the remaining 750 MW unit and Units 1-3 to within 5 years of the effective date of the final rule. The revised compliance time within 4 and 5 years allows time for design, engineer, and construct controls.*

**Comment:**

One environmental advocacy group (0182) stated that the proposed plantwide BART limit of 0.11 lb/MMBtu across all five FCPP units violates Executive Order 12898 on environmental justice. Specifically, the commenter stated that given the significant differences in pollution control systems among FCPP's five units, allowing a plant-wide average could create pollution "hotspots" with respect to co-pollutants. As an example, the commenter noted that while Units 4 and 5 have baghouses, Units 1 – 3 use less efficient venturi scrubbers for control of sulfur dioxide, particulate matter, and mercury. The commenter asserted that the plantwide average limit for NO<sub>x</sub> would allow increased emissions from Units 1 – 3 in the event of a temporary outage or reduced output from one or both of the larger units. The commenter stressed that while this may not increase the total NO<sub>x</sub> emissions from the plant, it would increase the amount of mercury and other toxic co-pollutants emitted into the surrounding community, which is a low-income community of color.

The commenter (0182) stated that this is precisely the type of scenario Executive Order 12898 seeks to avoid. The commenter indicated that EPA should impose unit-specific BART limits, which it unquestionably has the authority to do (citing 40 CFR part 51, Appendix Y). In the alternative, the commenter urged EPA to conduct a full environmental justice analysis, supported by modeling, to show that its plantwide average will not cause disproportionate environmental harm in the surrounding community under any operating scenario.

**Response:**

*EPA disagrees with the commenter that a plant-wide BART limit of 0.11 lb/MMBtu across all five FCPP units violates Executive Order 12898 on environmental justice. EPA's final action establishing this plant-wide emission limit for NO<sub>x</sub> represents an 80% reduction in overall NO<sub>x</sub> emissions over the current baseline emissions for this single facility. This final rule is not expected to have disproportionately high and adverse human health or environmental effects on minority or low-income population because it increases the level of environmental protection for all affected populations in the area including any minority or low-income population.*

*The commenter is correct that in the event of a temporary outage or reduced output from unit 4 or 5 the operator could continue to operate FCPP units 1-3 under the original BART proposal provided that they maintain compliance with the plant-wide emission limit of 0.11 lb/MMBtu for NO<sub>x</sub>. In order to maintain compliance with the plant-wide emission limit, units 1-3 would have to operate at a lesser capacity than they would normally operate if unit 4 and 5 were functioning because units 1-3 emit higher amounts of NO<sub>x</sub> than units 4 and 5. The NO<sub>x</sub> emission rates from Units 1-3 with SCR, based on 80 percent control of current emission rates would be 0.16, 0.13, and 0.12 lb/MMBtu respectively which are higher than the proposed plant-wide emission limit.<sup>80</sup> Therefore, to maintain compliance with the plant-wide NO<sub>x</sub> emission limit (which is based upon a 30 calendar-day rolling average), units 1-3 would have to operate at a reduced capacity and could only operate if unit 4 or 5 were also concurrently operating. This reduced capacity would result in an overall lower rate of emission for mercury and other co-pollutants from units 1-3. Therefore, there would be no increased emissions of mercury or other co-pollutants and no "hot-spots" or disproportionately high and adverse human health or environmental effects on minority or low-income population.*

*The BART Guidelines at 40 CFR Part 51, Appendix Y, Section 4 state that average emissions across any set of BART-eligible emission units within a fence line should be considered provided that the emission reductions from the pollutant be equal to those reductions that would be obtained by simply controlling each of the BART-eligible units at that source. EPA proposed and is finalizing a plant-wide heat input-weighted average emission limit of 0.11 lb/MMBtu. This BART determination can be met by achieving 80% control on Units 1 – 5 by the application of SCR. EPA further notes that the commenter's concern about increased usage of the less efficient Units 1 – 3 would not occur if APS implemented the alternative emission control strategy involving closure of Units 1 – 3.*

**Comment:**

One of the owners of FCPP (0174) and one utility industry association (0169.1) consider the BART proposal to be inconsistent with President Obama's January 18, 2011 Executive Order 13563 pertaining to regulatory strategy. One of the commenters (0174) alleged that EPA failed to properly consider the two key principles of the Executive Order:

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<sup>80</sup> See page 87 of the TSD for the proposed rule; Document No. EPA-R09-OAR-2010-0683-0002.



- Consistent with law, Agencies must consider costs and benefits and choose the least burdensome option.
- Agencies must consider low-cost approaches that reduce burdens and maintain flexibility. Regulations must be guided by objective scientific evidence.

The commenters (0169.1, 0174) asserted that SCR represents a very high cost, low benefit option. In addition, they stated that modeling that relies on CALPUFF version 5.8 and the IWAQM default background ammonia values does not represent the best available science.

**Response:**

*EPA disagrees that our BART determination is inconsistent with President Obama's Executive Order 13563 or that SCR is a high-cost, low-benefit option.*

*Executive Order 13563 is supplemental to and reaffirms the principles, structures, and definitions governing contemporary regulatory review that were established in Executive Order 12866 of September 30, 1993. Our proposed and final actions are not "significant regulatory actions" under the terms of Executive Order 12866 (58 FR 51735, October 4, 1993) because these rules only apply to one facility and are not rules of general applicability.*

*The President issued Executive Order 13563 on January 18, 2011, after we issued our Proposed Rule but just prior to our Supplemental Proposal. In general, the Order seeks to ensure the regulatory process is based on the best available science; allows for public participation and an open exchange of ideas; promotes predictability and reduces uncertainty; identifies and uses the best, most innovative, and least burdensome tools for achieving regulatory ends; and takes into account benefits and costs, both quantitative and qualitative.*

*EPA conducted our BART determination for FCPP using the site-specific five-factor analysis in the BART Guidelines. As part of that analysis, EPA carefully considered the cost of controls and the benefits of those controls to improve visibility in the surrounding Class I Areas to achieve the goals stated in the CAA and RHR. As described below in more detail, based on the results from the original analysis for the proposed BART determination, EPA concluded that the installation and operation of SCR on all five units at FCPP would not adversely affect the competitiveness of FCPP's cost to generate electricity compared to the cost to purchase electricity on the open market. EPA notes that our BART determination for FCPP does not specifically require SCR technology, rather, we have set an emission limit for NO<sub>x</sub> that can be achieved from the installation of SCR. The facility has the flexibility to determine the least-costly, least burdensome way of meeting that emission limit. EPA provides additional flexibility by giving the owners of FCPP the option to implement the alternative emission control strategy in lieu of BART, an alternative that was largely proposed by APS on behalf of FCPP's owners.*

*As discussed more fully in Section 3.1 of this RTC, EPA disagrees that SCR represents a high cost, low benefit option.*

*EPA's use of CALPUFF version 5.8 for modeling of visibility benefits and the IWAQM default background ammonia values represent the best available science as discussed above in responses to comments in Section 7.0 of this RTC.*

**Comment:**

One of the owners of FCPP (0174) stated that in establishing BART for FCPP, EPA did not consider the progress already made towards improving visibility on the Colorado Plateau. The commenter asserted that instead of taking this progress into consideration as support for establishing a cost-effective control option as BART in this first planning period, EPA imposed the most stringent and costly controls as BART and attempted to justify this proposal by raising uncertainties with respect to the contribution of nitrates to regional haze in the Colorado Plateau. The commenter argued that if EPA takes into consideration the available data showing the progress already made towards improving visibility on the Colorado Plateau, and the extensive work performed by the Western Regional Air Partnership that shows the small contribution of nitrates to regional haze, EPA will be compelled to conclude that reasonable progress can be made in the first planning period by requiring the installation of cost-effective LNB as BART for FCPP, and additional controls can be required, if necessary, in future planning periods.

The Navajo Nation (0223) acknowledged and supported the intent of the reasonable progress goals under the CAA [quoting 40 CFR 51.308(d)(1)(i)(B), which discusses calculating and using the necessary uniform rate of progress to set the reasonable progress goal], but stated that in its visibility analysis, EPA should consider the cumulative benefits in visibility improvements from all neighboring states' regional haze SIPs and BART determinations. The commenter also indicated that real-time data should be used whenever possible as it becomes available.

**Response:**

*EPA disagrees with the commenter that we must consider progress already made toward improving visibility on the Colorado Plateau or that reasonable progress can be made by the installation of LNB as BART at FCPP. EPA further disagrees that any reasonable progress already made towards improving visibility would invalidate the BART provisions of the RHR, as the commenter seems to imply. The FCPP is one of the largest stationary sources of NO<sub>x</sub> in the country, and is located near many Class I areas where visibility is highly valued, so it is highly appropriate to undertake a BART analysis for it. In any case, a BART analysis for FCPP is required under the RHR.*

*EPA does agree with certain aspects of the comments regarding a phased implementation strategy to attaining national visibility goals. In 40 CFR 51.308(f), States are required to revise their regional haze implementation plans every ten years, which is a process that involves evaluating their ability to attain reasonable progress goals and potentially updating their long-term strategy for regional haze. The periodic revision requirement described in 40 CFR 51.308(f), however, does not extend to the implementation plan for BART requirements. The*

*phased approach described by the commenter has certain benefits, and a phased approach is incorporated into the alternative emission control strategy.*

*Any downward trends in SO<sub>2</sub> and NO<sub>x</sub> emissions or improvement in visibility on the Colorado Plateau are due to variability in natural emissions on a short term basis, or else to reductions of anthropogenic emissions, which occur partly in response to regulatory requirements like BART. Application of BART is one means by which downward emission and impairment trends may continue.*

*Contrary to what the commenters seem to imply, seemingly small relative contributions to visibility impairment do not exempt sources from BART. Estimates of visibility impairment vary by the estimation method used. Reliance on an average over groups of days and on the percentage of the overall inventory may not be the best method for attributing impairment to particular sources; under the BART Guidelines, individual source impacts are estimated using CALPUFF modeling. Estimates of impairment from stationary source NO<sub>x</sub> also vary by location, calendar year, and time of year. For many Class I areas in the western U.S., the worst visibility occurs during summer, when carbon from fires is a dominant impairment component; this makes stationary source NO<sub>x</sub> appear small in a relative sense. Nevertheless, stationary source NO<sub>x</sub> remains an important component of visibility impairment, one that cannot be neglected. Any one segment of the overall emission inventory might be dismissed as too small to apply controls to, in which case no progress could be made toward the RHR national goal of remedying visibility impairment from manmade pollution. Instead, the RHR identifies stationary sources as an important category for evaluation, in the form of a BART analysis. Modeling has shown that many individual stationary sources have the potential to contribute to visibility impairment (i.e., have a modeled impact of at least 0.5 dv, 70 FR 39161). In particular, EPA modeling of FCPP as discussed in the TSD for our proposed rulemaking showed visibility impacts from 1.2 to 6.0 deciviews, depending on the Class I area (or from 0.8 to 3.2 deciviews if lower ammonia background is assumed as recommended by some commenters). These are not negligible impacts.*

*EPA also disagrees with the commenter that we should consider the cumulative benefits in visibility improvements from all neighboring states' regional haze SIPs and other BART determinations in determining BART for FCPP. The BART analysis is conducted on a source-specific basis. Nothing in the BART regulations or guidance requires that EPA consider visibility improvements from other sources in determining BART for a particular source under the RHR.*

*The Navajo Nation EPA has not developed a TIP for Regional Haze, nor does the Navajo Nation have within its jurisdiction any federal mandatory Class I areas as set by Congress<sup>81</sup>. As explained in the preamble to our proposed BART rule, FCPP and NGS are the only BART-eligible sources located on the Navajo Nation. FCPP contributes to impairment at many surrounding Class I areas.*

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<sup>81</sup> EPA notes that Navajo Nation has established its own parks and monuments, including Monument Valley, Canyon de Chelly, and the Four Corners Monument, however, these parks are not mandatory Class I Federal Areas as set by Congress.

*EPA is exercising its discretion to promulgate emission limitations for FCPP to close the regulatory gap with respect to this facility. In light of the magnitude of emissions of NO<sub>x</sub> from FCPP, EPA is proposing to find that it is necessary or appropriate to establish BART requirements for NO<sub>x</sub> from FCPP, and is proposing specific NO<sub>x</sub> limits as BART.*

*EPA agrees with the commenter that real-time data should be used whenever possible as it becomes available.*

## **8.2 Comments on the Proposed BART Determination for PM**

### **Comment:**

One of the owners of FCPP (0176/0177) asserted that the existing controls at FCPP constitute BART for PM emissions. The commenter contended that the impact of PM controls on the visibility in the neighboring Class I areas would be “vanishingly small” while the cost would be “exorbitant” (resulting in cost effectiveness ranging from \$51,500 – \$148,659 per ton reduced and from \$1.4 billion – \$3.7 billion per dv improvement). The commenter pointed out that Table 4 in the proposal preamble, where EPA’s modeling of the proposed BART emission levels is summarized, shows visibility improvements of 0.02 dv at three Class I areas, 0.01 dv at seven areas, and 0.00 at the remaining areas. Given that the EPA’s own definition requires at least 0.5 dv to “contribute” to visibility impairment, the commenter argued that EPA has not presented a basis to require FCPP to retrofit any additional PM controls at the plant, particularly not at an estimated capital cost of over \$215 million. Another of the FCPP owners (0179) and the Navajo Nation (0223) made similar points, but in relation only to Units 1 – 3. A third FCPP owner (0174) similarly noted that the impact of PM reductions estimated by EPA would have almost no effect on visibility, concluding that no additional controls should be required as BART for FCPP.

The Navajo Nation (0223) stated that EPA acknowledged the high incremental cost of new PM controls on Units 1 – 3 (citing 75 FR 64230), yet justified the cost effectiveness of baghouses by comparison with similar retrofit projects in EPA Region 9. This commenter argued that EPA failed to properly evaluate the costs associated with installation of bag houses using site-specific parameters, thereby deviating from the BART Guidelines. The commenter also stated that future CAA rulemakings, such as MACT regulations, will provide EPA an opportunity to evaluate the feasibility of control technology during periodic reviews of the EPA air quality standards. The commenter asserted that continued operation of venturi scrubbers to meet emission limits of 0.03 lb/MMBtu and an opacity limit of 20 percent satisfies BART for Units 1 – 3.

The Navajo Nation (0223) expressed support for the supplemental proposal to require a PM emission limit of 0.015 lb/MMBtu and 10 percent opacity limit on Units 4 and 5. The commenter presumed that FCPP can readily meet these standards prior to installation of SCR since the limits can be achieved with the existing bag houses.

Regarding the EPA’s proposed 10 percent opacity standard for each unit, two of the owners of FCPP (0168, 0176/0177) stated that the EPA has not specified any costs or predicted

any improvement in visibility that would result from such limits. The commenters asserted that without such basis, the EPA cannot justify the proposed opacity limits. The commenters concluded that the EPA should withdraw its proposed determination that baghouses are BART for Units 1 – 3 and its proposal to make the opacity standard for Units 4 and 5 more stringent.

**Response:**

*As stated in our proposed BART determination for PM, the existing venturi scrubbers on Units 1 – 3 at FCPP do not constitute BART. In our proposed BART determination for FCPP, EPA proposed a PM emission limit for Units 1 – 3 that can be achieved through the installation of any of four different PM control options. At the time of our BART proposal, the MATS Rule for electric utility steam generating units had not yet been proposed, nor had APS suggested its alternative emission control strategy to close Units 1 – 3 in lieu of complying with BART for NOx. Because the final MATS rule has been issued See 77 FR 9304, February 16, 2012 and sets filterable PM and mercury limits that would be applicable to the units at FCPP, and because EPA is finalizing this rule to allow APS to either comply with the alternative emission control strategy or BART for NOx, EPA is determining that it is not necessary or appropriate at this time to finalize our proposal to set new PM limits for Units 1 – 3.*

*Regarding our proposed BART determination for PM for Units 4 and 5, we are finalizing the proposed 0.015 lb/MMBtu emission limit based upon the proper operation of the existing baghouses. However, we have determined based on the comments we received from the operator of FCPP that it is not necessary or appropriate to take final action on the proposed 10 percent opacity limit. We have determined that imposing a 10 percent opacity limit will not provide greater assurance that Units 4 and 5 at FCPP are meeting the PM emission limit of 0.015 lb/MMBtu. We have determined previously that a 20 percent opacity limit is sufficient to ensure the PM emission limit is being continuously met. The 10 percent opacity limit was generally supported by the Navajo Nation and environmental groups. EPA has promulgated some recent rules for electric generating units that have retained a 20 percent opacity standard rather than reducing that limit to 10 percent. Specifically, EPA's revised the New Source Performance Standard for large electric generating units at 40 CFR Part 60, Subpart Da, to lower the PM emission limit for new units to 0.09 lb/MMBtu for gross energy output or 0.097 lb/MMBtu for net energy output. For existing units that reconstruct or modify, Subpart Da establishes an emissions limit of 0.015 lb/MMBtu. For both standards, EPA retained a 20 percent opacity standard as being sufficient to ensure compliance with either the 0.090 (0.097) lb/ MMBtu or 0.015 lb/ MMBtu PM emission limit. EPA's MATS rule, which was finalized just a few months ago, also retained a 20 percent opacity standard as being sufficient to ensure compliance with the PM emission limit that will be required for electric generating units subject to that rule.*

*The importance of the opacity limit is that a certain percentage opacity is an instantaneous demonstration that a unit is in compliance with its PM emission limit. If a unit does not install and operate a PM continuous emissions monitor, then EPA ensures compliance with the PM emission limit by requiring an episodic source test. For the periods between episodic source testing, EPA can ensure continuous compliance with the PM emission limit by observing that the unit's stack emissions do not exceed a set opacity. EPA's recent rulemakings have determined that 20 percent opacity is sufficient to ensure compliance with a PM emission*

*limit lower than the emission limit we have determined is BART for Units 4 and 5. Accordingly, EPA is determining the 20 percent opacity limit that we promulgated in our 2007 FIP for FCPP as being adequate to ensure continuous compliance with the PM BART limit or 0.015 lb/MMBtu.*

**Comment:**

One group of environmental advocacy groups (0182) supported setting a 10 percent opacity limit for Units 1 – 5, as measured by continuous opacity monitors (COMS), for the reasons stated in the proposal preamble. However, based on information in a report prepared by Vicki Stamper and submitted by the commenter (docket number 0182.3), the commenter (0182) argued that the particulate matter BART limits for FCPP Units 1 – 3 should be based on the installation of fabric filter baghouses, as this control is likely the only PM control that will ensure the FCPP units can meet the forthcoming mercury MACT limit of 1 lb/TBtu and the related PM limit. The commenter added that baghouses will also likely result in the lowest filterable PM emission rates and will also greatly reduce fine particulate.

The commenter (0182) added that based on prior PM<sub>10</sub> BACT determinations with baghouses, a BART limit on filterable PM<sub>10</sub> should be no higher than 0.010 lb/MMBtu, along with an opacity limit no higher than 10 percent as EPA required as BACT at the Desert Rock facility. The commenter agreed that an opacity limit is necessary to show continuous compliance with the particulate matter BART limits (citing 75 FR. 64223).

In addition, the commenter (0182) indicated that EPA has proposed a BART limit only for PM, which appears to be only filterable particulate matter. The commenter stated that the BART guidelines specify that BART should be evaluated and defined for both PM<sub>10</sub> and PM<sub>2.5</sub> (citing 40 CFR part 51, Appendix Y, section IV.A) and, consequently, that EPA must evaluate and define BART limits for both PM<sub>10</sub> and PM<sub>2.5</sub>. The commenter also asserted that as part of the PM<sub>2.5</sub> BART determination, EPA must impose emission limits on condensable particulate matter, which is typically in the size range of 2.5 micrometers or smaller. Thus, the commenter asserted that in addition to a filterable PM BART limit, EPA should impose a BART limit on total PM<sub>2.5</sub>.

One public interest advocacy group (0112) supported EPA's proposal and supplemental proposal to require a PM limit and a 10 percent opacity limits on Units 4 and 5. The commenter indicated that these limits should become effective prior to SCR installation, regardless of whether the BART or alternative emission control plan is implemented. A private citizen (0192) also stated that PM and opacity limits on Units 4 and 5 should become effective at the earliest practicable date, seeing no reason why their effective date should be tied to SCR installation.

In "preliminary" comments submitted prior to the supplemental proposal, a similar group of environmental advocacy groups (0095) suggested PM limits of 0.012 lb/MMBtu on a 6-hour block average, applicable to each individual unit at FCPP. The commenter suggested that compliance be required by 2014, determined using CEMS. The commenter also supported EPA's proposal of an opacity limit of 10 percent, to be measured using COMS. The commenter added

that the BART determination should include a provision that FCPP may forego BART implementation at any unit if it agrees to retire that unit prior to the deadline for BART implementation. The commenter requested that these limits be published for comment in any *Federal Register* notice published to take comment on the FCPP alternative BART proposal.

**Response:**

*EPA proposed a BART limit of 0.012 lb/MMbtu for Units 1-3. There are various control technologies that can achieve this limit including a baghouse, as mentioned by the commenter. The least expensive approach would be to install a wet membrane ESP after the venturi scrubber. BART is an emission limit and EPA does not dictate the control technology that must be installed to meet it. As mentioned in the previous response, EPA is determining that it is not necessary or appropriate at this time to take final action on the proposed PM BART limit for Units 1-3. Nonetheless, as stated in the TSD for our proposal, EPA does not believe the existing venturi scrubbers constitute BART.*

*EPA agrees with the commenter that the PM and Hg emission limits in the MATS Rule<sup>82</sup> may require installation of baghouses on Units 1-3 to meet the standards. EPA is not finalizing a PM BART determination at this time for those 3 units because these units will either be closed, consistent with the alternative emission control strategy, or will be subject to the MATS Rule, which will set additional emission limits. Because EPA is not finalizing a PM standard at this time for Units 1-3, it is not timely to address the commenters' recommendation on an opacity limit for these units or the tighter limit of 0.01 lb/MMbtu.*

*EPA is finalizing the proposed PM BART limit for Units 4 and 5 of 0.015 lb/MMbtu which can be met with the proper operation of the existing baghouses. Because these baghouses are more than 25 years old, it is not appropriate to impose a more stringent PM limit such as one that has been set or proposed for a newly constructed EGU.*

*EPA disagrees with the commenters' recommendation that the condensable fraction must be included in the PM BART limits. EPA has previously outlined our reasoning as to why an H<sub>2</sub>SO<sub>4</sub> limit is not appropriate at this time (it will be addressed through the pre-construction permitting process if needed) and EPA expects that H<sub>2</sub>SO<sub>4</sub> will be the main component of condensable PM from a coal fired EGU with an SCR. The existing 20% opacity limit is sufficient to provide reasonable assurance of the unit's compliance with the PM BART limit.*

*As mentioned in a previous response, EPA is not finalizing the proposed 10% opacity limit. While the 10% opacity limit was generally supported by the Navajo Nation and environmental groups, upon further consideration of opacity limits set in other national EPA rulemakings, including the final MATS rule and NSPS Subpart Da, EPA is maintaining the 20% opacity limit that is already in the 2007 FCPP FIP.*

*EPA agrees with commenters that PM limits on Units 4 and 5 should become effective prior to SCR installation, as Units 4 and 5 generally already meet the 0.015 lb/MMbtu limit.*

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<sup>82</sup> See 77 FR 9304, February 16, 2012

*EPA is finalizing a compliance date for PM emission limits on Units 4 and 5 to be within 6 months after restart following the next scheduled major outages in 2013 and 2014.*

*EPA disagrees with the commenter that a CEMs (presumably a PM CEMs) be used to determine the continued compliance with the PM limits for Units 4 and 5. As stated previously, the existing 20% opacity limit is sufficient to provide reasonable assurance of the unit's compliance with the PM BART limit.*

**Comment:**

One commenter (0182.3) submitted a technical review of the PM BART determination, which was attached to the comments of an environmental advocacy group (0182), as noted above. A brief summary of the major points of this review related to Units 1 – 3 follows:

- Venturi scrubbers are not the best system of continuous emission reduction.
- The costs of installation new particulate controls, particularly baghouses, at FCPP Units 1 – 3 are reasonable.
  - Costs of PM controls are overestimated.
  - Effectiveness of PM controls is underestimated.
  - APS's cost effectiveness analysis of PM controls only reflects incremental costs.
  - Revised analyses show that the installation of a baghouse is cost effective – average cost effectiveness ranging from \$40.04/ton to \$52.56/ton.
- The energy and environmental impacts analyses weigh strongly in favor of installation of baghouses at FCPP Units 1 – 3.
  - A baghouse will likely be necessary to meet mercury MACT limits.
  - New PM controls will be needed to meet the EPA's proposed PM limit for non-mercury metal HAPs.
  - The greater reduction in mercury emissions that a baghouse would allow for could help address mercury deposition levels in the region.
  - The secondary plume from FCPP Units 1 – 3 causes localized visibility impairment.
- Upgraded PM controls at FCPP Units 1 - 3 will improve visibility at nearby Class I areas.
- The BART limits for Units 1 – 3 should be based on the installation of baghouses with a limit on filterable PM<sub>10</sub> no higher than 0.010 lb/MMBtu, along with a 6-minute average opacity limit no higher than 10 percent. The EPA must also define BART limits for PM<sub>2.5</sub> and condensable PM.

The commenter's (0182.3) major points related to PM BART for Units 4 and 5 are as follows:

- Units 4 and 5 can meet lower particulate matter BART limits than proposed by EPA.
- The EPA should evaluate the PM and SO<sub>2</sub> reductions that can be obtained with the elimination of bypasses of the scrubber.
- The EPA must evaluate and impose BART limits for PM<sub>10</sub> and PM<sub>2.5</sub>.



- The filterable PM emission limits should be no higher than 0.012 lb/MMBtu, which the units are actually achieving. The EPA should evaluate options for achieving filterable PM emission limits of 0.010 lb/MMBtu as has been required to meet BACT requirements in several recent PSD permits. The proposed 10 percent opacity limit measured with COMS is necessary to show continuous compliance with the PM BART limits.

**Response:**

*As previously mentioned, EPA is not finalizing the PM BART determination for Units 1-3 at this time.*

*With regards to units 4 and 5 PM BART, EPA does not agree that the limit needs to be set at what can be achieved by new EGUs considering these baghouses are more than 25 years old. EPA also disagrees with the need for a PM<sub>10</sub>, PM<sub>2.5</sub> or a condensable limit for these units. There is very little data available at this time for setting any of these limits. A PM limit is an adequate surrogate for these smaller fractions. A leak in a baghouse will pass all size fractions of PM and setting the limit with a Method 5 front half measurement is adequate for all size fractions for a baghouse-controlled coal fired EGU. As mentioned previously and elaborated on more in RTC in section 8.4, EPA does not agree that a condensable limit is needed for BART.*

### **8.3 Comments on BART for SO<sub>2</sub>**

**Comment:**

Some commenters (0095, 0112, 0140, 0182) asserted that SO<sub>2</sub> BART should be required for FCPP, while one commenter (0224) simply noted that FCPP is subject to BART for SO<sub>2</sub>. Their comments are summarized in the paragraphs that follow.

One federal agency commenter (0224) stated that FCPP is subject to BART for SO<sub>2</sub>. The commenter stated that Units 4 and 5 should be able to meet a limit of 0.12 lb/MMBtu on an annual average basis by upgrading the existing scrubbers.

One group of environmental advocacy groups (0182) discussed the Regional Haze rules, the TAR, and the SO<sub>2</sub> emissions from FCPP and concluded that EPA is under a legal obligation to conduct a BART analysis for SO<sub>2</sub> emissions from FCPP and, to the extent EPA has failed to make a finding that it is “necessary or appropriate” to regulate SO<sub>2</sub> emissions from the FCPP, such a failure is arbitrary, capricious, and not supported by the administrative record. The commenter added that EPA’s proposed FIP is also arbitrary and capricious because it fails to conduct any BART analysis for SO<sub>2</sub> emissions from the FCPP, and because EPA fails to comply with its methodology for conducting BART determinations found in the Regional Haze rules at 40 CFR 51.308(e) and the BART Guidelines.

According to the commenter (0182), EPA argues that FCPP’s current SO<sub>2</sub> emissions limits are “close to or equivalent” to the limit that would be established under BART. The commenter argued that this conclusion is likewise arbitrary and capricious because EPA has

failed to undertake any scientific or technical analysis to support its conclusion – rather than conduct such an analysis, EPA simply stated that the FCPP agreed to reduce SO<sub>2</sub> emissions pursuant to a prior voluntary compliance agreement. However, the commenter notes that a review of the administrative record shows that EPA did not conduct an SO<sub>2</sub> BART determination for the FCPP at that time, and has not conducted such an analysis since that time.

The commenter (0182) goes on to assert that under the plain language of the Regional Haze rules at 40 CFR 51.308 and the BART Guidelines, EPA must now make an SO<sub>2</sub> BART determination for the FCPP as part of this source-specific regional haze FIP. Moreover, the commenter argued that an SO<sub>2</sub> BART determination is likewise important to meet the requirements of section 110 of the CAA as it relates to interstate transport of visibility impairing emissions. The commenter contended that EPA's failure to make an SO<sub>2</sub> BART determination for FCPP under the methodology prescribed by its own regulations and guidelines is arbitrary and capricious and must be corrected in the final rule.

The commenter (0182) made the following points about an SO<sub>2</sub> BART analysis at FCPP:

- The fact that the FCPP reduced SO<sub>2</sub> earlier than BART deadlines should not influence a proper BART determination. The commenter asserted that given the complicated regulatory history of SO<sub>2</sub> controls at FCPP and the fact that SO<sub>2</sub> controls were required since the mid 1970's but were not installed until the early 1980's, APS should not be given credit to avoid a complete SO<sub>2</sub> BART analysis because the company finally took actions to achieve better SO<sub>2</sub> control. The commenter also stated that an analysis of the new 1-hour average SO<sub>2</sub> NAAQS standard could show that FCPP's current controls are necessary to ensure the FCPP does not cause or contribute to violations of the 1-hour average SO<sub>2</sub> NAAQS, and thus are not early controls. Finally, the commenter stated that given that EPA imposed enforceable SO<sub>2</sub> emission limits in 2007, the same year regional haze SIPs were due to be submitted to EPA and given that the methods planned on to reduce SO<sub>2</sub> at FCPP could be implemented fairly readily (i.e., there was no installation of new pollution controls), it is difficult to consider these controls as being implemented early.
- The SO<sub>2</sub> limits of the FCPP FIP are not as stringent as BART. The commenter stated that without a BART analysis for SO<sub>2</sub> for each of the FCPP units, it is not known how much the current FIP requirements differ from what would have been required to meet BART. The commenter indicated that EPA can only allow an alternative to BART as long as it has been demonstrated to result in greater reasonable progress than BART. The commenter noted that the permit for Desert Rock, which would also use Navajo coal, limited SO<sub>2</sub> emissions to 0.06 lb/MMBtu. In addition, the commenter added that the current SO<sub>2</sub> controls on Units 4 and 5 do not treat 100 percent of the flue gas – the EPA's BART determination should evaluate the cost and visibility benefits of treating 100 percent of the flue gas for all units.
- FCPP must meet presumptive SO<sub>2</sub> BART limits at a minimum. The commenter pointed out that the presumptive BART limit for EGUs like FCPP is 95 percent control, the commenter asserted should be the regulatory floor. The commenter requested that EPA undertake an SO<sub>2</sub> BART analysis for FCPP on a unit-by-unit basis and develop specific limits for each unit. The commenter argued that a plantwide limit would only be

acceptable if it ensured emission reductions that were better than what would be required by a BART determination for each unit. The commenter added that the presumptive limits may be BART, but this will be known only after a thorough BART analysis. Finally, the commenter asked that EPA not delay the final NO<sub>x</sub> and PM BART determinations while conducting the required SO<sub>2</sub> BART rulemaking.

In “preliminary” comments submitted prior to the supplemental proposal, a similar group of environmental advocacy groups (0095) suggested that the owners of FCPP should be required to perform an SO<sub>2</sub> BART analysis for all five units for submission to EPA and the public no later than February 18, 2011, with comments due by the comment deadline that was then in force for the BART rulemaking (i.e., March 18, 2011). The commenter further stated that EPA should propose an SO<sub>2</sub> BART determination by April 30 and a final determination at the time it finalized the FIP, with compliance with the SO<sub>2</sub> BART limits required by 2014. The commenter added that the BART determination should include a provision that FCPP may forego BART implementation at any unit if it agrees to retire that unit prior to the deadline for BART implementation. The commenter requested that these proposed requirements be published for comment in any *Federal Register* notice published to take comment on the FCPP alternative BART proposal.

A public interest advocacy group (0112) stated that the SO<sub>2</sub> limits need to be tightened up for FCPP to further reduce visibility impairment and to reduce the acidification of rainfall caused by the formation of H<sub>2</sub>SO<sub>4</sub>. The commenter stated that because the damaging effects of H<sub>2</sub>SO<sub>4</sub> in precipitation on ancestral Puebloan sandstone dwellings and pictographs are not fully understood, it is disappointing for the FCPP proposals not to address SO<sub>2</sub>. The commenter asked that FCPP be required to perform a BART analysis for all five units by a date established by EPA.

**Response:**

*As many of the commenters acknowledge, EPA finalized a FIP in May 2007 that required significant SO<sub>2</sub> emissions reductions from FCPP and established continuous SO<sub>2</sub> emissions limits for FCPP. See 72 FR 25698 (May 7, 2007). The 2007 FIP required FCPP to increase the removal efficiency of its SO<sub>2</sub> emissions controls from 72% to 88%, resulting in a SO<sub>2</sub> emissions reduction of approximately 22,000 tons per year. EPA had proposed this FIP in September 2006. The 2006 proposed FIP stated that “EPA believes that the SO<sub>2</sub> controls proposed today for FCPP are close to or the equivalent of a regional haze BART determination of SO<sub>2</sub>. This takes into consideration the early reductions this action will achieve and the modification to the existing SO<sub>2</sub> scrubbers.” 72 FR 25700. We received several comments on our 2006 proposal which stated that EPA should be undertaking a BART analysis for SO<sub>2</sub> rather than setting the SO<sub>2</sub> emissions limit based on FCPP’s agreement to improve its SO<sub>2</sub> removal efficiency from 72% to 88%. In finalizing that rulemaking in the 2007 FIP, EPA responded that it was exercising its authority pursuant to Section 49.11 of the TAR to implement measures that are necessary or appropriate to protect air quality in Indian country. Id. EPA determined that the SO<sub>2</sub> emissions reductions would be federally enforceable as soon as the 2007 FIP was finalized which would be potentially five years before EPA could achieve enforceable SO<sub>2</sub> emissions reductions through making a BART determination. See id. EPA also considered the Navajo Nation’s request for EPA*

*to establish enforceable SO<sub>2</sub> emissions reductions immediately that, in the opinion of the Navajo Nation, “appear[] to be equivalent to BART.” Id. Therefore, EPA’s determination on this issue in finalizing the 2007 FIP was “that it is neither necessary nor appropriate at this time to undertake a BART determination for SO<sub>2</sub> from FCPP given the timing of the substantial SO<sub>2</sub> reductions resulting from this FIP.” Id. In addition, we stated that “given that the SO<sub>2</sub> controls for FCPP immediately achieve significant reductions in SO<sub>2</sub> comparable to what could ultimately be achieved through a formal BART determination, EPA believes that it will not be necessary or appropriate to develop a regional haze plan to address SO<sub>2</sub> for the Navajo Nation in the near term.” Id. 25700-701. Both APS, as operator of FCPP, and Sierra Club sought judicial review of our 2007 FIP.*

*The comments on this action essentially repackage the comments we received and provided a response for on the 2007 FIP. The comments have not presented any new facts or legal considerations that have arisen or changed since we responded to comments requesting a BART determination for SO<sub>2</sub> in 2007.*

### **Comment:**

One commenter (0182.3) submitted a technical review of SO<sub>2</sub> BART, which was attached to the comments of an environmental advocacy group (0182). The commenter asserted that the SO<sub>2</sub> FIP requirements do not reflect the level of SO<sub>2</sub> control currently being achieved at FCPP Units 1 – 3. According to the commenter, a review of 2008 and 2009 SO<sub>2</sub> emissions data compared to APS data on annual uncontrolled SO<sub>2</sub> emissions in the coal show that these FCPP units are achieving greater than 93 percent control on an annual average basis. Thus, the commenter argued that the 88 percent control limitation cannot be considered as “close to or equivalent to” BART and the emission limits for SO<sub>2</sub> should be no higher than the removal efficiencies actually being achieved.

The commenter (0182.3) provided a BART analysis for SO<sub>2</sub> at FCPP Units 1 – 3 and concluded that SO<sub>2</sub> BART for FCPP Units 1 – 3 should be a 95 percent SO<sub>2</sub> control requirement or an emission limit of 0.09 lb/MMBtu, applicable to each unit on a rolling average basis of 30 boiler operating days. The commenter added that this BART limit would be met by the addition of baghouses upstream of the existing wet scrubbers at these units (which will be required to meet MACT and also PM BART), along with other physical or operational changes to the scrubbers to improve SO<sub>2</sub> removal efficiency to 95 percent. The commenter indicated that compliance should be based on CEMS and, if a percent removal requirement is imposed, daily sampling of sulfur in the coal from which daily percent SO<sub>2</sub> removal is then determined with the actual SO<sub>2</sub> data from the CEMS. Finally, the commenter stated that these limits should apply on a unit-by-unit basis to ensure that each unit is required to achieve the best continuous level of emission reductions.

The commenter (0182.3) also asserted that the 2007 SO<sub>2</sub> FIP requirements do not reflect the level of SO<sub>2</sub> control currently being achieved at FCPP Units 4 and 5. According to the commenter, the annual data show that the FCPP Units 4 and 5 are achieving approximately 90 to 91 percent SO<sub>2</sub> removal from the uncontrolled SO<sub>2</sub> in the coal on an annual average basis. Thus,

the commenter claimed that the 88 percent control limitation cannot be considered as “close to or equivalent to” BART and the emission limits for SO<sub>2</sub> should be no higher than the removal efficiencies actually being achieved.

The commenter (0182.3) stated that FCPP Units 4 and 5 are not meeting EPA’s presumptive BART limits of 95 percent SO<sub>2</sub> control or an SO<sub>2</sub> emission limit of 0.15 lb/MMBtu. The commenter presented a BART analysis for SO<sub>2</sub> at FCPP Units 4 and 5 and concluded that SO<sub>2</sub> BART for FCPP Units 4 and 5 should be a limit of 95 percent SO<sub>2</sub> control based on EPA’s presumptive BART requirements, which would be achieved with the elimination of all scrubber bypass along with other scrubber modifications necessary to improve SO<sub>2</sub> removal efficiency to 95 percent. At the minimum, the commenter asserted that SO<sub>2</sub> BART for FCPP Units 4-5 should be no less than a limit reflecting 92 percent control or 0.14 lb/MMBtu, as this would reflect the level of control the FCPP Units 4 and 5 were designed for with the elimination of all scrubber bypass. The commenter proposed the same compliance requirements set out above for Units 1 – 3.

**Response:**

*As discussed in response to the prior comment, EPA finalized a FIP in 2007 for FCPP. EPA responded to comments in that FIP action suggesting that EPA should require FCPP to achieve a 95% removal efficiency to be consistent with presumptive BART for SO<sub>2</sub>. The 2007 FIP stated: “EPA disagrees with the comment that the BART Guidelines, 70 FR 39104, 39171 (July 6, 2005) establish a presumption that BART at FCPP is 95% control for SO<sub>2</sub>. Although the BART Guidelines did establish a presumption of either 95% control for SO<sub>2</sub> or 0.15 lbs/MMBtu for large power plants, this presumption applies only to power plants that are currently uncontrolled or achieving less than 50% control of SO<sub>2</sub>. Id. As indicated in the preamble to this proposed FIP, this presumption thus does not apply to power plants, such as FCPP, with existing SO<sub>2</sub> controls achieving at least 50% removal efficiency.” Id. at 25700, n.3. The comments here have not set forth any new facts or changes in the law since we responded to this comment in 2007.*

## **8.4 Other Comments on BART**

**Comment:**

One group of environmental advocacy groups (0182) stated that as an alternative to a condensable PM<sub>2.5</sub> limit, EPA could set limits on the pollutants which form condensable PM<sub>2.5</sub>, such as sulfuric acid mist (H<sub>2</sub>SO<sub>4</sub>) and ammonia, as EPA proposed as part of the SJGS BART rulemaking (citing 76 FR 491, January 5, 2011). If EPA adopts this approach, the commenter urged EPA to set an emission limit for H<sub>2</sub>SO<sub>4</sub> no higher than the limit of 1.06 x 10<sup>-4</sup> lb/MMBtu for each unit as proposed for SJGS based on the use of low reactivity catalyst and the most current information from the Electric Power Research Institute. If CEMS are unavailable for this pollutant, the commenter urged EPA to require stack test monitoring for H<sub>2</sub>SO<sub>4</sub> on a more frequent basis than annual monitoring.

The commenter (0182) also requested that EPA set emission limits for ammonia at a rate no higher than the 2.0 parts per million as proposed at SJGS, to be monitored with CEMs. The commenter indicated that EPA should clarify in the final rule that the emission limits for H<sub>2</sub>SO<sub>4</sub> and ammonia are being required under the Regional Haze program as part of a BART determination for the facility and must be complied with within 3 years of the date of the final rule.

In “preliminary comments submitted prior to the supplemental proposal, a similar group of environmental advocacy groups (0095) suggested the same limits for ammonia and H<sub>2</sub>SO<sub>4</sub> based on the proposed limits for SJGS. The commenter added that the BART determination should include a provision that FCPP may forego BART implementation at any unit if it agrees to retire that unit prior to the deadline for BART implementation. The commenter requested that these limits be published for comment in any *Federal Register* notice published to take comment on the FCPP alternative BART proposal.

**Response:**

*EPA disagrees with the comment that Region 9 should set the same emission limits for ammonia and sulfuric acid as Region 6 in its proposed BART determination for SJGS.*

*In its January 5, 2011 proposed rulemaking for SJGS, Region 6 proposed an ammonia slip limit of 2.0 ppmvd on an hourly average and requested comment on a range from 2.0 ppmvd to 6.0 ppmvd. In its final BART rulemaking (76 FR 52388, August 22, 2011), Region 6 determined that an emission limit and monitoring were not warranted for ammonia and did not finalize its BART determination for SJGS with the proposed 2.0 ppmvd ammonia limit.*

*In its proposal for SJGS, Region 6 proposed an emission limit for sulfuric acid of  $1.06 \times 10^{-4}$  lb/MMBtu on an hourly average, and requested comment on a range from  $1.06 \times 10^{-4}$  to  $7.87 \times 10^{-4}$  lb/MMBtu. In its final rulemaking, Region 6 finalized an emission limit for sulfuric acid of  $2.6 \times 10^{-4}$  lb/MMBtu to minimize its contribution to visibility impairment. Region 6 calculated this emission limit using an estimation methodology from the EPRI, assuming the use of an ultra low activity catalyst (0.5% total conversion of SO<sub>2</sub> to SO<sub>3</sub>), zero ammonia slip, no sorbent injection, and EPRI-recommended values for removal by existing downstream control equipment.*

*Actual measurements of baseline sulfuric acid emissions have not yet been determined at FCPP and the calculation of projected sulfuric acid emissions after installation and operation of SCR using the EPRI methodology is dependent on future decisions made by the facility on the type of SCR catalyst and number of layers used, as well as numerous assumptions about loss to downstream components, such as air preheaters and baghouses, the true values of which are currently not yet defined or known for FCPP., EPA Region 9 is the permitting authority for preconstruction permits on the Navajo Nation, and an increase in sulfuric acid emissions from the installation of SCR may trigger major modification PSD permit requirements at a low threshold of 7 tpy (see 40 CFR 52.21) or Tribal minor new source review (NSR) permit requirements at a threshold of 2 tpy (see 40 CFR Part 49 Subpart C). Preconstruction permitting review may also be triggered from significant emissions increases of PM<sub>2.5</sub> from SCR installation*

*at FCPP. If one of these pollutant triggers PSD, the permitting authority must provide an Additional Impact Analysis under the PSD program. The PSD program also requires the permitting authority to determine BACT for pollutants that triggered PSD. A similar control technology review may also be required at the discretion of the permitting authority under the Tribal Minor NSR program. For these reasons, Region 9 has determined that for FCPP, emission limits and monitoring requirements for sulfuric acid are more appropriately reviewed in the preconstruction permitting process.*

**Comment:**

Citing the BART Guidelines at 40 CFR part 51, Appendix Y, section V, one environmental advocacy group (0182) stated that BART emission limits and compliance schedules must be based on “boiler operating day.” The commenter indicated that the NO<sub>x</sub> BART proposal of 0.11 lb/MMBtu is based on a 30-day, calendar rolling average (citing 75 FR 64235) and the supplemental BART proposal is silent as to type of 30-day rolling average is intended (citing 76 FR 10530).

The commenter (0182) claimed that the “very high” proposed BART emission limits suggest that EPA set these limits to encompass spikes that occur during startups and shutdowns. The commenter asserted that setting and enforcing limits based on boiler operating day would necessarily exclude spikes that occur before and after outages, such as startups, shutdowns, and malfunctions. According to the commenter, such periods should be subject to separate limits set at the pre-SCR uncontrolled level to encourage good work practice standards during these periods while allowing the SCR and other emission control technologies to be operated at an efficient and continuous capacity in compliance with BART. The commenter argued that it is clear that the BART Guidelines are based on establishing separate limits for emissions spikes to avoid misapplying the Guidelines and setting unnecessarily high BART emission limits.

**Response:**

*EPA agrees that the BART Guidelines specify that the permit (or implementation plan that establishes the emission limitations), for EGUs must “specify an averaging time of a 30-day rolling average, and contain a definition of “boiler operating day” that is consistent with the definition in the proposed revisions to the NSPS for utility boilers in 40 CFR Part 60 subpart Da (70 FR 9705, February 28, 2005)”. The proposed revisions to the NSPS in 2005 included a definition for “boiler operating day”:*

*Boiler operating day for units constructed, reconstructed, or modified on or before February 28, 2005, means a 24-hour period during which fossil fuel is combusted in a steam generating unit for the entire 24 hours. For units constructed, reconstructed, or modified after February 28, 2005, boiler operating day means a 24-hour period between 12 midnight and the following midnight during which any fuel is combusted at any time in the steam generating unit. It is not necessary for fuel to be combusted the entire 24-hour period.*

*The definition of boiler operating day was finalized on June 13, 2007 (72 FR 32722) as proposed.*

*EPA agrees that the NO<sub>x</sub> limit for the alternative proposal should be set for 30 successive boiler operating days and that a “boiler operating day” should be defined as any day in which the boiler fires fossil fuel and therefore includes periods of startup or shutdown. Because the NO<sub>x</sub> emission limit under the alternative emission control strategy already includes periods of startup or shutdown, separate limits are not required. The final rule reflects this approach.*

*For the original proposal, EPA does not find it necessary to define boiler operating day because the limit is a heat input weighted plant-wide limit. Only operating hours for any of the 5 units would be included. When a unit is not operating, those hours are not included in the plant-wide 30 day average. Additionally, the heat-input weighted plant-wide limit also includes periods of startup and shutdown, therefore, separate limits are not required.*

**Comment:**

One environmental advocacy group (0182) commented that EPA should require FCPP to install all control equipment within 3 years of the date of a final FIP, as EPA did at the San Juan Generating Station. The commenter stated that there is ample data to supporting the contention that all this emission control technology can be installed and operational within 3 years or less.

**Response:**

*EPA disagrees with the comment that EPA should set a 3 year compliance timeframe because EPA proposed a 3 year compliance timeframe for SJGS. In its proposed rulemaking for SJGS<sup>83</sup>, Region 6 proposed a 3 year timeframe for SJGS to comply with the proposed limits but requested comment on a compliance range of 3 – 5 years. In its final rulemaking, Region 6 finalized a compliance timeframe of 5 years and determined that because of site congestion at SJGS, a longer timeframe than average (37 – 43 months) to install SCR on the 4 units at SJGS would be required. The final BART determination for FCPP requires retrofit of 5 existing units at FCPP. In the final rule for FCPP, Region 9 is requiring installation and operation of SCR controls for one 750 MW unit within 4 years of the effective date, and the remaining 750 MW unit and Units 1 – 3 within 5 years of the effective date. Based on all of the factors that will be involved in the design, purchase and operation of the SCR controls, Region 9 considers this schedule to be appropriate and expeditious.*

**Comment:**

One group of environmental advocacy groups (0095) stated in comments submitted prior to publication of the supplemental proposal that FCPP has a large impact on visibility in the region, and that time has come to eliminate these impacts. The commenter opined that it is incumbent upon EPA to curtail these impacts to the maximum extent possible by issuing a strong

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<sup>83</sup> See 76 FR 491, January 5, 2011



FIP addressing all visibility-impairing pollutants. (See the commenter's suggested limits for the pollutants elsewhere in this section.)

In comments dated prior to publication of the supplemental proposal, a near-by county in a neighboring state (0106) and an individual county commissioner (0108) supported EPA's proposed action on FCPP because it will result in significant reductions in NO<sub>x</sub> and other haze-forming pollutants that also negatively impact public health. The commenters noted that ozone levels in the area have nearly reached nonattainment levels, and that the regional economy thrives on the quality of the natural and historical resources which may be significantly diminished by the presence of haze. In a resolution passed prior to publication of the supplemental proposal, a near-by city in a neighboring state (0105) encouraged EPA to comply with both the RHR and the CAA's "good neighbor" provisions and require BART on FCPP (and SJGS) to reduce haze and to improve visibility and health in the Four Corners airshed.

A private citizen (0084) stated, in comments submitted after APS announced its intent to purchase SCE's stake in Units 4 and 5 and to shut down Units 1 – 3 but prior to publication of the supplemental proposal, that APS should continue with its proposed transactions and EPA should continue to consider its proposed BART rule. The commenter argued that APS's plans would result in a smaller reduction in emissions than would the BART proposal, but a combination of the two would provide more jobs and economic stability and improve air quality.

**Response:**

*As stated in other EPA responses within this document, a BART determination represents a case-by-case determination that accounts for site specific characteristics in the five-factor analysis. While choosing an emission limit that represents the lowest emission rate achieved by similar facilities may be justified in some cases, the BART Guidelines do not specifically require emission reductions "to the maximum extent possible". As discussed in more detail elsewhere in this RTC (See Section 8.1), EPA has determined that a plant-wide NO<sub>x</sub> emission limit of 0.11 lb/MMBtu, representing an 80% reduction in plant-wide emissions and achievable by the installation and operation of post-combustion controls, is BART for FCPP based on site-specific considerations, including physical limitations of the boilers.*

*EPA has determined that finalizing a FIP implementing the BART provisions of the RHR to reduce NO<sub>x</sub> emissions from FCPP on the Navajo Nation is appropriate at this time. EPA expects the NO<sub>x</sub> reductions required for FCPP in the final FIP, combined with the NO<sub>x</sub> reductions required in the final FIP for SJGS issued by EPA Region 6 (76 FR 52388, August 22, 2011), will contribute to improved air quality in the Four Corners area; therefore a FIP for the Navajo Nation implementing the "good neighbor" provisions under the Clean Air Act (Section 110(a)(2)(D)(i)) is not necessary at this time.*

*EPA disagrees with the commenter that the alternative emission control strategy would result in smaller emission reductions compared to our final BART determination. As outlined in more detail elsewhere in this RTC (See Section 9.0), EPA has determined that the alternative emission control strategy will result in greater annual emission reductions than BART.*

**Comment:**

One public interest advocacy group (0112) stated that EPA should hold FCPP to the highest possible level of monitoring and validation of the FIP. The commenter indicated that this is justified by the fact that FCPP previously discontinued use of a re-heat of the scrubber exhaust on Units 1 – 3 without authorization from EPA.

**Response:**

*EPA agrees that monitoring, record-keeping, and reporting requirements are critical elements in enforcing the emission rates established in the final FIP. As stated in the proposed BART determination, the final BART determination requires FCPP to comply with 40 CFR Part 75 requirements, including requirements related to quality assurance testing, relative accuracy test audits. The requirements of the final FIP will be incorporated by the Navajo Nation Environmental Protection Agency (NNEPA) into the facility's Part 71 Operating Permit, and will require FCPP to submit annual compliance reports and testing results to the NNEPA and EPA Region 9.*

*EPA was never notified of the discontinued use of the reheaters for Units 1-3. EPA is not aware of when these units were taken out of service. Although EPA would have appreciated the opportunity to weigh in on this decision, we are not aware of any regulation that would have prevented APS from removing the re-heaters.*

*These 3 units do not have an opacity limit under the 2007 FIP, so the wet stack and lack of continuous opacity monitors should not be a monitoring issue. They are required to monitor and report deviations of the pressure drop and scrubber liquid flow to the venturi scrubbers to assure proper operation of these control devices for PM.*

## 9.0 Comments on APS's Alternative Proposal and EPA's Supplemental Proposal

### Comment:

One of the owners of FCPP (0176/0177) pointed out that the November 2010 APS proposal included two critical components: (1) a proposal to close Units 1 – 3 and install SCRs on Units 4 and 5; and (2) EPA's contemporaneous agreement that these activities resolve any liability FCPP may have under regional haze BART, Reasonably Attributable Visibility Impairment Best Available Retrofit Technology (RAVI BART), NSR, and NSPS. The commenter asserted that EPA's supplemental proposal addresses only half of APS's proposal – the half that achieves better than BART emission reductions, plant-wide reductions of all other emissions, and greater visibility improvement at nearby Class I areas – but ignores the other half of the APS proposal – the half that provides APS and the FCPP co-owners with needed regulatory certainty. Unless there is a contemporaneous resolution of these key issues with EPA, the commenter cannot and does not support EPA's supplemental proposal. With a full resolution of these issues, the commenter would then support the supplemental proposal.

In the November 2010 APS proposal, APS explained that it proposed the alternative strategy because it was faced with uncertainty on all sides. The commenter (0176/0177) indicated that FCPP must resolve these uncertainties before spending significant capital on upgraded pollution controls. For this reason, the proposal to install SCRs on Units 4 and 5 in 2018 is inexorably linked with EPA's contemporaneous agreement to resolve any plant obligations under the referenced programs.

Another of the owners of FCPP (0168) similarly rejected the supplemental proposal without contemporaneous resolution of all obligations that FCPP may have related to the CAA programs listed above. The commenter added that it would consider accepting the supplemental proposal if these other potential issues are resolved, but emphasized that acceptance of the supplemental proposal would be voluntary and based on its own business interests.

### Response:

*EPA understands that the owners of FCPP are seeking to resolve any potential regulatory noncompliance at a roughly simultaneous time. However, EPA must use different mechanisms for promulgating rules and resolving enforcement issues. The comment requests resolution of potential past non-compliance with NSR and NSPS requirements. Potential past non-compliance can be resolved through entering into a Consent Decree containing a judicially approved release from liability. Such a Consent Decree under the Clean Air Act must be approved by the United States Department of Justice and must also be lodged in a United States District Court where the public is allowed to comment on it. Consent Decrees must be entered by the United States District Court for a release of liability of potential past non-compliance to be effective. Accordingly, this rulemaking action cannot effectuate any release of liability for potential past non-compliance with NSR or NSPS.*

*The comment is also seeking some resolution with respect to a potential finding by the Department of Interior that visibility impairment at a Class I area is reasonably attributable to FCPP's emissions. If the Department of Interior made such a finding, then EPA would be obligated to determine whether EPA should make a BART determination.*

*EPA is aware that several environmental groups have petitioned the Department of Interior to make a finding that impairment at Class I areas is reasonably attributable to FCPP.<sup>84</sup> The NPS, on behalf of Department of Interior, has declined to make such a finding based on EPA's work in this rulemaking.<sup>85</sup> The environmental groups also filed a Complaint in the United States District Court for the District of Columbia<sup>86</sup> contending that the Department of Interior was unreasonably delaying making a finding of reasonable attribution from FCPP. On June 30, 2011, the Court dismissed the Complaint<sup>87</sup> holding that the NPS's letters refusing to make the finding of reasonable attribution constituted denying the Petitioners' request for a RAVI finding. Therefore, there are no pending petitions with the Department of Interior requesting a finding that visibility impairment at any Class I areas is reasonably attributable to FCPP. In any event, a BART determination under RAVI would likely be the same as under this BART determination.*

**Comment:**

One public interest advocacy group (0112) requested that EPA publicly disclose (to the extent legal counsel will allow) how each of the conditions set forth in the APS proposal (i.e., related to RAVI BART, NSR, and NSPS violations) is incorporated into and/or is accommodated by the EPA's supplemental proposal.

**Response:**

*As discussed above, EPA can resolve potential past non-compliance with NSR and NSPS through entering into a Consent Decree approved by the Department of Justice and lodged in the United States District Court. The public will have an opportunity to comment on any Consent Decree and may request the Court to determine whether the Consent Decree is in the public interest.*

*Although EPA does not believe that there are any pending petitions to the Department of Interior to make a finding that the visibility impairment at any Class I area is reasonably*

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<sup>84</sup> See National Parks Conservation Association, et al., Petition to United States Department of Interior, United States Department of Agriculture, and United States Forest Service, February 16, 2010, in the docket for this rulemaking.

<sup>85</sup> See letter from Will Shafroth, Department of Interior to Stephanie Kodish, NPCA, March 8, 2011 in the docket for this proposed rulemaking.

<sup>86</sup> See National Parks Conservation Association, et al., Petition to United States District Court for the District of Columbia, January 20, 2011, in the docket for this final rulemaking.

<sup>87</sup> See National Parks Conservation Association, et al., Plaintiffs, v. United States Department of Interior and United States Department of Agriculture, Defendants. Civil Action No. 11-130 (GK). United States District Court for the District of Columbia, June 30, 2011, 794 F. Supp. 2d 39; 2011 U.S. Dist. LEXIS 70170; 74 ERC (BNA) 1015. In the docket for this final rulemaking.

*attributable to FCPP's emission, EPA also considers any BART determinations it makes to consider the same factors whether the BART determination is triggered by a finding of reasonable attribution or under 40 CFR 51.308(e).*

**Comment:**

One of the owners of FCPP (0176/0177) stated that it is imperative to note that its support of the supplemental proposal (if other potential liabilities are resolved as discussed above) is based solely on the rationale that this achieves a result better than the proposed BART FIP, and that this “better than BART” outcome is a result of the closure of Units 1, 2, and 3. The commenter stressed that in no case – either in the original BART FIP proposal or in the supplemental proposal – does the commenter support any determination that SCR constitutes BART for FCPP. A second FCPP owner (0168) stated that its acceptance of the supplemental proposal upon resolution of the other potential issues would be a voluntary action based on its own business interests; the commenter does not support any BART determination that calls for installation of SCR at FCPP.

Another of the FCPP owners (0174) similarly emphasized the belief that SCR cannot be justified as BART at FCPP. Accordingly, the commenter stated that EPA’s October 2010 BART proposal should not be used as the benchmark for evaluating and proposing a BART alternative. The Navajo Nation (0223) also did not agree that SCR is BART for FCPP.

**Response:**

*EPA disagrees with the commenters that SCR is not BART. Based on our five-factor analysis, as described in the TSD for our proposed BART determination, SCR is cost effective and results in the greatest anticipated improvement in visibility. One of the owners of FCPP notes that the “better-than-BART” outcome is a result of the closure of Units 1, 2, and 3. However, the closure of Units 1 – 3 alone does not result in greater emission reductions than EPA’s proposed BART determination, and represents only a roughly 30% reduction from baseline emissions. The closure of Units 1 – 3, in combination with SCR on Units 4 and 5, results in the “better-than-BART” outcome.*

*The voluntary nature of the alternative emission control strategy does not negate EPA’s BART determination because (1) EPA must determine what BART is in order to fulfill the requirements of the alternative program to BART as prescribed in the RHR, and (2) EPA cannot require the full or partial closure of a facility as a BART alternative, therefore the alternative emission control strategy remains an optional business choice of the owners of FCPP to implement in lieu of BART, if they see fit.*

**Comment:**

Eleven private citizens (0122, 0139, 0140, 0141, 0145, 0149, 0158, 0159, 0166, 0167, 0201) expressed general support for the supplemental proposal, although five of these

commenters (0122, 0145, 0156, 0158, 0167) did not support the 2018 completion date. One commenter (0167) preferred a completion date within 3 years of the final EPA decision, two commenters (0122, 0158) preferred a completion date of 2014, and one commenter (0145) asserted it cannot wait until 2014.

One of the private citizens (0139) supported the supplemental proposal with a few changes: (1) APS should be required to implement the upgrades incrementally over the next 7 years, with 1/7th of the work to be completed each year, (2) penalties should be enforced for any year in which they lag behind the schedule, (3) retirement of the existing units should follow the same schedule, and (4) clean-up of the existing sites, incrementally, over the 7 years.

Another of the private citizens (0159) stated that the supplemental proposal yields even greater emissions reductions than the original BART proposal, promising greater health and economic benefits at significantly lower cost to the utilities and their ratepayers. The commenter also noted that APS and BHP Billiton pledged that no layoffs would be associated with the shutdown of the three smaller units at FCPP under this proposal.

A third private citizen (0167) urged EPA to lower the proposed numeric limits on NO<sub>x</sub> and PM and to add limits for ammonia and H<sub>2</sub>SO<sub>4</sub>. The commenter argued that such limits would mean healthier air for us all, better views of our magnificent national parks, and a stronger tourism economy.

Several other commenters (0108, 0112, 0113, 0143, 0150, 0152, 0175, 0183, 0192, 0200, 0223) also expressed support for the supplemental proposal, although some indicated some reservations about certain aspects of the proposal. These comments are summarized in the following paragraphs.

The Navajo Nation (0223) tentatively supports the supplemental proposal with the following caveats:

- The alternative emission control strategy must be determined through government-to-government consultation with the Navajo Nation and give primary consideration to the economic interests of the Nation in the continued operation of FCPP. (See Section 4.1 for more detail.)
- The Navajo Nation does not agree to a determination that SCR is BART for FCPP.

The commenter (0223) agreed that the supplemental proposal would result in 100 percent control of NO<sub>x</sub>, SO<sub>2</sub>, PM, mercury, and other hazardous pollutants by shutting down Units 1 – 3 by 2014, which would significantly reduce the emissions of FCPP.

One state air agency (0113) anticipated substantial environmental benefits for the Four Corners region from the alternative proposal, and from an air emissions standpoint regarded this alternative proposal as superior to the October 2010 BART proposal. The commenter indicated that because the alternative proposal appears to have support from the facility's operators, it should result in a higher likelihood of long-term success. The Attorney General's office (0200) from the same state supported these comments. A U.S. Senator (0150) from the same state also

expressed support for the supplemental proposal because it would help to address longstanding concerns with air quality in the Four Corners region at a lower cost than the initial BART proposal. This commenter noted that the Class I areas affected by FCPP (and SJGS) are drivers of the economy in Southwest Colorado, and that emission from the plants have caused a variety of negative public health impacts.

One federal agency (0175) supported the supplemental proposal, but would prefer a NO<sub>x</sub> limit of 0.05 lb/MMBtu (as discussed in Section 8.1). The commenter agreed that the supplemental proposal would provide greater visibility improvement in the surrounding Class I areas than EPA's original BART proposal of October 2010, as well as additional benefits such as reduced water consumption and reduced CO<sub>2</sub>, SO<sub>2</sub>, and mercury emissions. An environmental advocacy group (0183) similarly supported the supplemental proposal (with a lower, but unspecified, NO<sub>x</sub> limit) and stressed the health and ecosystem benefits that would result from lower emissions of NO<sub>x</sub>, PM, SO<sub>2</sub>, mercury, and CO<sub>2</sub> (which are discussed further in Section 4.2).

One public interest advocacy group (0143) and one private citizen (0192) supported EPA's supplemental proposal for FCPP. The private citizen (0192) specifically supported the shutdown of Units 1 – 3 by 2014 and application of a NO<sub>x</sub> limit of 0.098 lb/MMBtu for Units 4 and 5 with a compliance date of July 31, 2018. Given that SCR is a mature technology, EPA originally proposed BART in October 2010, and FCPP has operated with only minimal air emissions control for over 40 years, the commenter asserted this compliance schedule is ample. The commenter also voiced support for providing flexibility to FCPP through setting the limit as heat-input weighted limit and through a lower NO<sub>x</sub> limit on a 3-year rolling average.

One Tribe in the Four Corners area (0152) approximately 60 miles north of FCPP supported the supplemental proposal. The commenter gave the following reasons for this support: (1) any reductions in emissions from FCPP will result in cleaner and healthier air on the Reservation; (2) the tribe's two air monitors show that the Reservation is nearing nonattainment status for ozone, and reducing NO<sub>x</sub> emissions from FCPP may help maintain attainment; and (3) any improvement in visibility in the Class I areas in the region will positively affect visibility on the Reservation.

Another public interest advocacy group (0112) similarly expressed support for adding regulatory language to the proposed BART determination for FCPP that would allow FCPP to implement the alternative control strategy in lieu of having to implement EPA's proposed BART. This commenter also indicated support for the option of adding a NO<sub>x</sub> emission limit requiring greater than 80 percent control over longer averaging times weighted for heat input.

However, this commenter (0112) added that EPA should not make a final decision on whether to accept the alternative control strategy until it receives a "professional and credible" cost accounting of FCPP's costs, including the additional pollution control investments for Units 4 and 5. The commenter indicated that the cost accounting should explain where the money will come from for retirement of Units 1 – 3 and for pollution control upgrades for Units 4 and 5.

The commenter (0112) also questioned EPA's statement that the alternative emission control strategy to shut down Units 1 – 3 by 2014 not only results in 100 percent control of NO<sub>x</sub>, but also 100 percent control of all other pollutants emitted by those units. The commenter alleged that this is a misleading statement because the shutdown of Units 1 – 3 is simply a business decision; the emission reductions are not attributable to any CAA program or enforcement of controls by EPA. The commenter stated that the "100 percent control" wording paints too rosy a picture by using the ratio of emissions after shutdown to emission levels that are completely unacceptable at present. According to the commenter, FCPP remained the most polluting power plant in the United States as of March 20, 2011.

**Response:**

*EPA has reviewed the comments in general support of our Supplemental Proposal. Specific comments on revisions to various aspects of the alternative emission control strategy, such as compliance timeframes, emission limits for sulfuric acid and ammonia, lower limits for NO<sub>x</sub>, health and ecosystem benefits, disagreement that SCR is BART, and the interests of the Navajo Nation, are included and addressed in more detail elsewhere in this Section and more broadly within this document (e.g., Sections 4 and 8).*

*Regarding the timing of the installation of controls, EPA disagrees with commenters that the compliance date for the alternative to BART should occur earlier than 2018, or that EPA should impose incremental progress in NO<sub>x</sub> reductions over the intervening 7 years. As described in our Supplemental Proposal, in order to implement the alternative emission control strategy, APS and other owners of FCPP must receive approvals from three regulatory agencies as well as finalize coal contract negotiations with BHP Billiton, and receive approval from DOI on the lease agreement with the Navajo Nation. These various components take time, as does the actual planning and installation of SCR as retrofits on existing boilers, Units 4 and 5. Therefore, the year 2018 compliance timeframe for the alternative emission control strategy in our final rulemaking is reasonable and appropriate.*

*EPA disagrees with the comment that EPA should not make a decision on the alternative emission control strategy until it receives a "professional and credible" cost accounting of FCPP's costs for Units 4 and 5. Under the RHR (see 40 CFR §51.308(e)(2)), a cost analysis is not required element for an alternative to BART analysis. Even though EPA has not done a cost analysis of this alternative emission control strategy, EPA expects the cost of the alternative is likely to be lower than the cost of BART because the BART Alternative involves installation of additional controls on fewer units at FCPP.*

*EPA disagrees with commenters who contend that our statement that the closure of Units 1 – 3 at FCPP results in 100% control of those units is misleading. If Units 1 – 3 close, those three units will not emit any air pollutants, i.e., 100% control. EPA further notes that the alternative emission control strategy not only involves closure of Units 1 – 3, but also installation of SCR on Units 4 and 5, further reducing facility-wide emissions of NO<sub>x</sub>.*

**Comment:**



The Navajo Nation (0223) agreed that shut down of Units 1, 2, and 3 by January 2014 and installation of SCR on Units 4 and 5 by July 31, 2018, in order to satisfy the requirements of CAA section 169A(b)(2) and the RHR, 40 CFR 51.308(e), is realistically achievable. The commenter noted that EPA recognized in the supplemental proposal that APS must obtain approvals from several agencies, and that the Navajo Nation Council recently endorsed a lease renewal for FCPP; however, the lease renewal process is not yet complete as the lease renewal still needs to be reviewed and approved by the DOI, which the commenter stated will likely include review required under NEPA. The commenter indicated that if the final approval is delayed, there may be associated delays in compliance scheduling.

The commenter (0223) expressed appreciation for EPA's understanding of the complexities related to the lease renewal that could delay the finalization of lease, including right-of-way issues that could also impact the life of FCPP. The commenter requested that EPA continue to provide flexibility to allow the leasing process to be completed.

**Response:**

*EPA has reviewed the Navajo Nation's comments agreeing with the timing of the alternative emission control strategy. As noted in the comment, EPA is aware that the lease approval process through DOI will take time, as will the approval of the sale of Southern California Edison's share of Units 4 and 5 to APS. Our final rulemaking requires a compliance timeframe for the alternative emission control strategy no later than July 2018.*

**Comment:**

One environmental advocacy group (0182) and one federal agency (0224) asserted that the supplemental proposal is not better than BART for NO<sub>x</sub>. The commenters provided somewhat different rationales for this assertion, as summarized below.

The environmental advocacy group (0182) argued that the supplemental proposal is not better than BART for at least three reasons. The commenter indicated that to qualify as "better than BART," an alternative must achieve "greater reasonable progress towards achieving national visibility conditions" than BART by resulting in "greater emissions reductions" than BART [citing 40 CFR 51.308(e)]. The commenter stated that the alternative put forward by EPA fails to meet these requirements as follows:

- The alternative proposal's delayed compliance date results in fewer emission reductions as compared to those emission reductions that should be required to begin occurring no later than 5 years after plan approval.
  - The CAA requires BART to be installed no later than 5 years after EPA's final rulemaking [citing 42 U.S.C. 7479A(b)(2)(A)]. By offering FCPP a BART compliance deadline of July 2018, EPA is illegally extending a mandatory deadline under the CAA. *See Sierra Club v. EPA*, 129 F.3d 137, 140 (D.C. Cir. 1997); *Sierra Club v. EPA*, 719 F.2d 436, 469 (D.C. Cir. 1983). Furthermore, installation of SCR at

Units 4 and 5 can be accomplished easily within 2 years (citing Comment 0182), making a 7-year “grace period” for BART compliance unnecessary.

- To justify this delay, EPA links the extended deadline to the end of the first long-term strategy period for regional haze [citing 76 FR 10535; 40 CFR 51.308(e)(2)(iii)], but these are separate and distinct deadlines. While the statute requires the installation and operation of BART within 5 years, the purpose of the first long-term strategy deadline is to ensure that those already-imposed reductions are actually working. Also, the BART regulations require “all necessary emissions reductions [to] take place during the period of the first long-term strategy for regional haze” [citing 40 CFR 51.308(e)(2)(iii)], but the alternative proposal violates this requirement by deferring the required BART reductions until the very end of this period.
- Use of an artificially inflated baseline, coupled with the potential increase in output from Units 4 and 5, renders the claimed emissions reductions largely illusory. The commenter quoted Comment 0182 as saying that EPA’s analysis incorrectly assumes that all five units currently operate at a 91 percent capacity factor when, in fact, they all operate at lower levels, which artificially inflates the baseline from which EPA calculated the alternative’s emission reductions. On the other side of the equation, EPA underestimated potential emissions from increased output at Units 4 and 5 (i.e., beyond 91 percent) to make up for the lost generation from the shutdown of Units 1 – 3.
- The proposed emission limits do not constitute BART (see Section 8.1). The commenter cited comments prepared by NPS (submitted as an attachment to Comment 0182) which found that based on the assumption that SCR can achieve 0.05 lb NO<sub>x</sub>/MMBtu on an annual basis, after 2016 the BART alternative would fail to achieve greater cumulative NO<sub>x</sub> reductions than would installation of BART (SCR) on all five units. (See the paragraph below for more on this NPS comment.).

As noted by the previous commenter, based on its assumption that NO<sub>x</sub> BART for all five units at FCPP should be 0.05 lb NO<sub>x</sub>/MMBtu on an annual basis, the federal agency (0224) found that after 2016 the BART alternative would fail to achieve greater cumulative NO<sub>x</sub> reductions than would installation of BART (SCR) on all five units. (These calculations were made assuming that Units 4 and 5 would also achieve a NO<sub>x</sub> emission rate of 0.05 lb/MMBtu on an annual basis under the supplemental proposal, and were projected out to 2028.) In order to achieve greater cumulative reductions than BART, the commenter identified an “Accelerated BART Alternative” that would include shutdown of Units 1-3 by 2014, as proposed, plus require that SCR be operational on Unit 4 by the beginning of 2017 and on Unit 5 by the end of September 2017, 10 months sooner than proposed by EPA.

**Response:**

*EPA disagrees with the comment that the alternative emission control strategy is not better than BART, but agrees that a reexamination of baseline emissions and projected capacity factors in the future is warranted. In our Supplemental Proposal, we relied upon the baseline emissions APS provided of 45,132 tons NO<sub>x</sub> per year, representing a 91% capacity factor on all units. We examined annual emissions reported by FCPP to CAMD, and calculated average*

annual NO<sub>x</sub> emissions over 2001 – 2010 of 42,395 tpy.<sup>88</sup> As reported in the TSD for our proposed BART determination, facility-wide NO<sub>x</sub> emissions over 2001 – 2009 ranged from 40,331 to 47,300 tpy. While the baseline emissions provided by APS and used by EPA in our Supplemental Proposal was within the range of annual NO<sub>x</sub> emissions, in response to these comments, we conducted an additional analysis to compare the alternative emission control strategy against our final BART determination for NO<sub>x</sub> using the 2001 – 2010 average as the baseline emission rate and an assumed capacity factor of 81% for Units 4 and 5 under the alternative emission control strategy.<sup>89</sup> We assume no change in capacity factors of Units 1 – 5 if all 5 units continue operation under the BART scenario. Based on heat input reported to CAMD and maximum capacity heat input reported in the Part 71 permit for FCPP, we calculate the average capacity factor for Units 4 and 5 over 2001 – 2010 to be 76% and 75% respectively. This analysis shows that in 2014 and 2015, the alternative emission control strategy results in lower NO<sub>x</sub> emissions than BART due to the closure of Units 1 – 3 at the end of 2013. In 2016, 2017, and 2018, BART results in lower emissions than the alternative, and in 2019 and beyond, the alternative emission control strategy (5,556 tpy), with phased-in controls on Units 4 and 5 by the end of 2018, results in lower emissions than BART (8,479 tpy). For comparison, our analysis from the Supplemental Proposal using a capacity factor of 91% resulted in emissions under the alternative from 2019 and beyond to be 5,798 tpy, and under BART to be 9,026 tpy. In total, the alternative results lower emissions from FCPP over more calendar years (2014-2015, and 2019 and beyond) than does BART (2016-2018). Even if APS operated Units 4 and 5 at 100% capacity, EPA calculates that emissions under the alternative emission control scenario in 2019 and beyond to be 6,859 tpy, which is still lower than under BART. On a cumulative basis, i.e., the sum total of NO<sub>x</sub> emissions over 2011 to 2064, the BART Alternative also results in lower emissions than BART, both at an 81 percent capacity factor and at 100 percent capacity.

Commenters argue that if the BART emission limit were lower, the alternative would not be better than BART. For example, if EPA required an emission limit representing a 90% reduction in NO<sub>x</sub> emissions, annual NO<sub>x</sub> emissions would be lower than 5,000 tpy. However, as discussed in great detail elsewhere in this RTC (See response to comments in Section 8.1), EPA has determined that an 80% reduction in NO<sub>x</sub> emissions is BART for FCPP. It is inappropriate to compare the alternative emission control strategy against a target for BART that commenters would like to see based on maximum emission reductions achieved without consideration of site-specific characteristics of FCPP.

Commenters further argue that by offering FCPP a BART compliance deadline of July 2018, EPA is illegally extending a mandatory deadline under the CAA, and that installation of SCR at Units 4 and 5 can easily be accomplished within 2 years. EPA disagrees and notes that the compliance timeframe for EPA's BART determination requiring SCR installation on all 5 units is within 5 years of the effective date of the final rule, consistent with the maximum time allowed under the CAA §169A(g)(4) in the definition of "as expeditiously as practicable". The commenter is confusing requirements under BART and requirements under the alternative to BART. EPA is not extending the BART compliance deadline beyond a 5 year period. Rather,

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<sup>88</sup> See: "data 01-10" tab in "BART v Alternative.xlsx" in the docket for this final rulemaking.

<sup>89</sup> In testimony to the ACC, Mark Schiavoni of APS testified that he anticipates capacity factors over 2015 – 2030 to range from 75 – 81% for Units 4 and 5 (See document titled "Schiavoni Testimony\_TRANSCRIPT.pdf" in the docket for this final rulemaking).

*EPA is allowing additional time to implement the alternative emission control strategy, as allowed under the provisions of the RHR for the implementation of “other alternative measure rather than to require sources subject to BART to install, operate, and maintain BART” (See 40 CFR §51.308(e)(2)).*

*EPA disagrees with commenters that reductions under the alternative to BART violates 40 CFR §51.308(e)(2)(iii). The requirement simply states the reductions take place during the period of the first long term strategy and does not specifically prescribe that those reductions must take place at the beginning, middle, or end of the period of the first long term strategy.*

*Based on the foregoing discussion and the calculations provided in our docket, EPA confirms our previous determination that the alternative emission control strategy will result in greater NO<sub>x</sub> emission reductions than BART in 2019 and into the future.*

**Comment:**

To evaluate the supplemental proposal’s impact on SO<sub>2</sub> emissions, one federal agency commenter (0224) assumed that the scrubbers on Units 4 and 5 would be upgraded (perhaps by conversion to a wet stack) concurrently with the SCR installation to achieve 0.12 lb/MMBtu. Based on this assumption, the commenter confirmed that both the supplemental proposal and the commenter’s “Accelerated BART Alternative” (see comment above) would be better than BART at 0.12 lb/MMBtu or current emissions levels.

This commenter (0224) also noted that EPA has stated that the supplemental proposal would result in significant reductions of all relevant pollutants, including a 30 percent reduction in the FCPP’s carbon footprint. The commenter confirmed this for CO<sub>2</sub> emissions based on figures from CAMD from 2005-2010. According to the commenter, Units 1-3 accounted for an average of 5,056,802 tpy of CO<sub>2</sub> emissions out of a total of 15,499,044 tpy at FCPP during this period.

**Response:**

*EPA agrees with the commenter that the Supplemental Proposal will result in emission reductions beyond what would be achieved by the NO<sub>x</sub> BART determination for multiple pollutants. As discussed in the Supplemental Proposed Rule (76 FR 10537), the shutdown of Units 1 through 3 will result in significant additional reductions of NO<sub>x</sub>, as well as reductions of, PM, SO<sub>2</sub>, CO<sub>2</sub>, and mercury emissions that would otherwise not be achieved by the NO<sub>x</sub> BART determination.*

**Comment:**

One environmental advocacy group (0182) supported APS’s “business decision” to close Units 1 – 3, but characterized the company’s alternative proposal as an attempt to leverage this business decision into a 2-year extension of time to install BART on Units 4 and 5. The

commenter noted that the BART regulations are clear that installation of controls is to occur within 5 years, or sooner if practicable. Therefore, the commenter asserted that it would be illegal for the EPA to extend the deadline for BART upgrades at Units 4 and 5 beyond the mandated 5-year or less timeframe.

The commenter (0182) noted that EPA refers to the supplemental proposal as an alternative to BART under 40 CFR 51.308(e), but the commenter stated that this regulatory provision is inapplicable in the circumstances of this case. Based on the commenter's reading of 40 CFR 51.308(e), the commenter indicated that the supplemental proposal fails as an alternative to BART because it does not address all the BART-eligible sources on the Navajo Nation – NGS is also a BART-eligible source. The commenter also alleged that the supplemental proposal does not qualify as an alternative to BART under the rules because, as discussed above, the commenter asserted that the alternative will not “achieve greater reasonable progress than would have resulted from installation and operation of BART” for NO<sub>x</sub> at all FCPP units during the period of the first long-term strategy for regional haze.

**Response:**

*EPA disagrees with these comments. The motivation, whether financial or environmental, behind APS's proposal to close Units 1 – 3 is not relevant to the analysis, as discussed in other EPA responses to comments in this Section, complies with the requirements of the RHR for implementing an alternative to BART (See 40 CFR §51.308(e)(2)(iii)). EPA further notes that our final BART determination of installing SCR on all 5 units requires compliance with the final BART limits within five years of the effective date of the final rule, consistent with the compliance timeframes in the CAA (See CAA §169A(g)(4)) and the RHR (See 40 CFR §51.308(e)(1)(iv)). As stated previously, these comments confuse the requirements of an alternative to BART with the requirements of a BART determination.*

*EPA also disagrees with the commenter's reading of 40 CFR §51.308(e) that the Supplemental Proposal fails as an alternative to BART because it does not address all BART-eligible sources on the Navajo Nation (i.e., Navajo Generating Station). The provisions of the RHR describing the requirements for an alternative measure to BART (i.e., see 40 CFR §51.308(e)(2)(i)(B)) states:*

*The State is not required to include every BART source category or every BART-eligible source within a BART source category in an alternative program, but each BART-eligible source in the State must be subject to the requirements of the alternative program, have a federally enforceable emission limitation determined by the State and approved by EPA as meeting BART in accordance with section 302(c) or paragraph (e)(1) of this section, or otherwise addressed under paragraphs (e)(1) or e(4) of this section.*

*The RHR allows some sources to be included under the alternative program, and some sources to meet BART (i.e., paragraph (e)(1) of the RHR at 40 CFR §51.308) or the CAIR (i.e., paragraph (e)(4) of the RHR at 40 CFR §51.308). As long as all BART-eligible sources are*

*subject to either the BART alternative, a BART limitation, CAIR, or a federally enforceable emission limitation determined to meet BART, the requirements of the RHR under 40 CFR §51.308(e) are met. EPA agrees that NGS is the other BART-eligible source on the Navajo Nation. EPA Region 9 intends to propose a BART determination for NGS in addition to finalizing our BART determination and the alternative emission control strategy for FCPP.*

*As described in detail in another EPA response to a comment within this Section of the RTC, EPA has determined that the alternative will achieve greater reasonable progress than would be achieved through the installation and operation of BART at FCPP.*

**Comment:**

One of the owners of FCPP (0176/0177) and a utility industry association (0187) stated that EPA has the legal authority to implement an alternative emission control strategy, provided the plant owners agree to that strategy. The commenters indicated that the BART rules [40 CFR 51.308(e)] establish that alternative emission control measures that achieve greater reasonable progress than BART – as “greater reasonable progress” is defined in EPA’s rules – may properly be adopted and implemented in lieu of BART. The commenters presented the history of related legal cases and added that the authority for those regulations has been confirmed in three cases by two different federal appellate courts. *Central Arizona Water Conservation District v. EPA*, 990 F.2d 1531 (9th Cir. 1993); *Center for Energy and Economic Development v. EPA*, 398 F.3d 653 (D.C. Cir. 2005); *Utility Air Regulatory Group v. EPA*, 471 F.3d 1333, 1340-41 (D.C. Cir. 2006).

**Response:**

*EPA agrees with this comment and notes that our final rulemaking provides the owners of FCPP the option of implementing the alternative emission control strategy in lieu of BART.*

## 10.0 Other Comments

### Comment:

Forty-five private citizens (0087, 0088, 0089, 0091, 0118, 0119, 0123, 0125, 0127, 0128, 0129, 0130, 0135, 0136, 0137, 0138, 0140, 0141, 0144, 0147, 0149, 0153, 0154, 0155, 0156, 0157, 0158, 0162, 0170, 0171, 0172, 0173, 0181, 0186, 0188, 0190, 0198, 0199, 0201, 0202, 0208, 0209, 0210, 0211, 0213, 0214) explicitly stated that they support EPA's efforts to clean up FCPP. Many of these commenters asked for the strictest regulations. Another private citizen (0093) implied that EPA should act to clean up emissions from FCPP and noted that cleaner air will result in a cleaner Colorado snow pack, which will result in cleaner water in the Colorado River.

Twelve private citizens (0092, 0122, 0126, 0133, 0134, 0145, 0157, 0161, 0172, 0190, 0195, 0213, 0214) stated that FCPP should be de-commissioned. Several of these commenters argued that the plant should only be shut down if it cannot cease emitting pollutants, while others argued the plant should be shut down immediately. One of the latter commenters (0092) stated that if FCPP is not de-commissioned, it should be retrofitted with BART. Another of these commenters (0133) does not assert that either of the two proposals is sufficient. In contrast, one private citizen (0135) finds either of the proposals to be sufficient.

Nine private citizens (0122, 0126, 0134, 0140, 0145, 0170, 0186, 0190, 0195, 0197) recommended that renewable energy sources can be used in place of coal-fired power plants.

### Response:

*EPA acknowledges the comments supportive of our proposals but disagrees with commenters that suggest that FCPP should be de-commissioned or shut down immediately.*

*In addition to other CAA programs, EPA assesses air quality with respect to NAAQS. The Four Corners area is designated attainment for each of the NAAQS.<sup>90</sup> This means that the air quality in the Four Corners area is meeting the national health-based standards set by EPA.*

*For this action, EPA finds that under 40 CFR 49.11, it is necessary or appropriate to achieve emissions reductions of NO<sub>x</sub> from FCPP required by the CAA's RHR program. NO<sub>x</sub> is a significant contributor to visibility impairment in the numerous mandatory Class I Federal areas surrounding FCPP. The emission reductions finalized will help achieve the goals of the RHR. The RHR however does not require nor does it authorize EPA to de-commission or shut down facilities to achieve the goals of the rule.*

*EPA agrees with commenters who stated that renewable energy sources can be used in place of coal-fired power plants. However, the RHR does not require that coal-fired facilities use or switch to renewable energy sources to meet the goals of the rule. The RHR establishes a five step process EPA must follow when performing a case-by-case BART determination. In the first*

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<sup>90</sup> Please see [http://www.epa.gov/region09/air/maps/maps\\_top.html](http://www.epa.gov/region09/air/maps/maps_top.html) for EPA Region 9 air quality designations.

*step, “Identification of all available retrofit technologies”, EPA does not consider BART as a requirement to redesign a source (see 70 FR at 39164).*

**Comment:**

Fifty-two private citizens (0085, 0086, 0087, 0088 , 0089, 0091, 0092, 0122, 0123, 0124, 0125, 0126, 0127, 0128, 0132, 0134, 0135, 0136, 0137, 0138, 0140, 0141, 0147, 0148, 0149, 0151, 0153, 0154, 0155, 0156, 0157, 0158, 0159, 0160, 0161, 0162, 0165, 0166, 0170, 0171, 0172, 0173, 0178, 0181, 0188, 0190, 0197, 0199, 0202, 0208, 0211, 0213, 0214) expressed concern about the poor air quality in the Four Corners area. Forty of these commenters (0085, 0086, 0087, 0089, 0091, 0092, 0123, 0126, 0127, 0128, 0134, 0136, 0137, 0138, 0141, 0148 , 0149, 0151, 0153, 0154, 0155, 0157, 0158, 0159, 0160, 0161, 0162, 0166, 0170, 0171, 0172, 0173, 0178, 0181, 0188, 0197, 0202, 0211, 0213, 0214) claimed that FCPP has diminished the visual quality of their respective regions. The regions mentioned in the comments include Bayfield, Cortez, Durango, La Plata City, Pagosa Springs, and Oxford, CO; Southwest CO; Albuquerque, Farmington , Mancos, Pecos, and Shiprock, NM; Bluff, UT; and Class I areas such as Arches, Chaco Canyon, Grand Canyon , Maroon Bells, Mancos Valley, Mesa Verde, Sleeping Ute, and Wheeler Peak. One of these commenters (0172) disapproved of pollution coming from Arizona affecting Colorado.

Five private citizens (0089, 0091, 0124, 0128, 0201) supported EPA’s proposal to reduce NO<sub>x</sub> emissions at FCPP. Two private citizens (0091, 0201) supported EPA’s proposal to reduce PM emissions at FCPP.

**Response:**

*EPA acknowledges the comments and generally agrees with comments regarding diminished visibility in the Four Corners Area. As detailed in our response to the previous comment above, the air quality in the Four Corners area is meeting the national health-based standards as set by EPA. EPA agrees with commenters that the NO<sub>x</sub> emission reductions finalized will reduce visibility impairment in the numerous mandatory Class I Federal areas surrounding FCPP.*

*As described in Section 8.2 of this RTC, EPA is not taking action at this time on our proposal to set new PM limits for Units 1 – 3. If APS is unable to or decides against implementing the alternative emission control strategy and continues operation of Units 1 – 3, EPA will again conduct a five-factor analysis for PM for Units 1 – 3 and propose another BART determination for public comment.*

**Comment:**

The Navajo Nation (0223) pointed out that as a federal agency, EPA has a trust responsibility to the Navajo Nation that requires it to give special consideration to the Nation’s



best interests in any action.<sup>91</sup> Because of the significant interest of the Navajo Nation in FCPP (see related comments in Section 4.1), the commenter asserted that the BART proposal clearly implicates the Nation's tribal trust interests. The commenter further contended that since EPA is adopting a FIP for BART in lieu of a TIP by the Navajo Nation, the EPA is essentially "standing in the shoes" of the Nation for purposes of making the BART determination and should, therefore, defer to tribal views when making environmental policy decisions and give the same weight to the BART factors that the Navajo Nation would in determining BART for FCPP; that is, to the extent that the Nation recommends a particular control technology as BART for power plants located on the Nation's lands, EPA should give substantial weight to that recommendation as part of its decision-making process. (As discussed in Section 8.1, the commenter asserted that advanced combustion controls, rather than SCR, properly represent BART for FCPP.) Thus, the commenter stated that as the Nation's trustee and "stand-in" for the BART determination for FCPP, the EPA should not select a more stringent BART than the commenter argued is required by the RHR to achieve "reasonable progress" where doing so would likely have substantial adverse impacts on the Navajo Nation. (See Section 4.1 for related comments on the potential impacts identified by the commenter.)

The commenter (0223) also stated that EPA has a duty to undertake government-to-government consultations with the Navajo Nation, and that EPA must coordinate with the Navajo Nation in its relationship with, and reliance on, other federal agencies. The commenter pointed out that EPA relies on data provided by the NPS, another federal trustee of the Nation, but has not coordinated consultation between NPS and the Navajo Nation on this rulemaking. The commenter indicated that the May 2011 EPA Tribal Policy recognizes that such coordination is required under Executive Order 13175 and asserted that EPA should coordinate consultation with the U.S. Forest Service (who provided data used in the proposed rulemaking) as well as various DOI agencies that have an interest in this rulemaking, including NPS, the Bureau of Indian Affairs, the U.S. Fish and Wildlife Service, the Office of Surface Mining Reclamation and Enforcement, and potentially the Bureaus of Land Management and Reclamation. The commenter added that consultation with Department of Energy (DOE) may be important in regard to including FCPP in a study that DOE is proposing to carry out for NGS, which also is located on the Navajo reservation and uses Navajo coal.

### **Response:**

*It is EPA's policy (EPA Policy on Consultation and Coordination with Indian Tribes, May 4, 2011 (EPA Tribal Consultation Policy))<sup>92</sup> to consult on a government-to-government basis with federally recognized tribal governments when EPA actions and decisions may affect tribal interests. Consultation is a process of meaningful communication and coordination between EPA and tribal officials prior to EPA taking actions or implementing decisions that may affect tribes. One of the primary goals of the EPA Tribal Policy is to fully implement both*

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<sup>91</sup> To support this assertion, the commenter cited Executive Order 13175 (65 FR 67249, November 6, 2000; *EPA Policy on Consultation and Coordination with Indian Tribes*, section IV "Guiding Principles," May 4, 2011 (EPA Tribal Policy); and the 1984 EPA Indian Policy.

<sup>92</sup> See "EPA Policy on Consultation and Coordination with Indian Tribes", May 4, 2011, in the docket for this final rulemaking.

*Executive Order 13175<sup>93</sup> and the 1984 Indian Policy, with the ultimate goal of assuring tribal concerns and interests are considered whenever EPA's actions may affect tribes by strengthening the consultation, coordination, and partnership between tribal governments and EPA.*

*For this action, EPA consulted with the Navajo Nation in accordance with the Executive Order and EPA's Indian Policies on numerous occasions. A record of all consultations with tribes is included in the docket for this final rulemaking.<sup>94</sup> As stated in the 2011 EPA Tribal Consultation Policy, as a process, consultation includes several methods of interaction that may occur at different levels.<sup>95</sup> EPA consulted with the Navajo Nation at various times throughout the process at various levels of government, including in-person consultation meetings with the President of the Navajo Nation on May 19, 2011 and June 13, 2012.*

*EPA acknowledges the significant interest of the Navajo Nation in FCPP. Based on a request made by the Navajo Nation during our May 19, 2011, consultation meeting, EPA examined potential adverse impacts to Navajo Nation if the owners of FCPP chose to implement the alternative emission control strategy in lieu of BART. The results of this analysis were discussed with President Shelly during a consultation meeting on July 13, 2012 and will be provided to President Shelly by letter as a follow-up to our consultation.*

*EPA agrees that we are acting to implement the BART requirements for a facility located on the Navajo Reservation in circumstances in which the Tribe has not applied, or been approved, to administer the applicable CAA program. EPA is mindful of the Navajo Nation's views and recommendations, particularly where there is a potential substantial adverse economic impact to the Navajo Nation. We disagree however that the Agency must "defer to tribal views when making environmental policy decisions". EPA is carrying out the requirements of the CAA and the Regional Haze Rule pursuant to our authority to implement these requirements in the absence of an EPA-approved program. EPA notes that the CAA and the TAR provide mechanisms for eligible Indian tribes to seek approval of tribal programs should they wish to administer CAA requirements.*

*As we stated in our proposed rule, FCPP is one of the nation's largest emitters of NO<sub>x</sub> (over 42,000 tons of NO<sub>x</sub> in 2009), was built roughly four decades ago, and has not installed any new NO<sub>x</sub> controls since the 1990's. FCPP is also located within 300 km of 16 Class I areas, sometimes known as the Golden Circle of National Parks.<sup>96</sup>*

*For this action EPA carefully considered the unique location of FCPP with respect to proximate Class I areas as well as its economic importance to Navajo Nation. We conducted a detailed analysis of available emission control technologies against the five-factors specified in the BART Guidelines. EPA also conducted extensive air modeling (included in the Supplemental Proposal). Additionally, we have considered the numerous comments we received on our*

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<sup>93</sup> See "Executive Order 13175 of November 6, 2000" in the docket for this final rulemaking.

<sup>94</sup> See document "Timeline of all Tribal Consultations on BART.docx" in the docket for this final rulemaking.

<sup>95</sup> See "EPA Policy on Consultation and Coordination with Indian Tribes", May 4, 2011, in the docket for this final rulemaking.

<sup>96</sup> See [http://www.nps.gov/history/history/online\\_books/nava/adhi/adhi4e.htm](http://www.nps.gov/history/history/online_books/nava/adhi/adhi4e.htm).

*proposals. In making our final decision we have had to balance the findings of our analysis along with the interests of various stakeholders, our unique government-to-government relationship with tribes, and our responsibility to carry out the requirements of the CAA and RHR to achieve reasonable progress towards visibility improvements.*

*This final FIP strikes a reasonable balance between reducing emissions to improve visibility while allowing for the facility to implement those reductions in a manner that is consistent with its continued operation and economic viability.*

*EPA has received information and comments from numerous federal agencies for this rulemaking and considered these in our final decision (all information and comments are included in the docket). However, EPA disagrees that we relied principally on data from the National Park Service. EPA conducted our own cost and visibility analyses for FCPP. EPA plans to coordinate with the Department of Interior in any future tribal consultations related to BART for the two coal-fired facilities located on the Navajo Nation.*

*EPA acknowledges that the Department of Interior has contracted with the National Renewable Energy Lab (NREL) of the Department of Energy to examine renewable energy options for the Navajo Generating Station, which is also located on the Navajo Nation and uses coal from the Kayenta Mine, located on Navajo and Hopi land. Information on the NREL study is available from DOI<sup>97</sup> and will be included in the docket for EPA's upcoming proposed rulemaking for NGS.*

**Comment:**

One private citizen (0163/0164/0216) asserted that the FCPP BART analysis should be based on the use of bituminous coal (with heat content of 11,500 Btu/lb) at the plant, but FCPP indicated that the plant uses sub-bituminous coal (with heat content of 8,880 or 8,776 Btu/lb). Based on this point, the commenter asserted that FCPP needs to have the air models redone, available technologies reselected, cost of control technology redone, energy control impacts redone, economic control impacts redone, non-air quality control impacts redone, existing controls reevaluated, useful life of FCPP re-evaluated, air visibility re-evaluated and anticipated improvement of visibility re-evaluated.

**Response:**

*EPA disagrees with the commenter. The classification of coal used at FCPP is only relevant to the presumptive NO<sub>x</sub> limits established for EPA's RHR regulations, which suggest emission limits based on the coal classification and boiler type. 40 CFR Part 51, Appendix Y, E.5. Table 1. EPA discussed the presumptive NO<sub>x</sub> limits for Units 3 – 5<sup>98</sup> at FCPP in terms of both bituminous and sub-bituminous coal, however, EPA conducted a full five-factor analysis for BART. Coal classification is not related to any aspect of the full five-factor BART analysis, therefore, regardless of whether the coal burned at FCPP is sub-bituminous or bituminous,*

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<sup>97</sup> <http://www.doi.gov/navajo-gss/index.cfm>

<sup>98</sup> Presumptive limits apply only to EGUs greater than 200 MW in size. Units 1 and 2 are smaller than 200 MW, therefore the presumptive limits do not apply to those units.

*EPA's five-factor analysis does not need to be redone and our BART determination does not need to be re-evaluated.*

*As stated in the TSD the classification of coal used by FCPP has historically been sub-bituminous;<sup>99</sup> however, FCPP asserts that its coal has more characteristics of bituminous coal than sub-bituminous coal, and should be classified as bituminous. Based on this categorization, FCPP cites the presumptive limit for NO<sub>x</sub> for bituminous coal of 0.39 lb/MMBtu from a dry-bottom wall fired boiler as its applicable presumptive BART limit for Unit 3. See 40 CFR Part. 51, Appendix Y, E.5. Table 1. The presumptive limit for NO<sub>x</sub> for sub-bituminous coal is 0.23 lb/MMBtu. Id. Generally, the high volatile content of sub-bituminous coal is known to ease burning and improve efficiency of combustion controls to reduce NO<sub>x</sub>, thus, the presumptive limit for sub-bituminous coal is lower than for bituminous coal.*

*The presumptive limits are not binding requirements for BART, rather they are included in the BART Guidelines as limits that most EGUs can meet through the use of current combustion control technologies. However, the BART Guidelines further state that the reviewing authority may determine that an alternative control level is appropriate based on the careful consideration of the statutory factors. Because EPA made our BART determination based upon our careful examination of the five factors rather than relying on the general presumptions set forth in the BART Guidelines, it was not necessary for our analysis or purposes of this regulation to determine whether the coal used by FCPP is bituminous or subbituminous.*

*With respect to the modeling of FCPP operations the type of coal burned and associated heat content were not germane to the analysis. The model is not itself, nor does it rely upon, a production cost model. The underlying costs of operation, including fuel quantity and heat content, as they flow through the summary economic statistics, are not modified with respect to the type of coal consumed.*

**Comment:**

Three of the owners of FCPP (0168, 0174, 0176/0177), who argued that advanced combustion controls constitute BART for NO<sub>x</sub> at FCPP, pointed out that SCR can be assessed as a potential control option later, under the reasonable progress component of the regional haze program. One of the commenters (0176/0177) provided background information about the Regional Haze program and noted that the CAA and BART rules treat BART as a part of the larger “reasonable progress” requirement. The commenter asserted that under the broader visibility program, the advanced combustion controls proposed by the commenter as BART can and should be deemed also to satisfy the reasonable progress milestone in the current planning period. The commenter added that whether additional emission controls may be needed after the application of this BART is a question that should be addressed in the larger context of the many sources of regional haze impairment on the Colorado Plateau, including, for example, mobile sources and prescribed and uncontrolled fires, as well as the ongoing regional planning efforts to address haze in the Western states. The commenter suggested that SCR can be considered during the next 10-year planning period (2018-2028) if it proves that additional emission reductions are

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<sup>99</sup> See Determination of Four Corners Coal Ranking, March 11, 2008 by Alan Papp. Docket ID: EPA-R09-OAR-2010-0683-0056.

needed to ensure reasonable progress. Another of the commenters (0168) stated that this approach would achieve reasonable progress and have the following benefits: (1) reduce the immediate financial burden on its customers, (2) allow time for greater certainty in terms of potential carbon limits and customer demand, and (3) retain greater flexibility in future resource decisions including the possibility of divestiture.

**Response:**

*EPA disagrees with the commenter that advanced combustion controls constitute BART for NO<sub>x</sub> at FCPP, and that therefore SCR should be assessed as a potential control option later, under the reasonable progress component of the regional haze program. EPA also disagrees that under the broader visibility program, the advanced combustion controls proposed by the commenter as BART can and should be deemed also to satisfy the reasonable progress milestone in the current planning period.*

*As detailed in the TSD, Unit 2 at FCPP experienced operational difficulties subsequent to its 1999 retrofit with LNB. Additionally, as noted in the Andover Report<sup>100</sup> there are operational risks associated with LNB/OFA retrofits on the Units at FCPP. Finally, it is not clear that the boilers APS cited as having achieved NO<sub>x</sub> emissions of 0.4 lb/MMBtu or lower following retrofit with LNB + OFA are indeed comparable to the units at FCPP. EPA therefore concluded that LNB and LNB+OFA are not capable of achieving the level of NO<sub>x</sub> control needed for BART.*

*Regarding the comment to address FCPP in a broader regional planning context, EPA addressed this comment in Section 8.0. However, EPA further notes that the BART requirement of the RHR applies to major stationary sources built within a limited timeframe that contribute to visibility impairment at nearby Class I areas. EPA and state or local air agencies have other regulatory mechanisms to address emissions from new stationary sources or mobile sources, and EPA further notes that those sources need not be addressed under BART, or assessed in a five-factor analysis for an individual facility.*

**Comment:**

One of the owners of FCPP (0176/0177), a group of FCPP owners (0185), and a utility industry association (0187) noted that the proposal preamble indicated that there is a visible plume originating from FCPP Units 1 – 3 that has some visibility-impairing effect in the area, and that EPA sought information on this secondary visible plume, its frequency and persistence, and whether it affects or can be observed from any Class I area (citing 75 FR 64231-32). The owner of FCPP (0176/0177) stated that the BART rules [40 CFR 51.308(d)] and CAA [section 169(a)(1)] address visibility in Class I areas, and added that the EPA does not have a “roving commission” to address visibility impairments that occur outside Class I areas. The commenter pointed out that although there is an “integral vista program” to protect views from within Class I areas (citing 40 CFR 51.301), such integral vistas must be identified by a Federal Land Manager according to specified criteria (citing 40 CFR 51.304), and only one such vista has been identified (in Maine) (citing 40 CFR 81.437). On this basis, the commenter concluded that

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<sup>100</sup> See “TSD ref [104] Andover Report” in the docket for this rulemaking at: EPA-R09-OAR-2010-0683-0059.

“EPA’s attempt to justify additional regulation of [PM] emissions and opacity on the basis of a purported association with alleged visibility impairment that EPA stated may result from [an FCPP] ‘plume’ outside Class I areas is ill-considered and should be abandoned.”

The utility industry association (0187) and group of FCPP owners (0185) stated that the Regional Haze program cannot be used to address visibility impairment outside of a Class I area, even if it is visible from such an area (citing CAA section 169A(a)(1), and that in the absence of evidence that this plume exists and significantly affects visibility in a Class I area, there is no basis for this aspect of the proposed rule. Another of the owners of FCPP (0174) simply asserted that the Regional Haze program provides no authority to require additional PM controls based on a “purported” plume generated by the units at FCPP.

The Navajo Nation (0223) stated that it is inappropriate for EPA to request comment on the secondary visible plume without verifying the existence of the plume or characterizing the nature, cost, and effects observed in Class I areas. This commenter included this argument in justifying continued operation of venturi scrubbers with an emission limit of 0.03 lb/MMBtu and a 20 percent opacity standard as PM BART for Units 1 – 3 (see Section 8.2).

**Response:**

*EPA disagrees with the commenters that we were attempting to address visibility impairments outside of a Class I area under BART or that EPA requested comment without verifying the existence of the secondary plume. EPA specifically requested comment in our proposed rule about whether the secondary visible plume (that EPA Region 9 staff observed in New Mexico out as far as Aztec and Bloomfield en route to Farmington from Albuquerque ) can be seen from Mesa Verde National Park, the closest Class I area to FCPP or any other Class I area near FCPP. In the TSD, EPA discusses whether this secondary visible plume is related to the poor control of fine particulates by the venturi scrubbers. Although EPA did propose PM and opacity limits, EPA also took comment on whether BART can be satisfied by allowing APS to continue to operate its existing venturi scrubbers on Units 1–3.*

*Although EPA received numerous comments on visibility impairment and anticipated improvement in the area from both our proposed rule and the supplemental proposed rule, EPA did not receive any specific information regarding whether this secondary plume impacts visibility in any Class I area near FCPP.*

*As described in Section 8.2 of this RTC, EPA is not taking action at this time on our proposal to set new PM limits for Units 1 – 3. If APS is unable to or decides against implementing the alternative emission control strategy and continues operation of Units 1 – 3, EPA may again conduct a five-factor analysis for PM for Units 1 – 3 and propose another BART determination for public comment.*

**Comment:**

One public interest advocacy group (0112), the Navajo Nation (0223), and one environmental advocacy group (0182) supported establishment of a 20 percent opacity limit for material handling. The public interest advocacy group (0112.1) stated that the FCPP site is subject to numerous dust-storm events originating in northwestern Arizona, and the additional fugitive dust that could be picked up by these strong winds at the FCPP property added to the incoming dust from the west makes breathing and outdoor activity miserable on from 4 to 12 days per year for residents of Montezuma County, CO and San Juan County, NM. The commenter supports requiring FCPP to develop a dust control plan within 90 days of promulgation of the final rule to be submitted to the EPA Regional Administrator and implemented immediately. The commenter also asked that courtesy copies of the dust control plan be submitted to appropriate local governments in the Four Corners area, such as the Navajo Nation EPA, San Juan County (NM), and Montezuma, Dolores, and La Plata Counties (CO).

The Navajo Nation (0223) added that the fugitive dust plan should be reviewed thoroughly and include appropriate recordkeeping and monitoring requirements. The commenter also expressed support for the constructive approaches described in the supplemental proposal to the management of dust, ash, and PM, stating that these approaches are practicable and will be consistent with EPA's ongoing progress and rulemaking under the CAA for mercury, coal combustion residues, GHGs, and other contaminants; improve the efficiency of Units 4 and 5; and provide environmental and health co-benefits, which are essential for quality of life and economic opportunities.

One of the owners of FCPP (0176/0177) noted that in addition to the proposed BART requirements, EPA proposed separate fugitive dust control requirements and a 20 percent opacity limitation for certain material handling operations, which are unrelated to the CAA visibility program. The commenter laid out the history of EPA's past attempt to apply fugitive dust controls to FCPP, pointing out that EPA included such requirements in the 2007 FIP for the plant and the commenter sought judicial review of those requirements based on the absence of a reasoned explanation. *Arizona Public Service Co. v. EPA*, 562 F.3d 1116 (10<sup>th</sup> Cir. 2009) ("*APS v. EPA*"). The commenter added that upon EPA's motion, the court vacated and remanded the fugitive dust requirements (citing *APS v. EPA* at 1121-22, 1131; the EPA Merits Brief at 53; and 75 FR 64232, Oct. 19, 2010).

The commenter argued that the proposed requirements are arbitrary and should not be finalized because the facts upon which EPA relies are inadequate to support the conclusion that fugitive dust control requirements are "necessary or appropriate" to protect air quality at FCPP. The commenter's points are outlined below:

- The "necessary or appropriate" language in the TAR at 40 CFR §49.11(a) is limiting – not all requirements that could potentially yield some air quality benefit are "necessary or appropriate to protect air quality." The EPA has indicated in the past that this language is intended to be limiting (citing the *APS v. EPA* EPA Merits Brief at 56, 60 and EPA's NSR rules for Indian country at 71 FR 48696, 48714, August 21, 2006).
- Although the Administrative Procedures Act (APA) requires that there be some intelligible principle or criteria to guide the Agency's decisions, the EPA has not identified the criteria that guide its judgment as to which regulatory requirements are

“necessary or appropriate” and which are not. Such exercises of standardless discretion are arbitrary and capricious. *Qwest Corp. v. FCC*, 258 F.3d 1191, 1201-02 (10th Cir. 2001); *Dithiocarbamate Task Force v. EPA*, 98 F.3d 1394, 1402 (D.C. Cir. 1996). See also *Pennaco Energy, Inc. v. EPA*, 692 F. Supp. 2d 1297, 1314 (D. Wyo. 2009). Without identified criteria, EPA’s proposed conclusion that fugitive dust controls are “necessary or appropriate” is inevitably arbitrary.

- The reasons given in the proposal preamble for imposing fugitive dust requirements are inadequate to support the proposed conclusions. In the end, EPA makes no effort to identify a specific, concrete air quality problem that needs to be addressed or to quantify FCPP’s contribution to any such problem.
- Regulation of fugitive dust without a well-defined air quality basis would not only be arbitrary in and of itself, but would also conflict with guidance the EPA has provided to the states. This guidance includes (1) the 1986 document *Identification, Assessment, and Control of Fugitive Particulate Emissions* (EPA/600/8-86/023, excerpt attached to the comments as Exhibit H); (2) the 1977 memorandum *Guidance on SIP Development and New Source Review in Areas Impacted by Fugitive Dust* (attached as Exhibit I); and (3) the 1987 *PM<sub>10</sub> SIP Development Guideline* (attached as Exhibit J).<sup>101</sup>
- The EPA may not depart from its established policies without reasoned explanation. Although EPA may argue that it is not expressly bound by its SIP policies in crafting a FIP for Indian country, EPA cannot ignore those policies without expressing good reason to do so. To avoid being arbitrary or capricious, a federal agency must treat like situations alike and must follow its own established policies, in the absence of a well-reasoned basis for doing otherwise. *Transactive Corp. v. United States*, 91 F.3d 232, 237 (D.C. Cir. 1996); *Illinois State Chamber of Commerce v. EPA*, 775 F.2d 1141, 1147 (7th Cir. 1985).
- The EPA has provided no explanation for its selection of the 20 percent opacity limit, as opposed to no limit or a higher limit (citing 75 FR 64232). A rule without any stated basis is necessarily arbitrary and capricious. *Small Refiner Lead Phase-Down Task Force v. EPA*, 705 F.2d 506, 551 (D.C. Cir. 1983). See also, *Appalachian Power Co. v. EPA*, 135 F.3d 791, 818 (D.C. Cir. 1998). See *Northeast Md. Waste Disp. Auth. v. EPA*, 358 F.3d 936, 948 (D.C. Cir. 2004); *Columbia Falls Aluminum Co. v. EPA*, 139 F.3d 914, 923 (D.C. Cir. 1998); *American Maritime Ass’n v. United States*, 766 F.2d 545, 566 n. 30 (D.C. Cir. 1985).
- Opacity limits for fugitive dust in SIPs and TIPs appear to be widely varied, as shown in the 1983 document *Opacity Regulations: Summary of State Regulations and Rulemaking Status* (attached as Exhibit M with summary tables reproduced in the comments). Data from a 2007 study by UARG show a variety of opacity limits for coal handling activities in recent PSD permits for new coal-fired plants (excerpt attached as Exhibit N). The NSPS 20 percent opacity standard in 40 CFR part 60, subpart Y cannot properly be the basis for the FCPP opacity limit because Congress intended that, in general, existing sources such as FCPP would be subject to less stringent standards than new sources built after the applicability dates of the various NSPS. *California v. Department of the Navy*,

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<sup>101</sup> The Exhibits referenced by commenter 0176/0177 are attached as embedded PDF files to the comment letter in the docket for this rulemaking, at EPA-R09-OAR-2010-0683-0177 or EPA-R09-OAR-2010-0683-0176.



431 F. Supp. 1271, 1291 (N.D. Cal. 1977), *aff'd*, 624 F.2d 885 (9th Cir. 1980). See S. Rep. No. 1196, 91st Cong., 2d Sess. 15-16 (1970); Arbuckle, *et al.*, Environmental Law Handbook (Twelfth ed. 1993) at 127.

Another of the owners of FCPP (0168) expressed general support for the points made by Commenter 0176/0177.

**Response:**

*EPA acknowledges support for establishing a 20% opacity limit for material handling and a Dust Control Plan at FCPP. For the reasons outlined below, EPA has finalized both these requirements. EPA notes that the Dust Control Plan shall include a description of the dust suppression methods for controlling dust from site activities including coal handling and storage facilities, ash handling, storage, and landfills, and road sweeping activities. The 20% Opacity standard will apply to any crusher, grinding mill, screening operation, belt conveyor, or truck loading or unloading operation.<sup>102</sup>*

*As mentioned in an earlier response to this RTC, EPA notes that on June 21, 2010, EPA proposed and solicited comments on two regulatory options for establishing national standards for management of CCW (75 FR 35127). The proposal includes options for fugitive dust controls that would apply to FCPP when finalized.*

*EPA agrees with the commenter that the fugitive dust plan should be reviewed and should include appropriate recordkeeping and monitoring requirements. EPA intends to review the Dust Control Plan prior to approval for use.*

*EPA agrees with the commenter that the fugitive dust and 20% opacity limit are unrelated to the CAA visibility program. EPA also agrees with the history laid out by the commenter on fugitive dust controls at FCPP. EPA included these dust control requirements in the previous FIP finalized in 2007 because EPA considered them necessary or appropriate under the TAR to assure that the dust from this facility does not adversely contribute to possible violations of the NAAQS for PM<sub>10</sub>. Most large coal fired power plants are either covered by a State's general opacity limit (generally set at 20%), a specific limit in its permit or the NSPS Standards for coal handling (NSPS Subpart Y). APS is correct that EPA withdrew the 2007 FIP requirements on dust when APS appealed the rule. EPA had not adequately documented in the record for the 2007 FIP our basis for establishing the 20% opacity regulation. For the 2007 FIP, EPA chose not to defend our position based on the record for that rulemaking and instead chose to address the issue in a subsequent FIP action, such as this one.*

*EPA disagrees with the commenter that the fugitive dust and opacity requirements are arbitrary or that our argument is inadequate to support our conclusion that fugitive dust control requirements are necessary or appropriate to protect air quality at FCPP. EPA first promulgated dust control requirements for new coal handling equipment on January 15, 1976*

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<sup>102</sup> Submittals received by EPA as a result of these requirements may be requested by the public via a Freedom of Information Act request unless claimed as Confidential Business Information (CBI) by the author of the document and determined to meet the CBI regulations at 40 CFR part 2 by EPA

*(41 FR 2232). This rule affected equipment constructed or modified after the 1970s that affected facilities built or modified after October 24, 1974. The purpose of these New Source Performance Standards (NSPS) was:*

*NSPS implement CAA section 111(b) and are issued for categories of sources which have been identified as causing, or contributing significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare. The primary purpose of the NSPS are to help States attain and maintain ambient air quality by ensuring that the best demonstrated emission control technologies are installed as the industrial infrastructure is modernized.*

*See 74 FR 51951 (October 8, 2009).*

*EPA's basis for finding that it is necessary or appropriate for FCPP to comply with a requirement to limit its material handling emissions to 20% or less is being set forth in this rulemaking. EPA has promulgated a 20 percent opacity limit for all new coal handling operations built after the mid 1970s in the New Source Performance Standards. This NSPS standard applied to any coal handling equipment processing more than 200 tons per day of coal. Because FCPP receives approximately 10 million tons of coal per year for combusting in Units 1-5, it may be processing more than 27,000 tons of coal per day. This is more than 100 times the smallest size coal handling operation subject to the NSPS, and which EPA considered necessary for protecting public health and welfare. As mentioned before, FCPP's massive quantity of coal moves by conveyor belt across FCPP's property line, passing through numerous transfer points before the coal is loaded into the storage silos that feed the individual pulverizers and combustion units. Each of these transfer points along with the conveyor belts has the potential for PM emissions. The PM can be minimized by collection devices or dust suppression techniques such as covered conveyors or spraying devices at the transfer points.*

*FCPP and the BHP Navajo Mine that provides FCPP's coal are within close proximity to Morgan Lake which is a recreational lake with public access just beyond the FCPP's property line. Excess dust can blow over the FCPP property line to Morgan Lake and adjacent properties. EPA has received complaints from Navajo Tribal members concerning excess dust emissions generated from the ash landfill FCPP maintains, as well as from the other material handling and storage operations.*

*EPA concludes that it is necessary or appropriate to set enforceable fugitive dust/PM suppression measures to protect ambient air quality because (1) there is a large potential for dust emissions from the facility coal and ash operations to be emitted and blow across the property line, (2) EPA has received numerous complaints concerning excess dust from the ash landfill and other operations, and (3) these activities are occurring in close proximity to a public access area.*

*EPA disagrees with the commenter that the 20 percent opacity limit is arbitrary and capricious. While EPA acknowledges that New Mexico does not have a general opacity limit that*

*applies to dust, the other three Four Corners States do. In Arizona and Colorado a general 20 percent opacity limit applies at all facilities including “grandfathered” coal fired EGUs. In Utah the general opacity limit for facilities built before the CAA in 1971 are subject to a 40 percent opacity limit. However, all of Utah’s large coal-fired EGUs were constructed after 1971 and are subject to a 20 percent general opacity limit, i.e., the NSPS. Therefore, if FCPP had been built a few years later or a few miles in a different direction, it would be subject to the NSPS or a SIP provision limiting its coal material handling and storage operations to 20 percent opacity.*

*Because FCPP is located on the Navajo Nation where generally applicable limits that often are included in SIPs do not exist and because it was constructed nearly 40 years ago, and because dust control measures at coal fired power plants are important for maintaining the PM<sub>10</sub> NAAQS in the areas adjacent to the power plant properties, EPA finds that it is necessary or appropriate to impose measures to limit the amount of PM emissions from these material handling and storage emission sources. EPA recently imposed similar dust control requirements at the Navajo Generating Station, which is also on the Navajo Nation. 75 FR 10174.*

**Comment:**

One environmental advocacy group (0182) noted that the owners of FCPP Units 4 and 5, or their governing utility commissions, may determine that it is more prudent to cease coal-fired operations than to install the emissions controls required to operate the units indefinitely. The commenter suggested that the EPA should include alternative language in the FIP that would accommodate cessation at or within the 5-year deadline for compliance with BART or, should the EPA require compliance with emission limits at an earlier date as the commenter recommended, the shutdown scenario should be tied to the date on which BART compliance is required. The commenter pointed out that Oregon has proposed a Regional Haze Plan including such multiple options, giving the plants and their governing commissions the flexibility to select the most economically and environmentally sound option (citing the Oregon plan which was included with the comments as an attachment).

**Response:**

*EPA disagrees with the commenter. The owners of FCPP Units 4 and 5 did not suggest in its alternative to BART proposal any scenario that would include shut down of Units 4 or 5. Unless the owners of FCPP suggest the closure of Units 4 and 5 as an alternative to BART, EPA does not have the authority to consider this as another option. At any time, the owners have the choice to shutdown entirely by the BART compliance timeframe in lieu of installing BART. In the final rule EPA has finalized both BART and the alternative to BART (which would include shut down of Units 1-3) and given the owners of FCPP the choice of which option to implement.*

**Comment:**

One environmental advocacy group (0184) stated that the EPA must consult in accordance with sections 7(a)(1) and 7(a)(2) of the Endangered Species Act (ESA) with regards

to the proposed FIP because of the impacts of FCPP on threatened and endangered fish, wildlife, and plants and their designated critical habitats, which the commenter discussed at some length. The commenter added that EPA has discretion under the TAR to limit emissions of mercury, selenium, and other pollutants that may adversely affect the razorback sucker and Colorado pikeminnow, and these species' critical habitats. According to the commenter, this discretion is part of what triggers the Agency's obligation to consult pursuant to sections 7(a)(1) and 7(a)(2) of the ESA.

**Response:**

*EPA disagrees with the commenter that determining BART and promulgating this FIP for FCPP necessitates ESA Section 7 consultation. EPA understands that the US Fish and Wildlife Service (FWS) is primarily concerned about the effects of mercury and selenium on endangered fish species in the San Juan River. EPA notes that under the BART Alternative, mercury and selenium emissions will be reduced from FCPP due to the closure of Units 1 – 3. Additionally, EPA's national MATS rule set new emission limits for mercury that would apply to Units 1 – 3 at FCPP if those units are not closed. EPA further notes that the goal of the Regional Haze Rule is to control emissions of visibility-impairing pollutants in order to restore visibility to natural conditions at the mandatory Federal Class I areas, and mercury and selenium do not affect visibility. Therefore, EPA does not have authority to regulate emissions of mercury or selenium under BART.*

**Comment:**

The coal supplier for FCPP (0117) questioned the legality of EPA's approach to the Regional Haze program at FCPP. According to the commenter, EPA's BART and better-than-BART proposals are not authorized because BART is not "reasonably separable" from the remainder of a regional haze implementation plan for the Navajo Nation under the TAR. The commenter went on to question EPA's entire approach to the Regional Haze program, which the commenter asserted impermissibly isolates BART from the context of the overall reasonable progress goal in violation of the CAA. After a lengthy discussion, the commenter concluded that the minimum amount of reasonable progress that BART needs to achieve in a given Class I area cannot be determined until the amount of reasonable progress achieved by other CAA and state programs is subtracted from that area's reasonable progress goal. The commenter asserted that EPA's determination of BART for FCPP is fatally flawed because that determination has failed to consider not only the reasonable progress goals for affected Class I areas but also the amounts of reasonable progress that will be achieved in those areas by other non-regional-haze programs. The commenter stated that EPA has not determined BART for FCPP in accordance with the law, and thus the Agency's proposed BART for FCPP should be withdrawn. For similar reasons, the commenter alleged that the NO<sub>x</sub> emission reductions that would be achieved under the supplemental proposal are in excess of the amount required to achieve the reasonable progress goals in the area.

The commenter (0117) added that EPA must consider the reasonable progress already achieved by past FCPP emission reductions. The commenter stated that until the 2007 FIP

became effective, emissions from FCPP were not subject to any enforceable limits, and that FCPP's uncontrolled SO<sub>2</sub>, NO<sub>x</sub>, and PM emission rates should perhaps serve as the baseline for determining the visibility improvements resulting from that FIP. The commenter argued that these visibility improvements would almost certainly satisfy the reasonable progress goals of many Class I areas for the first planning period, and that significant portions of the areas' progress goals have likely been achieved by the "additional" SO<sub>2</sub> reductions provided by the 2007 SIP. The commenter concluded that any necessary reasonable progress remaining to be achieved by NO<sub>x</sub> BART at FCPP cannot be determined until the reasonable progress achieved by prior emissions reductions at FCPP is considered.

In this context, the commenter (0117) stated that EPA's BART determination did not properly weigh the statutory factors. The commenter stated that it does not appear that EPA's selection of BART has been influenced by any meaningful consideration of the statutory factors (citing EPA's rationale at 75 FR 64230). Specifically, the commenter indicated that individual Class I area visibility improvements from SCR have not been compared with respect to the statutory factors to visibility improvements from LNB, and the actual amounts of those improvements have not been measured against the amounts of improvements needed to meet reasonable progress goals. The commenter also stated that cost effectiveness metric used by EPA (i.e., \$/ton of NO<sub>x</sub> reduced) does not satisfy the statutory requirement to consider the cost to comply with the Regional Haze program; that is, because EPA's determination of BART for FCPP has not considered the true costs of compliance with the statutory requirement to make reasonable progress, the determination is fatally flawed and should be withdrawn. Finally, the commenter discussed the "remaining useful life" statutory factor, noting that under the BART Guidelines remaining useful life is ignored in the majority of BART determinations (citing 40 CFR part 51, Appendix Y, section IV.D.4.k), which the commenter asserted is inappropriate. According to the commenter, Congress designated the remaining useful life of the source as an important consideration because it did not want to impose the burdens of control technology retrofits on sources that were more than 15 years old at the time the statute was enacted. Given that it is now 34 years after the BART requirements were enacted, the commenter argued that the "remaining useful life" statutory factor should weigh heavily in BART determinations for older sources such as FCPP, instead of being ignored.

In summing up these comments, the commenter (0117) stated that EPA's proposed BART determination and "better-than-BART" determination for FCPP are substantially flawed. According to the commenter, these determinations fail to implement fundamental statutory and regulatory concepts and instead rely on EPA's "inappropriate, incorrect, illogical, and/or unlawful" guidance, and fail to properly consider and weigh several of the five statutory factors for determining BART. As a result, the commenter stated that EPA should consider withdrawing both proposals and begin anew in a manner that avoids the major flaws and deficiencies within the current proposals.

**Response:**

*EPA disagrees with the commenter who questioned the legality of our approach and that stated that EPA's BART and "better than BART" proposals are not authorized because BART is not "reasonably separable" from the remainder of a regional haze implementation plan for the*

*Navajo Nation under the TAR. We also disagree that our approach to the Regional Haze program impermissibly isolates BART from the context of the overall reasonable progress goal in violation of the CAA, and that our proposed BART for FCPP should be withdrawn.*

*EPA’s authority to promulgate a source-specific FIP in Indian Country is based on CAA sections 301(a) and (d)(4) and the regulations implementing these provisions known as the TAR at 40 CFR Part 49. CAA section 301(d)(4) provides EPA with broad discretion to promulgate regulations directly for sources located in Indian country<sup>103</sup>, including on Indian reservations if we determine such Federal regulations are “necessary or appropriate” and the Tribe has not promulgated a TIP. Specifically, in 40 CFR 49.11, EPA interpreted CAA section 301(d)(4) to authorize EPA to promulgate “such Federal implementation plan provisions as are necessary or appropriate to protect air quality”. As such, because the Navajo Nation has not implemented a TIP for Regional Haze, EPA interprets the TAR to provide discretion to EPA to determine which requirements of the RHR are necessary or appropriate to protect air quality, and to promulgate just those implementation plan provisions accordingly. Because two stationary sources on the Navajo Nation meet the BART eligibility criteria, EPA has determined that it is necessary or appropriate at this time to evaluate source-specific FIPs to implement the BART requirement of the RHR for each BART-eligible facility located on the Navajo Nation. The basis for our determination is discussed in several prior responses (See, e.g., Sections 2.1, 4.1.2, and 8.1). The Courts have agreed with EPA that it may implement requirements that are necessary or appropriate without providing for all aspects of the CAA programs. See *Arizona Public Service v. EPA* 562 F.3d 1116 (10<sup>th</sup> Cir. 2009).*

*EPA disagrees with the comment that BART must be established in relation to reasonable progress goals. State or Tribal Implementation Plans for Regional Haze must establish goals that provide for reasonable progress towards achieving natural visibility conditions for each mandatory Class I Federal area located within its borders (40 CFR 51.308 (d)(1)). The FCPP and the NGS are both located within the Navajo Nation Indian Reservation, and for the reasons outlined above, EPA is conducting BART determinations for each facility. There are no mandatory Class I Federal areas as designated by Congress located within the Navajo Nation.<sup>104</sup> EPA further notes that the five-factor analysis outlined in the BART Guidelines, which were promulgated as a notice and comment rulemaking, does not require consideration of reasonable progress goals in determining BART for a given facility.*

*EPA also disagrees with the comment that our cost effectiveness analysis should be withdrawn because it did not satisfy statutory requirements. EPA notes that there is no regulatory or statutory requirement to consider the cost to comply with the Regional Haze*

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<sup>103</sup> “Indian country” is defined under 18 U.S.C. 1151 as: (1) All land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and including rights-of-way running through the reservation, (2) all dependent Indian communities within the borders of the United States, whether within the original or subsequently acquired territory thereof, and whether within or without the limits of a State, and (3) all Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same. Under this definition, EPA treats as reservations trust lands validly set aside for the use of a Tribe even if the trust lands have not been formally designated as a reservation.

<sup>104</sup> EPA notes that Navajo Nation has established its own parks and monuments, including Monument Valley, Canyon de Chelly, and the Four Corners Monument, however, these parks are not mandatory Class I Federal Areas as set by Congress.

*Program as a whole within an individual five-factor BART analysis. Because the Regional Haze Program requires review every ten years, it is impractical in a BART analysis (which occurs during the first Regional Haze planning period) to anticipate and consider the costs of undefined requirements in all future planning periods.*

*EPA also disagrees that the minimum amount of reasonable progress that BART needs to achieve in a given Class I area cannot be determined until the amount of reasonable progress achieved by other CAA and state programs is subtracted from that area's reasonable progress goal. Neither the CAA nor Regional Haze regulations set any quantitative presumptive targets for the amount of reasonable progress that must be achieved. Rather, the regulations allow for flexibility in determining the amount of reasonable progress towards the ultimate goal of returning to natural background conditions.*

*EPA disagrees with the commenter that EPA must consider the reasonable progress already achieved by past FCPP emission reductions and that previously uncontrolled SO<sub>2</sub>, NO<sub>x</sub>, and PM emission rates prior to previous FIPs for FCPP should serve as the baseline for measuring visibility improvements. In its own five-factor BART analysis, APS used actual NO<sub>x</sub> emissions from 2001 – 2003 as baseline emissions for determining visibility improvement from NO<sub>x</sub> controls. NO<sub>x</sub> emissions from 2001 – 2003 were generally consistent with and representative of NO<sub>x</sub> emissions over the past ten years.<sup>105</sup> EPA agrees with APS in its use of actual emissions over a recent time frame, rather than attempting to rely on previously uncontrolled emissions emission rates from FCPP as a baseline.*

*Additionally, nothing in the BART regulations or guidance requires that EPA consider past emission reductions in determining BART under the RHR. However, as part of the required five-factor analysis for BART EPA did evaluate and consider the current pollution control equipment in use at FCPP.*

*EPA disagrees with the comment that EPA's BART determination did not properly weigh the statutory factors. As discussed elsewhere in this document, the BART Guidelines allow the reviewing authority (State, Tribe, or EPA) the discretion to determine how to weigh and in what order to evaluate the statutory factors (cost of compliance, the energy and non air quality environmental impacts of compliance, any existing pollution control technology in use at the source, the remaining useful life of the source, and the degree of improvement in visibility which may reasonably be anticipated to result from the use of such technology), as long as the reviewing authority justifies its selection of the "best" level of control and explains the CAA factors that led the reviewing authority to choose that option over other control levels (see 70 FR 39170, July 6, 2005). EPA provided a detailed justification for our BART evaluation process and five-factor analysis in the TSD for our proposed BART determination. This justification has been discussed in more detail in prior responses to comments (see, e.g., Sections 6.0 and 8.1)*

*EPA also disagrees with the comment that individual Class I area visibility improvements from SCR have not been compared with respect to the statutory factors to visibility improvements from LNB. In the preamble to our October 19, 2010 proposed BART determination and in the*

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<sup>105</sup> As seen in Table 3 below, NO<sub>x</sub> emissions in 2001 and 2003 were highest over the 10 year period, but generally consistent with emissions over the past 10 years.

*accompanying TSD, EPA compared the anticipated visibility improvement from SCR with the anticipated improvement from combustion controls (LNB or LNB+OFA) (See 75 FR 64230, Table 3, and TSD Tables 36 – 39), and noted that EPA modeled the visibility improvement from SCR to far exceed the modeled improvement from combustion controls. As discussed elsewhere in this document (see Section 3.0), commenters and EPA both calculated the incremental cost between SCR and combustion controls, and the incremental cost of SCR is reasonable and does not warrant eliminating SCR as the top BART option. In the TSD for our proposed BART determination, EPA also compared the non-air quality environmental impacts of LNB and SCR in the discussion on potential effects of both controls to the salability of fly ash. Because EPA determined, based on an affordability analysis, that SCR should not force FCPP to close because it could still generate electricity at lower cost than to purchase power on the open market, a comparison of the effect of LNB and SCR on the remaining useful life of the facility is not necessary. Additionally, without a firm commitment from the facility owner to close before the end of the 20-year amortization period, it is inappropriate to consider a shorter useful life in the five-factor analysis.*

*EPA disagrees with the commenter that we ignored the “remaining useful life” statutory factor in our BART decision. EPA considered this factor in our BART analysis (see pages 42-43 of the TSD). As discussed in the TSD and in responses to comments within this document, the remaining useful life of an EGU subject to BART is determined by the utility. EPA cannot arbitrarily decide that an EGU has less useful life when it is not within our BART rulemaking authority to require closure of an EGU. If a utility solicited a shorter useful life than one that would allow the full amortization of any necessary pollution controls, EPA would take that into account in the cost analysis, provided that there was assurance the EGU would cease operation by that time.*

**Comment:**

In virtually identical comments that addressed both FCPP and NGS submitted prior to the supplemental proposal, one public interest advocacy group (0094) and one environmental advocacy group (0146) requested that EPA assert maximum responsibility to oversee the TAR for promulgating oversight of FCPP and NGS on the Navajo Nation.

**Response:**

*EPA agrees with commenters that we have a responsibility under the TAR for oversight of FCPP and NGS. We are exercising our authority under the TAR to implement these BART provisions at FCPP as necessary or appropriate to protect air quality in Indian country.*

**Comment:**

One private citizen (0131) asserted that the BART proposals for FCPP and SJGS unfairly subject SJGS to greater controls than FCPP for political reasons specifically that EPA seems to be favoring FCPP because of a potentially large local block of voters for 2012. The commenter



stated that EPA needs to wait until FCPP is cleaned up before taking any further action on SJGS. The commenter asserted that SJGS is probably being blamed for haze caused by FCPP.

**Response:**

*EPA disagrees with this comment. EPA Regions IX and VI developed five-factor BART analyses for FCPP and SJGS independently following the established BART Guidelines with absolutely no political considerations. EPA Region 9 notes that the BART determinations for FCPP and SJGS both require the installation and operation of SCR, the most stringent NO<sub>x</sub> control option, on all units no later than 5 years from the effective date of the final rule. Region 9 is finalizing both our BART determination for FCPP, as well as the alternative emission control strategy. If the owners of SJGS had proposed to Region 6 an alternative to BART, Region 6 would also have given serious consideration to the merits of that alternative. Region 9 also notes that the boiler configurations and existing air pollution control equipment at FCPP and SJGS are different, resulting in the different numerical emission limits set as BART. However, as discussed elsewhere in this RTC, the numerical emission limits result in comparable NO<sub>x</sub> reduction efficiencies at FCPP and SJGS (80% reduction at FCPP versus 83% at SJGS).*

*EPA also disagrees with the commenter that EPA should wait until FCPP is cleaned up before taking action on SJGS because SJGS is probably being blamed for haze caused by FCPP. The RHR and BART Guidelines do not limit BART determinations for different facilities located in close proximity to each other from occurring simultaneously, and if FCPP and SJGS were both located in the state of New Mexico, the BART determinations would have been made concurrently. Additionally, visibility modeling conducted for each facility alone and based on the specific emissions from that given facility, showed that SJGS and FCPP each contribute to visibility impairment at 16 nearby Class I areas.*

**Comment:**

One private citizen (0151) supported the EPA Region 6's proposal to implement retrofit technology at the San Juan Generating Station (SJGS). Another private citizen (0209) supported imposing maximum restrictions on both the FCPP and the San Juan Generating Station. A third private citizen (0210) supported the comments submitted by Senator Bennet of Colorado on cleaning up SJGS.

**Response:**

*EPA thanks commenters for submitting comments on Region 6's BART determination for SJGS to the docket for the BART determination for FCPP proposed by Region 9. Region 9 provided comments we received on SJGS to Region 6. EPA agrees that reducing emissions at both power plants will result in improvements in both visibility and air quality in the Four Corners area.*

**Comment:**

While acknowledging that FCPP emits significant amounts of air pollutants, the Navajo Nation (0223) pointed out that EPA's statement that FCPP is the largest emitter of NO<sub>x</sub> in the United States is based on gross emissions measured in tons per year. According to the commenter, it would be more meaningful to consider emissions in the context of the size of FCPP and the energy produced, measured in pounds per MMBtu, compared with other plants burning coal. The commenter stated that EPA should compile, and make available to the public, information that would allow a fair and accurate assessment of emissions from FCPP compared to those from other coal-fired plants.

**Response:**

*EPA agrees with the commenter that expressing emissions in pounds per MMBtu (lb/MMBtu) provides additional information and changes the relative "ranking" of FCPP against other coal-fired power plants, but disagrees with the commenter that lb/MMBtu is more meaningful for two reasons:*

*(1) The goal of the BART requirement of the Regional Haze Program is to reduce the visibility impact of air pollution emissions from certain stationary sources on nearby Class I areas. From this perspective, the total mass of visibility-impairing pollutants emitted from the stationary source is most meaningful. If the goal of the program was to improve the efficiency of the power plant, then evaluating emissions on a lb/MMBtu basis would be more meaningful than a total mass basis.*

*(2) Evaluating "rankings" based on lb/MMBtu ignores how often the facility operates and how large the facility is, both of which affect the annual mass emissions of pollutants into the atmosphere. For example, in 2001,<sup>106</sup> when FCPP was ranked #3 in terms of total tons of NO<sub>x</sub> emitted, FCPP was ranked #97 in terms of pounds of NO<sub>x</sub> per MMBtu heat input. The top two facilities in terms of lb/MMBtu in 2001 emitted NO<sub>x</sub> at rates of 1.7 and 1.4 lb/MMBtu, but only operated 3 and 6 months that year, and each emitted less than 200 tons of NO<sub>x</sub>, compared to the 47,000 tons of NO<sub>x</sub> emitted by FCPP. Similarly, in 2011,<sup>107</sup> when FCPP was the highest NO<sub>x</sub> emitter in the nation, FCPP was ranked #23 in terms of lb/MMBtu. The highest NO<sub>x</sub> emitter in terms of lb/MMBtu in 2011 was a facility that emitted NO<sub>x</sub> at a rate of 1.9 lb/MMBtu, but only emitted 146 tons of NO<sub>x</sub> that year, compared to the 39,000 tons of NO<sub>x</sub> emitted by FCPP.*

*Another way to evaluate the NO<sub>x</sub> data, is to first sort facilities by heat input before examining ranking based on lb/MMBtu. In 2001, FCPP was the 14<sup>th</sup> largest power plant in terms of heat input. Compared to the 13 other facilities with greater heat input, FCPP emitted NO<sub>x</sub> at the highest rate (0.56 lb/MMBtu), with emission rates of the 13 other facilities ranging from 0.16 – 0.54 lb/MMBtu. This shows that all larger (heat input) power plants, in 2001, achieved lower lb/MMBtu NO<sub>x</sub> emission rates than FCPP. In 2001, the best performing facility that was larger (heat input) than FCPP that was the WA Parish power plant in Texas, which operates four*

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<sup>106</sup> See spreadsheet titled "2001 CAMD.xls" in the docket for this final rulemaking

<sup>107</sup> Data reported for 2011 are preliminary data available from CAMD. See spreadsheet titled "2011 and 2012 prelim CAMD.xlsx" in the docket for this final rulemaking.

natural gas-fired units and four coal-fired units. The emission rate reported in Table 3 represents coal-fired units only.<sup>108</sup>

In 2011, FCPP was the 21<sup>st</sup> largest power plant in the nation in terms of heat input. Compared to the 20 other facilities with greater heat input, FCPP again emitted NO<sub>x</sub> at the highest rate (0.55 lb/MMBtu), with emission rates of other larger facilities ranging from 0.01 to 0.24 lb/MMBtu. Of the largest facilities, the facility achieving 0.01 lb/MMBtu was a natural gas-fired combined cycle facility (West County Energy Center in Florida), therefore, EPA did not include this facility in Table 3. The second best performer of the 20 largest facilities was the John E. Amos power plant in West Virginia, a coal-fired power plant emitting NO<sub>x</sub> at a rate of 0.05 lb/MMBtu.

Between 2001 to 2011 (see Table 3 below),<sup>109</sup> the range of NO<sub>x</sub> emission rates from the largest coal-fired power plants in the nation declined, going from a range of 0.16 – 0.54 lb/MMBtu to 0.05 – 0.24 lb/MMBtu, whereas the FCPP NO<sub>x</sub> emission rate over 2001 to 2011 showed little change. This suggests FCPP has not kept pace with the other largest coal-fired power plants in the nation in terms of reducing its lb/MMBtu NO<sub>x</sub> emission rate.

In this final rulemaking, EPA is requiring FCPP to meet a facility-wide NO<sub>x</sub> emission limit of either 0.11 lb/MMBtu as BART, or for Unit 4 and 5 to each meet a NO<sub>x</sub> emission limit of 0.098 lb/MMBtu under the BART Alternative. This final rulemaking will allow FCPP to keep pace with the largest coal-fired power plants in the nation in terms of reducing emissions of NO<sub>x</sub>.

Table 3: Ranking of FCPP from 2001 – 2012 Based on 3 Metrics

Year	Total NO <sub>x</sub> Mass (tons)	NO <sub>x</sub> rate (lb/MMBtu)	Heat Input (million MMBtu)	NO <sub>x</sub> range of larger heat input coal-fired power plants (lb/MMBtu)
2001	#3 (47,000)	# 97 (0.56)	# 14 (168)	0.15 – 0.54
2002	#8 (42,000)	#75 (0.57)	#26 (146)	0.16 – 0.59
2003	#3 (45,000)	#57 (0.57)	#18 (159)	0.11 – 0.53
2004	#1 (41,000)	#43 (0.55)	#23 (147)	0.04 – 0.47
2005	#1 (42,000)	#48 (0.53)	#21 (156)	0.05 – 0.46
2006	#1 (45,000)	#40 (0.56)	#18 (160)	0.05 – 0.41
2007	#2 (41,000)	#37 (0.56)	#23 (147)	0.05 – 0.46
2008	#2 (40,000)	#29 (0.55)	#25 (146)	0.04 – 0.46
2009	#1 (43,000)	#28 (0.54)	#16 (157)	0.05 – 0.33
2010	#1 (39,000)	#20 (0.55)	#23 (140)	0.05 – 0.28
2011	#1 (39,000)	#22 (0.55)	#21 (141)	0.05 – 0.24
2012 (1 <sup>st</sup> Q)	#1 (9,700)	#14 (0.54)	#12 (36)	0.08 – 0.24

<sup>108</sup> However, the natural-gas fired units at WA Parish do not have a significant effect in dramatically reducing the total facility NO<sub>x</sub> emission rate because those units are operated at a low capacity factor, e.g., see tab entitled “WA Parish only” in the spreadsheet “2001 CAMD.xls”.

<sup>109</sup> See spreadsheets titled “2002 CAMD.xls”, “2003 CAMD.xls”, “2004 CAMD.xls”, “2005 CAMD.xls”, “2006 CAMD.xls”, “2007 CAMD.xls”, “2008 CAMD.xls”, “2009 CAMD.xls”, and “2010 CAMD.xls” in the docket for this final rulemaking.