

FWS/ANWS-AR-AQ

August 31, 2012

Mr. Thomas G. Rogers, Administrator  
Air Modeling and Data Assessment Section  
Divisions of Air Resource Management  
Florida Department of Environmental Protection  
2600 Blair Stone Road, MS 5500  
Tallahassee, Florida 32399-2400

Dear Mr. Rogers:

On August 3, 2012, the State of Florida provided a proposed revision to its State Implementation Plan (SIP) for Regional Haze. The revision focused on removing dependence on the Clean Air Interstate Rule (CAIR) by conducting source-by-source Best Available Retrofit Technology (BART) and Reasonable Progress (RP) determinations. In both cases, the State performed a comprehensive analysis and review process that included significant data collection, source screening, and robust air quality impact analyses. The process developed and conducted by the State is an example to others on how these aspects of the Regional Haze Rule were intended to be evaluated. The following discussion is an accumulation of comments and suggestions that we think will improve the State's evaluation and further protect our nation's most protected lands.

This letter acknowledges that the U.S. Department of Interior, U.S. Fish and Wildlife Service (FWS), in consultation with the National Park Service (NPS), has conducted a substantive review of the revised Regional Haze SIP. The content areas reflect priorities for the Federal Land Management agencies, and we have enclosed comments associated with these priorities. Please note, however, that only the U.S. Environmental Protection Agency (EPA) can make a final determination regarding the document's completeness and, therefore, ability to receive federal approval from EPA. The NPS may provide comments during the comment period for EPA's Federal Register Notice proposal on the Florida SIP.

Overall, the Florida Draft Regional Haze SIP includes the necessary elements and offers all the information needed to adequately address regional haze. The technical support document is comprehensive and addresses much of the information necessary for a full review. The SIP is well written and a good example for other States to follow. It is noteworthy that, by 2010, Florida's actual sulfur dioxide (SO<sub>2</sub>) emissions are below the 2018 projected emissions levels. Additionally, FWS is pleased that a number of sources either agreed to voluntarily reduce emissions or were required by the State to adjust current emission control devices to reduce emissions in order to contribute to State's Reasonable Progress Goals. The addition of emission

controls as a result of a robust evaluation of Reasonable Progress is an example of how progress improvements can be obtained and this should be used as an example for other States. FWS' comments regarding RP and the revised BART determinations are provided in the enclosure. The enclosure discusses RP, general comments that apply to the entire SIP (such as: exempted sources, cost-effectiveness analyses, consistency of information between Exhibit 2 and the Florida Department of Environmental Protection (DEP) BART Determination, proposed shutdowns, and proposed top controls), and detailed discussions regarding the BART determinations for fuel-oil and natural gas fired sources, coal fired sources, and Non-Electric Generating Units (EGUs). Within the detailed BART determination discussion there are several questions that should be addressed.

We would be glad to discuss the comments provided and are willing to work with Florida DEP to address any of the issues discussed in this letter. Again, the State of Florida is commended for the high quality of work, level of detail for the analysis, clear and concise writing of the revised Regional Haze SIP. We compliment you on your hard work and dedication to the significant improvement in our nation's air quality related values and visibility.

Sincerely,

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

Enclosure (1)

cc:

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**U.S. Fish and Wildlife Service**  
**Comments On**  
**Florida's Revised Best Available Retrofit Technology Determinations (BART)**  
**Under the Regional Haze State Implementation Plan (SIP)**  
**August 31, 2012**

On August 3, 2012, the State of Florida provided a proposed revision to its State Implementation Plan (SIP) for Regional Haze. The revision focused on removing dependence on the Clean Air Interstate Rule (CAIR) by conducting source-by-source Best Available Retrofit Technology (BART) and Reasonable Progress (RP) determinations. The State of Florida provided these revisions to the U.S. Department of the Interior, U.S. Fish and Wildlife Service (FWS) and the National Park Service (NPS).

The air program staff of the FWS, in consultation with the NPS, has conducted a substantive review of the revised BART Determinations under the Regional Haze SIP. This enclosure provides general comments that apply to the entire SIP and then detailed discussion regarding several specific sources.

**Reasonable Progress**

Regarding the discussion of Reasonable Progress, Florida's use of "Q/d" (emissions and distance) as an initial screening surrogate for visibility impact is well explained and comparable to methods developed and used by EPA and the Visibility Improvement State and Tribal Association of the Southeast (VISTAS) Regional Planning Organization (RPO). The document explains that Florida was concerned about public clarity in the use of "Q/d" screening. However, FWS supports the more robust method of screening sources for consideration developed by the VISTAS RPO. The utilization of emission and distance, a very basic relationship, was established to indicate a source's potential to impair visibility at a Class I area. The VISTAS's method considers wind trajectories and residence time relationships and offers a more defensible indicator of potential apportionment. In addition, Florida's adoption of a "Q/d" cutoff value of 50, and considering "Q" as representing only sulfur dioxide (SO<sub>2</sub>) emissions, deviates from other applications that have used a threshold of 10 for Q/d to represent the combination of sulfur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), and fine particulates (PM<sub>10</sub>). Florida altered the standard screening approach to allow more sources to pass under its threshold. Fortunately, many of the sources listed were not screened out of evaluation. The high count of sources that remained in the Reasonable Progress review despite a relaxed screening criterion emphasized the importance for Florida to perform source-by-source determination review.

**General BART Comments**

Ten BART-eligible sources exempted out of BART through modeling exemptions that produced a visibility impact at the nearest Class I area between 0.490 – 0.499 deciviews. These sources accepted permit limits in order to be exempted from BART. In developing the Regional Haze SIPs, EPA confirmed to VISTAS that this type of emission reduction was acceptable

For BART visibility cost-effectiveness analyses, visibility impairment generally was considered only for the nearest Class I area and not for all Class I areas within 300 kilometers of the source

that were impacted by the subject-to-BART sources. Visibility cost estimates necessarily would be reduced by using the aggregate visibility improvement at all Class I areas rather than for only the nearest Class I area. We continue to believe that it is appropriate to consider both the degree of visibility improvement in a given Class I area, as well as the cumulative effects of improving visibility across all of the affected Class I areas. It simply does not make sense to use the same metric to evaluate the effects of reducing emissions from a BART source that impacts only one Class I area as for a BART source that impacts multiple Class I areas. Additionally, it does not make sense to evaluate impacts at one Class I area, while ignoring other impacts at Class I areas that are similarly significantly impaired.

Information provided in Exhibit 2 of the Florida Regional Haze State Implementation Plan (SIP) usually contains company documents and recommendations for each BART analysis, along with the proposed Florida Department of Environmental Protection (FDEP) BART determination, and proposed permit language. However, four BART determinations in Exhibit 2 contain only the company information, but lack the FDEP BART determination and proposed permit language. These four sources are Tampa Electric – Big Bend Plant, Gulf Power – Crist Plant, Florida Power & Light – Martin Plant, and JEA – Northside Plant. We acknowledge that FDEP BART determinations for these four sources do appear in the body of the Regional Haze SIP, but Exhibit 2 should contain the proposed permits with the permit limits as well.

### **Proposed Shutdowns**

#### City of Tallahassee Purdom Generating Station -- Unit 7

The City of Tallahassee Purdom Generating Station Unit 7 is a 44 megawatt (MW) steam-electrical generator fired with oil and natural gas that will be shut down by December 31, 2013. As such, BART emission limits for nitrogen oxides (NO<sub>x</sub>), sulfur dioxide (SO<sub>2</sub>) and particulate matter (PM) for Unit 7 should be set at zero after December 31, 2013, and must be federally-enforceable. Additionally, the permit should state that a new Prevention of Significant Deterioration (PSD) permit application, review, and approval must occur prior to any initiation of future operations, if any, past the shutdown date.

#### Florida Power and Light Turkey Point -- Unit No. 2

The SIP includes a proposed construction permit for Florida Power and Light – Turkey Point Unit No. 2, a 440 MW boiler, that requires “as soon as practicable, but not later than December 31, 2013, the permittee shall permanently shut down Unit 2....” As such, BART emission limits for NO<sub>x</sub>, SO<sub>2</sub>, and PM for Unit No. 2 should be set at zero after December 31, 2013, and must be federally-enforceable. Additionally, the permit should state that a new PSD permit application, review, and approval must occur prior to any initiation of future operations, if any, past the shutdown date.

### **Proposed Existing ‘Top Controls’**

The discussions below are not meant to criticize the very significant controls installed by Tampa Electric Company and Gulf Power Company to control each of the BART pollutants. The FWS acknowledges the necessary effort and expense to install that level of control. Given the high level of control already achieved, a five-factor BART cost-effectiveness determination of any emission control that is more effective is a simple matter. So, even though the FWS has

questioned in some instances below the validity of existing controls being deemed as the ‘top controls’ and it has questioned the approvability to be considered ‘better-than-BART’ claims as a valid alternative-to-BART, the existing controls are very likely BART and can be shown to be so with a minimal five-factor analysis as cited below. Given the high level of control capability of the existing controls, the FWS has questions about certain current emission limits proposed by FDEP for SO<sub>2</sub> and NO<sub>x</sub>.

### Tampa Electric Company Big Bend Station -- Units 1, 2 and 3

Tampa Electric Company Big Bend Station Units 1, 2, and 3 are coal-fired electrical generating units that FDEP has determined have “top level emission controls” and as such are not being required to complete the five-factor BART determination. The FWS acknowledges extremely good controls for SO<sub>2</sub>, NO<sub>x</sub>, and PM, but has some comments relating to control of each pollutant.

#### ***SO<sub>2</sub> controls: Wet Flue Gas Desulfurization (Wet FGD)***

An FDEP proposed permit condition requires 95% removal of SO<sub>2</sub>, but does not specify any SO<sub>2</sub> emission rate limit. Tampa Electric proposed 95% removal, or as an alternative, an emission rate that does not exceed 0.25 lb SO<sub>2</sub>/million British Thermal Units (MMBtu). Granted, wet FGD is the most stringent control available for SO<sub>2</sub> control, but it is capable of 98% removal and a 0.06 lb/MMBtu emission rate. FDEP should propose an emission limit and a removal rate that considers “. . . the level of control that is currently best achievable,” as stated in the BART regulation.<sup>1</sup> The Appendix Y BART presumptive SO<sub>2</sub> limit of 0.15 lb/MMBtu is not being met if the 0.25 lb/MMBtu emission limit as proposed by Tampa Electric is being used for compliance. Appendix Y also states that the most stringent control available means emission control where, “. . . all possible improvements to any control devices have been made.”<sup>2</sup> An emission limit consistent with the emission rate being achieved should be included in the permit.

#### ***NO<sub>x</sub> controls: Selective Catalytic Reduction (SCR)***

SCR can be considered as the most stringent control available for NO<sub>x</sub> control if combustion controls (e.g., low NO<sub>x</sub> burners (LNB)) are also used. The provided summary does not mention whether there are any combustion controls in place. If not, the BART determination should consider them. SCR preceded by combustion controls is capable of achieving 0.05 lb/MMBtu NO<sub>x</sub> control, whereas the current permitted NO<sub>x</sub> emission limit for this unit is 0.12 lb/MMBtu. Appendix Y states that the most stringent control available means emission control where, “. . . all possible improvements to any control devices have been made.”<sup>3</sup> Please include the information requested and confirm that the current 0.12 lb/MMBtu NO<sub>x</sub> emission limit is appropriate.

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<sup>1</sup> See 40 CFR Part 51, Appendix Y, Section IV.E.4.

<sup>2</sup> Ibid., See Section IV.D.STEP 1.9.

<sup>3</sup> Ibid.

***Particulate Matter Controls: Electrostatic Precipitators (ESP)***

The currently installed ESP units are not actually considered as ‘top controls’ for particulate matter as is claimed. Properly operating fabric filters could be considered as the most stringent controls available. However, given the recent Best Available Control Technology (BACT) analysis and the current emission limit of 0.03 lb/MMBtu it is unrealistic that the cost analysis for fabric filters would show them to be economically feasible. A simple BART determination showing that incremental benefits from fabric filters over existing controls would not be cost-effective should be included. FDEP should confirm that the current ESP units are operated optimally<sup>4</sup> and that the 0.03 lb/MMBtu limit remains sufficiently stringent.

**Gulf Power Company Crist Electric Generating Plant Units 6 and 7**

FDEP stated that Units 6 and 7 currently utilize ‘top-level controls’ for SO<sub>2</sub>, NO<sub>x</sub>, and PM control and/or employ an alternative-to-BART that provides greater control than an individual five-factor BART determination for each regulated pollutant would provide.

***SO<sub>2</sub> controls: Wet FGD***

FDEP states that the current wet FGD on Units 6 and 7 is “designed” to provide 95% removal of SO<sub>2</sub>, without stating that this is a reduction efficiency permit limit. Likewise, an emission limit is not stated. Wet FGD is generally considered as the most stringent control available for SO<sub>2</sub> control and it is capable of 98% removal of SO<sub>2</sub> with an equivalent 0.06 lb/MMBtu emission rate. FDEP should propose an emission limit and percent removal that considers “. . . the level of control that is currently best achievable,” as stated in the BART regulation.<sup>5</sup>

***NO<sub>x</sub> controls: Selective Catalytic Reduction (SCR) with Low NO<sub>x</sub> Burners (LNB)***

In general, SCR with combustion controls (e.g., LNB & over-fire air (OFA)) can be considered as the most stringent control available for NO<sub>x</sub> control. However, SCR/LNB is capable of achieving an emission rate of 0.05 lb/MMBtu NO<sub>x</sub> and up to 92% control. The current NO<sub>x</sub> reduction efficiency is stated as 85%. Emission limits should reflect “. . . the level of control that is currently best achievable.”<sup>6</sup>

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<sup>4</sup> Ibid., See Section IV.D.STEP 3.4.

<sup>5</sup> Ibid., See Section IV.E.4.

<sup>6</sup> Ibid.

***Particulate Matter Controls: Electrostatic Precipitators***

The currently installed Electrostatic Precipitator (ESP) and wet FGD reasonably might be considered as the ‘top control’ for PM as is indicated. Properly operating fabric filters could be determined as the more stringent control, but given the current emission limit of 0.03 lb/MMBtu it is highly unlikely that a cost analysis for fabric filters would show them as economically feasible. A simple BART determination showing that incremental benefits from fabric filters over existing controls would not be cost-effective should be included. FDEP should confirm that the current ESP units are operated optimally and that the 0.03 lb/MMBtu remains sufficiently stringent.

***Alternative-to-BART Proposal***

Since FDEP has asked all sources subject-to-BART to perform the five-factor BART determination for all BART-affected units without respect to CAIR or Cross-State Air Pollution Rule (CSAPR), it is inappropriate for Gulf Power Company to use compliance with CAIR or CSAPR as a yardstick to deem the current control configurations as an Alternative-to-BART.

Gulf Power Company presented FDEP with an Alternative-to-BART request for SO<sub>2</sub> control because its non-BART units 4 and 5 are also equipped with wet FGD and the aggregated SO<sub>2</sub> reductions from units 4, 5, 6, and 7 are attributed by Gulf Power Company as BART reductions. However, units 4 and 5 were controlled in order to comply with other non-BART regulatory purposes. Please consider that Section V of the BART regulations urges consideration of averaging across units *that are all subject to BART*. The BART regulation *does not address averaging across both BART and non-BART sources*.<sup>7</sup> EPA affirmed this interpretation in a letter dated July 1, 2011, to the State of Wisconsin.<sup>8</sup>

Because Crist’s actual 2011 SO<sub>2</sub> emission rate is below the presumptive BART limit of 0.15 lb/MMBtu, Gulf Power Company asked that FDEP determine this is ‘better-than-BART’. As stated earlier, BART is the emission rate and reduction efficiency set by the regulating authority to reflect the actual capability of the control alternative selected,<sup>9</sup> even if such permit limits are lower than presumptive BART requirements. As such, the permit limits by definition are considered as BART and thus, cannot be better-than-BART. FDEP should reject Gulf Power Company’s claim that the current emission rate is ‘better-than-BART.’

Gulf Power presented the same positions for Alternatives-to-BART for NO<sub>x</sub> control as were presented above for SO<sub>2</sub> control; namely using non-BART units’ emission

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<sup>7</sup> Ibid., See Section V.

<sup>8</sup> Letter dated 9/16/2011 from Cheryl L. Newton, EPA, Region V to Bill Baumann, Wisconsin Dept. of Natural Resources, p. 3-4.

<sup>9</sup> Ibid., See Section IV.E.4.

reductions to claim ‘better-than-BART’ accomplishment and using actual emission reduction capability below presumptive BART to claim ‘better-than-BART’ accomplishment. The FWS conclusions (i.e. rejection of Alternative-to-BART claims) are the same for NO<sub>x</sub> controls as those presented above for SO<sub>2</sub> controls. FDEP should reject Gulf Power Company’s claim that the current emission rate is ‘better-than-BART.’

Gulf Power stated that PM from Units 6 and 7 should be exempted from PM-BART requirements based on the prior exemption modeling for PM that was performed when CAIR took SO<sub>2</sub> and NO<sub>x</sub> out of BART. However, FDEP determined that for the present time, sources that are subject to BART should not rely on CAIR or CSAPR for compliance with BART and that all three pollutants, SO<sub>2</sub>, NO<sub>x</sub> and PM, should undergo a five-factor BART analysis. This position would imply that it is not appropriate to rely on PM-only exemption modeling as was the case under CAIR. Even though the five-factor BART analysis should be performed, the current control equipment, reconstructed ESPs and FGD, would likely constitute BART with a simple BART determination showing that incremental benefits from fabric filters over existing controls would not be cost-effective.

## **BART Discussions for Fuel-oil and Natural Gas Fired Sources**

General comment: FDEP seems to have settled on a BART requirement for the use of 0.7% sulfur No.6 fuel-oil, or sometimes higher sulfur fuel, at oil-burning EGUs. MANE-VU set a goal for the northeast United States that called for 0.5% residual fuel-oils to be used by 2018. The northeastern states’ BART limits were determined to be cost-effective at various facilities with a cost of \$2,500 - \$4,658 per ton of SO<sub>2</sub> reduction, using 2008-2009 oil prices. Granted, there may be geographic differences in cost of fuel-oil and oil availability, but FDEP should consider re-examining these factors and determining if blended 0.5% sulfur No. 6 fuel-oil might be justified in certain BART determinations or as a statewide requirement. The BART determinations seemed to analyze 0.3% sulfur fuel-oil and deemed it to be not cost-effective, whereas 0.5% sulfur fuel-oil could be cost-effective. Any re-calculations would be reasonably simple, involving only linear interpolations and extrapolations.

### Florida Power & Light Turkey Point Power Plant -- Unit No. 1

The permit revisions proposed in 2011 by FDEP state that Unit No. 2 will be shut down by December 31, 2013, as discussed earlier in these comments. In Section 2, “Permit Revisions” and in the BART section of the Regional Haze SIP, FDEP proposes to limit fuel-oil powering of Unit No. 1 to 25% of capacity, thereby leaving up to 75% of capacity to be powered by natural gas. Section 2 also proposes not replacing the multi-cyclone dust collectors for PM control by December 31, 2013, (as was initially provisioned in the facility’s 2009 FDEP-issued construction permit to implement BART), but still meeting the 2009 BART PM permit limit of 0.07 lb/MMBtu. However, neither the “Public Notice of Intent to Issue Air Permit” nor the Draft Permit Revision backup information reflect the “Permit Revisions” as noted in the preceding two sentences. These differences should be rectified.

The original 2009 BART required 0.7% sulfur No. 6 fuel oil. However, sufficient 0.3% sulfur fuel oil may be seasonally available to blend 0.5% sulfur fuel oil for use year-round, given that only 25% of the annual capacity will use fuel-oil. Since sulfur content of the fuel feed is the only available SO<sub>2</sub> control alternative, such an alternative should be considered. The potential of impacts because of the close proximity to Everglades National Park makes this a more important consideration.

Review of the Florida Power & Light original January 2007 BART determination and the subsequent documents reveals a lack of NO<sub>x</sub> BART deliberations or a NO<sub>x</sub> BART emission limit. Units No. 1 and No. 2 currently control NO<sub>x</sub> with LNB. The BART section of the Draft Regional Haze SIP, on pages 125 and 128, states a NO<sub>x</sub> emission limit of 0.53 lb/MMBtu while operating on fuel-oil, but this limit does not appear in the proposed permit. The SIP additionally states that the cost of add-on NO<sub>x</sub> controls could not be justified due to the low 25% of capacity operation on fuel-oil. The SIP did not consider additional combustion controls. There is no NO<sub>x</sub> BART determination presented anywhere in the documentation for the 2011 revised BART or the original 2009 BART determination. Little attention was likely paid to NO<sub>x</sub> control due to its inclusion under CAIR prior to this time. Now that a full five-factor BART determination is being required by FDEP for all three pollutants, it would seem that NO<sub>x</sub> control should be revisited. Please consider the development of a NO<sub>x</sub> BART determination examining at a minimum the addition of combustion controls (e.g., OFA and flue gas recirculation (FGR) and provide detailed information on the SCR and Selective Non-Selective Catalytic Reduction (SNCR) analysis that was referenced. The revised permit should contain the NO<sub>x</sub> BART emission limit. Again, the potential of impacts because of the close proximity to Everglades National Park makes this a more important consideration.

#### Florida Power & Light Company Martin Power Plant -- Units No. 1 and No. 2

Units No. 1 and No. 2, each 863 MW Electric Generating Units (EGU), currently burn 0.7% sulfur fuel oil and have installed LNB/FGR/OFA for NO<sub>x</sub> control. FDEP determined that the level of controls already in place for SO<sub>2</sub>, NO<sub>x</sub> and PM are consistent with BART.

Regarding SO<sub>2</sub> control, Florida Power & Light asserted that all wet and dry FGD controls were excluded from consideration, because there are no instances in the RACT/BACT/LAER Clearinghouse (RBLC) database where this type of control is used on oil-fired units. Lower sulfur fuel oils were considered as technically feasible, but 0.3% sulfur fuel oil resulted in a cost of \$24,155 per ton of SO<sub>2</sub> removed and \$154.9 million per deciview of visibility improvement.

As noted above, a good set of combustion controls exist at Units No. 1 and No. 2. SCR for NO<sub>x</sub> control was determined to cost \$5,323 per ton of NO<sub>x</sub> removed and \$203 million per deciview of visibility improvement and was dismissed as BART due to a lack of cost-effectiveness.

Without a cost-effectiveness analysis in the Florida Power & Light BART determination, Florida Power & Light chose to install ESPs for PM control for each of Units No. 1 and No. 2 by the end of 2014 at a total cost of \$111.2 million. However, in section 7.8.4.8 on page 147 of the Draft Regional Haze SIP, FDEP does not provide for the new ESPs to be considered as BART. It is puzzling that Florida Power & Light offered to install ESPs for PM control, yet FDEP did not

include them as BART. Preferably ESPs should be accepted as BART, but if not FDEP should explain why ESPs were not accepted as BART.

### Florida Power and Light Manatee Power Plant -- Units No. 1 and No. 2

Units No. 1 and No. 2 are each rated at 800 MW output. Units No. 1 and No. 2 are each currently equipped with multiple cyclones for PM control, and LNB, an FGR system, staged combustion and OFA air for NO<sub>x</sub> control. FDEP proposed using a greater natural gas firing capacity from 5,670 MMBtu/hr to 8,650 MMBtu/hour, along with a lower sulfur fuel oil content of 0.7% sulfur to control SO<sub>2</sub>.

Regarding SO<sub>2</sub> control, Florida Power & Light asserted that all wet and dry FGD controls were excluded from consideration, because this type of control is not used on oil-fired units. Lower sulfur fuel oils were considered to be technically feasible, but 0.3% sulfur fuel resulted in a cost of \$9,000 per ton of SO<sub>2</sub> removed and \$103.5 million per deciview of visibility improvement. Blending a 0.5% sulfur fuel might interpolate to approximately \$4,500 per ton of SO<sub>2</sub> removed, if a reliable supply of 0.3% fuel-oil could be assured for blending.

SCR for NO<sub>x</sub> control was determined to cost \$3,776 per ton of NO<sub>x</sub> removed and \$66.1 million per deciview of visibility improvement. A cost of \$3,776 per ton of NO<sub>x</sub> removed might be considered as reasonable considering that several plants have proposed NO<sub>x</sub> BART controls costing in this range: Great River Energy – Stanton Plant, Minnesota Power – Taconite Harbor Plant, Pacific Gas & Electric – Boardman Plant, and PacifiCorp – Jim Bridger Plant. However, it is recognized that the cost per deciview at the nearest Class I area is elevated, so this may be a possible reason to forego controls.

Without a cost-effectiveness analysis in the Florida Power & Light BART determination, Florida Power & Light chose to install ESPs for PM control on Units No. 1 and No. 2 in 2012 and 2013 at a total cost of \$111.2 million. However, in section 7.8.4.9 on page 151 of the Draft Regional Haze SIP, FDEP does not provide for the new ESPs to be considered as BART. It is puzzling that Florida Power & Light offered to install ESPs for PM control, yet FDEP did not include them as BART. Preferably ESPs should be accepted as BART, but if not FDEP should explain why ESPs were not accepted as BART.

### Northside Generating Station -- Unit No. 3

FDEP stated that the permit for Unit No. 3 (rated at 563.7 MW) already contains a federally enforceable provision to limit the use of high sulfur residual fuel oil to 21% of capacity, and limits the use of high sulfur residual fuel-oil to 15.5% from 2011 through 2016. The capacity limit is further reduced to 8% on residual fuel oil when Units No. 1 and No. 2 are fully operational. Further, since Unit No. 3 will not install pollution control equipment to meet the MACT limits by April 16, 2015, after that time the 8% capacity limit would be in effect under all operating conditions. Unit No. 3 currently has no SO<sub>2</sub> or PM controls and has LNB for NO<sub>x</sub> control.

Reduction of sulfur content of residual fuel oil from the current 1.8% to 1% would cost \$7,184 per ton of SO<sub>2</sub> removed and \$31.1 million per deciview of visibility improvement and was deemed to be excessive for BART purposes.

SCR was shown to cost \$4,584 per ton of NO<sub>x</sub> removed and \$6.1 million per deciview of visibility improvement. Both were deemed to be excessive for BART by FDEP. However, a control efficiency of only 80% was assumed. With combustion controls (LNB is already installed) along with SCR the efficiency can be up to 92%.<sup>10</sup> Recalculation would lead to even lower costs per ton and per deciview. Actually, the cost of visibility improvement is well in the range that most states have considered as being reasonable for BART. The existing FDEP-permitted emission limit is 0.30 lb/MMBtu and is considered as being BART.

An ESP was considered for PM control at a cost of \$18,083 per ton and \$78 million per deciview of visibility improvement, but was rejected as too expensive for BART. The current permitted PM emission limit of 0.1 lb/MMBtu is considered as BART.

#### Lakeland Electric C. D. McIntosh Jr. Power Plant Units No. 1 and No. 2

Unit No. 1 has a maximum permitted heat input of 985 million British thermal units per hour (MMBtu/hr) and Unit No. 2 has a maximum permitted heat input of 1,185 MMBtu/hr. Unit No. 1 is currently limited to a maximum of 2.5% sulfur content residual fuel oil and Unit No. 2 is currently limited to a maximum of 0.7% sulfur content residual fuel oil (0.8 lb/MMBtu of SO<sub>2</sub> emissions). FDEP proposed as BART for SO<sub>2</sub> control for Unit No. 1 a maximum of 0.7% sulfur content residual fuel oil at a cost of \$7,939 per ton and \$11.3 million per deciview of visibility improvement. No change for Unit No. 2 from the current 0.7% sulfur fuel oil was proposed. No analysis was provided for consideration of an alternative 0.5% sulfur fuel oil for Unit No. 2.

SCR for Units No. 1 and No. 2 was considered at a cost of \$5,241 per ton of NO<sub>x</sub> reduction and \$10.9 million per deciview of visibility improvement, but was rejected by FDEP due to excessive cost-effectiveness. However, these two cost estimates are less than those that were accepted as BART for SO<sub>2</sub> control for Unit No. 1 as shown above. The cost of visibility improvement for NO<sub>x</sub> is in the range that many states have considered as being reasonable for BART. Additional combustion controls besides the existing FGR controls (e.g., LNB, staged combustion, OFA and reburn) should have been considered in the BART determination.<sup>11</sup> The analysis for SCR used a control efficiency of 80%. With combustion controls as noted in the previous sentence SCR can attain up to 92% control efficiency.<sup>12</sup> This is another alternative that should be considered.

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<sup>10</sup> Ibid., See section IV.D.STEP 4.e.6.

<sup>11</sup> Ibid., See section IV.D.STEP 3.3

<sup>12</sup> Ibid., See section IV.D.STEP 4.e.6.

The \$65,865 cost per ton for PM reduction and \$41.7 million per deciview of visibility improvement using ESP control were considered too expensive for BART.

## **BART Discussions for Coal-Fired Sources**

### Progress Energy – Crystal River Power Plant Units No. 1 and No. 2

Units No. 1 and No. 2 are tangentially-fired, dry bottom pulverized coal-fueled boilers with gross capacity ratings of 440.5 and 523.8 MW, respectively. Each has an ESP to control PM and LNB to control NO<sub>x</sub>. The existing BART permit issued February 26, 2009, and the proposed, revised BART under review at this time allow Progress Energy three alternative options for complying with BART, with a requirement that Progress Energy decide amongst the options by January 1, 2015. Appendix Y indicates that compliance with BART should occur as expeditiously as possible, but no later than five years from the date of EPA’s final approval of Florida’s Regional Haze SIP,<sup>13</sup> which in this case is about 2018.

The two alternatives which provide for either BART compliance by January 1, 2018, or for mitigating emissions by 2018 to obtain an exemption from BART, are both certainly acceptable. The alternative allowing a discontinuation of Units No. 1 and No. 2 by December 31, 2020, is not a viable BART alternative, because the discontinuation date of December 31, 2020, will likely be later than five years after Environmental Protection Agency (EPA) approval of the Florida Regional Haze SIP. Appendix Y takes into account the “remaining useful life” of units in determining control costs. The regulation does not provide for operation without the required BART controls beyond five years after EPA approval of the SIP, whether the source operator agrees to a shutdown after a certain date or wishes to retain the flexibility to operate beyond that date.<sup>14</sup> This option is contingent upon the commercial commencement of two new nuclear units.

The Dry FGD analysis in Table 7 shows that a \$445 million Total Capital Investment will be recovered over a two-year useful life, because the assumption is that the plant will close in 2020 when the nuclear units are commercially operational. The resulting cost of \$10,034 per ton of SO<sub>2</sub> was deemed excessive. According to Appendix Y the cost of the Dry FGD alternative also should have been amortized over an assumed 15 years of useful life to determine the annual cost.<sup>15</sup> The cost per ton of SO<sub>2</sub> removal under this assumption is \$1,345, which would not be considered as excessive and would therefore require controls after 2018.

However, the \$79,434,138 cost per deciview of visibility improvement is not affected by the amortization period. FDEP did not assert in its determination that this cost of visibility improvement was deemed as excessive, but may have done so. With such a declaration Dry FGD would not have been required to be installed at any time. However, please note that the

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<sup>13</sup> Ibid., See section I.E.3.

<sup>14</sup> Ibid., See section IV.D.STEP 4.k.

<sup>15</sup> Ibid., See section IV.D.STEP 4.k.3.

Dry FGD analysis assumed only a 60% capacity of Units No. 1 and No. 2, which would require the permit to include a limit for 60% of capacity use for the units.<sup>16</sup> Any conclusion arrived at from this paragraph could still be negated by failure of Progress Energy to come into compliance with the Mercury and Air Toxics Standards (Utility MACT), which may force the retirement of these two units as stated in Progress Energy's BART determination.

Regarding NO<sub>x</sub> control, FDEP asserted in section 7.8.4.3, on page 131 of the SIP, that CSAPR is better than BART, so a NO<sub>x</sub> BART five-factor determination is not required. The premise of the entire FDEP revised BART process requires a NO<sub>x</sub> BART determination, because CSAPR is no longer applicable. The BART determination for Crystal River Power Plant Units 1 and 2 contained some conclusions that SCR was considered, but Progress Energy concluded that installation would cost \$182,000,000 for both units and this would be too expensive and have little impact on visibility improvement. These conclusions implied that a NO<sub>x</sub> BART analysis was performed, but the information was not provided by Progress Energy or by FDEP, and a firm cost per ton and cost per deciview were not presented to justify the conclusions reached. Other combustion controls in addition to the existing LNB were not considered as a NO<sub>x</sub> BART alternative.<sup>17</sup> The record should contain these deliberations and NO<sub>x</sub> BART conclusions should be based on them.

#### Gulf Power -- Lansing Smith Generating Plant Boilers No. 1 and No. 2

Units No. 1 and No. 2 are tangentially-fired, dry bottom pulverized coal-fueled boilers with gross capacity ratings of 175 MW and 205 MW, respectively. Current equipment includes both hot and cold side ESPs to control PM on each boiler and LNB (Unit No. 1), LNB & OFA (Unit No. 2) and SNCR (both units) to control NO<sub>x</sub>. Gulf Power uses Colombian coal with current emission factors for SO<sub>2</sub> control of 1.42 lb/MMBtu (Unit No. 1) and 1.43 lb/MMBtu (Unit No. 2).

Gulf Power proposed to install Dry Sorbent Injection (DSI) using trona (48% efficiency) on each unit, along with a switch to a Colombian coal with 25% less sulfur content. The wet FGD alternative SO<sub>2</sub> control showed a reasonable \$1,862 (Unit No. 1) and \$2,009 (Unit No.2) cost per ton even though it was about nine times the \$210 per ton cost using DSI with the coal switch. The wet FGD alternative remains cost-effective (even when using 95% removal efficiency, rather than the control potential of 98%), and should have been more carefully considered as BART on a cost per ton basis.<sup>18</sup> The visibility impact analysis of wet FGD resulted in FDEP making a subjective argument of 'minimal perceptibility' improvement and dismissing it. More can be said about the fallacy of minimal perceptibility arguments, but in this case the FDEP analysis stopped short of producing the \$21,665,817 cost per deciview of visibility improvement. It would be on this basis that an FDEP evaluation of cost-effectiveness of visibility improvement

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<sup>16</sup> Ibid., See section IV.D.STEP 4.d.2.

<sup>17</sup> Ibid., See section IV.D.STEP 3.3.

<sup>18</sup> Ibid., See section IV.D.STEP 4.g.

might be determined as being too expensive. However, before such a conclusion is reached a control efficiency should be analyzed in an effort to significantly reduce the cost per deciview.

In considering NO<sub>x</sub> controls, even though SCR was dismissed, consideration should have been given to additional combustion controls (e.g., OFA on Unit No. 1, along with FGR & staged combustion on both units).<sup>19</sup> Such controls are often very cost-effective. As an aside, it is curious that the analysis of the addition of SCR at 90% effectiveness produced 0.0 deciviews of improvement, because a significant NO<sub>x</sub> reduction would be expected to produce some level of improved visibility. Please review the analysis and revise if necessary.

Regarding PM control, page 5 of FDEP's "Draft Permit" states that the permittee is required to make physical or operational changes to the existing ESPs to avoid increasing PM emission caused by use of DSI systems, including relocation/physical changes to the air pre-heaters and conversion of the hot-side ESPs to cold side ESPs. These requirements are not repeated on page 170 in the "Conclusion" section of the Regional Haze SIP. The language should be consistent.

## **BART Discussions for Non-EGUs**

### CEMEX Cement, Inc. North Brooksville Cement Plant – Line 1

The BART determination dated August 13, 2008, for units in Line 1 was not amended in the current, revised BART determinations. The current control equipment and emission limits derived from the 2008 BART determination would seem to remain reasonable. The only unanswered question is whether or not the Company opted to install SCR by October 31, 2013, as allowed for in the 2008 BART.

### White Springs Agricultural Chemicals, Inc./PCS Phosphate 'C' & 'D' Sulfuric Acid Plants

Sulfuric Acid Plants (SAP) C and D each use the double absorption process to control sulfur dioxide emissions to meet the current BART determination permit limit of 3.5 lb SO<sub>2</sub>/ton of 100% H<sub>2</sub>SO<sub>4</sub> and 0.14 lb NO<sub>x</sub>/ton of 100% H<sub>2</sub>SO<sub>4</sub>. Also, in the revised BART, FDEP significantly reduced several PM emission limits to appropriate levels using good statistical methods.

Regarding SO<sub>2</sub> control, EPA Region 4 recommended that replacement of the phosphate infused vanadium catalyst with cesium infused catalyst in the final bed(s), among other possible improvements, should be considered in a BART determination.<sup>20 21</sup> The FDEP position was to establish a double-absorption process with an SO<sub>2</sub> emission limit of 3.5 lb/ton of 100% H<sub>2</sub>SO<sub>4</sub> on

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<sup>19</sup> Ibid., See section IV.D.STEP 3.3.

<sup>20</sup> Letter dated January 27, 2010 from Richard Schutt, EPA, Region IV to Joseph Kahn, FDEP.

<sup>21</sup> Revised Technical Evaluation and Preliminary Determination for White Springs Agricultural Chemicals, Inc., July 22, 2009, p. 4.

a 24-hour continuous emission monitors (CEMS) rolling average and allow White Springs Agricultural Chemicals, Inc. future latitude to make necessary modifications to assure that the emission limit is met.<sup>22</sup> The emission limit of 3.5 lb/ton of 100% H<sub>2</sub>SO<sub>4</sub> is consistent with a preponderance of other BART determinations on SAPs, possibly leading to a propensity of FDEP to maintain competitive parity between sources. Nevertheless, Appendix Y states that in a BART determination, “. . . you should consider ways to improve the performance of existing control devices, particularly when a control device is not achieving the level of control that other similar sources are achieving in practice with the same device.”<sup>23</sup> Appendix Y also states, “You should be sure to consider the level of control that is currently best achievable at the time that you are conducting your BART analysis.”<sup>24</sup> Mississippi Phosphate Corp. at two SAPs in Pascagoula, Mississippi proposed BART as 3.25 lb/ton of 100% H<sub>2</sub>SO<sub>4</sub>, while cesium catalysts have been used on double absorption units at CF Industries in Plant City, Florida and at DuPont Burnside in Louisiana. Certainly, if the alternative BART determinations are objectively shown not to be cost-effective on a cost per ton or a cost per deciview of visibility improvement basis then they would not require implementation.

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<sup>22</sup> Ibid., pp. 21, 22.

<sup>23</sup> See 40 CFR Part 51, Appendix Y, Section IV.STEP 3.4.

<sup>24</sup> Ibid., See section IV.E.4.