

National Park Service (NPS) Regional Haze SIP feedback for the Georgia, Department of Natural Resources, Environmental Protection Division

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1 Executive Summary

The National Park Service (NPS) appreciates the opportunity to review *Georgia's State Implementation Plan (SIP) For Regional Haze (PRE-DRAFT)*. The Georgia Department of Natural Resources, Environmental Protection Division—Air Protection Branch (GA EPD) developed a well-organized, detailed SIP and held a consultation meeting with the NPS on the proposed regional haze plan as required under §7491 (d) of the Clean Air Act.

The NPS consultation meeting, held on June 14, 2022, included staff from the NPS Air Resources Division (ARD), NPS Interior Region 2, Great Smoky Mountains and Mammoth Cave National Parks, as well as GA EPD. In addition, staff from the U.S. Forest Service (USFS), Fish and Wildlife Service (FWS), and the Environmental Protection Agency Region 4 (EPA) attended. During this consultation meeting, the NPS provided conclusions regarding the current draft as well as recommendations to strengthen the Georgia SIP which are discussed in detail in this document.

Georgia is home to three Class I areas, Cohutta Wilderness Area, managed by the USFS, and Okefenokee and Wolf Island National Wildlife Refuges, managed by the FWS. In addition, emissions from Georgia affect visibility at NPS managed Great Smoky Mountains National Park, in North Carolina and Tennessee. NPS review and comment is focused on NPS-managed areas and is not intended to represent the other Federal Land Management (FLM) agencies.

As noted in the draft SIP, significant reductions in SO₂ and NO_x emissions have occurred throughout Georgia and the southeast region in the last decade. The NPS recognizes and commends Georgia's emission reduction achievements that have contributed to visibility improvements in nearby Class I areas. However, additional progress is necessary before the ultimate visibility goal of no human caused impairment is realized for Class I areas affected by Georgia emissions.

Georgia emissions are not predicted to change substantially between the most current 2017 inventory and the 2028 future year. Except for proposed fuel switches at two facilities, Georgia is not proposing the installation of any additional controls in this round of regional haze planning. NPS review finds that there may be additional reasonable opportunities to reduce emissions at Georgia facilities. As described in these comments, this outcome is due in part to Georgia's analytical process for source selection and identification of pollutants to consider for control measures. The NPS raised concerns regarding source selection process and the exclusion of NO_x in communication to VISTAS states as early as May 17th, 2021. The Georgia SIP does not substantively address this previous NPS feedback. It is with this in mind that the following recommendations are reiterated, and detailed feedback is given.

As described in Sections 2, the NPS recommends that GA EPD:

- Include impacts to Great Smoky Mountains NP in SIP
- Evaluate and implement reasonable NO_x emission reduction opportunities in the round 2 regional haze SIP.
- Revise the source selection approach and address additional sources.

- Establish a cost threshold similar to those established by other states in this round of regional haze planning to thoroughly document decisions.

NPS Facility specific recommendations (Sections 3 and 4):

- Georgia Power Co. Plants Bowen and Wansley
 - Evaluate ways to optimize current pollution control equipment
 - Establish SO₂ and NO_x emission limits reflective of the existing control capabilities
- Georgia Power Co. Plant Scherer
 - Analyze options for improving SCR performance
- International Paper Co. Temple Inland
 - Conduct four-factor analyses for SO₂ and NO_x
- Brunswick Cellulose LLC
 - Conduct a four-factor analysis for NO_x emissions
- International Paper Co. Savannah
 - Update the four-factor analyses to include NO_x emissions

2 Overarching Feedback

2.1 Class I Areas Addressed in the SIP

The NPS recommends that GA EPD update the SIP and recognize Great Smoky Mountains National Park as one of the areas affected by Georgia emissions. Chapter seven of the SIP addresses Georgia facility impacts to the in-state Class I areas and out-of-state Class I areas where the individual facility PSAT contribution exceeds 1% of the total EGU plus non-EGU impact. The NPS recommends that GA EPD expand the tables in this section to include the modeled impacts from Georgia facilities in all VISTAS Class I areas. By omitting emissions below the 1% threshold, chapter seven does not fully disclose the impact of Georgia emission sources in all Class I areas, including Great Smoky Mountains National Park, which is affected by Georgia emissions.

The VISTAS PSAT and AOI analyses indicate that among VISTAS region states, Georgia emissions and facilities impact Great Smoky Mountains National Park. The NPS has identified five Georgia facilities as contributing to the top 80% of visibility impairment at Great Smoky Mountains National Park based on either the AOI or Q/d analysis results. Based on the cumulative AOI rankings, each of the facilities recommended for analysis are among the top ten most-impacting Georgia facilities across VISTAS Class I areas. This highlights that NPS recommendations capture the most important Georgia sources for consideration.

2.2 FLM Consultation

The NPS appreciates that Georgia provided the draft SIP materials to the FLMs at least 60 days in advance of their scheduled public comment period. Georgia's FLM consultation period meets the prescribed timeframes outlined in 40 CFR 51.308(i)(2) of the implementing regulations.

As discussed during the NPS/GA consultation meeting, Georgia intends to release the draft SIP for public comment two days after the close of the 60-day FLM consultation period. The NPS objective is that GA EPD can use the information presented in these comments to "meaningfully inform" the long-term strategy and improve the Georgia SIP by securing additional emission reductions in this round of regional haze planning. An approach that allows for *substantive* engagement from the FLMs is consistent with the intent of the consultation procedures outlined in §7491 of the Clean Air Act (CAA) and 40 CFR 51.308(i)(2) of the implementing regulations.

FLM consultation under the Regional Haze process is one of the most significant opportunities for the FLMs to carry out their congressionally designated "affirmative responsibility" to protect air quality related values in the Class I areas they manage. The SIPs will influence visibility in Class I areas for the next decade. EPA underscored the value of FLM involvement in the SIP development process in the preamble to the Regional Haze rule¹:

*As discussed in the proposed rule, **state consultation with FLMs is a critical part of the development of quality SIPs.** . . . We proposed to add a requirement that such consultation on SIPs and progress reports **occur early enough to allow the state time for full consideration of FLM input,** but no fewer than 60 days prior to a public hearing or other public comment opportunity. [Emphasis added.]*

EPA further elaborated that FLM participation in the RPO is not sufficient to address the FLM consultation opportunity:

*Finally, some multi-state organization commenters asked for confirmation that state and FLM participation in the RPO process would continue to meet the consultation requirement. **The EPA does not agree that such participation would suffice for consultation because being informed of the technical work performed by the multi-state organizations is not the same as the FLMs being substantively involved in regulatory decisions a state makes on what controls to require based on that work (i.e., the decisions on the longterm strategy on which public comment will be sought prior to submission to the EPA in the form of a SIP revision).** Furthermore, the objective of these provisions is not to achieve FLM consultation with states on setting RPGs, since that process is largely mechanical in nature because RPGs are to be based on the long-term strategy and do not involve any additional policy decisions. We note that a standing invitation for FLM participation in the work*

¹ Protection of Visibility: Amendments to Requirements for State Plans, Final Rule, 82 Fed. Reg. 3078 (January 10, 2017).

performed by multi-state organizations may be part of the procedures that a SIP provides for continuing consultation between the state and the FLM, as required by 40 CFR 51.308(i)(4). [Emphasis added.]

2.3 Exclusion of NO_x from Four-Factor Analyses

2.3.1 Georgia SIP Conclusions Regarding the Exclusion of NO_x from SIP RP determination:

Georgia used the modeling analysis results to conclude that evaluation of NO_x emission sources is not necessary in this round of regional haze planning. This conclusion was initially based on the VISTAS modeling, which used a 2011 base year. In the draft SIP, Georgia compared the 2011 VISTAS modeling with an EPA modeling study that used a 2016 base year to support the 2011 VISTAS modeling conclusions:

EPA's September 2019 modeling study, also shows that sulfates will continue to be the prevailing visibility impairing species in 2028 at VISTAS Class I areas and is consistent with a similar analysis of baseline conditions . . . These results corroborate the findings of the VISTAS study and indicate that focusing resources on the control of SO₂ is appropriate for this round of regional haze planning.

Based on this conclusion, GA EPD did not evaluate or consider NO_x control technologies in their four-factor analyses and reasonable progress determinations.

2.3.2 NPS Conclusions and Recommendations Regarding the Exclusion of NO_x from reasonable progress determinations:

The NPS recognizes that sulfate is the dominant anthropogenic visibility-impairing pollutant in Great Smoky Mountains National Park. The nitrate contribution to impairment is also important as supported by current monitoring information. As discussed in the NPS/GA June 14, 2022 consultation meeting PowerPoint presentation and the NPS May 17, 2021 response to VISTAS's states regarding their source selection & technical analysis for regional haze SIP development, the nitrate contribution to visibility impairment on the 20% most impaired days has been increasing over the last decade at Great Smoky Mountains, Mammoth Cave, and Shenandoah National Parks. The NPS recommends evaluating opportunities to reduce NO_x emissions from Georgia stationary sources in this RH planning period. (NPS May 17, 2021 comments to the VISTAS region state are attached to these comments for additional details and reference.)

The NPS recommendation to consider NO_x emissions is supported by information in the EPA's July 8, 2021 Memorandum, Clarifications Regarding Regional Haze State Implementation Plans for the Second Implementation Period (EPA Clarification Memo), which states in Section 2.2:

Consistent with the first planning period, EPA generally expects that each state will analyze sulfur dioxide (SO₂) and nitrogen oxide (NO_x) in selecting sources and determining control measures. In nearly all Class I areas, the largest particulate matter (PM) components of anthropogenic visibility impairment are sulfate and nitrate, caused primarily by PM precursors SO₂

and NO_x, respectively. A state that chooses not to consider at least these two pollutants in the second planning period should show why such consideration would be unreasonable, especially if the state considered both these pollutants in the first planning period. Regional offices are encouraged to work closely with states to ensure the bases for their decisions are sufficiently developed to demonstrate a reasonable analysis.

Currently, GA EPD's approach relies on 2028 modeling projections to determine that nitrate is not a significant contributor to impairment. Current IMPROVE monitoring information contradicts this conclusion.

As outlined in NPS May 17, 2021 communication with the VISTAS states, the VISTAS modeling used a 2011 base year which is not representative of current visibility monitoring trends for nitrate. The subset of 20% most impaired days from the base year are carried forward into the 2028 future year analysis. This assumes that the 2011 distribution of most-impaired days is reflective of current trends. Monitoring data show this is not the case and suggest the VISTAS 2028 results are biased toward summer months when sulfate concentrations are generally highest and nitrate concentrations are generally low. (Please reference the NPS May 17, 2021 comments for additional details).

To be clear, the NPS is not recommending that the modeling analysis should be redone or discarded. Rather, the NPS recommends that Georgia supplement their approach and rely on a weight-of-evidence, including the visibility monitoring data, to draw conclusions regarding measures to consider in the SIP.

The NPS appreciates GA EPD's efforts to compare the VISTAS modeling results with the more recent EPA 2016 base year modeling study. While the EPA results predict that sulfate will continue to be the dominate visibility impairing pollutant in the VISTAS Class I areas, the results still appear to under predict the nitrate contribution relative to current visibility monitoring information. Again, the NPS recommends that GA EPD rely on the weight-of-evidence and consider the monitoring information in addition to the modeling.

Finally, as noted above, the magnitude of NO_x emissions from Georgia stationary sources is significant (based on both current and 2028 inventories) and is within the state's purview to control. Reducing NO_x emissions would have additional regional co-benefits for ozone and nitrogen deposition. Great Smoky Mountains NP is currently part of two limited maintenance plans for ozone and has 12 acidified streams on the Clean Water Act 303(d) list for pH-impaired surface waters from excessive atmospheric nitrogen and sulfur deposition. A total maximum daily load (TMDL) of nitrogen and sulfur deposition was established to restore these streams which will require additional nitrogen and sulfur reductions to reach these protective critical loads.

For all of these reasons, the NPS recommends that Georgia consider NO_x emission reduction opportunities in this round of RH SIP development, as discussed in the facility-specific comments below.

2.4 Source Selection

The NPS Air Resources Division provided extensive comments on the VISTAS approach to source selection in our May 17, 2021 communication with the VISTAS's states. Again, we refer GA EPD back to those comments for a detailed discussion of NPS concerns related the VISTAS source selection methods.

The outcome of GA EPD's source selection process resulted in the evaluation of three sources for four-factor analysis, Georgia Power Company Plant Bowen, Brunswick Cellulose LLC, and International Paper Savannah.

Based on the 2017 NEI, these three sources account for 46% of Georgia's point source SO₂ emissions and 18% of Georgia's point source NO_x emissions. Based on the VISTAS PSAT results,² these three sources account for 42% of Georgia's projected 2028 contribution to impairment in Great Smoky Mountains NP and 2% of the *total* projected 2028 EGU plus non-EGU impairment in the park. For context, in their draft Regional Haze guidance, EPA initially proposed that capturing 80% of a state's contribution to visibility impairment would constitute a "reasonable" number of sources for reasonable progress analysis. While this this recommendation is not in the final 2019 guidance, Section 2.1 of the EPA 2021 Clarification Memo states:

What is reasonable will depend on the specific circumstances. We generally think that a threshold that captures only a small portion of a state's contribution to visibility impairment in Class I areas is more likely to be unreasonable.

Based on the 2017 NEI, Georgia is in the top 30% of the highest SO₂ and NO_x emitting states in the country and selected three sources for reasonable progress analysis. For comparison, the state of Idaho selected nine sources but is ranked among the states with the lowest SO₂ plus NO_x emissions. Georgia is ranked 17th for the highest SO₂ plus NO_x emissions amongst all U.S. states, with 63,925 tons/year of NO_x and 32,569 tons/year of SO₂ emissions statewide. Idaho is ranked 45th with 8,008 tons/year of NO_x emissions and 2,571 tons/year of SO₂ emissions. Idaho's statewide emission burden is roughly one tenth of Georgia's, yet Idaho selected and evaluated three times as many sources for reasonable progress four-factor analysis.

The NPS ARD re-sorted and ranked the VISTAS Area of Influence (AOI) results to develop source lists that capture 80% of the AOI impact ($\text{EWRT SO}_4^* \text{ Q/d SO}_2 + \text{EWRT NO}_3^* \text{ Q/d NO}_x$) for each Class I area in the VISTAS region. This produced a list of all the facilities that contribute up to 80% of the AOI impact in each of the VISTAS Class I areas and identified 30 Georgia facilities that affect visibility in any Class I area (see GA_80p_list_all_C1As_GRSM.xlsx). There are three Georgia sources on the 80% of the AOI impact list for Great Smoky Mountains NP. NPS ARD then reviewed this list considering information provided in the SIP and our original Q/d list to develop a final list of six sources

² Data pulled from the information provided in the excel spreadsheet "VISTAS PSAT Source Apport Results April 2020.xlsm," available at: <https://www.metro4-sesarm.org/content/task-7-source-apportionment-modelingtagging>.

recommended for analysis. These are listed in the table below; sources highlighted in green exceeded the 1% threshold in the VISTAS PSAT modeling and were selected by Georgia for analysis. Each of the six sources on the NPS list below are in the top ten Georgia facilities impacting haze when ranked based on their cumulative AOI impacts across all VISTAS Class I areas (see GA_80p_list_all_C1As_GRSM.xlsx). This highlights that the highest visibility impacting Georgia facilities are captured on the NPS list.

Table 1. NPS updated list and review of Georgia facilities recommended for four-factor analysis, June 2022

Facility Name	NPS Class I Area	On NPS Q/d List?	On NPS GRSM 80% of AOI List?	Number of VISTAS C1As Source Falls on Individual C1A 80% List	Exceeds GA's 2% AOI Threshold?	C1As GA's AOI Threshold Exceeded?	Tagged By GA in PSAT?	Exceeds GA's 1% PSAT Threshold?	C1As GA's PSAT Threshold Exceeded?	Selected by GA for 4FA?
Ga Power Company - Bowen	GRSM	Yes	Yes	11	Yes	COHU	Yes	Yes	COHU, OKEF, WOIS	Yes
Ga Power Company - Scherer	GRSM	Yes		7						
Brunswick Cellulose LLC	GRSM	Yes		2	Yes	WOIS	Yes	Yes	WOIS	Yes
International Paper Co Rome Linerboard (Temple Inland)	GRSM		Yes	5	Yes	COHU	Yes			
Ga Power Company - Plant Wansley	GRSM		Yes	9						
International Paper - Savannah	NA	No	No	7	Yes	OKEF, WOIS	Yes	Yes	OKEF, WOIS	Yes

Abbreviations: GRSM, Great Smoky Mountains National Park; COHU, Cohutta Wilderness Area; OKEF, National Wildlife Refuge; WOIS, Wolf Island National Wildlife Refuge.

Table 1 highlights that Plant Bowen exceeded Georgia's 2% of sulfate or nitrate AOI impact at just one Class I area, the Cohutta Wilderness, but exceeded Georgia's PSAT 1% of sulfate or nitrate visibility impairment at three Class I areas. This underscores the inconsistency in the VISTAS source selection process and that the individual facility percent-of-impact threshold used in the AOI screening step is both arbitrarily high and likely overly aggressive in screening potentially important sources for individual Class I areas.

2.5 Requirement to Address In-state Contributions to Haze

Section 7.4 of the draft SIP presents the modeling source apportionment results. This section states that "emissions from other regional planning organizations (MANE-VU, LADCO, and CENRAP) generally have higher contributions to 2028 visibility impairment at mandatory federal Class I areas in VISTAS than the emissions from the home state." This point was reiterated by GA EPD during the NPS/GA June 14, 2022, consultation meeting. During this meeting GA EPD staff reiterated that that based on the source attribution results, out of state contributions to haze are far more significant than Georgia contributions. GA EPD concluded that it is therefore "reasonable for Georgia to select fewer sources than other states."

The NPS does not agree with this rationale for limiting source selection. Reasonable progress provisions direct each state to consider a reasonable subset of sources within its own boundaries and evaluate those sources in the context of the four statutory factors. Declining to select sources because there are larger contributions from out-of-state regions unnecessarily limits achievable

progress. The cumulative benefit of multiple emission reductions will be needed to continue progress toward unimpaired visibility in Class I areas. EPA underscores the importance of focusing on in-state opportunities to reduce emissions in section 2.1 of the July 2021 Clarification Memo:

In applying a source selection methodology, states should focus on the in-state contribution to visibility impairment and not decline to select sources based on the fact that there are larger out-of-state contributors. What is reasonable will depend on the specific circumstances. We generally think that a threshold that captures only a small portion of a state's contribution to visibility impairment in Class I areas is more likely to be unreasonable. Similarly, a threshold that excludes a state's largest visibility impairing sources from selection is more likely to be unreasonable.

Further, the Georgia SIP conclusion referenced above compares the impact from a single state to the impact of regional planning organization (RPO) groupings of 6–12 states. The impact of combined emissions from an RPO may often exceed that of a single state. This does not diminish the states responsibility to address in-state emissions in the SIP. Based on SO₂ and NO_x point source emissions reported in the 2017 NEI, Georgia is ranked 17th for the highest SO₂ plus NO_x emissions amongst all U.S. states, with 63,925 tons/year of NO_x and 32,569 tons/year of SO₂ emissions statewide. This highlights that the emissions from Georgia point sources are significant. (The 2028 inventories reported in Appendix B-1a do not project reductions in current emissions from Georgia point sources.)

2.6 Decision-Making Criteria for Reasonable Progress Determinations

GA EPD could improve the draft SIP by more fully documenting the criteria relied upon to make the final reasonable progress (RP) determinations, as required under the regional haze (RH) regulations.³

Georgia completed a SO₂ four factor analysis for three facilities, Georgia Power Company's Plant Bowen, Brunswick Cellulose LLC, and International Paper Savannah Plant. The draft SIP indicates that the costs of compliance for additional SO₂ emission controls are unreasonable for both the facilities evaluated. However, GA EPD does not identify the measures, criteria, or thresholds used to make these determinations in the draft SIP.⁴

The NPS recommends that the SIP document the full rationale upon which the reasonable progress decisions are based. Cost evaluation—which is a statutory requirement—entails more than estimating control costs for an individual source or unit (the analytical component of a cost

³ 40 CFR § 51.308 (f)(2)(i): The State must include in its implementation plan a description of the criteria it used to determine which sources or groups of sources it evaluated and how the four factors were taken into consideration in selecting the measures for inclusion in its long-term strategy. [Emphasis added]

⁴ For Plant Bowen, GA EPD concluded “additional SO₂ emission reduction measures identified were determined to result in unreasonable costs of compliance.” For Brunswick Cellulose, GA EPD concluded “In summary, the additional SO₂ emission reduction measures identified were determined to result in unreasonable costs of compliance except for the replacement of No. 6 fuel oil and TDF with natural gas in the No. 4 Power Boiler.”

analysis). It also requires the state to document *why* each of the four-factors, including the costs of controls, would or would not be considered reasonable for the source in question. In their 2019 regional haze guidance, EPA recommends that a useful metric in making such determinations is the estimated cost per ton of pollutant reduced.⁵ EPA further elaborates in the 2019 Guidance that:

When the cost/ton of a possible measure is within the range of the cost/ton values that have been incurred multiple times by sources of similar type to meet regional haze requirements or any other CAA requirement, this weighs in favor of concluding that the cost of compliance is not an obstacle to the measure being considered necessary to make reasonable progress. . . . Where the cost/ton of a possible measure exceeds the historical range of cost/ton values, we recommend that the state not automatically conclude that the cost of compliance by itself makes the measure not necessary to make reasonable progress.

Many states have identified a cost-effectiveness threshold in their draft proposals in this round of regional haze planning. Some of the controls evaluated by Georgia are well within these cost-effectiveness ranges. For example, other states have proposed the following cost/ton thresholds:

- \$5,000/ton in Arkansas (EGUs) and Texas
- \$6,100/ton in Idaho
- \$10,000/ton in Colorado and Oregon
- A range from \$5,000 to \$10,000/ton in Nevada
- A range from \$4,000 to \$6,500/ton in Arizona

Finally, for International Paper Savannah and Brunswick Cellulose, GA EPD concluded that based on the “*fact that the state of Georgia is well below the glidepath for the 2018-2028 period indicates that requiring additional SO₂ emission control devices for the sources would not be reasonable for purposes of making further progress in reducing regional haze.*” The NPS notes that visibility benefit and visibility projections relative to the URP *alone* are not an appropriate basis for rejecting otherwise cost-effective controls. EPA covered this topic in their July 8, 2021, Clarification Memo (§5.4):

The URP is a planning metric used to gauge the amount of progress made thus far and the amount left to make. It is not based on consideration of the four statutory factors and, therefore, cannot answer the question of whether the amount of progress made in any particular implementation period is “reasonable progress.” This concept was explained in the RHR preamble (82 FR at 3099). Therefore, states must select a reasonable number of sources and

⁵ 2019 EPA Guidance on Regional Haze State Implementation Plans for the Second Implementation Period, Part II, Step 5—Decisions on what control measures are necessary to make reasonable progress.

evaluate and determine emission reduction measures that are necessary to make reasonable progress by considering the four statutory factors. [emphasis added]

The preamble to the Regional Haze Rule referenced in the EPA guidance further discusses the relationship between the URP, visibility improvement, and the four statutory factors. From the preamble:

The commenter's second suggestion, that states should be able to reject "costly" control measures if the RPG for the most impaired days is not "meaningfully" different than current visibility conditions, is counterintuitive and at odds with the purpose of the visibility program. In this situation, the state should take a second look to see whether more effective controls or additional measures are available and reasonable. Whether the state takes this second look or not, it may not abandon the controls it has already determined are reasonable based on the four factors. Regional haze is visibility impairment that is caused by the emission of air pollutants from numerous sources located over a wide geographic area. At any given Class I area, hundreds or even thousands of individual sources may contribute to regional haze. Thus, it would not be appropriate for a state to reject a control measure (or measures) because its effect on the RPG is subjectively assessed as not "meaningful." Also, for Class I areas where visibility conditions are considerably worse than natural conditions because of continuing anthropogenic impairment from numerous sources, the logarithmic nature of the deciview index makes the effect of a control measure on the value of the RPG less than its effect would be if visibility conditions at the Class I area were better. Thus, if a state could reject a control measure based on its individual effect on the RPG, the state would be more likely to reject those measures that are necessary to make reasonable progress at the dirtiest Class I areas, which would thwart Congress' national goal. [Emphasis added.]

We recommend that GA EPD establish a cost threshold to support the reasonable progress determinations and require all technically feasible, cost-effective controls identified through four-factor analyses in this planning period.

3 EGU Facility-Specific Recommendations for Georgia

3.1 Determination of “effectively controlled” for EGUs

As noted above, GA EPD selected one Electric Generation Unit (EGU) facility to consider for additional controls. GA EPD determined that this facility is already “effectively controlled” however, an analysis of existing controls was not performed to verify these determinations (see facility specific feedback below). GA EPD concluded:

Considering [the outcome of controls analyzed] and that Units 1-4 are fully controlled with wet FGD scrubber systems that are operated and maintained to optimize performance for not only SO₂ emissions removal but also for other environmental compliance requirements, such as MATS mercury emissions limits and ELG selenium wastewater treatment, it was concluded that the MATS alternative SO₂ limit of 0.20 lb/MMBtu for Units 1-4 be included in the Georgia Regional Haze SIP for the second implementation period.

Section 2.3 of the July 2021 EPA Clarification Memorandum addressed the analytical expectations for “effectively controlled” determinations:

*The underlying rationale for the “effective controls” flexibility is that if a source’s emissions are already well controlled, it is unlikely that further cost-effective reductions are available. A state relying on an “effective control” to avoid performing a four-factor analysis for a source should demonstrate why, for that source specifically, a four-factor analysis would not result in new controls and would, therefore, be a futile exercise. States should first assess whether the source in question already operates an “effective control” as described in the August 2019 Guidance. **They should further consider information specific to the source, including recent actual and projected emission rates, to determine if the source could reasonably attain a lower rate. It may be difficult for a state to demonstrate that a four-factor analysis is futile for a source just because it has an “effective control” if it has recently operated at a significantly lower emission rate.** In that case, a four-factor analysis may identify a lower emission rate (e.g., associated with more efficient use of the “effective existing controls”) that may be reasonable and thus necessary for reasonable progress. If a source can achieve, or is achieving, a lower emission rate using its existing measures than the rate assumed for the “effective control,” a state should further analyze the lower emission rate(s) as a potential control option. [Emphasis added.]*

In the following sections, annual averages of historic operating and emissions data for the three Georgia EGUs recommended for analysis by the NPS are presented. This information shows that most of these facilities have achieved lower SO₂ or NO_x (or both) emission rates in the past, presenting opportunities to analyze potential upgrades and/or fine-tuning of existing emissions control equipment, consistent with Section 3.2 of the 2021 EPA clarification guidance memo:

*“Similarly, in some cases, states may be able to achieve greater control efficiencies, and, therefore, lower emission rates, using their existing measures. Considering efficiency improvements for an existing control (e.g., using additional reagent to increase the efficiency of an existing scrubber) as a potential measure is generally reasonable since in many cases such improvements may only involve additional operation and maintenance costs. **States should generally include efficiency improvements for sources’ existing measures as control options in their four-factor analyses in addition to other types of emission reduction measures.**” [Emphasis added.]*

As discussed during the NPS/GA June 14, 2022 consultation call and presentation, the NPS has reviewed several examples of cost analyses for scrubber upgrades in this round of haze planning. In many cases these improvements were found to be very cost-effective.

3.2 Georgia Power Company Plant Bowen

3.2.1 Georgia Power Company Plant Bowen Summary of NPS Recommendations:

CAMD data suggest that the Bowen units could achieve:

- A SO₂ emission rate of 0.04–0.07 lb/MMBtu, potentially reducing SO₂ emissions by 3,130 to 4,646 tons annually.
- A NO_x emission rate of 0.07 lb/MMBtu, potentially reducing NO_x emissions by 2,710 tons annually.

The NPS recommends that Georgia:

- Evaluate options to optimize current pollution control equipment efficiency for the Bowen units.
- Establish emission limits for SO₂ and NO_x that reflect the capabilities of the emission controls currently installed on the Bowen units.

3.2.2 Georgia Power Company Plant Bowen Facility Background:

Georgia Power Plant Bowen (Bowen) is located in Cartersville, Bartow County, about 186 km south southwest of Great Smoky Mountains National Park. Plant Bowen is ranked number one among the Georgia facilities for haze contributions in VISTAS Class I areas based on both AOI and PSAT source screening results. Using the NPS recommended screening threshold to capture 80% of the total Class I area AOI impact, this source:

- Is on the 80% of total AOI impact for 11 VISTAS Class I areas, including Great Smoky Mountains NP.
- Is ranked number 7 out of 92 sources that fall on the Great Smoky Mountains NP’s 80% of total AOI impact list.
- Is ranked number 11 out of 238 VISTAS state sources that fall on any VISTAS region Class I area’s 80% of total AOI impact list when ranking based on the cumulative AOI impact.

Bowen consists of four tangentially-fired electric generating units (EGUs). Unit Gross Capacities⁶ and in-service dates are as follows:

- Unit 1: 805.8 MW (1971)
- Unit 2: 788.8 MW (1972)
- Unit 3: 952.0 MW (1974)
- Unit 4: 952.0 MW (1975)

These supercritical boilers are fired with bituminous coal from the Gibson South Mine owned by Alliance Coal in southern Indiana, the MC#1 Mine owned by Foresight Energy in southern Illinois, Galatia Mine owned by Murray Energy Corporation in southern Illinois, the Bailey Mine owned by Consol Pennsylvania Coal Company in Pennsylvania and the Antioch Mine owned by Solar Sources, Inc, located in southern Indiana.

Each unit at plant Bowen is equipped with selective catalytic reduction (SCR), electrostatic precipitators (ESPs), and wet Flue Gas Desulfurization (FGD) scrubbers. Units 3 and 4 are also equipped with fabric filter baghouses, and all units utilize hydrated lime and activated carbon injection systems as needed for performance optimization and to maintain mercury compliance with the MATS rule.

Of 1,156 power plants in EPA's Clean Air Markets Database (CAMD) in 2021, Bowen ranked #41 for sulfur dioxide (SO₂) emissions (6,699 ton) and #25 for nitrogen oxides (NO_x at 6,248 tons). Bowen's carbon dioxide (CO₂) emissions of 10,376,634 tons rank #19 in the US.

Of 3,291 EGUs in CAMD in 2021, Bowen's EGU emissions and rankings are shown below.

Table 2. Georgia Power Plant Bowen emission summary, CAMD 2021

Unit ID	SO ₂ (tons)	SO ₂ Rank	NO _x (tons)	NO _x Rank	CO ₂ (short tons)	CO ₂ Rank
1BLR	1,320	184	975	244	2,479,143	182
2BLR	1,101	223	1,195	188	1,928,705	220
3BLR	2,299	110	2,605	72	3,154,657	124
4BLR	1,949	137	1,474	139	2,814,130	152

In their 2022 Integrated Resource Plan, Georgia Power, a subsidiary of Southern Company, is proposing to close 3,500 MW of coal plant capacity by the end of 2028. If approved, the closures will affect 12 coal units at five coal plants (the individual units were not specified in Georgia Power's press release). However, the company specifically noted that they plan to continue operating Bowen plant coal units 3 and 4 (with a combined capacity of 1,904 MW) until 2035.

⁶ Plant Bowen has maximum planning capacities of 724 MW for each of Units 1 and 2 and 892 MW for each of Units 3 and 4.

3.2.3 Georgia Power Company Plant Bowen GA EPD SIP Conclusions:

The SIP four-factor analysis for Plant Bowen evaluated fuel switching to lower sulfur coal and replacement of the existing wet scrubbers with dry FGDs. According to the GA EPD:

The emission sources at Georgia Power – Plant Bowen (Plant Bowen) evaluated in the submitted Four Factor Analysis report are already subject to various stringent emission limits, and emissions reductions have already been made at the facility. Currently, the coal-fired electric generating units (EGUs), Units 1-4, must burn <3% sulfur coal and are fully controlled for SO₂ with FGD scrubbers. All units are subject to the Georgia Multi-pollutant Rule (sss), which requires the scrubbers to be operated with an average 95% removal rate or greater, and scrubber operation is further optimized for compliance with all applicable regulations, including the Mercury and Air Toxics Standard (MATS), and Effluent Limitation Guidelines (ELG). Compared to emissions preceding installation of the scrubber, Plant Bowen has reduced annual SO₂ emissions from Units 1-4 by over 96%.

Plant Bowen evaluated whether additional emissions controls for SO₂ are feasible for Units 1-4.

Georgia did not evaluate or consider upgrades or optimization of the existing wet scrubber systems.

3.2.4 NPS Review of Georgia Power Company Plant Bowen:

It is not clear why GA EPD did not consider optimization of the existing wet scrubbers and instead evaluated replacement with dry scrubbers which typically have lower control efficiencies than wet scrubbers. The NPS recommends that GA EPD consider the following information and evaluate potential optimization of the existing control equipment, consistent with the 2021 EPA clarification memo.

Bowen is equipped with control equipment typically considered top tier emission controls (i.e., wet FGD scrubbers for SO₂ and SCR for NO_x). However, NPS review of 2010–2021 CAMD emissions data indicates that SO₂ and NO_x emission rates have been generally increasing in recent years.

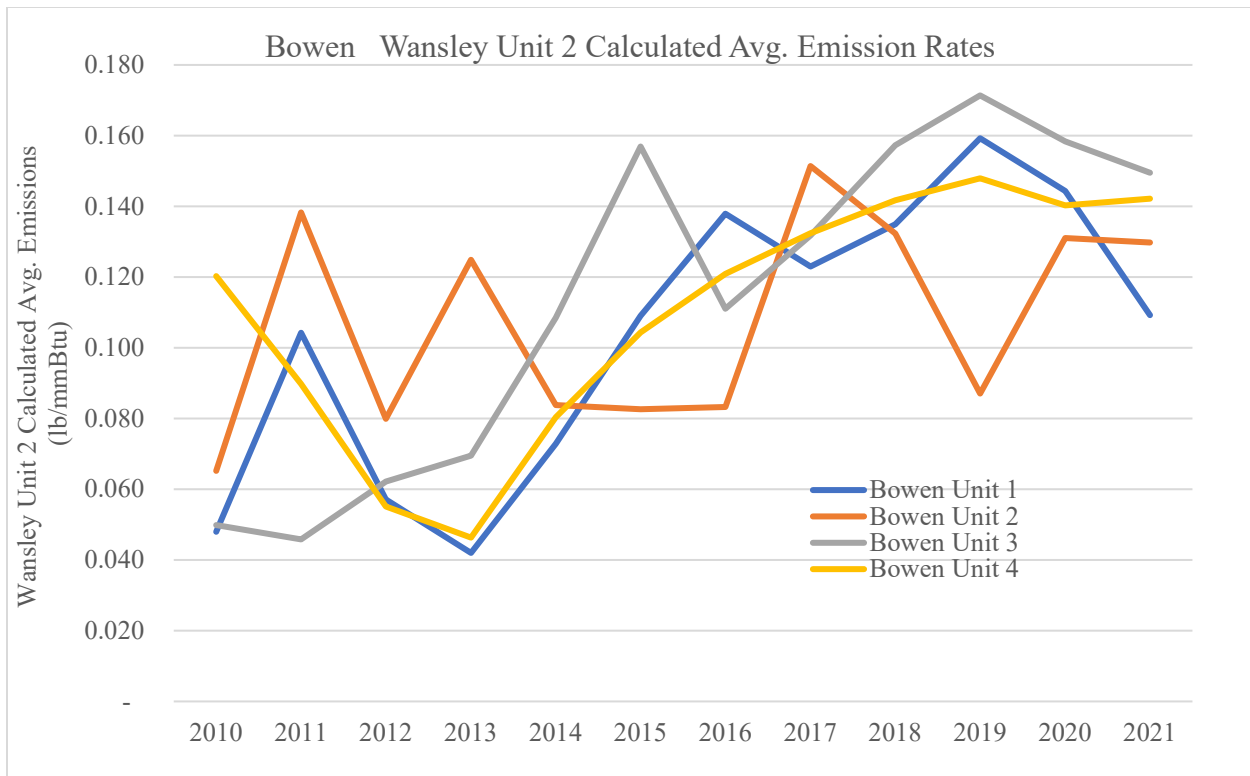


Figure 1. Plant Bowen SO₂ emissions (lb/MmBtu) 2010–2021, CAMD

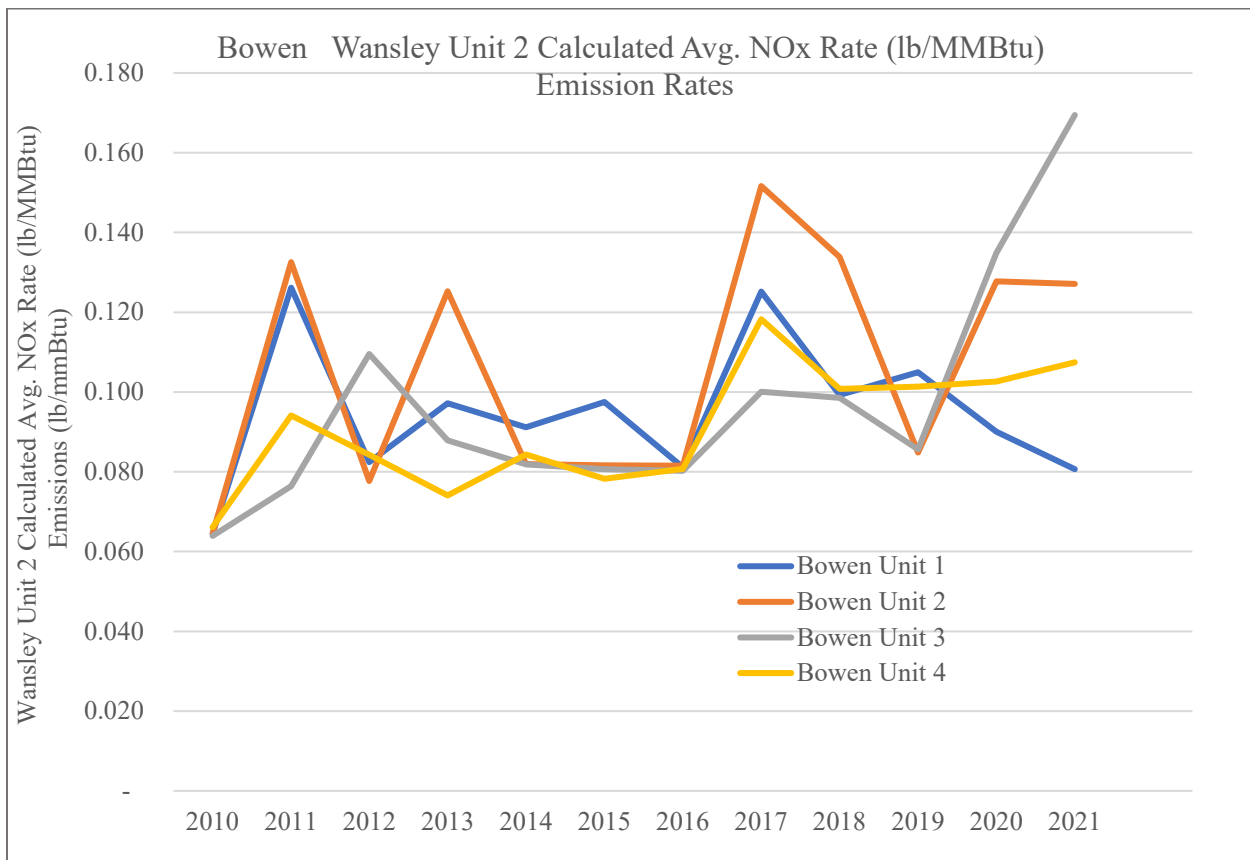


Figure 2. Plant Bowen NO_x emissions (lb/MmBtu) 2010–2021, CAMD

We request that GA EPD establish emission limits for SO₂ and NO_x that reflect the capabilities of the emission controls currently installed. For example, the CAMD data suggest that the Bowen EGUs could achieve a SO₂ emission rate of 0.04–0.07 lb/mmBtu and a NO_x emission rate of 0.07 lb/mmBtu, annual emissions (at 0.07 lb/mmBtu) would be reduced by about 3,130 and 2,710 tons, respectively, from 2021 emissions.

3.3 Georgia Power Company Plant Wansley

3.3.1 Georgia Power Company Plant Wansley Summary of NPS Recommendations:

CAMD data suggest that the Wansley units could achieve:

- A SO₂ emission rate of 0.04–0.07 lb/MMBtu.
- A NO_x emission rate of 0.06–0.07 lb/MMBtu.

The NPS recommends that Georgia:

- Evaluate options to optimize current pollution control equipment efficiency for the Wansley units and establish emission limits for SO₂ and NO_x that reflect the capabilities of the current emission controls, or;
- Make any anticipated shutdowns scheduled to occur prior to 2028 federally enforceable through the regional haze SIP.

3.3.2 Georgia Power Company Plant Wansley Facility Background:

Georgia Power Plant Wansley (Wansley) is located in Franklin, Heard County, about 246 km southwest of Great Smoky Mountains National Park. Plant Wansley is ranked fifth among the Georgia facilities for haze contributions in VISTAS Class I areas based on the AOI source screening results. Using the NPS recommended screening threshold to capture 80% of the total Class I area AOI impact, this source:

- Is on the 80% of total AOI impact for 9 VISTAS Class I areas, including Great Smoky Mountains NP.
- Is ranked number 44 out of 92 sources that fall on the Great Smoky Mountains NP's 80% of total AOI impact list.
- Is ranked number 52 out of 238 VISTAS state sources that fall on any VISTAS region Class I area's 80% of total AOI impact list when ranking based on the cumulative AOI impact

Plant Wansley consists of two tangentially-fired electric generating units (EGUs). Unit Gross Capacities⁷ and in-service dates are as follows:

- Unit 1: 865 MW (1976)

⁷Wansley Plant is a 1,904-megawatt (MW) coal-fired power station operated by Southern Company near Franklin, Georgia: https://www.gem.wiki/Wansley_Plant

- Unit 2: 865 MW (1976)

Each unit at plant Wansley is equipped with selective catalytic reduction (SCR), electrostatic precipitators (ESPs), and wet Flue Gas Desulfurization (FGD) scrubbers. These supercritical boilers are fired with subbituminous coal from the Gibson South Mine owned by Alliance Coal in southern Indiana, the Sugar Camp Mine owned by Foresight Energy in southern Illinois, Galatia Mine owned by Murray Energy Corporation in southern Illinois and the Antioch Mine owned by Solar Sources, Inc, located in southern Indiana.

Of 1,156 power plants in EPA's Clean Air Markets Database (CAMD) in 2021, Bowen ranked #156 for annual sulfur dioxide (SO₂) emissions (921 tons) and #221 for nitrogen oxides (565 tons). Wansley's carbon dioxide (CO₂) emissions of 1,334,526 tons rank #368 in the US.

3.3.3 Georgia Power Company Plant Wansley GA EPD SIP Conclusions:

The Georgia SIP concludes the following regarding the Wansley facility:

This facility is 156.8 km from the Cohutta Wilderness Area and the AoI sulfate contribution is 1.05%. SO₂ emissions used in the AoI analysis was 4,856.0 tpy. The SO₂ emissions for the past three years were 2,720.78 tpy (2017), 2,134.03 tpy (2018), and 1,656.01 tpy (2019) and the average over this period was 2,170.27 tpy. Scaling the AoI sulfate contribution of 1.05% by the ratio of current to 2028 SO₂ emissions (2,170.27/4,856.0) results in a revised AoI sulfate contribution of 0.47%; therefore, this facility will be screened out due to insignificant visibility impacts at the Cohutta Wilderness Area.

Recent actual emissions reported for the Wansley plant are much lower than what was assumed in the 2028 VISTAS emissions inventory and modeling. Georgia used this information to scale the AOI impacts "by the ratio of current to 2028 emissions" concluding that this facility should be screened from analysis. In addition, during the NPS/GA June 14, 2022 consultation call, GA EPD noted that the Georgia Power Company recently announced that they plan to close the Wansley plant units. In either circumstance, the NPS recommends that pending closures and/or reductions in utilization should be made federally enforceable under the haze SIP and occur within this regional haze planning period. If the shutdowns are made federally enforceable and occur prior to 2028, then the following comments to address optimization of existing control equipment may be moot. If the units continue to operate beyond 2028, the NPS recommends that GA EPD require an analysis to evaluate optimization of the existing control equipment in this planning period.

3.3.4 NPS Review of Georgia Power Company Plant Wansley:

The Wansley Plant is equipped with control equipment typically considered top tier emission controls (i.e., wet FGD scrubbers for SO₂ and SCR for NO_x). However, NPS review of 2010–2021 CAMD emissions data indicates that SO₂ and NO_x emission rates have been generally increasing in recent years.

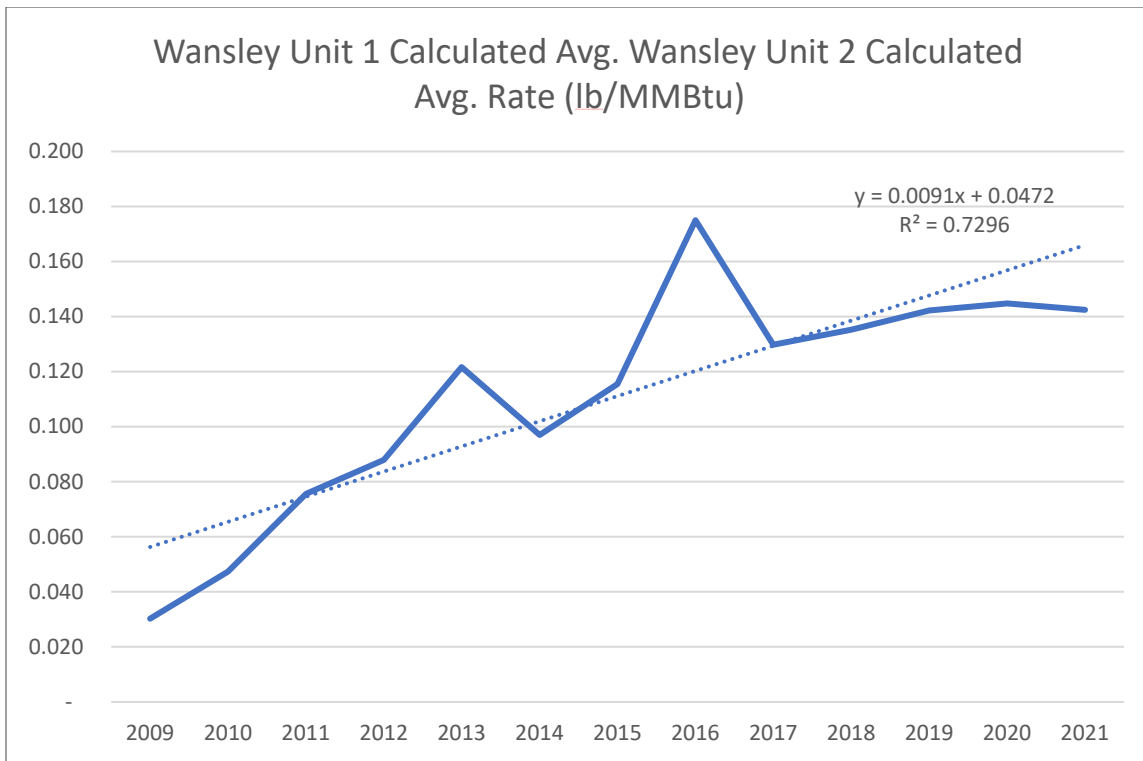


Figure 3. Plant Wansley Unit 1 SO₂ emissions rate (lb/MmBtu) 2009–2021, CAMD

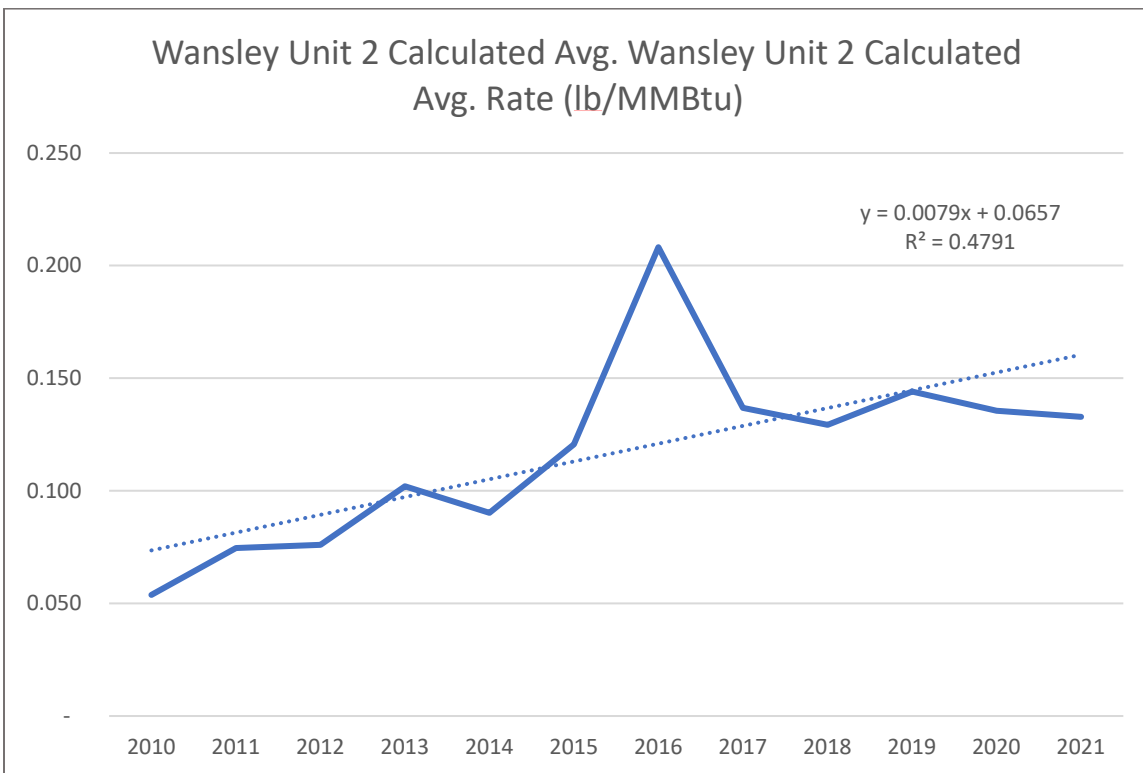


Figure 4. Plant Wansley Unit 2 SO₂ emissions rate (lb/MmBtu) 2010–2021, CAMD

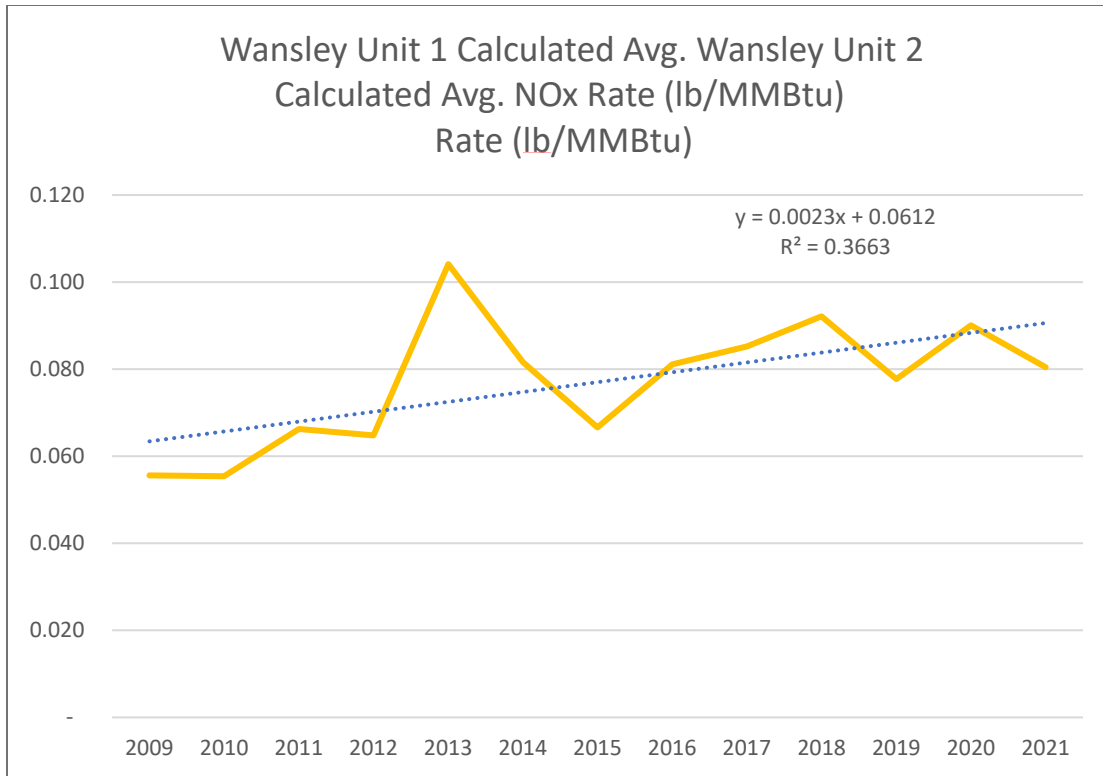


Figure 5. Plant Wansley Unit 1 NO_x emissions rate (lb/MmBtu) 2009–2021, CAMD

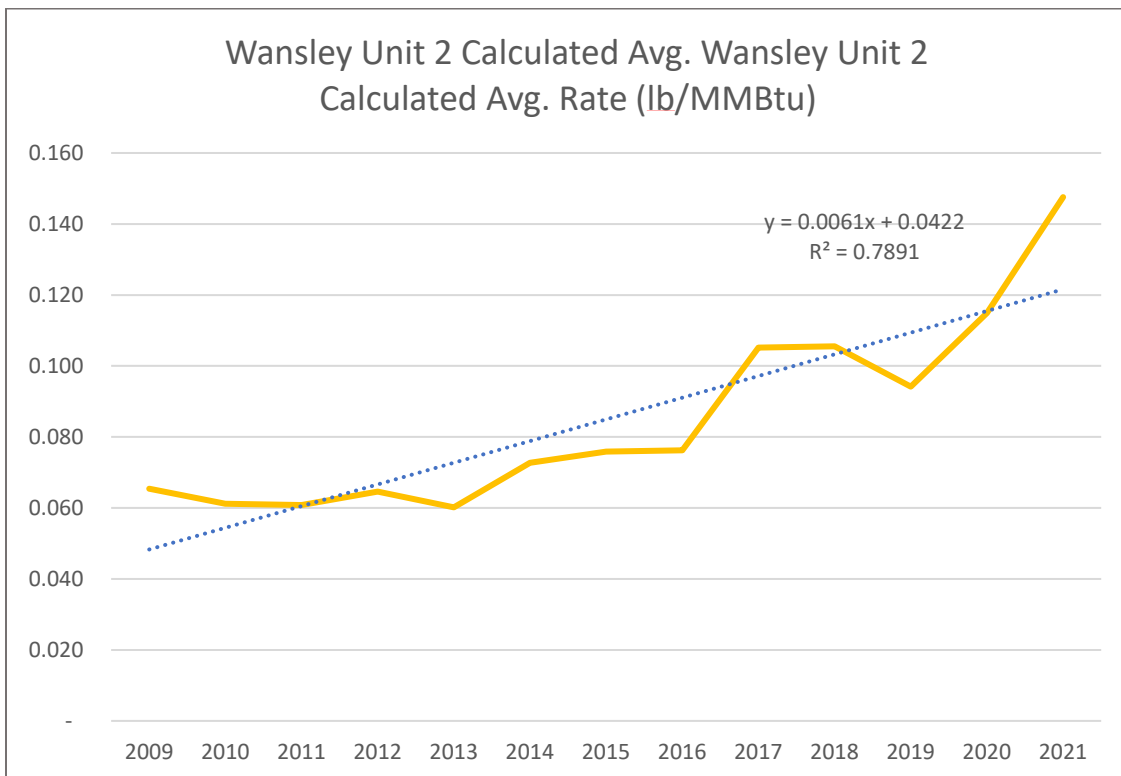


Figure 6. Plant Wansley Unit 2 NO_x emissions rate (lb/MmBtu) 2009–2021, CAMD

Unless a federally enforceable shutdown is required by 2028, we request that GA EPD establish emission limits for SO₂ and NO_x that reflect the capabilities of the emission controls currently installed on the Wansley units. For example, the CAMD data suggest that the Wansley EGUs could achieve a SO₂ emission rate of 0.04–0.07 lb/mmBtu and a NO_x emission rate of 0.06–0.07 lb/mmBtu.

3.4 Georgia Power Company Plant Scherer

3.4.1 Georgia Power Company Plant Scherer Summary of NPS Recommendations:

For SO₂: The scrubbers on units 1–3 are operating at 97%–98% control efficiency on low-sulfur PRB coal and achieving average annual emission rates well below 0.02 lb/MMBtu.

- Units 1–3 are very effectively controlled for SO₂.
- No additional analysis is recommended.

For NO_x: The SCR systems on Units 1–3 are operating at 51%–77% control efficiency and achieving average annual emission rates of 0.12 – 0.15 lb/mmBtu.

- Units 1–3 are not effectively controlled for NO_x. According to CAMD the SCR units were installed between 2010 and 2013.
- The NPS recommends that Georgia complete an analysis to investigate options for improving SCR performance for the Scherer units still in operation.

3.4.2 Georgia Power Company Plant Scherer Facility Background:

Georgia Power Plant Scherer (Scherer) is located near Juliette, in Monroe County, about 174 km south of Great Smoky Mountains National Park. Plant Scherer is ranked seventh among the Georgia facilities for haze contributions in VISTAS Class I areas based on the cumulative AOI source screening results. Using the NPS recommended screening threshold to capture 80% of the total Class I area AOI impact, this source:

- Is on the 80% of total AOI impact for 7 VISTAS Class I areas.
- Is not on the Great Smoky Mountains NP's 80% of total AOI impact list, *likely because NO_x emissions are the primary concern which may not be adequately captured in AOI*. However, this source is on the original NPS Q/d list.
- Is ranked number 75 out of 238 VISTAS state sources that fall on any VISTAS region Class I area's 80% of total AOI impact list when ranking based on the cumulative AOI impact.

Plant Scherer currently consists of three tangentially-fired electric generating units (EGUs).⁸ Unit Gross Capacities and in-service dates are as follows:

- Unit 1, 891.0 MW (1982):
 - Georgia Power 8.4%,
 - Oglethorpe Power Company 60%,
 - MEAG Power 30.2%,
 - Dalton Utilities 1.4%;
- Unit 2, 891.0 MW (1984):
 - Georgia Power 8.4%,
 - Oglethorpe Power Company 60%,
 - MEAG Power 30.2%,
 - Dalton Utilities 1.4%;
- Unit 3, 891.0 MW (1987):
 - Georgia Power 75%^{III},
 - Gulf Power 25%;

Each unit is equipped with selective catalytic reduction (SCR), baghouses, and wet lime FGD scrubbers. All units use halogenated powdered activated carbon injection systems to maintain mercury compliance with the MATS rule. These subcritical boilers are fired with subbituminous coals from the Powder River Basin (PRB) in Wyoming, the Buckskin Mine owned by Buckskin Mining, Cordero Rojo Mine owned by Kennecott, the Eagle Butte Mine owned by Alpha Coal and the Caballo Mine and North Antelope Rochelle owned by Peabody Coal.

Of 1,156 power plants in EPA's Clean Air Markets Database (CAMD) in 2021, Scherer ranked #165 for sulfur dioxide (SO₂) emissions (795 ton) and #38 for nitrogen oxides (NO_x at 5,389 tons). Scherer's carbon dioxide (CO₂) emissions of 10,303,305 tons rank #21 in the US.

Of 3,291 EGUs in CAMD in 2021, Scherer's EGU emissions and rankings are shown below.

Table 3. Plant Scherer emission summary, CAMD 2021

Unit ID	SO ₂ (tons)	SO ₂ Rank	Avg. NO _x Rate (lb/MMBtu)	NO _x (tons)	NO _x Rank	CO ₂ (short tons)	CO ₂ Rank
1	176	420	0.102	1,135	204	2,388,535	184
2	125	437	0.082	689	324	1,721,095	249
3	165	424	0.095	825	289	1,862,219	230
4	329	372	0.139	2,741	62	4,331,456	41

⁸ The 891 MW Unit 4, owned by Florida Power & Light (76.36%) and Jacksonville Energy Authority (23.64%) ceased operation December 31, 2021.

In their 2022 Integrated Resource Plan, Georgia Power, a subsidiary of Southern Company, is proposing to close 3,500 MW of coal plant capacity by the end of 2028. If approved, the closures will affect 12 coal units at five coal plants. In addition to the recent retirement of Plant Scherer Unit 4, Unit 3 is tentatively scheduled to retire by 2028.

3.4.3 NPS Review of Georgia Power Company Plant Scherer:

Georgia screened Plant Scherer from four-factor analyses. The NPS review of 2010 – 2021 CAMD emissions data indicates that SO₂ emissions are well-controlled but that NO_x control efficiency is generally low for typical SCR systems.

SO₂ Analysis

The scrubbers on units 1–3 are operating at 97%–98% control efficiency on low-sulfur PRB coal and achieving average annual emission rates below 0.02 lb/mmBtu. NPS review finds that Scherer Units 1–3 are very effectively controlled for SO₂ emissions.

NO_x Analysis

The SCR systems on Units 1–3 are operating at 53%–74% control efficiency and achieving average annual emission rates of 0.12–0.15 lb/mmBtu. NPS review finds that Scherer Units 1–3 are not effectively controlled for NO_x emissions. According to the CAMD database, the SCR units were installed between 2010 and 2013. The EPA Control Cost Manual (CCM) Chapter on SCR notes that modern SCR systems on “*commercial coal-, oil-, and natural gas-fired SCR systems are often designed to meet control targets of over 90 percent*” (down to 0.04 lb/MMBtu). This suggests that the Scherer SCR systems have low performance in comparison to other similar units. The NPS recommends that GA EPD require an evaluation of the SCR systems for the Scherer units and investigate ways to improve performance and reduce NO_x emissions.

4 Non-EGU Facility-Specific Recommendations for Georgia Sources

4.1 International Paper Co Rome Linerboard—Temple Inland

4.1.1 Facility Background & Summary of NPS Recommendations for Temple Inland:

Temple Inland was selected for PSAT tagging but was screened by Georgia based on the PSAT threshold. Based on the 2017 NEI, Temple Inland is a significant source of NO_x (1,665 tons/year) and SO₂ emissions (1,429 tons/year). Temple Inland is ranked third among the Georgia facilities for haze contributions in VISTAS Class I areas based on the cumulative AOI source screening results. Using the NPS recommended screening threshold to capture 80% of the total Class I area AOI impact, this source:

- Is on the 80% of total AOI impact for 5 VISTAS Class I areas; including Great Smoky Mountains NP.
- Is ranked number 40 out of 92 sources on the Great Smoky Mountains NP’s 80% of total AOI impact list.
- Is ranked number 37 out of 238 VISTAS state sources on any VISTAS region Class I area’s 80% of total AOI impact list when ranking based on the cumulative AOI impact.

The NPS recommends that GA EPD conduct or require four-factor analyses for SO₂ and NO_x for the Temple Inland facility.

4.2 Brunswick Cellulose, LLC

4.2.1 Summary of NPS Recommendations For Brunswick Cellulose:

- The proposed fuel switch will address SO₂ emissions but will not address NO_x emissions. The NPS recommends that Georgia conduct a four-factor analysis for NO_x emissions from this source.
- The NPS recommends revising the URP language in the draft SIP and updating the four-factor analyses to consider NO_x emissions.

4.2.2 Brunswick Cellulose Facility Background:

Brunswick Cellulose is ranked fourth among the Georgia facilities for haze contributions in VISTAS Class I areas based on the AOI source screening results. Using the NPS recommended screening threshold to capture 80% of the total Class I area AOI impact, this source:

- Is on the 80% of total AOI impact for 2 VISTAS Class I areas. It is also on the original NPS Q/d list for Great Smoky Mountains NP.
- Is ranked number 41 out of 238 VISTAS state sources on any VISTAS region Class I area's 80% of total AOI impact list when ranking based on the cumulative AOI impact.

Based on the 2017 NEI, Brunswick Cellulose is a significant source of NO_x emissions (1,445 tons/year NO_x and 281 tons/year SO₂). This facility was one of the three sources selected by Georgia to evaluate for RP through a four-factor analysis.

4.2.3 GA EPD SIP Conclusions for Brunswick Cellulose:

Georgia completed an SO₂ four-factor analysis for this facility and determined that a fuel switch from tire-derived fuel to natural gas with limits on fuel oil use is reasonable progress for power boiler #4.

From the Draft SIP:

*Based on results of the four-factor analysis **and the fact that the state of Georgia is below the glidepath for the 2021-2028 period, no add-on SO₂ controls are deemed feasible or cost-effective and would not be reasonable for purposes of making further progress in reducing regional haze.** The discontinuing of No. 6 fuel oil usage and replacement with natural gas in No. 4 Power Boiler is expected to reduce SO₂ emissions by approximately 49 tpy with a negative cost-effectiveness, meaning that Brunswick Cellulose would save money by switching from No. 6 fuel oil to natural gas, even at the higher natural gas price associated with a curtailment. [Emphasis added.]*

4.2.4 NPS Review of Brunswick Cellulose:

A fuel switch will address SO₂ emissions for power boiler #4, but it will not address NO_x emissions. The NPS recommends that Georgia conduct a four-factor analysis for NO_x emissions for significant NO_x-emitting units at the Brunswick facility.

Additionally, the following comments are based on NPS review of the SIP conclusions and the SO₂ four-factor analysis completed for Brunswick Cellulose. Fuel replacements and wet scrubbers were evaluated for power boiler #4 and recovery furnaces #5 and #6. Trona dry sorbent injection (DSI) was also evaluated for power boiler #4. Based on the SIP information, the wet scrubber and DSI options would result in significantly greater SO₂ emission reductions than the fuel switch, likely due to the flexibility to continue burning limited amounts of No. 6 fuel oil during periods of natural gas curtailment.

NPS reviewers completed a high-level review of the revised four-factor analysis cost estimates provided in Appendix G-3. The NPS agrees with several revisions made to the cost analyses, including the use of the current bank prime rate, a 30-year equipment life and control efficiency assumptions⁹ used in the scrubber and DSI analyses. However, NPS review finds that several of the indirect operating costs do not reflect the most recent CCM wet scrubber chapter methods. None-the-less, based on the analysis in the SIP, the cost of a wet scrubber is approximately \$10,000/ton for power boiler #4 and \$20,000+/ton for recovery furnaces #5 and #6. (The \$10,000/ton estimate for a wet scrubber on power boiler #4 is within the upper end of the cost threshold ranges established by other states in this round of Regional Haze Planning.)

Given that the fuel switch is estimated to result in a cost savings (even at higher natural gas prices), the NPS reviewers concur that the incremental costs of selecting a scrubber system in lieu of a fuel switch are not justified from a cost standpoint. However, the NPS does not support GA EPD's rationale documenting the final RP determination for Brunswick Cellulose, which states that "*Georgia is below the glidepath for the 2021-2028 period*" and therefore, "*no add-on SO₂ controls are deemed feasible.*"

The URP is not a "safe harbor" to reject otherwise cost-effective controls (see explanation in Section 2.1.1 above). The NPS recommends revising this language in the draft SIP and identifying a cost threshold to clearly justify control determinations.

4.3 International Paper Savannah

4.3.1 Summary of NPS Recommendations for International Paper Savannah:

- A fuel switch for power boiler 13 will address SO₂ emissions from this unit—it will not address NO_x emissions. The NPS recommends that GA EPD require or conduct a four-factor analysis for NO_x emissions from this facility.
- The NPS recommends revising the URP language in the draft SIP and updating the four-factor analyses to consider NO_x emissions.

⁹ The company assumed a 98% control efficiency for a wet scrubber and a 90% control efficiency for a DSI system.

4.3.2 International Paper Savannah Facility Background:

IP Savannah is ranked second among the Georgia facilities for haze contributions in VISTAS Class I areas based on the AOI source screening results. The greatest impacts are in two Georgia Class I areas managed by the Fish and Wildlife Service (FWS). Using the NPS recommended screening threshold to capture 80% of the total Class I area AOI impact, this facility:

- Is on the 80% of total AOI impact for 7 VISTAS Class I areas. While it is not on an NPS list for Great Smoky Mountains NP, NPS reviewers considered this facility because it was selected by Georgia for impacts to other Class I areas.
- Is ranked number 33 out of 238 VISTAS state sources that fall on any VISTAS region Class I area's 80% of total AOI impact list when ranking based on the cumulative AOI impact.

Based on the 2017 NEI, Savannah Paper is currently a significant source of NO_x and SO₂ emissions (1,309 TPY NO_x and 5,186 tons/year SO₂). This facility was one of the three sources selected by Georgia to evaluate for RP through a four-factor analysis.

4.3.3 GA EPD SIP Conclusions for International Paper Savannah:

Georgia completed an SO₂ four-factor analysis for the power boiler #13 and Recovery Furnace #15 at this facility and determined that a fuel switch from coal to natural gas with limits on fuel oil use is reasonable progress for power boiler #13.

From the Draft SIP:

*Georgia EPD's evaluation of IP Savannah's four-factor analysis, the existing and future controls already scheduled for the No. 15 Recovery Furnace (RF15) and the No. 13 Power Boiler (PB13), **and the fact that the state of Georgia is well below the glidepath for the 2018-2028 period indicates that requiring additional SO₂ emission control devices for the sources at IP Savannah would not be reasonable** for purposes of making further progress in reducing regional haze. However, the removal of coal as a fuel in PB13 was determined to be reasonable.. [Emphasis added.]*

4.3.4 NPS Review of International Paper Savannah:

This source was not on the NPS lists but was selected by Georgia for four-factor analyses. However, we address it here because Georgia considered this source in their reasonable progress four-factor analysis determinations. A fuel switch will address SO₂ emissions from power boiler #13, but it will not address NO_x emissions. The NPS recommends that Georgia conduct a four-factor analysis for NO_x emissions for significant NO_x-emitting units at the IP Savannah facility.

Additionally, the following comments are based on NPS review of the SIP conclusions and the SO₂ four-factor analysis completed for IP Savannah. The NPS defers to other FLMs to comment on whether the final reasonable progress determinations are adequate to improve visibility in Class I areas they manage.

Fuel replacements, wet and dry scrubbers and trona DSI were evaluated for power boiler #13. A wet scrubber was analyzed for recovery furnace #15. Based on the SIP information, the wet and dry scrubber and DSI options would result in significantly greater SO₂ emission reductions for power boiler #13 than the fuel switch, likely due to the flexibility to continue burning limited amounts of No. 6 fuel oil during periods of natural gas curtailment.

Again, the NPS defers to the other FLMs regarding the adequacy of the cost estimates, but note that we agree with several assumption used in the cost analyses, including the use of the current bank prime rate, a 30-year equipment life and control efficiency assumptions¹⁰ used in the scrubber and DSI analyses.

Based on the estimates provided in the draft SIP, for power boiler #13 a wet or dry scrubber would be very cost effective at \$3,183/ton for a wet scrubber and \$2,982/ton for a dry scrubber. Given this, the NPS does not support GA EPD's rationale documenting the final RP determination for IP Savannah, which states that "*Georgia is below the glidepath for the 2021-2028 period*" and therefore, "*additional SO₂ emission control devices for the sources at IP Savannah would not be reasonable.*"

The URP is not a "safe harbor" to reject otherwise cost-effective controls (see explanation in Section 2.1.1 above). The NPS recommends revising this language in the draft SIP and identifying a cost threshold to clearly justify control determinations.

Finally, Georgia did not address the 1,300 tons/year of NO_x emissions (2017 NEI) for this source. The NPS recommends updating the four-factor analyses to consider NO_x emissions.

¹⁰ The company assumed a 98% control efficiency for a wet scrubber and a 90% control efficiency for a DSI system.