

June 10, 2022

Ms. Karen Hays
Stationary Source Permitting Program
Georgia EPD - Air Protection Branch
4244 International Parkway, Suite 120
Atlanta, Georgia 30354

Re: Response to EPA Comments on Georgia Regional Haze SIP Pre-Draft

Dear Ms. Hays,

As requested by Georgia EPD, Georgia Power Company submits the following response to comments from the United States Environmental Protection Agency (EPA) regarding the Georgia Regional Haze state implementation plan (SIP) pre-draft submitted by Georgia EPD on April 22, 2022, for EPA review. Georgia Power appreciates the opportunity to respond to these comments and offers the information provided below to assist Georgia EPD in preparing the final SIP. However, none of the additional information below warrants revision to the Plant Bowen Four-Factor Analysis (FFA) and no changes are needed to Georgia Power's recommended "reasonable progress" measure, which is based on the Mercury and Air Toxics Standard (MATS) alternative SO₂ limit of 0.20 lb/MMBtu for Plant Bowen Units 1-4. The information below is provided in addition to Georgia Power's October 2021 response to the Georgia EPD and EPA comments on the Plant Bowen FFA.

Compliance Schedule

[EPA Key Comment 2: Please clarify what the compliance schedules are for Power Boiler 13 at IP-Savannah and Units 1-4 at Plant Bowen pursuant to 40 CFR 51.308\(f\)\(2\).](#)

EPA requests the clarification of the compliance schedule for Plant Bowen. As recommended in the Bowen FFA, the Regional Haze compliance schedule for Plant Bowen should be the effective date of EPA approval of the Georgia Regional Haze SIP. This approach avoids the potential for inconsistent requirements during the review of the SIP or in the event of an EPA disapproval, often referred to as a "SIP gap," which can lead to confusion. Section 4.5 of the Plant Bowen FFA recommends that the permit issued to implement the MATS alternative SO₂ limit should make clear that compliance with the limit and all supporting monitoring, recordkeeping, and reporting conditions will be required immediately upon final EPA approval of that portion of Georgia's Regional Haze SIP. Because no additional controls need to be installed, the MATS alternative SO₂ limit can be immediately applicable following completion of the EPA approval process.

Plant Bowen Emissions & Compliance Margin

EPA General Comment 4: For the emissions units listed in Key Comment 1.b. above and for Units 1-4 at Plant Bowen, the EPA recommends: a) providing a comparison of recent, past actual emissions/emissions rates versus permitted allowable emissions/emissions rates and b) assessing whether the compliance margin is reasonable in each case. To the extent there is a significant discrepancy between the recent actual emissions/rates and the permitted emissions/rates, the State should consider adopting a more stringent SO₂ emission limit for the source or explain why it is declining to do so. The EPA will work with the State to address this comment.

EPA comments that Plant Bowen should provide a comparison of recent, past actual emissions and emission rates to applicable emissions limits to assess whether the compliance margin is reasonable. Georgia Power provides annual operational and emissions information for Plant Bowen Units 1-4 from 2019 through 2021 in Tables 1-3 below. As 2019 was the most recent full annual period at the time of the submittal of the Plant Bowen FFA in November 2020, Georgia Power appropriately used the 2019 annual information as the projected 2028 baseline in the analysis.

Table 1. 2019 Plant Bowen Units 1-4 Data Used as Projected 2028 Baseline

Plant Bowen 2019 Data	Unit 1	Unit 2	Unit 3	Unit 4	Total Units 1-4
Total Net Generation (MWh)	3,342,955	2,342,644	1,873,360	3,428,128	10,987,087
Total Heat Input (MMBtu)	37,995,217	24,257,188	20,413,398	36,206,975	118,872,778
Total SO ₂ Emissions (tons)	3,026	1,778	1,749	2,678	9,231
Average SO ₂ rate (lb/MMBtu)	0.16	0.14	0.17	0.14	0.16
Average SO ₂ removal rate (%)	96.3	96.5	96.0	96.4	96.3

Table 2. 2020 Plant Bowen Units 1-4 Data

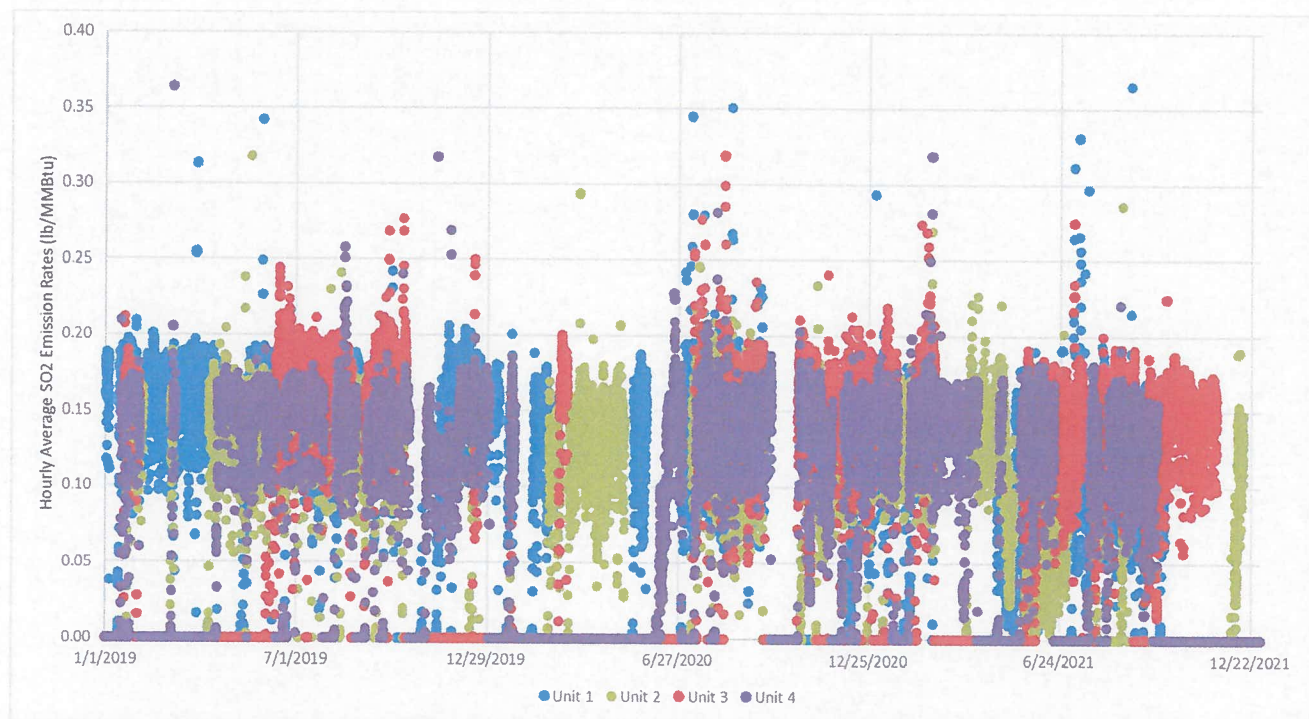
Plant Bowen 2020 Data	Unit 1	Unit 2	Unit 3	Unit 4	Total Units 1-4
Total Net Generation (MWh)	1,672,507	2,246,587	1,761,146	2,288,295	7,968,535
Total Heat Input (MMBtu)	18,262,714	23,599,508	18,434,425	24,276,634	84,573,281
Total SO ₂ Emissions (tons)	1,318	1,617	1,460	1,703	6,098
Average SO ₂ rate (lb/MMBtu)	0.15	0.14	0.16	0.14	0.15
Average SO ₂ removal rate (%)	96.5	96.8	96.3	96.4	96.5

Table 3. 2021 Plant Bowen Units 1-4 Data

Plant Bowen 2021 Data	Unit 1	Unit 2	Unit 3	Unit 4	Total Units 1-4
Total Net Generation (MWh)	2,247,067	1,787,666	2,781,053	2,636,320	9,452,106
Total Heat Input (MMBtu)	24,163,172	18,798,330	30,747,130	27,428,187	101,136,819
Total SO ₂ Emissions (tons)	1,320	1,101	2,299	1,949	6,669
Average SO ₂ rate (lb/MMBtu)	0.11	0.12	0.15	0.14	0.13
Average SO ₂ removal rate (%)	97.3	97.0	96.4	96.6	96.8

Tables 1-3 show that the 30-day average SO₂ emission rate data from the most recent years of 2020 and 2021 are consistent with 2019. In addition, the variability of SO₂ emission rates from each unit is demonstrated in the scatterplot graph in Figure 1, which shows the hourly average SO₂ emission rates for each unit for 2019 – 2021 that comprise the 30-day averages. The range of these values continue to support that the compliance margin is not only reasonable but necessary in comparison to the MATS alternative SO₂ limit of 0.20 lb/MMBtu.

Figure 1. Plant Bowen Units 1-4 Hourly SO₂ Emission Rates, 2019 – 2021



The compliance margin for the SO₂ emissions is also appropriate and reasonable because the existing wet FGD systems for Plant Bowen Units 1-4 must be optimized not only for SO₂ removal but also to maintain compliance with MATS mercury emissions control and wastewater treatment requirements for both mercury and selenium. Therefore, to maintain optimized conditions for the compliance requirements of the existing wet FGD systems and allow for necessary compliance margin to address natural variability, Georgia Power once again confirms that the MATS alternative SO₂ limit of 0.20 lb/MMBtu is the appropriate limit as proposed for Plant Bowen Units 1-4 in the Georgia Regional Haze SIP for the second implementation period.

Plant Wansley Emissions

EPA General Comment 6.d.: The EPA suggests adding a statement explaining the reason for the significant difference between Plant Wansley's projected 2028 SO₂ emissions of 4,856.0 tpy and the 2017-2019 SO₂ emissions of 2,720.78 tpy (2017), 2,134.03 tpy (2018), and 1,656.01 tpy (2019), with an average over the 2017-2019 period of 2,170.27 tpy. In particular, it would be helpful to identify if there are new emissions limitations and/or controls that are contributing to the 2017-2019 lower emissions resulting in SO₂ emissions much lower than the projected 2028 emissions and whether they are state enforceable.

EPA asks Georgia EPD for an explanation for the difference between Plant Wansley's projected 2028 SO₂ emissions of 4,856 tons compared to the average annual 2017-2019 emissions of 2,170.27 tons, including if any new emissions limitations or controls contributed to the lower emissions. Georgia Power provides the annual SO₂ tons for Plant Wansley Units 1 & 2 from 2017 to 2021 in Table 4 below. Plant Wansley has not become subject to any new emissions limits or installed any new controls during this time period. The decrease in emissions during this time period is attributable to the decrease in operation of these units due to both unit-specific and system economics, including the impacts on electricity demand during the COVID-19 pandemic.

Table 4. Plant Wansley Units 1 & 2 Annual Emissions

Year	SO₂ Emissions (tons)
2017	2,720
2018	2,132
2019	1,654
2020	171
2021	921

Plant Bowen – Evaluation by Unit

EPA General Comment 8.c.iii.: The FFA for Plant Bowen focuses on controls for the entire plant in the aggregate. The EPA recommends that the FFA be supplemented to include analysis for each individual boiler unit at Plant Bowen, including cost per ton of SO₂ reduction quantifications for each boiler. See 40 CFR 51.308(f)(2)(iii) (requiring documentation of the technical basis underlying an FFA). This analysis is recommended because each boiler can operate independently from the other boilers. The EPA additionally recommends that these analyses be completed under the assumption that Units 1 and 2 will continue to operate and, separately, under the assumption that Units 1 and 2 will be decommissioned no later than December 31, 2027, as formally requested by Georgia Power in Georgia PSC Docket #44160. See 40 CFR 51.308(f)(2)(iv)(C) (requiring consideration of “[s]ource retirement and replacement schedules”).

EPA General Comment 8.c.iv.: The FFA for Plant Bowen discusses switching from Illinois Basin coal to either Powder River Basin (PRB) coal or Central Appalachian (CAPP) coal as SO₂ control options that are feasible. For PRB coal, the FFA describes potential physical limitations in coal handling that may make it more difficult to fully switch to PRB coal at Plant Bowen. It is unclear if these limitations are identical for all four boilers. The EPA recommends that the FFA describe any such physical limitations for each individual boiler rather than for the plant in the aggregate.

EPA comments that the Plant Bowen FFA focuses on controls for the entire plant in aggregate and requests additional information on why the analysis was not completed on an individual unit basis. Applicable to General Comment 8.c.ii, as shown in Table 1 of this response, the 2019 Baseline operational and emissions data was provided by unit in Table 2 of the Plant Bowen FFA.

With the specific costs included in the Plant Bowen FFA, evaluating each unit on an individual basis was not necessary and would not have provided different results. Similarly, while no units at Plant Bowen currently have approved retirement dates, any assumed unit retirements would also not have changed the results. This is due to the fact that, to be conservative, the evaluation did not include capital equipment costs associated with each control (as discussed in more detail below). Thus, both the costs (such as fuel, commodities, and labor) and emissions reductions generally vary proportionally with the number of affected units. In fact, evaluating fewer units or individual units in isolation could actually remove any cost efficiencies gained by implementing the control options at all four units, which would only lead to increased costs per SO₂ tons reduced. Therefore, for evaluating the control options in the Plant Bowen FFA, each individual unit is proportionally the same and would return cost per SO₂ tons reduced values equal to or greater than the aggregated plant totals.

To be conservative, Georgia Power did not include in the cost effectiveness evaluation potential capital costs (such as safety equipment needed for fire and dust suppression) associated with a switch to PRB coal. Georgia Power omitted those costs due to the high level of uncertainty in the specific estimates and the detailed engineering studies that would be required to fully estimate the costs associated with needed equipment installations. Although uncertain, those costs could be up to \$180 million—and they could potentially vary by unit. The evaluation and inclusion of these capital costs per boiler would only increase the already high cost of over \$6,400 per ton SO₂ reduced for fuel switching to PRB coal

determined in the Plant Bowen FFA. However, since Georgia Power did not include those more unit-specific costs in the Plant Bowen FFA, conducting the analysis on a unit-by-unit basis would not change the result.

Plant Bowen – Evaluation of Coal Blending

EPA General Comment 8.c.v.: Regarding switching to either PRB coal or CAPP coal as an SO₂ control option, the EPA recommends that coal blending be considered as a potential control option for inclusion in the FFA (e.g., blending Illinois Basin coal with PRB coal at various percentages). See 2019 Guidance, p. 30 (discussing adjustments to a source's fuel mix as a potential control option). The EPA recommends that any discussion of coal blending as a control option include whether blending different types of coal could mitigate any physical limitations associated with coal handling that might otherwise result in a facility derate.

Regarding the fuel switching options evaluated in the Bowen FFA, EPA requests more information about the possibility of coal blending or introducing a percentage of PRB or CAPP coals, rather than full fuel switching. While those options could be technically feasible, they would present technical challenges and additional costs for smaller emission reductions. Therefore, for the purposes of the Bowen FFA, Georgia Power considers coal blending of either CAPP or PRB coals to be inferior options to the full fuel switching options already evaluated, and therefore inappropriate for further review.¹ Since coal blending would only increase costs and yield smaller emissions reductions, it would result in higher cost per SO₂ ton reduced.

The significant challenges of coal blending of PRB coal instead of full fuel switching would pose additional costs and burden. Due to the safety requirements of handling PRB coal, coal blending of PRB at any percentage would require the implementation of the same equipment for the coal handling systems to address fire and dust suppression as it would for full fuel switching to PRB coal. Coal blending also introduces significant new logistical challenges, due to the need for consistent and precise mixing of coal types. Maintaining consistent percentages of IB and PRB coal being fed to the boiler would be labor and time intensive, if not impossible. Due to the differences in coal characteristics, variations in the ratio of IB coal to PRB coal would negatively impact not only the operation of the boiler but also all supporting systems, including environmental controls. Compared to full fuel switching to PRB coal, coal blending would lead to increased costs and burden for Plant Bowen with respect to maintaining compliance with environmental requirements, training personnel, and establishing effective operational systems programming.

In addition, the derate of the unit capacity associated with fuel switching to PRB coal would still apply to coal blending with PRB. The estimated capacity derate would remain proportional to the amount of PRB coal introduced. In the Bowen FFA of the full switch to PRB coal, the 27% derate was calculated based on the heat content of PRB coal (8,800 Btu/lb) in comparison to IB coal (12,002 Btu/lb). Therefore, any PRB coal percentage evaluated would provide 27% less heat input to the unit than the same percentage of IB coal, resulting in a proportional unit capacity derate and associated capacity replacement costs.

¹ See EPA Draft New Source Review Workshop Manual, at B.41-B.43 (1990) (recommending that top-down control evaluations reject inferior options that are both more costly and less effective)

Similarly, direct costs, such as fuel costs and environmental control commodities costs, would also adjust proportionally to the percentage of PRB or CAPP coal introduced. On the other hand, the labor costs for fuel handling considered in the Bowen FFA would actually increase for coal blending of PRB, rather than adjusting proportionally to the percentage of PRB coal introduced. For less emissions reduction, the labor costs for coal blending would be greater than the additional labor costs evaluated for full fuel switching, due to the increased labor needed for coal pile management of two types of coal.

Therefore, the options of coal blending of PRB coal or CAPP coal are not included in the Bowen FFA, because they are inferior options to the evaluations provided for full fuel switching to PRB coal or CAPP coal, which were both determined to be too high cost per ton SO₂ reduced and therefore not appropriate or necessary for Plant Bowen for the second Regional Haze implementation period.

Thank you for the opportunity for Georgia Power to provide a response to these comments. Should you have any questions regarding these comments, please contact Rachel Greiner at (404) 851-4916.

Sincerely,

A handwritten signature in dark ink, appearing to be 'Rosa Chi', with a stylized, flowing script.

Rosa Chi
Air Manager