



SC DEPARTMENT *of* **ENVIRONMENTAL SERVICES**

Bureau of Air Quality Prevention of Significant Deterioration Preliminary Determination Modeling Analysis Review

**DOMINION ENERGY SOUTH CAROLINA INC CANADYS STATION
13139 AUGUSTA HIGHWAY
WALTERBORO, South Carolina 29488
COLLETON County**

Permit No. PSD-50000027 v1.0
Agency Air Number: 0740-0002
September 18, 2026

This review was performed by the Bureau of Air Quality of the South Carolina Department of Environmental Services in accordance with South Carolina Regulations for the Prevention of Significant Air Quality Deterioration.

Modeling Analysis Reviewed by:

Alexander Finnerty
Air Quality Meteorologist/Modeler
Bureau of Air Quality

Modeling Analysis Approved by:

Gregory Quina III, Manager
Modeling Section
Bureau of Air Quality

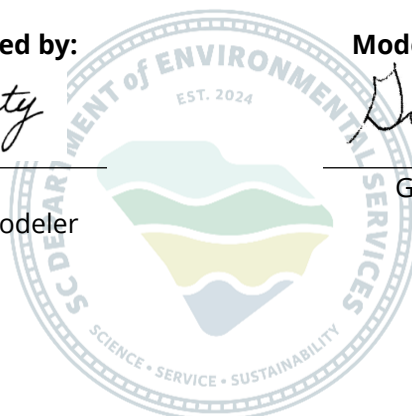


Table of Contents

1.0 Timeline (Modeling Action History)	1
2.0 Air Quality Impact Analysis	2
2.1 Class II Area Impact Analysis	2
2.1.1 Class II Preliminary Modeling Analysis	2
2.1.1.1 Significant Impact Level (SIL) Analysis	3
2.1.1.2 Significant Impact Area (SIA) Analysis	6
2.1.1.3 Significant Monitoring Concentration (SMC) Analysis	6
2.1.2 Class II Area Full Impact Analysis	7
2.1.2.1 National Ambient Air Quality Standards (NAAQS) Analysis	8
2.1.2.2 Class II PSD Increment Analysis	9
2.2 Additional Impacts Analysis	11
2.2.1 Growth	11
2.2.2 Soils and Vegetation	11
2.2.3 Visibility	12
2.3 Class I Area Impact Analysis	13
2.3.1 Class I Significant Impact Level Analysis	13
2.3.2 Class I Increment Consumption Impact Analysis	15
2.3.3 Class I AQRV Analysis	15
2.3.3.1 Class I Visibility Analysis	16
2.3.3.2 Class I Deposition Analysis	17
2.4 South Carolina Facility-Wide Compliance Demonstration	18

List of Tables

Table 1 – Class II Significant Impact Level Analysis	3
Table 2 – Class II PM _{2.5} Project Impact Analysis using MERPs.....	5
Table 3 – Ozone Project Impact Analysis using MERPs.....	5
Table 4 – Significant Monitoring Concentrations	6
Table 5 – SIA and 20D Sources Included for NAAQS Analyses.....	8
Table 6 – Class II NAAQS Full Impact Analysis.....	9
Table 7 – SIA and 20D PSD Increment Consuming Sources.....	10
Table 8 – Class II PSD Increment Analysis	10
Table 9 – Class II Soils and Vegetation Analysis.....	12
Table 10 – Class I Significant Impact Level Analysis	14
Table 11 – Class I PM _{2.5} Project Impact Analysis using MERPs.....	15
Table 12 – AQRV Screening Analysis	15
Table 13 – Class I Area Visibility Impairment Analysis at Cape Romain NWR.....	16
Table 14 – Class I Area Visibility Impairment Analysis at Wolf Island NWR.....	17
Table 15 – Class I Area Visibility Impairment Analysis at Okefenokee Swamp NWR	17
Table 16 – Class I Sulfate/Nitrate Deposition Analysis at Cape Romain NWR (kg/ha/yr)	17
Table 17 – Class I Sulfate/Nitrate Deposition Analysis at Wolf Island NWR (kg/ha/yr)	17
Table 18 – Class I Sulfate/Nitrate Deposition Analysis at Okefenokee Swamp NWR (kg/ha/yr).....	18
Table 19 – Standard No. 2 - Ambient Air Quality Standards Modeling Analysis.....	19
Table 20 – Background Monitoring Data (µg/m ³)	20
Table 21 - Standard No. 8 – Toxic Air Pollutants De Minimis Analysis.....	20

1.0 Timeline (Modeling Action History)

3/12/2026	A Prevention of Significant Deterioration (PSD) pre-application meeting was held with representatives from Dominion Energy South Carolina Inc Canadys Station, Tora Consulting, LLC and ALL4 Company, and the South Carolina Department of Environmental Services (SC DES), Bureau of Air Quality (BAQ).
4/24/2026	SCDES received a PSD permit application from Dominion Energy South Carolina Inc Canadys Station.
7/10/2026	SCDES received an updated/revised PSD permit application from Dominion Energy South Carolina Inc Canadys Station.
7/13/2026	Air Modeling of BAQ emailed the revised PSD application and relevant air dispersion modeling files to EPA Region 4 for review.
7/14/2026	Air Modeling of BAQ emailed the revised PSD application and relevant air dispersion modeling files to Tim Allen (Fish and Wildlife Refuge Federal Land Manager) for review.
7/23/2026	Air Modeling of BAQ received email correspondence from Tim Allen (Fish and Wildlife Refuge Federal Land Manager) requesting only a minor correction to the application.
8/06/2026	Air Modeling of BAQ received email correspondence from Sunday Gotvald of EPA stating that EPA had reviewed the draft Preliminary Determination and did not have any comments at that time.
8/21/2026	SCDES received a revised air dispersion modeling report.
9/18/2026	The BAQ placed the PSD Preliminary Determination and PSD Construction Permit No. PSD-50000027 v1.0 on public notice for a thirty-(30) day comment period. All appropriate Federal and State Officials were notified.

2.0 Air Quality Impact Analysis

For a major facility, PSD regulations require an applicant to analyze the impact from the construction of a proposed new source(s) on the following areas:

1. Compliance with the National Ambient Air Quality Standards (NAAQS);
2. Compliance with the Class II PSD Increments;
3. Significant impact on PSD Class I Areas, including Class I PSD Increments;
4. Impairments to visibility, soil, and vegetation; and
5. Air Quality impact of general growth associated with the source.

All minor and major sources proposing new construction or construction modifications in South Carolina (SC) are also required to demonstrate that their facility will remain in compliance with South Carolina Regulation 61-62.5 Standards 2 (AAQS), and 7 (Class II PSD Increments).

Results of the compliance demonstration for this project indicate the following:

- a) For PSD Class II areas, there will be no exceedance of the NAAQS or Increments, and no adverse effect on growth, soils, vegetation or visibility is indicated.
- b) For PSD Class I areas, there will be no exceedance of Class I Significant impact levels at any of the three Class I areas within 300 km of the facility. A refined modeling analysis indicates there will also be no adverse effects on visibility, vegetation, or soils in any of those same Class I areas.
- c) There will be no exceedance of SC ambient air quality standards.

All minor and major sources proposing new construction are also required to demonstrate compliance with South Carolina Regulation 61-62.5 Standard No. 8 (toxics) unless otherwise exempt. All combustion sources will burn only virgin fuels. Therefore, all emissions from combustion are exempt from a compliance demonstration. Process emissions include six pollutants that will be emitted as fugitives from diesel storage tanks and other system leaks. Compliance for those pollutants is shown via a de minimis analysis.

The area surrounding the facility is currently in attainment for all NAAQS pollutants.

2.1 Class II Area Impact Analysis

The PSD Review requires pollutants, which are determined to be “major”, be evaluated by an air quality impact analysis. The air quality impact analysis consists of (1) a preliminary modeling analysis to determine which pollutants from the proposed project exceed their Class II Significant Impact Levels (SIL); and (2) a more comprehensive full impact analysis based on concentrations of pollutants that exceed the SIL for the entire facility and additional ‘facility-wide’ impacts from other facilities that may impact the Significant Impact Area (SIA).

2.1.1 Class II Preliminary Modeling Analysis

Potential emission rates from new sources for each pollutant determined to be significant at the facility were modeled to determine (a) maximum impacts relative to the appropriate SIL; (b) the impact area within which a full impact analysis must be performed (if applicable); and (c) whether or not the

facility may be exempted from the ambient monitoring data requirements. Each of these three preliminary Class II analyses is discussed below.

2.1.1.1 Significant Impact Level (SIL) Analysis

Table 1 provides the results of the SIL analysis for this project for the “major” pollutants. The maximum impact shown is the maximum modeled concentration (plus secondary impact for PM_{2.5} and just secondary impact for ozone). If the maximum impact is less than or equal to the SIL, then no further PSD analysis is required for that pollutant/averaging period.

The analysis shows the SIL was exceeded for PM₁₀, PM_{2.5}, NO₂, and ozone for the averaging periods indicated. Therefore, a Full Impact analysis is required for those pollutants. No further PSD analysis is required for SO₂ and CO; however, SO₂ and CO must be included in the Standard 2 (facility-only) compliance analysis (Section 2.4). Ozone impact is further addressed below the table.

Table 1 – Class II Significant Impact Level Analysis							
Pollutant	Averaging Time	Maximum Modeled Impact (µg/m ³) ⁽¹⁾	Secondary Impact (µg/m ³) ⁽²⁾	Total Impact (µg/m ³)	SIL (µg/m ³)	Exceeds SIL? (Yes/No)	Significant Impact Area (km)
PM ₁₀	24 Hour	9	N/A	9	5	Yes	1.83
	Annual	1.1	N/A	1.1	1	Yes	0.41
PM _{2.5}	24 Hour	5.7 ⁽³⁾	0.1	5.8	1.2	Yes	9.97
	Annual	0.9 ⁽⁴⁾	0.0	0.9	0.13	Yes	4.32
SO ₂	1 Hour	2 ⁽⁵⁾	N/A	2	8	No	--
	3 Hour	7	N/A	7	25	No	--
	24 Hour	2	N/A	2	5	No	--
	Annual	0	N/A	0	1	No	--
NO ₂	1 Hour	137 ⁽⁵⁾⁽⁶⁾	N/A	137	8	Yes	12.18
	Annual	10 ⁽⁶⁾	N/A	10	1	Yes	2.75
CO	1 Hour	1379	N/A	1379	2000	No	--
	8 Hour	214	N/A	214	500	No	--
Ozone	8 Hour	N/A	4.3 ppb	4.3 ppb	1.0 ppb	Yes	N/A
1) EPA's AERMOD model was used to determine primary pollutant maximum impacts. Highest-first-high concentration was used, except where noted otherwise							
2) EPA's MERPs are used to apply secondary pollutant impacts for PM _{2.5} and ozone. See more details below this table.							
3) Five-year average of the first-high concentrations							
4) Five-year average of the maximum annual concentrations							
5) The five-year average of the daily maximum 1-hour concentrations							
6) The NO ₂ /NO _x ARM2 conversion with a minimum of 0.50 and a maximum of 0.9 was applied within the model.							

Ozone:

The project impact calculated from secondary formation (from VOC and NO_x precursors) is greater than the ozone SIL (Table 1). Thus, the project may have a significant impact on ozone formation, and a cumulative analysis is necessary to demonstrate that the added secondary impact will not violate the ozone NAAQS. See Section 2.1.2.1 for the NAAQS ozone analysis.

Class II Secondary PM_{2.5} and Ozone Project Impacts:

In accordance with EPA's current ozone and PM_{2.5} modeling guidance, the Tier 1 Modeled Emission Rates for Precursors (MERPs) analysis was used to account for project-specific secondary impacts on 24-hour and annual PM_{2.5} (from SO₂ and NO_x precursor emissions) and 8-hour ozone (from NO_x and VOC precursor emissions). A MERP value represents the secondary pollutant emission rate increase that would produce a significant contribution (based on EPA's hypothetical photochemical modeling) to the respective primary pollutant as it relates to the primary pollutant SIL value.

The EPA's hypothetical modeled source in Allendale County, SC was selected for the MERPs analyses as the representative source due to similarities related to location, surrounding terrain elevation, climate, regional/local emissions and background pollutant concentrations between the project source site and the selected hypothetical source. Individual precursor project emission increases for NO_x, SO₂, and VOC are each less than 1000 TPY, so the 500 TPY hypothetical model case is used for each precursor pollutant. Since the turbine and boiler source release heights are more representative of the hypothetical high stack case, those sources apply the hypothetical high stack height (90-meter) model case for MERPs calculations. All other sources apply the low stack height (10-meter) model case for calculating impacts from the precursor emission using MERPs analyses. All significant impact analyses and compliance demonstrations that involve ozone and PM_{2.5} include secondary impacts by applying the MERP calculations.

Secondary PM_{2.5} project impacts must be estimated when any one of the contributing project emission increases (primary PM_{2.5} or secondary SO₂ or secondary NO_x) are greater than the respective SER threshold. For this project, primary PM_{2.5} and secondary pollutants SO₂ and NO_x project emissions are greater than the respective SER thresholds. Thus, secondary PM_{2.5} project impacts must be included prior to comparison with the SIL. The table below shows NO_x and SO₂ contributions to the total Class II secondary PM_{2.5} project impact (for each averaging period) using the project emission rates and MERP values for this specific project.

Table 2 – Class II PM_{2.5} Project Impact Analysis using MERPs			
	24-hour PM_{2.5}	Annual PM_{2.5}	Units
PM _{2.5} Secondary Impacts from NO _x (Project Contribution)	0.0477	0.0028	µg/m ³
PM _{2.5} Secondary Impact from SO ₂ (Project Contribution)	0.0344	0.0014	µg/m ³
Total PM _{2.5} Project Impact from Secondary Pollutants	0.0821	0.0042	µg/m ³
*For complete details of the MERPs analysis, please see the modeling summary.			

The total Class II secondary PM_{2.5} project impact shown in the table above is added to the modeled primary PM_{2.5} impact to completely address the combined PM_{2.5} impact prior to comparing to the appropriate SIL in Table 1. Since the combined PM_{2.5} project impact is greater than (or equal to) the respective PM_{2.5} 24-hour and annual SIL thresholds, the project is predicted to have a significant impact on PM_{2.5} formation. Thus, a full impact analysis is necessary to demonstrate that there will be no NAAQS and/or PSD increment violations with the proposed project. Please note that secondary PM_{2.5} project impacts from the proposed PSD project, as shown in Table 2, are also included in the comparison to the appropriate NAAQS (Table 6), PSD increments (Table 8), and Soils and Vegetation (Table 9) analyses.

Although the facility will not directly emit ozone, the proposed project will result in NO_x and VOC (precursors of ozone) project emission increases above the PSD SER. As a result, secondary ozone impacts from the proposed PSD project are calculated and compared to the EPA-recommended 8-hour ozone SIL (1.0 ppb). The table below shows the NO_x and VOC contributions calculated from MERPs to account for total secondary ozone project impact for this specific project.

Table 3 – Ozone Project Impact Analysis using MERPs		
	8-hour Ozone	Units
Ozone Secondary Impact from NO _x (Project Contribution)	4.23	ppb
Ozone Secondary Impact from VOC (Project Contribution)	0.02	ppb
Total Ozone Project Impact from Secondary Pollutants	4.25	ppb
*For complete details of the MERPs analysis, please see the modeling summary.		

The project impact calculated from secondary formation (from VOC and NO_x precursors) exceeds the 1.0 ppb ozone significant impact level concentration threshold. Thus, the total ozone project impact from secondary pollutants is added to the current 8-hour ozone design value in Table 6 to demonstrate that this project will not cause or contribute to an exceedance of the current 8-hr ozone standard.

2.1.1.2 Significant Impact Area (SIA) Analysis

The preliminary SIL modeling analysis (as shown in Table 1) is used to determine the SIA. The SIA is a circular area with a radius extending from the source to the lesser of: 1) the most distant point where the preliminary modeling analysis predicts a significant ambient impact will occur (greater than or equal to the SIL), or (2) a modeling receptor distance of 50 km. The SIA is established for each pollutant for every averaging period. The SIA is the area in which the NAAQS and PSD increments are evaluated using a full impact (cumulative) modeling analysis. All sources and receptors within the SIA were included in the full impact analyses. Other sources within the Screening Area (SA) will also be included in the full impact analyses, as appropriate. Table 1 indicates the maximum distances to significant impacts for each pollutant accordingly.

2.1.1.3 Significant Monitoring Concentration (SMC) Analysis

SIL model results (from Table 1) for PM₁₀ and NO₂ are also shown below in Table 4 along with significant monitoring concentrations for these pollutants. The significant monitoring concentrations are from SC Regulation 61-62.5, Standard No. 7. Impacts are the maximum modeled concentrations for each pollutant (i.e. highest-first-high).

Table 4 – Significant Monitoring Concentrations				
Pollutant	Averaging Period	Maximum Modeled Impact (µg/m ³)	Significant Monitoring Concentration (µg/m ³)	Exceeds (Yes/No)
PM ₁₀	24 Hour	9	10	No
NO ₂	Annual	10	14	No

Table 4 shows that the maximum impacts for PM₁₀ and NO₂ are below the significant monitoring concentration (SMC) levels, therefore, no pre-construction monitoring is required for these pollutants. Although there is no SMC for PM_{2.5}, existing monitoring needs to be justified for existing background use when PM_{2.5} is greater than (or equal to) the SIL. Section 2.4 of U.S. EPA's *Ambient Monitoring Guidelines for Prevention of Significant Deterioration* (EPA-450/4-87-007) permits the use of existing representative air quality data in place of preconstruction monitoring data, provided monitor location, quality of data, and currentness of data are acceptable.

Monitor Data

The area near the proposed facility is generally free from the impact of other point sources and area sources associated with human activities. Additionally, this area is free of complex terrain. Thus, according to the EPA document listed above, monitoring data from a regional monitor site may be used as representative background data in this case.

The nearest regional monitors for the facility site for PM₁₀, PM_{2.5}, and NO₂ are in Charleston, South Carolina. The nearest regional monitor for the facility site for Ozone is located in Monks Corner, South Carolina.

PM_{2.5} – The North Charleston Fire Station monitor was selected as the most representative monitor for this pollutant. The most recent data available is for 2022 through 2024. The monitor is located approximately 40 miles (64 km) to the east-southeast of the facility in a mostly rural area. The monitor is situated in an area characterized by relatively low population density and limited urban influence. These conditions are generally consistent with the even more rural setting of the facility. Thus, data from the North Charleston Fire Station monitor is considered the most representative for PM_{2.5}.

Ozone - Since the facility is significant for VOC, ozone monitoring data also needs to be reviewed. The nearest ozone monitor is located at Moncks Corner, approximately 36 miles (58 km) to the east northeast of the project site. The Moncks Corner monitor's proximity to the facility, data completeness, and predominantly rural surrounding land use make it well-suited to represent background conditions in the immediate project area. Based on these considerations, the Moncks Corner monitor was selected as the most appropriate and representative source of background ozone concentrations for use in the quantitative NAAQS analysis. The 2022-2024 design value for the Moncks Corner monitor is 61 ppb, which is below the 70 ppb standard.

These monitors are operated by SCDES in support of NAAQS attainment activities and meet the quality assurance requirements for this work. These activities require the data to be quality assured, and the level of quality assurance for these monitors meets the requirements for PSD modeling. Therefore, it has been determined that the data SCDES has obtained for background concentrations are representative of, or more conservative than, the ambient pollutant concentrations in the area of the proposed facility. In accordance with Chapter C, Section III of the New Source Review Manual (Draft document, dated October 1990), SCDES approves the use of this data to fulfill pre-construction monitoring requirements.

2.1.2 Class II Area Full Impact Analysis

A Full Impact Analysis is required for any pollutant for which the proposed source's estimated (modeled) ambient pollutant concentrations exceed the SIL (determined in Table 1). Separate analyses are performed for determining compliance with the NAAQS and PSD increments. The NAAQS analysis must also include background pollutant concentrations. The Full Impact Analysis consists of modeling all facilities within the SIA, and those in the SA which are not excluded by the screening protocol ("20D Rule," defined below) or via EPA's latest guidance in Appendix W and 11/20/2024 memo, *"Guidance on Developing Background Concentrations for Use in Modeling Demonstrations."* The SA is usually an area extending beyond the SIA to a distance of 50 km from the proposed source. The SIA determined for each pollutant is shown in Table 1.

The "Screening Threshold Method for PSD Modeling" or "20D Rule" was used to determine which sources within the SA to include. To exclude a source, the emissions (tpy) of a pollutant must be less than 20 times the distance (km) from the project site. Multiple emission points at a source were grouped together, and sources within 2 km of each other were summed prior to applying the 20D Rule. Those sources with emissions greater than or equal to 20D were retained and considered in the Full Impact modeling for both the Class II NAAQS and PSD Increment analyses (unless they could be excluded based on EPA guidance as mentioned in the paragraph above).

2.1.2.1 National Ambient Air Quality Standards (NAAQS) Analysis

The table below shows a list of facilities (in the SIA, plus those in the SA that could not be excluded using the 20D Rule) that are included in the full impact analysis for NAAQS modeling.

Table 5 – SIA and 20D Sources Included for NAAQS Analyses				
PM₁₀	PM_{2.5}	SO₂	NO₂	CO
Dominion - Canadys	Dominion - Canadys	--	Dominion – Canadys	--
Santee Cooper Cross Station	Santee Cooper Cross Station	--	Argos Cement Harleyville	--
--	--	--	Banks Construction Company Walterboro	--
--	--	--	Blythe Construction Inc – Walterboro Portable Asphalt Plant	--
--	--	--	CMEG Inc	--
--	--	--	Dominion Energy Cope Station	--
--	--	--	Dorchester Biomass, LLC	--
--	--	--	Giant Cement Company	--
--	--	--	Holcim US, Inc.	--
--	--	--	Orangeburg Department of Public Utilities	--
--	--	--	Resonac Graphite America Inc.	--
--	--	--	Santee Cooper Cross Station	--

Table 6 shows that when proposed facility emissions are modeled with other sources in the SIA and SA, and background values are added, the National Ambient Air Quality Standards are not exceeded and compliance has been demonstrated.

Table 6 – Class II NAAQS Full Impact Analysis							
Pollutant	Averaging Time	Maximum Modeled Impact (µg/m³)⁽¹⁾	Secondary Impact (µg/m³)⁽²⁾	Background Concentration (µg/m³)⁽³⁾	Total Impact (µg/m³)	Standard (µg/m³)	% of Standard
PM₁₀	24 Hour	4.9 ⁽⁴⁾	N/A	37.0	42	150	28
PM_{2.5}	24 Hour	3.6 ⁽⁵⁾	0.1	12.7	16	35	46
	Annual	0.9 ⁽⁶⁾	0.0	7.0	7.9	9.0	88
NO₂	1 Hour	171.1 ⁽⁷⁾⁽⁸⁾	N/A	⁽⁹⁾	171	188	91
	Annual	11.2 ⁽⁸⁾	N/A	11.9	23	100	23
Ozone	8 Hour	N/A ⁽¹⁰⁾	4.2 ppb	61 ppb	65 ppb	70 ppb	93
1) EPA's AERMOD model is used to determine primary pollutant maximum impacts. The highest-first-high modeled concentration (from the 5 years of modeled met data) is shown for annual averaging periods and the highest-second-high is shown for all other averaging periods, except where noted otherwise.							
2) EPA's MERPs are used to apply secondary pollutant impacts for PM _{2.5} and ozone NAAQS analyses. See Table 2 (for <u>secondary PM_{2.5} project impacts</u>) and Table 3 (for <u>secondary ozone project impacts</u>) for more information. (Secondary impacts from existing sources are accounted for within applied background concentrations.)							
3) Background concentrations are summarized in Section 2.4.							
4) The sixth-high over five years of met data.							
5) The five-year average of the eighth-high concentrations.							
6) The five-year average of the maximum annual concentrations.							
7) The five-year average of the eighth-high NO ₂ -1hr daily maximum concentrations.							
8) The NO ₂ /NO _x ARM2 conversion with a minimum of 0.50 and a maximum of 0.9 was applied within the model.							
9) Background concentrations are added directly within the model.							
10) Ozone is usually not emitted directly to the atmosphere. The cumulative ozone impact is a total of the current ozone design value and the <u>secondary ozone project impact</u> (as shown in Table 3).							

A detailed listing of dispersion parameters and modeled emission rates for all off-site sources included in the Class II NAAQS full impact analysis are shown in the facility's application (July 2026, and subsequent revisions and/or additions) and the corresponding electronic modeling files.

2.1.2.2 Class II PSD Increment Analysis

The full impact analysis for PSD increment consuming sources is performed in the same manner as the full impact analysis for the NAAQS shown above. The sources included are all increment consuming sources from the facility and those previously identified within the SIA and SA. The facilities included in the PSD increment analysis are shown in the table below.

Table 7 – SIA and 20D PSD Increment Consuming Sources			
PM₁₀	PM_{2.5}	SO₂	NO_x
Dominion - Canadys	Dominion - Canadys	--	Dominion – Canadys
Santee Cooper Cross Station	Santee Cooper Cross Station	--	Argos Cement Harleyville
--	--	--	Banks Construction Company Walterboro
--	--	--	Blythe Construction Inc – Walterboro Portable Asphalt Plant
--	--	--	CMEG Inc
--	--	--	Dominion Energy Cope Station
--	--	--	Dorchester Biomass, LLC
--	--	--	Giant Cement Company
--	--	--	Holcim US, Inc.
--	--	--	Orangeburg Department of Public Utilities
--	--	--	Resonac Graphite America Inc.
--	--	--	Santee Cooper Cross Station

The emissions from the PSD facility were combined with those from additional non-facility sources identified in Table 7 and included in the PSD Class II full impact increment modeling analysis. As a conservative measure, sources that expand PSD increment (i.e., negative increment emission rates) were not included within the modeling analyses. In addition, conservative maximum allowable permitted emission rates were used for all increment consuming sources. Table 8 indicates that the maximum impact for each pollutant and each averaging period was determined to be less than the PSD increment standard for each averaging period.

Table 8 – Class II PSD Increment Analysis						
Pollutant	Averaging Time	Maximum Modeled Impact (µg/m³)⁽¹⁾	Secondary Impact (µg/m³)⁽²⁾	Total Impact (µg/m³)	Standard (µg/m³)	% of Standard
PM₁₀	24 Hour	7.2	N/A	7	30	23
	Annual	1.1	N/A	1	17	6
PM_{2.5}	24 Hour	6.9	0.1	7	9	78
	Annual	1.0	0.0	1	4	25
NO₂	Annual	11.2 ⁽³⁾	N/A	11	25	44

1) EPA's AERMOD model is used to determine primary pollutant maximum impacts. The first high modeled concentration is shown for annual averaging periods and the highest second-high for other averaging periods.

2) The secondary PM_{2.5} project impacts, using the MERPs method, are shown in this column. There are no increment consuming emissions for offsite sources since this project sets the MSBD for PM_{2.5}. Thus, the same secondary impacts used in the NAAQS analysis were used here.

3) The NO₂/NO_x ARM2 conversion with a minimum of 0.50 and a maximum of 0.9 was applied within the model.

Dispersion parameters and modeled emission rates for all sources included in the Class II PSD increment full impact analysis are shown in the facility's application (dated July 2026, and subsequent revisions and/or additions) and corresponding electronic modeling files. The information is not reproduced for this document.

2.2 Additional Impacts Analysis

PSD review requires an analysis of any potential impairment to visibility, soils, and vegetation that may occur as a result of the proposed or modified facility/sources. The review also requires an analysis of the air quality impact projected for the area as a result of general commercial, residential, industrial, and other growth associated with the expansion.

2.2.1 Growth

The SC PSD rules require the applicant to provide information relating to the nature and extent of air quality impacts from all commercial, residential, industrial and other growth in the area the facility, or modification, would affect. For the purposes of this report, the area the facility would affect is defined as the significant impact area (SIA). The greatest SIA was determined to be 12.18 km.

The facility will hire approximately 50-75 new employees. It is anticipated that the workforce will come from already existing local population. The product will be distributed throughout the Southeast and is not being produced to support any anticipated growth in the immediate vicinity. Therefore, the construction and modification of the facility and any workforce-associated residential and commercial growth is not expected to cause or contribute to a quantifiable adverse impact on local ambient air quality.

2.2.2 Soils and Vegetation

Maximum predicted offsite impacts (highest-first-high) were compared to EPA screening levels and/or secondary NAAQS. As previously mentioned, emissions from the proposed facility do not cause or contribute to any predicted violations. Thus, modeling of all the proposed and existing emissions for the soils and vegetation analysis indicates that there will be no adverse impacts expected on soils or vegetation caused by the proposed facility emissions.

Table 9 – Class II Soils and Vegetation Analysis							
Pollutant	Averaging Time	Max. Impact (µg/m³) ⁽¹⁾	Background (µg/m³)	Facility/Regional Impact (µg/m³) ⁽²⁾	EPA Screening Concentration (µg/m³)	AAQS Standard (µg/m³) ^(10a)	Exceeds? (Y or N)
PM ₁₀	24-Hour	9.0	37.0	46	N/A	150	N
PM _{2.5}	24-Hour	5.8 ⁽³⁾⁽⁵⁾	12.7	19	N/A	35	N
	Annual	0.9 ⁽⁴⁾⁽⁵⁾	7.0	8	579 ^(10b)	15	N
NO ₂	1-Hour	137.2 ⁽⁶⁾⁽⁷⁾	61.5	199	66,000 ^(10c)	N/A	N
	4-Hour ⁽⁴⁾	137.2 ⁽⁶⁾⁽⁷⁾	61.5	199	3760 ^(10d)	N/A	N
	8-Hour ⁽⁴⁾	137.2 ⁽⁶⁾⁽⁷⁾	61.5	199	3760 ^(10d)	N/A	N
	1-Month ⁽⁴⁾	137.2 ⁽⁶⁾⁽⁷⁾	61.5	199	564 ^(10d)	N/A	N
	Annual	10.1 ⁽⁶⁾	11.9	22	94 ^(10d)	100	N
Ozone ⁽⁸⁾	8-Hour	4.2 ppb ⁽⁹⁾	61 ppb	65 ppb	--	70 ppb	N
1) The highest-first-high modeled concentration unless noted otherwise.							
2) Results include background values when available (see Section 2.4 for background details).							
3) Five-year average of the first-high concentration.							
4) Five-year average of the maximum annual concentrations							
5) Includes the primary PM _{2.5} impact (from the cumulative modeling analysis) and the secondary PM _{2.5} project impacts using MERPs methodology. Note: Secondary component impacts from existing sources are accounted for within applied background concentrations.							
6) The NO ₂ /NO _x ARM2 conversion with a minimum of 0.50 and a maximum of 0.9 was applied within the model.							
7) The five-year average of the first-high 1-hour daily maximum concentrations (also conservatively used for the 4-hour, 8-hour and 1-month averaging periods).							
8) Units for all values are ppb.							
9) The ozone maximum modeled concentration is based on the secondary ozone project impacts using the MERPs methodology.							
10) References: a) Secondary National Ambient Air Quality Standard b) "Responses of Plants to Air Pollution" Lerman, S.L., and E.F. Darley. 1975. "Particulates," pp. 141-158 (Chap. 7). In J.B. Mudd and T.T. Kozlowski (eds.) c) "Diagnosing Injury Caused by Air Pollution" (EPA-68-02-1344) d) "A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals" (EPA-450/2-81-018, 1980)							

2.2.3 Visibility

A visibility analysis for Class II areas is not necessary for this project, as there are no visibility sensitive located within the project's largest 24-hour SIA of 9.97 km.

2.3 Class I Area Impact Analysis

Air quality impacts must be addressed for all Class I areas within 300 km of a PSD facility. The Dominion Energy South Carolina Inc Canadys Station facility is located 93 km from Cape Romain NWR, 202 km from Wolf Island NWR, and 286 km from Okefenokee NWR. Thus, Class I impacts must be addressed for Cape Romain, Wolf Island, and Okefenokee.

A Class I analysis typically consists of the following:

- 1) SIL (Significant Impact Level) analysis;
- 2) PSD increment analysis (if required per the SIL analysis); and
- 3) AQRV (Air Quality Related Values) analysis, if requested by the FLM.

For this project, the SIL analyses were conducted and are addressed in Sections 2.3.1 and 2.3.2, respectively. None of the three wildlife management areas screened out (using “Q/D”) of the requirement to conduct an AQRV analysis, the details of which are shown in Section 2.3.3.

2.3.1 Class I Significant Impact Level Analysis

For the Class I SIL analysis, the facility modeled (using AERMOD) the project emissions with receptors placed in a circle at a range of 50 km from the facility. Since the closest Class I area is 93 km from the facility, this modeling is a conservative screening of the significant impact at the Class I areas. Results of this analysis indicated that PM_{10} and $PM_{2.5}$ were above applicable SIL thresholds for their respective 24-hour averages. The impacts of the facility emissions were greater than the applicable Class I SIL for the PM_{10} 24-hour and $PM_{2.5}$ 24-hour averaging periods with the conservative AERMOD compliance demonstration. For those pollutants/averaging periods, a CALPUFF analysis was then conducted using receptors in each of the three Class I areas (i.e., receptor fields developed by the Federal Land Manager for use in regional haze modeling). The maximum impacts from that analysis (plus secondary impact for $PM_{2.5}$ /24-hour) were below the respective SILs.

Table 10 shows the maximum impact at the modeled receptors compared to the respective SIL for each pollutant and averaging period. The air quality impacts are less than the Class I SIL for all pollutants and all averaging periods. Thus, no further analyses are required to demonstrate compliance with the PSD Class I increments.

Table 10 – Class I Significant Impact Level Analysis						
Pollutant	Averaging Time	Maximum Modeled Impact ($\mu\text{g}/\text{m}^3$)	Secondary Impact ($\mu\text{g}/\text{m}^3$) ⁽⁴⁾	Total Impact ($\mu\text{g}/\text{m}^3$)	SIL ($\mu\text{g}/\text{m}^3$)	Exceeds SIL? (Yes/No)
PM ₁₀	24 Hour	0.21 ⁽¹⁾	N/A	0.21	0.3	N
	Annual	0.03 ⁽²⁾	N/A	0.03	0.2	N
PM _{2.5}	24 Hour	0.216 ⁽¹⁾	0.053	0.269	0.27	N
	Annual	0.028 ⁽²⁾	0.003	0.03	0.05	N
SO ₂	3 Hour	0.26 ⁽²⁾	N/A	0.26	1.0	N
	24 Hour	0.07 ⁽²⁾	N/A	0.07	0.2	N
	Annual	0.005 ⁽²⁾	N/A	0.005	0.1	N
NO ₂	Annual	0.04 ⁽²⁾⁽³⁾	N/A	0.04	0.1	N
1) The maximum CALPUFF result from all receptors at the three pertinent CLASS I areas.						
2) The first high AERMOD result for the ring of receptors at a range of 50 km from the facility (except PM _{2.5} Annual, which is the first-high averaged over 5 years).						
3) The NO ₂ /NO _x ARM2 conversion with a minimum of 0.50 and a maximum of 0.9 was applied within the model.						
4) Secondary pollutant impacts via MERPs were used for PM _{2.5} .						

Class I Secondary PM_{2.5} Project Impacts

To account for secondary PM_{2.5} formation and following the September 20, 2021 “Revised Draft Guidance for Ozone and Fine Particulate Matter Permit Modeling”, a distance-weighted MERPs approach was used to calculate secondary impacts to PM_{2.5} that are associated with facility emission increases. In this MERPs approach, the distance between the facility and the Class I area (93 km for Cape Romain NWR) was considered. The sources were evaluated for secondary PM_{2.5} being calculated via linear interpolation between the 80km and 100km MERPs using the distance from the site to Cape Romain. to determine the highest impacts from each precursor contribution. As previously discussed for Class II secondary PM_{2.5} project impacts (in Section 2.1.1.1), a hypothetical source with a release height of 90 meters (for the turbines and boiler) and 10 meters (all other sources) with a 500 TPY emission rate is chosen to represent the characteristics of the source for precursor contributions using the MERPs analysis.

Table 11 (below) shows the MERPs method of calculating total secondary PM_{2.5} project impact calculated from project emissions and distance-weighted MERPs. The total secondary PM_{2.5} project impact shown in the table below is used for SIL and PSD increment combined (primary modeled + secondary MERPs) PM_{2.5} analyses.

Table 11 – Class I PM_{2.5} Project Impact Analysis using MERPs			
	24-hour PM_{2.5}	Annual PM_{2.5}	Units
PM _{2.5} Secondary Impact from NO _x (Project Contribution)	0.0326	0.0017	µg/m ³
PM _{2.5} Secondary Impact from SO ₂ (Project Contribution)	0.0207	0.0006	µg/m ³
Total PM _{2.5} Project Impact from Secondary Pollutants	0.0533	0.0023 ⁽¹⁾	µg/m ³
*For complete details of the MERPs analysis, please see the modeling summary.			
1) A slightly higher value of 0.003 was calculated by the facility and used in Table 10 above.			

Since the total primary plus secondary PM_{2.5} project impact is less than the respective 24-hour and annual Class I SIL thresholds, the project is not predicted to have a significant impact on PM_{2.5} formation at the Class I area. Thus, the source will not cause or contribute to Class I PSD increment violations, so a full impact PM_{2.5} modeling analysis is not required.

2.3.2 Class I Increment Consumption Impact Analysis

This analysis is not required since no significant impacts were indicated by the Class I SIL analysis (Table 10).

2.3.3 Class I AQRV Analysis

The FLAG 2010 document allows sources that are > 50 km from the Class I area to potentially screen out of the requirement to conduct an AQRV analysis. The screening is based on total emissions of certain pollutants and distance from the source to the Class I area. If $Q/D \leq 10$ (where D = distance (km) from the source to the Class I area; Q = emissions (TPY) of SO₂ + NO_x + PM₁₀ + H₂SO₄), the facility is not required to do an AQRV analysis. Note that only emission increases associated with the proposed project modification need to be considered (per additional information provided in public comment responses to the FLAG 2010 document).

The Q/D values for this project for each Class I area are shown below.

Table 12 – AQRV Screening Analysis								
Class I Area	Q (TPY) ⁽¹⁾					D (km) ⁽²⁾	Q/D ⁽³⁾	Analysis Req'd?
	SO ₂	NOx	PM ₁₀	H ₂ SO ₄	Total			
Cape Romain NWR	90.7	1264.9	1341.9	169.8	2867.3	93	30.8	Yes
Wolf Island NWR						202	14.2	Yes
Okefenokee Swamp NWR						286	4.0	Yes
1) Project emission increases based on the annualized maximum short-term emissions during fuel oil combustion operations.								
2) Distance from facility to Class I area								
3) If Q/D ≤ 10, an AQRV analysis is not required.								

These results show that an AQRV analysis is required for Cape Romain NWR, Wolf Island NWR, and Okefenokee Swamp NWR.

2.3.3.1 Class I Visibility Analysis

The visibility analysis evaluates visibility impairment relative to the natural background resulting from the proposed project.

Visibility impairment can be assessed through two methods: plume impairment and regional haze. Plume Impairment generally applies when the source is within 50 km of the Class I area. Regional Haze generally applies when the source is greater than 50 km from the Class I area, or there is aggregation of plumes from different sources. The FLAG 2010 guidance recommends the use of steady state and non-steady state dispersion modeling for both plume impairment (near field) and regional haze (distant/multi-source) situations, respectively.

Regional haze was evaluated for this project since the distance from the facility to the Cape Romain NWR, Wolf Island NWR, and Okefenokee Swamp NWR is greater than 50 km. Plume impairment was not evaluated.

The FLAG 2010 guidance establishes light extinction change (Δb_{ext}) thresholds of 5% and 10% for contribution to, and causation of visibility impairment, respectively. This is based on the 98th percentile (8th highest day) model result per year for an analysis that considers multiple (at least three) years of meteorological data. This analysis also uses the following: 1) monthly average relative humidity adjustment factors particular to the Class I area in question; 2) annual average background aerosol (sulfate and nitrate) levels; and 3) version 6.221 of the CALPOST processor.

Visibility modeling results are presented at both peak and 98th percentile levels to demonstrate two interpretations of the model results. As shown in Table 13, 14, and 15 below, the results show three exceedances (at most per year) of the 5% threshold on the highest impact days. However, the 98th percentile values for all three years are < 5%. Therefore, considering the degree and frequency of predicted visibility impairment, the emissions from the current project are not expected to cause an adverse impact on visibility at Cape Romain NWR, Wolf Island NWR, and Okefenokee Swamp NWR.

Table 13 – Class I Area Visibility Impairment Analysis at Cape Romain NWR				
Year	$\Delta b_{\text{ext}}^{(1)}$ (%)		Number of Days	
	Maximum	98th Percentile	$\Delta b_{\text{ext}} > 5\%$	$\Delta b_{\text{ext}} > 10\%$
2019	5.73	2.57	3	0
2020	5.49	2.94	1	0
2021	5.66	4.01	2	0
1) Light extinction change using the worst-case scenario.				

Table 14 – Class I Area Visibility Impairment Analysis at Wolf Island NWR				
Year	$\Delta b_{\text{ext}}^{(1)}$ (%)		Number of Days	
	Maximum	98th Percentile	$\Delta b_{\text{ext}} > 5\%$	$\Delta b_{\text{ext}} > 10\%$
2019	5.70	1.77	1	0
2020	2.57	1.21	0	0
2021	2.71	1.35	0	0

1) Light extinction change using the worst-case scenario.

Table 15 – Class I Area Visibility Impairment Analysis at Okefenokee Swamp NWR				
Year	$\Delta b_{\text{ext}}^{(1)}$ (%)		Number of Days	
	Maximum	98th Percentile	$\Delta b_{\text{ext}} > 5\%$	$\Delta b_{\text{ext}} > 10\%$
2019	3.15	1.04	0	0
2020	1.91	0.99	0	0
2021	3.39	1.18	0	0

1) Light extinction change using the worst-case scenario.

2.3.3.2 Class I Deposition Analysis

For the sulfate/nitrate deposition analysis, modeling was performed for the Class I area following the refined CALPUFF methodology outlined above. The tables below present the annual deposition values for each Class I area compared to the Deposition Analysis Threshold (DAT) for sulfur and nitrogen deposition of 0.01 kg/ha/yr. These DAT values are a guideline established by the FLM, not a regulatory standard. The estimated nitrate and sulfate deposition was less than the applicable DAT, and adverse impacts on the Cape Romain NWR, Wolf Island NWR, and Okefenokee Swamp NWR are not expected.

Table 16 – Class I Sulfate/Nitrate Deposition Analysis at Cape Romain NWR (kg/ha/yr)						
Year	Sulfur			Nitrate		
	Modeled	DAT	Exceeds?	Modeled	DAT	Exceeds?
2019	9.21E-04	0.01	No	1.65E-03	0.01	No
2020	1.06E-03		No	1.87E-03		No
2021	8.72E-04		No	1.44E-03		No

Table 17 – Class I Sulfate/Nitrate Deposition Analysis at Wolf Island NWR (kg/ha/yr)						
Year	Sulfur			Nitrate		
	Modeled	DAT	Exceeds?	Modeled	DAT	Exceeds?
2019	4.18E-04	0.01	No	7.87E-04	0.01	No
2020	3.01E-04		No	2.92E-04		No
2021	3.71E-04		No	4.62E-04		No

Table 18 – Class I Sulfate/Nitrate Deposition Analysis at Okefenokee Swamp NWR (kg/ha/yr)						
Year	Sulfur			Nitrate		
	Modeled	DAT	Exceeds?	Modeled	DAT	Exceeds?
2019	1.45E-04	0.01	No	2.80E-04	0.01	No
2020	1.01E-04		No	2.23E-04		No
2021	1.98E-04		No	4.49E-04		No

2.4 South Carolina Facility-Wide Compliance Demonstration

All minor and major sources proposing new construction or construction modifications in South Carolina are required to demonstrate compliance with South Carolina Regulation No. 62.5 Standards 2 (NAAQS), 7 (Class II PSD Increment), and 8 (Air Toxics). Compliance with each state standard is addressed below:

Standard 2: Compliance for PM₁₀, PM_{2.5}, and NO₂ is shown using results from the PSD Class II full impact AERMOD analysis (Table 6). Compliance for SO₂ and CO is shown using results from the PSD Class II SIL AERMOD analysis provided in Table 1 (SO₂ and CO were not included in the full impact analysis). A compliance demonstration for lead is not required since the facility-wide emissions are below the exemption emission rate.

Standard 7: Standard 7 (PSD) Part k - "Source Impact Analysis" and Part p - "Sources Impacting Federal Class I Areas - Additional Requirements" were addressed in Sections 2.1 and 2.3 above, as appropriate. Standard 7 increments were discussed and modeled as full impact (including all facility sources) in Section 2.1.2.2 (see Table 8). In addition, Class I Area impacts were addressed in Section 2.3 of this document.

Standard 8:

All combustion sources will burn only virgin fuels. Therefore, all emissions from combustion are exempt from a compliance demonstration. Process emissions include six pollutants that will be emitted as fugitives from diesel storage tanks and other system leaks. Compliance for those pollutants is shown via a de minimis analysis.

Compliance data for Standard 2 is shown in the table below.

Table 19 – Standard No. 2 - Ambient Air Quality Standards Modeling Analysis							
Pollutant	Averaging Time	Model Used	Maximum Modeled Concentration (µg/m³)⁽¹⁾	Background Concentration (µg/m³) ⁽²⁾	Total (µg/m³)	Standard (µg/m³)	% of Standard
PM₁₀	24 Hour	AERMOD	4.9 ⁽³⁾	37	42	150	28
PM_{2.5}	24 Hour	AERMOD	3.6 ⁽⁴⁾	12.7	16	35	46
	Annual	AERMOD	0.9 ⁽⁵⁾	7.0	8	12	67
SO₂	1 Hour	OTHER	⁽⁶⁾	23.5	≤196	196	≤100
	3 Hour	OTHER	⁽⁶⁾	20.3	≤1300	1300	≤100
NO₂	1 Hour	AERMOD	171.1 ⁽⁷⁾⁽⁸⁾	⁽¹⁰⁾	171	188	91
	Annual	AERMOD	11.2 ⁽⁸⁾⁽⁹⁾	11.9	23	100	23
CO	1 Hour	OTHER	⁽⁶⁾	1105	≤40,000	40,000	≤100
	8 Hour	OTHER	⁽⁶⁾	687	≤10,000	10,000	≤100
1) From the PSD Class II full impact NAAQS analysis, except for SO ₂ and CO which are from the Class II SIL analysis.							
2) Background concentrations are summarized in the table below.							
3) The sixth-high over five years of met data.							
4) The five-year average of the eighth-high concentrations.							
5) The five-year average of the maximum annual concentrations.							
6) A single factor other information approach (project only significant impact modeling) was used to show that emissions would not interfere with the attainment or maintenance of the standard.							
7) The five-year average of the eighth-high 1-hour daily maximum concentrations.							
8) The NO ₂ /NO _x ARM2 conversion with a minimum of 0.5 and a maximum of 0.9 ratio was applied within the model.							
9) The highest-first-high.							
10) Temporal season-by-hour-of-day NO ₂ background data from the Jenkins Ave Fire Station monitoring station was added within the model.							

The table below shows the background monitor location, year, and data that were used in the SC Standard No. 2 compliance demonstration above.

Table 20 – Background Monitoring Data (µg/m³)									
Pollutant	Site Name	County	Year	1-Hr	3-Hr	8-Hr	24-Hr	3-Mo	Annual
PM₁₀	Jenkins Ave/North Charleston FS	Charleston	22-24				37		
PM_{2.5}	North Charleston FS	Charleston	22-24				12.7		7.0
SO₂	Jenkins Ave Fire Station	Charleston	22-24	23.5	20.3				
NO₂	Jenkins Ave Fire Station	Charleston	22-24	61.5 ⁽¹⁾					11.9
CO	Parklane	Richland	22-24	1105		687			
Ozone	Moncks Corner	Berkeley, SC	22-24			61 ⁽²⁾			
PM ₁₀ 24-hr is the fourth-high over three-year period. The concentration listed for all other pollutants and averaging periods is the 3-year design value. 1) 61.5 µg/m ³ is used as the background value for Soils and Vegetation Analyses. Temporal season-by-hour-of-day NO ₂ background data from the Jenkins Ave Fire Station monitoring station were used for the 1-hour standard for all other analyses. 2) Units are ppb.									

The facility demonstrates compliance with SC Standard No. 8 using a de minimis analysis as shown below.

Table 21 - Standard No. 8 – Toxic Air Pollutants De Minimis Analysis			
Pollutant	CAS Number	Emission Rate (LB/DAY)	De Minimis (LB/DAY)
Benzene	71-43-2	0.060	1.800
Ethyl Benzene	100-41-4	0.101	52.200
Hexane	110-54-3	0.152	10.800
Methyl Mercaptan	74-93-1	0.003	0.120
Toluene	108-88-3	0.769	24.000
Xylene (mixed isomers)	1330-20-7	2.106	52.200