AIR COMPLIANCE ANALYSIS SUMMARY SHEET

COMPANY/FACILITY: Dominion Energy South Carolina Inc Canadys Station
DATE: DRAFT
LOCATION (City, County): Walterboro (Colleton)
REVIEWED BY: BPM/AJF
PERMIT NUMBER: 0740-0002
REQUEST: PSD Construction Permit

ANALYSIS:	**Y**	**AMBIENT AIR QUALITY STANDARDS**	**Y**	**PSD INCREMENT**
		TOXIC AIR POLLUTANTS	**Y**	**DE MINIMIS**
	Y	**EXEMPTION**		**DEFERRAL**
OTHER:		**EXPEDITED**	**N**	**COLLOCATED (Y or N)**

PROJECT DESCRIPTION: Dominion Energy South Carolina, LLC proposes to construct a combined-cycle combustion turbine facility near the unincorporated community of Canadys, or approximately 11 miles north of the town of Walterboro. This project is for the construction of three independent, advanced-class, multi-shaft, one-on-one combined cycle combustion turbine (CCCT) power trains. Each power train will include a combustion turbine-generator (CTG), a heat recovery steam generator (HRSG) equipped with supplementary firing (duct burners), and a steam turbine-generator (STG), configured to operate in a combined cycle arrangement. Each CCCT will be equipped with selective catalytic reduction (SCR) for the control of nitrogen oxides (NO_x) and an oxidative catalyst (OXCAT) for the control of carbon monoxide (CO) and volatile organic compounds (VOC). Ancillary equipment will include: one natural gas-fired auxiliary boiler, three diesel-fired emergency generators, two diesel-fired emergency fire water pumps, four natural gas-fired fuel gas heaters, two three-million gallon aboveground storage tanks (ASTs) for fuel oil, six inlet chiller towers, three delugable air-cooled heat exchangers, and fugitive emission components (valves, flanges, etc.).

SUMMARY OF MODELING ANALYSIS & RESULTS: A modeling analysis using the AERMOD and CALPUFF programs was provided by ALL4, LLC. The facility will be located in Colleton County. This project will be considered major under Standard 7 Prevention of Significant Deterioration (PSD). When a "Standard" is mentioned, it refers to the applicable section of South Carolina Regulation 61-62.5, Standards 1 through 8. When "the facility" is used in this summary, it refers to the Dominion Energy South Carolina Inc Canadys Station facility. A complete summary sheet is included.

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

1. Compliance with the National Ambient Air Quality Standards (NAAQS);
2. Compliance with the 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 major sources proposing new construction or construction modifications in South Carolina (SC) are also required to demonstrate that their facility will comply with South Carolina Regulation 61-62.5 Standards 2 (AAQS), 7 (Class II PSD Increments) and 8 (Air Toxics), as applicable.

<u>General Results</u>
The compliance demonstration indicates the following:
a) For PSD Class II areas, there will be no exceedance of the NAAQS or Increments, and no adverse effects 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 Class I 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.

General Analysis Notes

1. Modeling Scenarios – Modeling for each pollutant and averaging period for each compliance exercise was conducted for one or more of the following combustion turbines (CT) operating scenarios: design load, worst-case, and startup/shutdown with annualized emissions. Emissions for all other sources did not vary across the scenarios. The design load scenario was used for all averaging periods; the worst-case scenario was added for all short-term (24 hours or less) averaging periods; and the startup/shutdown annualized emissions scenario was done for just NO_2/1-hour. The different scenarios represent varying emission rates, exit temperatures or exit velocities for the CTs. For each modeling exercise, the maximum result among the different scenarios, and facility vs. BAQ model runs, is listed in this summary. The scenarios are briefly described below. Please see the facility application dated July 2026 for more details.

a) Design load – This scenario represents the most typical operating parameters for the CTs (100% load with inlet chilling on and duct burners at average ambient conditions and maximum annual emissions).

b) Worst-Case Load – An initial modeling analysis was conducted to determine the worst-case operational conditions of the CTs for all short-term (24-hours or less) averaging periods. This consisted of full and partial load emissions (ranging from 35-100% load) for natural gas and fuel oil, with and without duct burners and seven ambient temperatures. Startup and shutdown conditions were also evaluated. In total, 68 load scenarios were evaluated for each pollutant and short-term averaging period. The resultant worst-case exit temperature and velocity for each pollutant are shown in Table F.6 in this summary and were used as appropriate in the compliance modeling. Note that as a measure of conservatism, Minimum Emissions Compliance Load (MECL) exhaust parameters were applied to all startup/shutdown modeling for short-term standards including the balance of the time where the turbine is operating at the design load.

d) Startup / Shutdown Annualized Emissions – An additional startup/shutdown (SUSD) scenario was included for NO_2/1-hour Class II SIL and NAAQS modeling. This scenario addresses intermittent SUSD emissions by annualizing the maximum 1-hour emission rate expected across the four SUSD scenarios (cold, warm and hot starts, and shutdown). This was accomplished by multiplying the hourly emission rate by the ratio of total hours of intermittent operation per year to 8,760 hours.

2. Meteorological data used in AERMOD – Both the facility and BAQ AERMOD analyses used 2015-2019 data from the Charleston (SC) International Airport prepared by BAQ. The most recent version of AERMET (v24142) at the time of submittal was used to prepare the data for the facility's modeling submission.

3. Ambient Ratio Method 2 (ARM2) for NO_2 modeling – The ARM2 was used to manage conversion of NOx to NO_2 in all NO_2 AERMOD modeling runs. A minimum NO_2/NOx ratio of 0.5 and a maximum NO_2/NOx ratio of 0.9 were used.

This summary sheet is divided into the following sections:
Section A – PSD Significant Determination
Section B – PSD Class II Modeling Analysis (Preliminary and Full Impact)
Section C – PSD Additional Impact Analysis (Growth, Soils & Vegetation, and Visibility)
Section D – PSD Class I Impact Analysis
Section E – South Carolina (SC) Facility-wide Compliance Demonstration
Section F – Facility Emission Rates and Stack Parameters
Section G – PSD Appendix – Secondary Pollutant Impact Information

Acronyms/Abbreviations
AAQS = Ambient Air Quality Standards
ARM2 = Ambient Ratio Method Version 2
AQRV = Air Quality Related Values
BACT = Best Achievable Control Technology
BAQ = DHEC Bureau of Air Quality
CO = Carbon Monoxide
DAT = Deposition Assessment Threshold values for sulfate and nitrate set by the FLM
EPA = Environmental Protection Agency
FLAG = Federal Land Managers' Air Quality Related Values Workgroup Phase I Report
FLM = Federal Land Manager
FWS = Fish and Wildlife Service
GHG = Greenhouse gases
H_2SO_4 = Sulfuric Acid Mist
IWAQM = Interagency Workgroup on Air Quality Modeling Phase 2 Report
km = kilometer
lb/hr = pound per hour
m/s = meter per second
MERPs = Modeled Emission Rates for Precursors (MERPs)
Met = Meteorological
MECL = Minimum Emissions Compliance Load
MM = mesoscale meteorological data (i.e. MM4 or MM5)
MSBD = minor source baseline date
NAAQS = National Ambient Air Quality Standards
NO_2 = Nitrogen dioxide
NO_X = Oxides of Nitrogen
NSR = New Source Review
NWR = National Wildlife Refuge
Pb = Lead
PM = Particulate Matter
$PM_{2.5}$ = Particulate Matter <2.5 microns
PM_{10} = Particulate Matter <10 microns
ppb = parts per billion
PSD = Prevention of Significant Deterioration
SA = Screening Area
SC = South Carolina
SCDES = SC Department of Environmental Services
SER = Significant Emission Rate
SIA = Significant Impact Area
SIL = Significant Impact Level
SO_2 = Sulfur Dioxide
Standard 2 = SC State Regulation 61-62.5, Standard 2
Standard 7 = SC State Regulation 61-62.5, Standard 7
Standard 8 = SC State Regulation 61-62.5, Standard 8
TPY = Tons per year
TSP = Total Suspended Particulate
US = United States
VOC = Volatile Organic Compound
WRF = Weather Research and Forecasting

SECTION A - PSD SIGNIFICANT DETERMINATION

The facility will be a new source. Since this facility is listed in one of the 28 industrial categories defined in Standard 7, the PSD major source threshold is 100 TPY for any NSR (New Source Review) pollutant. Each pollutant increase is compared to this PSD threshold value. If a pollutant exceeds the threshold, the facility is determined to be "major" for PSD and will require a PSD review. If one pollutant exceeds the threshold value, the remaining pollutants are then compared to the significant levels to determine which other pollutants also require a PSD review. Pollutants not exceeding the PSD significance level will not require a PSD review; however, compliance with SC State Regulation 61-62.5, Standards 2 and 8 (as applicable) must be demonstrated for these pollutants using the appropriate guidelines defined for minor sources constructing and operating air emission sources in South Carolina.

Table A.1 below lists the maximum potential emission rates for this project. Comparison of each pollutant to the respective PSD significance level indicates that TSP, PM_{10}, $PM_{2.5}$, SO_2, NO_X, CO, and VOC/Ozone will require a PSD review. Since lead is below the significance threshold, no further PSD analysis is required for this pollutant.

Table A.1
PSD EMISSION RATES

Pollutant	Project Emissions (TPY)	PSD Significant Emission Rate (SER) (TPY)	PSD Review Required? (Yes/No) (1)
TSP	617	25	YES (2)
PM_{10}	615	15	YES
$PM_{2.5}$	613	10	YES
SO_2	119	40	YES
NO_x	731	40 (3)	YES
CO	2776	100	YES
Ozone (VOC or NO_x)	972 (4)	40 (3)	YES
Lead	0.08	0.6	NO
GHG ($CO2_e$)	7,886,858	75,000	YES (5)
H_2SO_4 Mist	197	7	YES (6)

1) Sources that exceed the significant threshold are required to perform an air quality impact analysis.

2) Although TSP exceeds the PSD significance level, there is no NAAQS value for comparison.

3) Major for VOC or NO_X is considered major for Ozone.

4) Emissions listed are for total VOC.

5) Although GHG (greenhouse gas) emissions exceed the PSD significance level, there is no NAAQS value for comparison. Thus, no air dispersion modeling for this pollutant is performed. This pollutant is addressed within the BACT Analysis section provided within the application.

6) The potential emissions for H_2SO_4 exceed the PSD threshold. However, the emissions are from virgin fuel burning and are exempt from Standard 8 modeling analysis.

SECTION B - PSD CLASS II MODELING ANALYSIS

The PSD review requires pollutants, which are determined to be "major," to be evaluated by an Air Quality Impact Analysis and Additional Impacts Analysis. The Air Quality Impact Analysis consists of: 1) a Preliminary Modeling Analysis to determine which pollutants from the proposed project, at the facility only**,** exceed their Class II Significant Impact Levels (SIL); and 2) for each pollutant that exceeds its SIL, a Full Impact Analysis that includes emissions from the facility and emissions from nearby facilities that may cause an impact in the Significant Impact Area (SIA). The Additional Impacts Analysis evaluates the impacts on soils, vegetation, and visibility.

B.1. PSD CLASS II PRELIMINARY MODELING ANALYSIS

Potential emission rates or net emission rate increases, for each pollutant determined to be significant at the facility (Table A.1), were modeled to determine: a) impacts relative to the Significant Impact Level (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 are discussed below.

B.1.a. SIGNIFICANT IMPACT LEVEL (SIL) ANALYSIS

Table B.1 provides the results of the SIL analysis for this project for the "major" pollutants as defined above. 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 PM_{10}, $PM_{2.5,}$ NO_2 and ozone for the averaging periods indicated. Therefore, a Full Impact analysis is required for those pollutants. No further PSD analysis is required for SO_2; however, SO_2 must be included in the Standard 2 (facility-only) compliance analysis (Section E). Ozone impact is further addressed below the table.

Table B.1 PSD CLASS II SIGNIFICANT IMPACT LEVEL (SIL)						
Pollutant	**Averaging Time**	**Model Used**	**Maximum Impact ($\mu g/m^3$) (1)**	**SIL ($\mu g/m^3$)**	**Exceeds SIL? (Yes/No)**	**Significant Impact Area (SIA) (km)**
PM_{10}	24-HOUR	AERMOD	9	5	Yes	1.83
	ANNUAL	AERMOD	1.1	1	Yes	0.41
$PM_{2.5}$	24-HOUR	AERMOD / MERPs	5.8 (2)(4)	1.2	Yes	9.97
	ANNUAL	AERMOD / MERPs	0.9 (3)(4)	0.2	Yes	4.32
SO_2	1-HOUR	AERMOD	2 (5)	8	No	--
	3-HOUR	AERMOD	7	25	No	--
	24-HOUR	AERMOD	2	5	No	--
	ANNUAL	AERMOD	0	1	No	--
NO_2	1-HOUR	AERMOD	137 (5)(6)	8	Yes	12.18
	ANNUAL	AERMOD	10 (6)	1	Yes	2.75
CO	1-HOUR	AERMOD	1379	2000	No	--
	8-HOUR	AERMOD	214	500	No	--
Ozone	8-HOUR	MERPs	4.3 ppb (7)	1.0 ppb	Yes	N/A
1) Highest-first-high concentration except where noted otherwise						
2) Five-year average of the first-high concentrations						
3) Five-year average of the maximum annual concentrations						
4) The $PM_{2.5}$ maximum impact concentration includes the AERMOD-modeled primary $PM_{2.5}$ project impacts and the total secondary $PM_{2.5}$ project impacts (as shown in Table G.4) using the Modeled Emission Rates for Precursors (MERPs) method. See more details in Section G.						
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.						
7) Ozone is usually not emitted directly to the atmosphere. The ozone maximum impact includes the secondary ozone project impact (as shown in Table G.6) using the Modeled Emission Rates for Precursors (MERPs) from NOx and VOC precursors. See more details in Section G.						
TSP is not considered a criteria pollutant for this analysis.						

Ozone:

The project impact calculated from secondary formation (from VOC and NOx precursors) is greater than the ozone SIL (Table B.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 B.2.a for the NAAQS ozone analysis.

B.1.b. SIGNIFICANT IMPACT AREA (SIA) ANALYSIS

The preliminary SIL modeling analysis (results shown in Table B.1) was used to determine the Significant Impact Areas (SIA). Each SIA is a circular area with a radius extending from the source to the lesser of the following: 1) the most distant point where the Preliminary Modeling Analysis predicts a significant ambient impact will occur (greater than the SIL), or 2) a modeling receptor distance of 50 km.

The SIA is established for each pollutant and averaging period. The SIA is the area in which the NAAQS and PSD increments are evaluated using a cumulative (Full Impact) modeling analysis. All sources within the SIA and all receptors within the SIA where the project predicts a significant impact

(where receptor concentrations exceed the applicable SIL) were included in the Full Impact Analyses. Other sources within the Screening Area (SA) were also included in the Full Impact Analyses, as appropriate.

B.1.c. AMBIENT BACKGROUND DATA ASSESSMENT

Significant Monitoring Concentration

Modeling significance results (impacts, from Table B.1) for PM_{10} and NO_2 are shown in Table B.2 below along with significant monitoring concentrations (SMC) for those pollutants. The impacts are the maximum modeled concentrations as noted in the table. The significant monitoring concentrations are from SC Regulation 61-62.5, Standard 7.

Table B.2
SIGNIFICANT MONITORING CONCENTRATIONS (SMC)

Pollutant	Averaging Period	Max. Impact (µg/m³) (1)	SMC (µg/m³)	Exceeds? (Y or N)
PM_{10}	24-Hour	9	10	No
NO_2	Annual	10 (2)	14	No
1) Highest-first-high concentration except where noted otherwise				
2) The NO_2/NO_X ARM2 conversion with a minimum of 0.50 and a maximum of 0.9 was applied within the model.				

The maximum impacts for PM_{10} and NO_2 are below the significant monitoring concentration (SMC) levels; therefore, no pre-construction monitoring is required for those pollutants. Section 2.4 of 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. Existing representative monitor data for PM_{10}, as well as $PM_{2.5,}$ NO_2, and ozone are discussed below.

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 regional monitor sites may be used as representative background data in this case. Design value background data is summarized in Section E.

PM_{10} – The combined data for the 2022 through 2024 period from the Jenkins Ave Fire Station/North Charleston Fire Station monitoring sites was selected as the most representative for this pollutant. The Jenkins Ave Fire Station PM_{10} monitor was decommissioned in January 2023, and was replaced by a new monitor, North Charleston Fire Station. Thus, the data from this new monitor has been used to complete the missing 2023 data. The North Charleston Fire Station monitor is located approximately 40 miles (64 km) to the east-southeast of the facility in a mostly rural area in North Charleston. The Jenkins Ave Fire Station monitor was approximately 1 km southeast of this location. The monitors are 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 Jenkins Ave/North Charleston FS monitors is considered the most representative for PM_{10}.

$PM_{2.5}$ – 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 $PM_{2.5}$.

NO_2 – The Jenkins Ave 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 41 miles (66 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 NO_2.

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.

The monitors discussed above 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.

B.2. PSD CLASS II FULL IMPACT MODELING 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 B.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 B.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 annual 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 annual 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.

<u>Example "20D" Calculation</u>:

Q (tpy) < 20*D (km) [if true, can exclude source]

Q = total annual emissions for source being evaluated for inclusion (each pollutant must be addressed)

D = distance from the SIA boundary to the facility considered for inclusion

Where:

$D = [(x_1 - x_2)^2 + (y_1 - y_2)^2]^{½} - R$

R = distance from the PSD Source to the edge of the SIA, or 50 km, whichever is less

x_1, y_1 = coordinates of the source being considered for exclusion (in km)

x_2, y_2 = coordinates of the PSD Source (in km)

B.2.a. PSD CLASS II FULL IMPACT - NAAQS ANALYSIS

Table B.3 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. The annual NO_2 modeling conservatively uses all sources that were included in the 1-hr modeling which had a considerably larger SIA/SA.

Table B.3
CLASS II FULL IMPACT ANALYSIS - NAAQS
SIA AND SA ("20D") SOURCES INCLUDED

PM_{10}	**$PM_{2.5}$**	**NO_2**
24-hour	**24-hr & Annual**	**1-hour & Annual**
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 B.4 shows that when proposed facility emissions are modeled with other sources in the SIA and SA, and background values are added (along with secondary impacts for $PM_{2.5}$ and Ozone), the NAAQS are not exceeded and compliance has been demonstrated.

Table B.4
CLASS II FULL IMPACT ANALYSIS - NAAQS

Pollutant	Averaging Time	Maximum Modeled Concentration ($\mu g/m^3$) (1)	Secondary Impact Concentration ($\mu g/m^3$) (2)	Background Concentration ($\mu g/m^3$) (3)	Total ($\mu g/m^3$)	Standard ($\mu g/m^3$)	% of Standard
PM_{10}	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
NO_2	1-Hour	171.1 (7)(8)(9)	N/A	(10)	171	188	91
	Annual	11.2 (8)	N/A	11.9	23	100	23
Ozone	8-Hour	N/A (11)	4.2 ppb	61 ppb	65 ppb	70 ppb	93

1) AERMOD was used to determine primary maximum impacts. The highest-first-high modeled concentration was used for annual averaging periods and the highest-second-high was used for all other averaging periods, except as noted otherwise.

2) Secondary pollutant impacts for $PM_{2.5}$ and Ozone were computed using MERPs. See section G.1 (and specific project-level secondary impacts in Tables G.4 and G.6) for more details. Note: Secondary impacts from existing off-site sources are accounted for within applied background concentrations.

3) Background concentrations are summarized in Section E.

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) The facility modeled concentration was slightly higher than the BAQ result and is listed here.

10) Background concentrations are added within the model. Refer to Table E.3 for 1-hour season-by-hour-of-day background values that are applied to the NO_2 1-hour results.

11) Ozone is usually not emitted directly to the atmosphere. The ozone maximum impact includes the secondary ozone project impacts (as shown in Table G.6) using the MERPs for NOx and VOC precursors. The total combined (current design value + secondary MERPs) ozone impact is shown to compare against the appropriate ozone standard. The current design value accounts for all existing source contributions.

The dispersion parameters and modeled emission rates for all offsite sources included in the Class II NAAQS Full Impact Analysis are not included in this summary. They are shown in the facility's application (dated July 2026) and corresponding electronic modeling files.

B.2.b. PSD CLASS II FULL IMPACT - 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 facilities previously identified within the SIA and SA. In accordance with Section 7.4.3.1 of the South Carolina Modeling Guidelines, the applicant elected to use the full NAAQS offsite inventory when evaluating the Class II PSD increments. The facilities included are shown in Table B.5.

Table B.5 PSD CLASS II FULL IMPACT ANALYSIS – INCREMENT SIA AND SA ("20D") PSD INCREMENT CONSUMING SOURCES INCLUDED		
PM_{10}	**$PM_{2.5}$**	**NO_X**
24-hr & Annual	**24-hr & Annual**	**Annual**
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 B.9 indicates that the maximum impact for each pollutant and averaging period does not exceed the respective PSD increment standard.

Table B.6 PSD CLASS II FULL IMPACT ANALYSIS – INCREMENT						
Pollutant	**Averaging Time**	**Maximum Modeled Concentration ($\mu g/m^3$) (1)**	**Secondary Impact Concentration ($\mu g/m^3$) (2)**	**Total Impact Concentration ($\mu g/m^3$)**	**Standard ($\mu g/m^3$)**	**% of Standard**
PM_{10}	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
NO_2	Annual	11.2 (3)	N/A	11	25	44
1) AERMOD was used to determine primary maximum impacts. The highest-first-high modeled concentrations for the 5 years of meteorological data are listed for annual averaging periods and the highest second-high is shown for 24-hour averaging periods.						
2) The secondary $PM_{2.5}$ project impacts (using the MERPs method as shown in Table G.4) are shown in this column.						
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.						

The dispersion parameters and modeled emission rates for all offsite sources included in the Class II Increment Analysis are not included in this summary. They are shown in the facility's revised application (dated July 2026) and corresponding electronic modeling files.

SECTION C - ADDITIONAL IMPACT ANALYSIS – GROWTH, SOILS & VEGETATION, AND VISIBILITY IMPAIRMENT

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.

C.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 (Table B.1).

The facility will hire approximately 50-75 new employees, and it is anticipated that the workforce will come from already existing local population. Electricity produced by the facility will be distributed throughout South Carolina 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.

C.2. SOILS AND VEGETATION

Maximum predicted offsite impacts were compared to EPA screening levels or secondary NAAQS (Table C.1). Modeling of all the proposed (facility-only) emissions indicates there will be no adverse impacts expected on soils or vegetation caused by those emissions.

Table C.1 SOILS AND VEGETATION ANALYSIS								
Pollutant	**Averaging Time**	**Model Used**	**Max. Impact ($\mu g/m^3$) (1)**	**Back-ground ($\mu g/m^3$)**	**Facility/ Regional Impact ($\mu g/m^3$) (2)**	**EPA Screening Concentration ($\mu g/m^3$)**	**AAQS Standard ($\mu g/m^3$) (11a)**	**Exceeds? (Y or N)**
PM_{10}	24-Hour	AERMOD	9.0	37.0	46	N/A	150	N
$PM_{2.5}$	24-Hour	AERMOD/ MERPs	5.8 (3)(5)	12.7	19	N/A	35	N
	Annual	AERMOD/ MERPs	0.9 (4)(5)	7.0	8	579 (11b)	15	N
NO_2	1-Hour	AERMOD	137.2 (6)(7)	61.5	199	66,000 (11c)	N/A	N
	4-Hour(4)	AERMOD	137.2 (6)(7)	61.5	199	3760 (11d)	N/A	N
	8-Hour(4)	AERMOD	137.2 (6)(7)	61.5	199	3760 (11d)	N/A	N
	1-Month(4)	AERMOD	137.2 (6)(7)	61.5	199	564 (11d)	N/A	N
	Annual	AERMOD	10.1 (6)	11.9	22	94 (11d)	100	N
Ozone (9)	8-Hour	MERPs	4.2 (10)	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 E 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. See section G.1 for more details. 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) The 8-hour average modeled concentration was conservatively used here to compare to the weekly standard. Background is also an 8-hour average value.

9) Units for all values are ppb.

10) The ozone maximum modeled concentration is based on the secondary ozone project impacts using the MERPs methodology. See section G.1 (and specific project-level secondary impacts in Table G.6) for more details. Units are ppb.

11) 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)

C.3. VISIBILITY

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

SECTION D – PSD CLASS I IMPACT ANALYSIS

Air quality impacts must be addressed for all Class I areas within 300 km of a PSD facility. Those Class I areas for this project (and distance from the facility) include the following: Cape Romain National Wildlife Refuge (93 km); Wolf Island National Wildlife Refuge (202 km); and Okefenokee Swamp National Wildlife Refuge (286 km). Thus, Class I impacts must be addressed for these three Class I areas.

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 Section D.1 below. None of the three wildlife management areas screened out of the AQRV analysis using "Q/D". The details of this analysis are shown beginning in Section D.3.

Model Overview

For the SIL and PSD increment analyses:

- If the Class I area is ≤ 50 km from the facility, AERMOD should be used.
- If the Class I area is > 50 km from the facility, a long-range transport model such as CALPUFF should be used. Alternatively, a conservative screening analysis can be done using AERMOD with an arc of receptors at a range of 50 km from the facility in the direction of the Class I area(s).

Both AERMOD and CALPUFF were used for the SIL analysis (see Section D.1 below).

For the CALPUFF modeling, WRF (Weather Research and Forecasting) data for 2019, 2020, and 2021 were used in CALMET (version 5.8) to provide input into CALPUFF (version 5.8.5). CALPOST (version 6.221) was used as the postprocessor to generate the ambient pollutant concentrations necessary at the Class I areas. More details about the model settings and model domain used are shown in the facility's revised application of July 2026. Note that CALPUFF review modeling was not performed by SCDES for this project but was accepted upon a review of the model input/output files and information in the facility's application.

D.1. CLASS I SIGNIFICANT IMPACT LEVEL ANALYSIS

For the Class I SIL analysis, the facility modeled the project emissions using AERMOD 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 provides a conservative screening of the impacts at the Class I areas. Table D.1 shows the maximum impacts at these receptors compared to the respective SIL.

The air quality impacts are less than the Class I SILs for PM_{10} annual, $PM_{2.5}$ annual, NO_2, and all the SO_2 averaging periods. The impacts of the facility emissions are greater than the applicable Class I SIL for the PM_{10} 24-hour and $PM_{2.5}$ 24-hour averaging periods. 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. All Class I SIL analysis results are shown in Table D.1 below.

Table D.1 PSD CLASS I SIGNIFICANT IMPACT LEVEL (SIL) ANALYSIS						
Pollutant	**Averaging Time**	**Maximum Modeled Concentration ($\mu g/m^3$)**	**Secondary Impact Concentration ($\mu g/m^3$) (4)**	**Total Project Impact Concentration ($\mu g/m^3$)**	**SIL ($\mu g/m^3$)**	**Significant Impact? (Y or N)**
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 a 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 $PM_{2.5}$. See Section G.5 for details.						

D.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 D.1).

D.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 ≤ 10 (where D = distance (km) from the source to the Class I area; Q = emissions (TPY) of SO_2 + NO_x + PM_{10} + H_2SO_4), 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 D.2 AQRV SCREENING ANALYSIS								
Class I Area	**Q (TPY)(1)**					**D (km) (2)**	**Q/D (3)**	**Analysis Req'd?**
	SO_2	**NO_x**	**PM_{10}**	**H_2SO_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	10.0	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 all three Class I areas within 300 km of the facility.

D.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 Cape Romain NWR, Wolf Island NWR, and Okefenokee Swamp NWR are all 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 D.3 (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 each less than 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 D.3
PSD CLASS I AREA VISIBILITY IMPAIRMENT ANALYSIS
at CAPE ROMAIN NWR

Year	Scenario (2)	Δb_{ext} (1) (%)		Number of Days	
		Maximum	98th Percentile	Δb_{ext} >5%	Δb_{ext} >10%
2019	FO04	5.73	2.57	3	0
2020	FO04	5.49	2.94	1	0
2021	FO04	5.66	4.01	2	0
1) Light extinction change					
2) FO04 is the worst-case scenario					

Table D.4 PSD CLASS I AREA VISIBILITY IMPAIRMENT ANALYSIS at WOLF ISLAND NWR					
Year	Scenario (2)	Δb_{ext} (1) (%)		Number of Days	
		Maximum	98th Percentile	Δb_{ext} >5%	Δb_{ext} >10%
2019	FO04	5.70	1.77	1	0
2020	FO04	2.57	1.21	0	0
2021	FO04	2.71	1.35	0	0
1) Light extinction change					
2) FO04 is the worst-case scenario					

Table D.5 PSD CLASS I AREA VISIBILITY IMPAIRMENT ANALYSIS at OKEFENOKEE SWAMP NWR					
Year	Scenario (2)	Δb_{ext} (1) (%)		Number of Days	
		Maximum	98th Percentile	Δb_{ext} >5%	Δb_{ext} >10%
2019	FO04	3.15	1.04	0	0
2020	FO04	1.91	0.99	0	0
2021	FO04	3.39	1.18	0	0
1) Light extinction change					
2) FO04 is the worst-case scenario					

D.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 table below presents 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 were less than the applicable DAT, and adverse impacts on the Cape Romain NWR, Wolf Island NWR, and Okefenokee Swamp NWR are not expected.

Table D.6 SULFATE/NITRATE DEPOSITION AT CAPE ROMAIN NWR (kg/ha/yr)						
Year	Sulfur			Nitrogen		
	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 D.7 SULFATE/NITRATE DEPOSITION AT WOLF ISLAND NWR (kg/ha/yr)						
Year	Sulfur			Nitrogen		
	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

Table D.7 SULFATE/NITRATE DEPOSITION AT WOLF ISLAND NWR (kg/ha/yr)						
Year	Sulfur			Nitrogen		
	Modeled	DAT	Exceeds?	Modeled	DAT	Exceeds?
2021	3.71E-04		No	4.62E-04		No

Table D.8 SULFATE/NITRATE DEPOSITION AT OKEFENOKEE SWAMP NWR (kg/ha/yr)						
Year	Sulfur			Nitrogen		
	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

SECTION E – 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 PM_{10}, $PM_{2.5}$, and NO_2 is shown using results from the PSD Class II full impact AERMOD analysis. Compliance for SO_2 and CO is shown using results from the PSD Class II SIL AERMOD analysis provided in Table B.1 (SO_2 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 B and D above, as appropriate. Standard 7 increments were discussed and modeled as full impact (including all facility sources) in Section B (see Table B.6). In addition, Class I Area impacts were addressed in Section D of this summary.

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 Standards 2 and 8 are shown in Tables E.1 – E.4 below.

Table E.1 STANDARD NO. 2 - AMBIENT AIR QUALITY STANDARDS ANALYSIS							
Pollutant	**Averaging Time**	**Basis**	**Maximum Concentration ($\mu g/m^3$) (1)**	**Background Concentration ($\mu g/m^3$)**	**Total ($\mu g/m^3$)**	**Standard ($\mu g/m^3$)**	**% of Standard**
PM_{10}	24-Hour	AERMOD	4.9 (2)	37	42	150	28
$PM_{2.5}$	24-Hour	AERMOD	3.6 (3)	12.7	16	35	46
	Annual	AERMOD	0.9 (4)	7.0	8	12	67
SO_2	1-Hour	OTHER	(5)	23.5	≤196	196	≤100
	3-Hour	OTHER	(5)	20.3	≤1300	1300	≤100
NO_2	1-Hour	AERMOD	171.1 (6)(7)	(9)	171	188	91
	Annual	AERMOD	11.2 (7)(8)	11.9	23	100	23
CO	1-Hour	OTHER	(5)	1105	≤40,000	40,000	≤100
	8-Hour	OTHER	(5)	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) The sixth-high over five years of met data.							
3) The five-year average of the eighth-high concentrations.							
4) The five-year average of the maximum annual concentrations.							
5) 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. See explanation in Table F.9.							
6) The five-year average of the eighth-high 1-hour daily maximum concentrations.							
7) 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.							
8) The highest-first-high.							
9) Temporal season-by-hour-of-day NO_2 background data from the Jenkins Ave Fire Station monitoring station was added within the model.							

Table E.2 BACKGROUND MONITORING DATA ($\mu g/m^3$)									
Pollutant	**Site Name**	**County**	**Year**	**1-Hr**	**3-Hr**	**8-Hr**	**24-Hr**	**3-Mo**	**Annual**
PM_{10}	Jenkins Ave/North Charleston FS	Charleston	22-24				37		
$PM_{2.5}$	North Charleston FS	Charleston	22-24				12.7		7.0
SO_2	Jenkins Ave Fire Station	Charleston	22-24	23.5	20.3				
NO_2	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 $\mu g/m^3$ 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 was used for the 1-hour standard for all other analyses. See Table E.3 for details.									
2) Units are ppb.									

Table E.3 NO_2 Season-by-hour Background Monitoring Data (μg/m³)				
Hour	**Winter**	**Spring**	**Summer**	**Fall**
1	45.2	38.3	28.2	42.6
2	46.4	42.6	30.1	39.5
3	43.3	37.6	24.5	35.1
4	42.6	40.8	30.7	32.0
5	44.5	45.2	37.6	36.4
6	45.2	50.8	40.8	37.6
7	47.7	52.1	42.6	40.8
8	53.9	52.1	30.7	42.0
9	52.7	40.1	25.1	40.1
10	43.9	24.5	20.7	30.7
11	39.5	18.8	17.6	23.8
12	31.4	15.1	14.4	19.4
13	23.8	16.3	13.2	14.4
14	23.8	15.7	13.2	16.9
15	21.9	13.2	13.2	16.3
16	22.6	13.2	12.5	13.2
17	32.0	15.1	15.1	21.3
18	35.7	16.9	13.8	23.8
19	43.3	17.6	16.9	35.7
20	54.6	28.2	21.3	47.0
21	54.6	31.4	20.7	48.3
22	53.9	36.4	21.3	47.7
23	50.2	33.2	23.8	43.3
24	50.8	37.0	27.6	43.3
Season-by-hour-of-day background is from Jenkins Ave Fire Station, Charleston County, SC 2022-2024.				

Table E.4 STANDARD NO. 8 – TOXIC AIR POLLUTANTS DE MINIMIS ANALYSIS			
Pollutant	**CAS Number**	**Emission Rate (LB/DAY)** (1)(2)	**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
1) Emission rates are rounded to three decimal places to compare to the de minimis threshold.			
2) Due to rounding, lb/day emission rates may not equal the same result obtained when the lb/hr rates below are multiplied by 24.			

SECTION F–SOURCE EMISSION RATES & STACK PARAMETERS

This section contains modeled source emissions rates, stack parameters, and other supportive information related to the sources at the facility.

Table F.1
STANDARD NO. 2 – AMBIENT AIR QUALITY STANDARDS EMISSION RATES (LB/HR)

Emission Point ID	PM_{10}		$PM_{2.5}$		SO_2		NO_x (1)		CO	
	24-hr	Ann	24-hr	Ann	1-hr	3-hr	1-hr	Ann	1-hr	8-hr
BOILER01	0.744	0.17	0.744	0.17	0.059		3.689	0.842	3.743	
COOL1_1-4	0.063		0.038		--		--		--	
COOL2_1-4	0.063		0.038		--		--		--	
COOL3_1-4	0.063		0.038		--		--		--	
COOL4_1-4	0.063		0.038		--		--		--	
COOL5_1-4	0.063		0.038		--		--		--	
COOL6_1-4	0.063		0.038		--		--		--	
CT1 (2)	93.0	46.19	93.0	46.19	9.0		81.0	50.36	49.17	
CT2 (2)	93.0	46.19	93.0	46.19	9.0		81.0	50.36	49.17	
CT3 (2)	93.0	46.19	93.0	46.19	9.0		81.0	50.36	49.17	
DELUGE1_1-4	0.263		0.158		--		--		--	
DELUGE2_1-4	0.263		0.158		--		--		--	
DELUGE3_1-4	0.263		0.158		--		--		--	
EMGEN01 (3)	0.020	0.027	0.020	0.027	(4)	0.012	(4)	2.971	6.201	0.775
EMGEN02 (3)	0.020	0.027	0.020	0.027	(4)	0.012	(4)	2.971	6.203	0.775
EMGEN03 (3)	0.020	0.027	0.020	0.027	(4)	0.012	(4)	2.971	6.203	0.775
EMGEN04 (3)	0.001	0.001	0.001	0.001	(4)	0.0004	(4)	0.036	1.042	0.130
EMGEN05 (3)	0.001	0.001	0.001	0.001	(4)	0.092	(4)	0.237	0.896	0.112
FP01 (3)	0.003 (3)		0.003		(4)	0.001	(4)	0.107	0.311	0.039
FP02 (3)	0.003 (3)		0.003		(4)	0.001	(4)	0.107	0.311	0.039
HEAT01	0.149		0.149		0.012		1.961		1.647	
HEAT02	0.149		0.149		0.012		1.961		1.647	
HEAT03	0.149		0.149		0.012		1.961		1.647	
HEAT04	0.022		0.022		0.002		0.294		0.247	
FACILITY TOTAL	281.4	140.5	281.0	140.0	27.10	27.23	252.9	167.5	177.6	159.1

1) NOx emissions are listed here but the facility applied the EPA ARM2 in their modeling to obtain the NO_2 results. See the AERMOD/AERMAP Specifications table below for more information.

2) The rates shown for CT1, CT2, and CT3 pertain to the design load scenario. Rates for their worst-case and startup/shutdown scenarios are shown in the facility's July 2026 revised application.

3) Modeled short-term emission rates are based on one hour per day operation for testing and annualized emissions are based on 500 hour/year emergency use.

4) In accordance with U.S. EPA's 1-hour NO2 Modeling Clarification Guidance, these emergency engines were excluded from the modeling demonstrations for the 1-hour NO_2 and SO_2 standards.

Table F.2 STANDARD NO. 7 - PSD CLASS II INCREMENT EMISSION RATES (LB/HR)						
Emission Point ID	Minor Source Baseline Date(s)					
	7/21/2026	7/21/2026			7/21/2026	7/21/2026
	PM_{10} (1)(2)	$PM_{2.5}$ (1)			SO_2 (1)	NO_X (1)(2)
		Primary (2)	SO_2	NO_X (2)		
BOILER01	--	--	--	3.69 (0.84)	--	3.69 (0.84)
CT1	93.0 (46.2)	93.0 (46.2)	9.0	81.0 (50.4)	9.0	81.0 (50.4)
CT2	93.0 (46.2)	93.0 (46.2)	9.0	81.0 (50.4)	9.0	81.0 (50.4)
CT3	93.0 (46.2)	93.0 (46.2)	9.0	81.0 (50.4)	9.0	81.0 (50.4)
HEAT01	--	--	--	1.96	--	1.96
HEAT02	--	--	--	1.96	--	1.96
HEAT03	--	--	--	1.96	--	1.96
FACILITY TOTAL	279 (138.6)	279 (138.6)	27.0	252.57 (155.96)	27.0	252.57 (155.96)
1) This project sets the MSBD for PM_{10}, $PM_{2.5}$, SO_2 and NOx in Colleton County. It also sets the MSBD for $PM_{2.5}$ for Dorchester County.						
2) Short term rates are shown with annual rates in parentheses.						

Table F.3 STANDARD NO. 2 AND 7 – EXEMPTED AMBIENT AIR QUALITY STANDARDS EMISSION RATES (TPY)						
Emission Point ID	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	Lead
BOILER01	--	--	--	--	--	4.89E-05
CT1	--	--	--	--	--	2.74E-02
CT2	--	--	--	--	--	2.74E-02
CT3	--	--	--	--	--	2.74E-02
HEAT01	--	--	--	--	--	4.30E-05
HEAT02	--	--	--	--	--	4.30E-05
HEAT03	--	--	--	--	--	4.30E-05
HEAT04	--	--	--	--	--	6.0E-06
FACILITY TOTAL	--	--	--	--	--	8.24E-02 (1)
1) Facility-wide lead emissions are less than 0.5 tpy, therefore it is exempt.						

Table F.4 STANDARD NO. 8 – DE MINIMIS TOXIC AIR POLLUTANTS EMISSION RATES (LB/HR)				
Emission Point ID	Benzene	Ethyl Benzene	Hexane	Methyl Mercaptan
	71-43-2	100-41-4	110-54-3	74-93-1
FUG7 & FUG8	2.51E-03	4.20E-03	5.57E-04	--
FUGNG	--	--	5.79E-03	1.07E-04
FACILITY TOTAL	2.51E-03	4.20E-03	6.35E-03	1.07E-04

Table F.5 STANDARD NO. 8 – DE MINIMIS TOXIC AIR POLLUTANTS EMISSION RATES (LB/HR)				
Emission Point ID	**Toluene**	**Xylene (mixed isomers)**	**N/A**	**N/A**
	108-88-3	**1330-20-7**		
FUG7 & FUG8	3.21E-02	8.79E-02		
FACILITY TOTAL	3.21E-02	8.78E-02		

Table F.6 EMISSION POINT DESCRIPTIVE INFORMATION				
Emission Point ID	**Source Identification & Description**	**Date Installed (Modified)**	**Status**	**Other**
BOILER01	Auxiliary Boiler - 99.8 Million Btu/hr Heat Input Firing Natural Gas	2026	Exempt Std 8: Burns only virgin fuel	
COOL1_1-4	Inlet Chiller No. 1 (Cells 1-4)	2026		
COOL2_1-4	Inlet Chiller No. 2 (Cells 1-4)			
COOL3_1-4	Inlet Chiller No. 3 (Cells 1-4)			
COOL4_1-4	Inlet Chiller No. 4 (Cells 1-4)			
COOL5_1-4	Inlet Chiller No. 5 (Cells 1-4)			
COOL6_1-4	Inlet Chiller No. 6 (Cells 1-4)			
CT1	Three Combined Cycle Combustion Turbines. Each rated at 4,115 Million Btu/hr Heat Input Firing Natural Gas and 3,495 Million Btu/hr Heat Input Firing Fuel Oil. Also, three Duct Burners – Each rated at 851.5 Million Btu/hr Heat Input Firing Natural Gas	2026	Exempt Std 2: Pb < 0.114 lb/hr (facility-wide) Exempt Std 8: Burns only virgin fuel	
CT2				
CT3				
DELUGE1_1-4	Deluge Cooling System No. 1 (Cells 1-4)	2026		
DELUGE2_1-4	Deluge Cooling System No. 2 (Cells 1-4)	2026		
DELUGE3_1-4	Deluge Cooling System No. 3 (Cells 1-4)	2026		
EMGEN01	Emergency Generator 1. Rated at 2,760 KW. Diesel-fired; < 500 hr/yr	2026	Exempt Std 2: Pb < 0.114 lb/hr (facility-wide) Exempt Std 8: Burns only virgin fuel	
EMGEN02	Emergency Generator 2. Rated at 2,760 KW. Diesel-fired; < 500 hr/yr	2026		
EMGEN03	Emergency Generator 3. Rated at 2,760 KW. Diesel-fired; < 500 hr/yr	2026		
EMGEN04	Cell Tower Emergency Generator. Rated at 100 KW. Diesel-fired; < 500 hr/yr	2026	Exempt Std 8: Burns only virgin fuel	
EMGEN05	SIP Hut Emergency Generator. Rated at 33.3 KW. Natural Gas fired.; < 500 hr/yr	2026		
FP01	Fire Water Pump 1. Deisel-fired. 315 hp. < 500 hr/yr	2026	Exempt Std 2: Pb < 0.114 lb/hr (facility-wide) Exempt Std 8: Burns only virgin fuel	
FP02	Fire Water Pump 2. Deisel-fired. 315 hp. < 500 hr/yr	2026		

Table F.6 EMISSION POINT DESCRIPTIVE INFORMATION				
Emission Point ID	**Source Identification & Description**	**Date Installed (Modified)**	**Status**	**Other**
FUG7	3-Million Gallon, Fixed Roof Fuel Oil Storage Tank #1	2026		
FUG8	3-Million Gallon, Fixed Roof Fuel Oil Storage Tank #2	2026		
HEAT01	Fuel Gas Heater 1. Natural gas-fired. 20 Million Btu/hr	2026	Exempt Std 2: Pb < 0.114 lb/hr (facility-wide) Exempt Std 8: Burns only virgin fuel	
HEAT02	Fuel Gas Heater 2. Natural gas-fired. 20 Million Btu/hr	2026		
HEAT03	Fuel Gas Heater 3. Natural gas-fired. 20MM Btu/hr	2026		
HEAT04	Fuel Gas Heater 4. Natural gas-fired. 3MM Btu/hr	2026		

Table F.7 POINT SOURCE PARAMETERS													
Emission Point ID	**Date Last Modeled**	**Location (UTM) [1]**		**Release Height AGL (ft)**	**Exit Temp. (°F)**	**Exit Velocity (ft/sec)**	**Inside Diameter (ft)**	**Discharge Orientation**	**Cap? (Y/N)**	**Distance To Property Line (ft)**	**Building Parameters**		
		East (m)	**North (m)**								**Height (ft)**	**Length (ft)**	**Width (ft)**
BOILER01	Current	534864	3658627	169	505	24.7	5.0	Vertical	N	See Modeling Files			
CT01	Current	534690	3658587	199	160 [2]	72.0 [2]	23	Vertical	N				
CT02	Current	534855	3658618	199	160 [2]	72.0 [2]	23	Vertical	N				
CT03	Current	535021	3658647	199	160 [2]	72.0 [2]	23	Vertical	N				
COOL1_1	Current	534674	3658679	51	70	24.5	12	Vertical	N				
COOL1_2	Current	534677	3658680	51	70	24.5	12	Vertical	N				
COOL1_3	Current	534679	3658680	51	70	24.5	12	Vertical	N				
COOL1_4	Current	534682	3658681	51	70	24.5	12	Vertical	N				
COOL2_1	Current	534673	3658686	51	70	24.5	12	Vertical	N				
COOL2_2	Current	534676	3658687	51	70	24.5	12	Vertical	N				
COOL2_3	Current	534678	3658687	51	70	24.5	12	Vertical	N				
COOL2_4	Current	534680	3658688	51	70	24.5	12	Vertical	N				

Table F.7 POINT SOURCE PARAMETERS													
Emission Point ID	Date Last Modeled	Location (UTM) [1]		Release Height AGL (ft)	Exit Temp. (°F)	Exit Velocity (ft/sec)	Inside Diameter (ft)	Discharge Orientation	Cap? (Y/N)	Distance To Property Line (ft)	Building Parameters		
		East (m)	North (m)								Height (ft)	Length (ft)	Width (ft)
COOL3_1	Current	534672	3658693	51	70	24.5	12	Vertical	N				
COOL3_2	Current	534674	3658693	51	70	24.5	12	Vertical	N				
COOL3_3	Current	534677	3658694	51	70	24.5	12	Vertical	N				
COOL3_4	Current	534679	3658694	51	70	24.5	12	Vertical	N				
COOL4_1	Current	534687	3658695	51	70	24.5	12	Vertical	N				
COOL4_2	Current	534689	3658696	51	70	24.5	12	Vertical	N				
COOL4_3	Current	534692	3658696	51	70	24.5	12	Vertical	N				
COOL4_4	Current	534694	3658696	51	70	24.5	12	Vertical	N				
COOL5_1	Current	534688	3658689	51	70	24.5	12	Vertical	N				
COOL5_2	Current	534690	3658689	51	70	24.5	12	Vertical	N				
COOL5_3	Current	534693	3658689	51	70	24.5	12	Vertical	N				
COOL5_4	Current	534695	3658690	51	70	24.5	12	Vertical	N				
COOL6_1	Current	534689	3658682	51	70	24.5	12	Vertical	N				
COOL6_2	Current	534691	3658683	51	70	24.5	12	Vertical	N				
COOL6_3	Current	534694	3658683	51	70	24.5	12	Vertical	N				
COOL6_4	Current	534696	3658683	51	70	24.5	12	Vertical	N				
DELUGE1_1	Current	535020	3658683	28	105	25	14	Vertical	N				
DELUGE1_2	Current	535025	3658684	28	105	25	14	Vertical	N				
DELUGE1_3	Current	535030	3658685	28	105	25	14	Vertical	N				
DELUGE1_4	Current	535034	3658686	28	105	25	14	Vertical	N	See Modeling Files			
DELUGE2_1	Current	534854	3658655	28	105	25	14	Vertical	N				
DELUGE2_2	Current	534858	3658655	28	105	25	14	Vertical	N				
DELUGE2_3	Current	534863	3658656	28	105	25	14	Vertical	N				
DELUGE2_4	Current	534868	3658657	28	105	25	14	Vertical	N				
DELUGE3_1	Current	534688	3658625	28	105	25	14	Vertical	N				
DELUGE3_2	Current	534692	3658626	28	105	25	14	Vertical	N				
DELUGE3_3	Current	534698	3658627	28	105	25	14	Vertical	N				
DELUGE3_4	Current	534702	3658628	28	105	25	14	Vertical	N				
EMGEN01	Current	534671	3658414	25	853	136	1.7	Vertical	N				

Table F.7
POINT SOURCE PARAMETERS

Emission Point ID	Date Last Modeled	Location (UTM) [1]		Release Height AGL (ft)	Exit Temp. (°F)	Exit Velocity (ft/sec)	Inside Diameter (ft)	Discharge Orientation	Cap? (Y/N)	Distance To Property Line (ft)	Building Parameters		
		East (m)	North (m)								Height (ft)	Length (ft)	Width (ft)
EMGEN02	Current	534836	3658444	25	853	136	1.7	Vertical	N				
EMGEN03	Current	535002	3658473	25	853	136	1.7	Vertical	N				
EMGEN04	Current	535397	3658533	10	450	45.4	0.29	Vertical	N				
EMGEN05	Current	535561	3658473	10	900	60.1	0.42	Vertical	N				
FP01	Current	534730	3658679	15	961	118.8	0.5	Vertical	N				
FP02	Current	535213	3658672	15	961	118.8	0.5	Vertical	N				
HEAT01	Current	534828	3658741	22.8	897	15.7	1.9	Vertical	N				
HEAT02	Current	534836	3658742	22.8	897	15.7	1.9	Vertical	N				
HEAT03	Current	534837	3658736	22.8	897	15.7	1.9	Vertical	N				
HEAT04	Current	534829	3658735	14.3	700	29.7	1	Vertical	N				

1) NAD83 datum

2 Rates in the table above are for the design load modeling scenario. See table below for the worst-case modeling scenario parameters per pollutant for the short term averaging periods. This data is inclusive of startup/shutdown events. Additional information can be found in the facility's revised July 2026 application.

Scenario	Pollutant	Exit Temp. (F)	Exit Velocity (ft/sec)
Worst-Case	PM_{10} & $PM_{2.5}$	165.4	52.6
	SO_2	165.4	52.6
	NO_2	160	71.8
	CO	165.4	52.6

Table F.8 AERMOD / AERMAP SPECIFICATIONS TABLE								
MET DATA	CHS-CHS 2015-2019 [Surface = Charleston, SC (45.9 ft MSL); Upper Air = Charleston, SC]							
	ADJ_U*	Y	(Y/N)					
ARM2/OLM/PVMRM SETTINGS	NO_2 Minimum In stack Ratio = 0.50 (1)			NO_2 Maximum Ambient Equilibrium Ratio = 0.90				
NED TERRAIN FILES	Allendale, Bamberg, Berkeley, Beaufort, Calhoun, Charleston, Clarendon, Colleton, Dorchester, Hampton, Jasper, Orangeburg, Williamsburg							
PROJECTION DATUM	NAD27			NAD83	Y		WGS-84		NWS-84	
RURAL or URBAN?	Rural	Y		Urban						
ELEVATIONS EXTRACTED	Buildings	Y		Sources	Y		Tanks		Receptors	Y
1) Default								

Table F.9 INFORMATION USED TO DEMONSTRATE NO INTERFERENCE WITH ATTAINMENT/MAINTENANCE OF AMBIENT STANDARDS (STANDARD NO. 2 AND NO. 7 AS APPLICABLE)		
Pollutant	**Basis**	**Discussion**
SO_2	Single Factor Option	Project only significant impact modeling: The 1-hour and 3-hour project-modeled maximum concentration for SO_2 does not exceed the applicable SILs for this pollutant. Conclusion: This approach is sufficient to demonstrate compliance with Standard 2.
CO	Single Factor Option	Project only significant impact modeling: The 1-hour and 8-hour project-modeled maximum concentration for CO does not exceed the applicable SILs for this pollutant. Conclusion: This approach is sufficient to demonstrate compliance with Standard 2.

SECTION G – PSD APPENDIX - SECONDARY POLLUTANT IMPACT INFORMATION

Purpose: This Appendix contains background information about Modeled Emission Rates for Precursors (MERPs) analysis and details of how secondary pollutant ($PM_{2.5}$ and ozone) concentrations were calculated for this project.

Background: EPA developed a two-tiered approach to quantitatively address individual source secondary impacts on 24-hour and annual $PM_{2.5}$ (from SO_2 and NOx precursor emissions) and 8-hour ozone (from NOx and VOC precursor emissions). Tier 1 involves the use of empirical relationships between precursor emissions and secondary impacts, while Tier 2 involves more refined case-specific chemical transport modeling. The Tier 1 approach is used for this project.

Methodology: The Tier 1 approach is based on EPA's April 2019 "*Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier 1 Demonstration Tool for Ozone and $PM_{2.5}$ under the PSD Permitting Program*" and EPA's clarification memo on this topic of April 2024.

EPA conducted photochemical modeling of hypothetical sources (with varying precursor emission rates, stack heights, and locations around the US) to determine primary pollutant impacts from secondary pollutants. Data from the single source hypothetical modeling analyses are provided in the "MERPs VIEW Qlik" web application (https://www.epa.gov/scram/merps-view-qlik).

EPA recommends using this 3-step approach:
1) Identify a representative hypothetical source from EPA's modeling results.
2) Acquire the source characteristics and associated modeling results for the hypothetical source.
3) Apply the source characteristics and photochemical modeling results from Step 2 above to the MERP equation (see below) to project the air quality impact and compare to the appropriate SIL (or standard).

MERP equation:

$$Project\ Impact = Modeled\ impact\ (hypothetical\ source) x \frac{Project\ emis.\ rate}{Modeled\ emis.\ rate\ (hypo.\ source)}$$

Scope of Secondary Pollutant Impacts for this project: The Tier 1 approach was applied using hypothetical model results for the PSD analyses as shown in Table G.1 below.

Table G.1
SECONDARY POLLUTANT IMPACTS USING PROJECT AND OFFSITE EMISSIONS

PSD Analysis		Emissions		
		Project		Offsite
		$PM_{2.5}$	Ozone	$PM_{2.5}$
Class II	SIL	Yes	Yes	
	NAAQS	Yes	Yes	
	Increment	Yes		Yes
	Soils & Vegetation	Yes	Yes	
Class I	SIL	Yes		

Further discussion, as appropriate, and quantification of secondary impacts for these analyses are addressed in the sections below.

EPA Hypothetical Modeled Source

The hypothetical modeled source and parameters used for the secondary impact calculations are shown in the table below.

Table G.2 EPA HYPOTHETICAL MODELED SOURCE	
Location (1)	Allendale County, SC
Emissions (TPY) (2)	500
Release Height (m) (3)	10 and 90
1) This hypothetical source was selected as representative of the project source based on similarities related to location, surrounding terrain elevation, climate, regional/local emissions and background pollutant concentrations.	
2) Individual precursor project emission increases for NOx, SO_2, and VOC are each less than 1000 TPY, so the 500 TPY hypothetical model case is used for each precursor pollutant.	
3) The sources with the greatest precursor emissions, CT1, CT2 and CT3, have a release height of 200 feet (61 meters). Thus, the 90 m stack height hypothetical model case was used for these sources (and the auxiliary boiler) as the most representative source height for the MERPs analyses. For precursor emissions from all remaining sources at the facility, a 10 meter hypothetical stack height model case was used.	

G.1. CLASS II SIL

G.1.a. $PM_{2.5}$

At least one of the contributing project emission increases (primary $PM_{2.5}$, secondary SO_2 or secondary NOx) is greater than the respective SER threshold as shown in Table A.1. As a result, both the primary and secondary $PM_{2.5}$ combined impacts from the proposed PSD project were included in the comparison to the appropriate $PM_{2.5}$ SIL as shown in Table B.1.

Primary $PM_{2.5}$ project emissions were modeled using AERMOD. The MERPs methodology (as described above) combines the impacts of SO_2 and NOx project emissions to determine the total project secondary contribution to $PM_{2.5}$ production.

The predicted secondary pollutant impacts from the Allendale County hypothetical source are summarized in Table G.3 (below).

Table G.3 PSD CLASS II SECONDARY IMPACTS TO $PM_{2.5}$ FOR HYPOTHETICAL SOURCE IN ALLENDALE COUNTY					
Primary Pollutant		**Hypothetical Source**		**Secondary Impact (μg/m³)**	
		Emissions (TPY)	**Stack Height (m)**	**NOx**	**SO_2**
$PM_{2.5}$	**24-hour**	500	10	0.0822 (1)	0.5128 (1)
	Annual	500	10	0.0058 (1)	0.0161 (1)
	24-hour	500	90	0.0274 (2)	0.1434 (2)
	Annual	500	90	0.0015 (2)	0.0059 (2)
1) The secondary impacts are the maximum concentrations from EPA modeling of the hypothetical 500 TPY source with 10 m stack height.					
2) The secondary impacts are the maximum concentrations from EPA modeling of the hypothetical 500 TPY source with 90 m stack height.					

Table G.4 (below) shows the calculations for total secondary $PM_{2.5}$ project impact.

Table G.4 $PM_{2.5}$ PROJECT SECONDARY IMPACT ANALYSIS - EPA HYPOTHETICAL MODELING (MERPs)					
Secondary Pollutant			$PM_{2.5}$		Units
			24-hour	Annual	
NOx	Emissions (1)	Project (3)	68.22	68.22	TPY
		Hypothetical Source (4)	500	500	TPY
		(A) Project / Hypothetical Source	0.1364	0.1364	None
	Secondary Impact (1)	(B) Hypothetical Source (4)	0.0822	0.0058	μg/m³
		(C) Project (5)	0.0112	0.0008	μg/m³
	Emissions (2)	Project (3)	665.40	665.40	TPY
		Hypothetical Source (4)	500	500	TPY
		(D) Project / Hypothetical Source	1.3308	1.3308	None
	Secondary Impact (2)	(E) Hypothetical Source (4)	0.0274	0.0015	μg/m³
		(F) Project (5)	0.0365	0.0020	μg/m³
SO_2	Emissions (1)	Project (3)	0.53	0.53	TPY
		Hypothetical Source (4)	500	500	TPY
		(G) Project / Hypothetical Source	0.0011	0.0011	None
	Secondary Impact (1)	(H) Hypothetical Source (4)	0.5128	0.0161	μg/m³
		(I) Project (5)	0.0005	1.70E-05	μg/m³
	Emissions (2)	Project (3)	118.32	118.32	TPY
		Hypothetical Source (4)	500	500	TPY
		(J) Project / Hypothetical Source	0.2366	0.2366	None
	Secondary Impact (2)	(K) Hypothetical Source (4)	0.1434	0.0059	μg/m³
		(L) Project (5)	0.0339	0.0014	μg/m³
Total Secondary $PM_{2.5}$ Project Impact (6)			0.0821	0.0042	μg/m³
* Due to rounding, TPY emission rates may not equal the same result obtained when the lb/hr rates above are multiplied by 4.38. The facility submitted numbers were conservative and have been used as the final values seen within the "Total Secondary PM2.5 Project Impact" row.					
1) Emissions and impacts associated with the MERPs stack height of 10 meters. This includes the three Emergency Generators (EMGEN01-EMGEN03), two Fire Pumps (FP01 & FP02), four Fuel Gas Heaters (HEAT01-HEAT04), Cell Tower Emergency Generator (EMGEN04), and SIP Hut Generator (EMGEN05) sources.					
2) Emissions and impacts associated with the MERPs stack height of 90 meters. This includes the Boiler (BOILER01) and three Combustion Turbine units (CT01, CT02 & CT03) sources.					
3) Per Table A.1					
4) Per Table G.3					
5) For NOx, (A) x (B) & (D) x (E); for SO_2, (G) x (H) & (J) x (K)					
6) (C) + (F) + (I) + (L). This is added to the primary modeled $PM_{2.5}$ project impact in Table B.1.					

G.1.b. Ozone

While the facility will not directly emit ozone, the proposed project will result in NOx and VOC (precursors of ozone) project emission increases above the PSD SER as shown in Table A.1.

As a result, secondary ozone impacts from the proposed PSD project were included in the comparison to the appropriate ozone SIL as shown in Table B.1. The MERPs method combines the impacts of NOx and VOC project-only emission increases to determine the total secondary contribution to ozone production as it relates to the EPA-recommended 8-hour SIL.

Tables G.5 and G.6 (below) show the MERPs method of calculating total secondary 8-hour ozone project impact using NOx and VOC emissions from this project.

Table G.5 PSD CLASS II SECONDARY IMPACT (CONTRIBUTION) TO OZONE PRODUCTION FOR HYPOTHETICAL SOURCE IN ALLENDALE COUNTY					
Pollutant		**Hypothetical Source**		**Secondary Impact (ppb)**	
		Emissions (TPY)	**Stack Height (m)**	**NOx**	**VOC**
Ozone	8-hour	500	10	2.94 (1)	0.0167 (1)
	8-hour	500	90	2.88 (2)	0.0116 (2)
1) The secondary impacts are the maximum concentrations from EPA modeling the hypothetical 500 TPY source with 10 m stack height.					
2) The secondary impacts are the maximum concentrations from EPA modeling the hypothetical 500 TPY source with 90 m stack height.					

Table G.6 OZONE PROJECT SECONDARY IMPACT ANALYSIS - EPA HYPOTHETICAL MODELING (MERPs)				
Secondary Pollutant			**Ozone**	**Units**
			8-hour	
NOx	Emissions (1)	Project (3)	68.22	TPY
		Hypothetical Source (4)	500	TPY
		(A) Project / Hypothetical Source	0.136	None
	Secondary Impact (1)	(B) Hypothetical Source (4)	2.94	ppb
		(C) Project (5)	0.399	ppb
	Emissions (2)	Project (3)	665.4	TPY
		Hypothetical Source (4)	500	TPY
		(D) Project / Hypothetical Source	1.331	None
	Secondary Impact (2)	(E) Hypothetical Source (4)	2.88	ppb
		(F) Project (5)	3.83	ppb
VOC	Emissions (1)	Project (3)	3.54	TPY
		Hypothetical Source (4)	500	TPY
		(G) Project / Hypothetical Source	0.007	None
	Secondary Impact (1)	(H) Hypothetical Source (4)	0.0167	ppb
		(I) Project (5)	0.0001	ppb
	Emissions (2)	Project (3)	968.52	TPY
		Hypothetical Source (4)	500	TPY
		(J) Project / Hypothetical Source	1.937	None
	Secondary Impact (2)	(K) Hypothetical Source (4)	0.0116	ppb
		(L) Project (5)	0.0225	ppb
Total Secondary Project Impact to Ozone (6)			4.25	ppb
* Due to rounding, TPY emission rates may not equal the same result obtained when the lb/hr rates above are multiplied by 4.38. The facility submitted numbers were conservative and have been used as the final values seen within the "Total Secondary Ozone Project Impact" row.				
1) Emissions and impacts associated with the MERPs stack height of 10 meters. This includes the three Emergency Generators (EMGEN01-EMGEN03), two Fire Pumps (FP01 & FP02), Piping Components (PC01), five Belly Tanks (BT01-BT05), four Fuel Gas Heaters (HEAT01-HEAT04), Cell Tower Emergency Generator (EMGEN04), and SIP Hut Generator (EMGEN05) sources.				
2) Emissions and impacts associated with the MERPs stack height of 90 meters. This includes the Boiler (BOILER01) and three Combustion Turbine units (CT01, CT02 & CT03) sources.				
3) Per Table A.1				
4) Per Table G.5				
5) For NOx, (A) x (B) & (D) x (E); for VOC, (G) x (H) & (J) x (K)				
6) (C) + (F) + (I) + (L). This is compared to the ozone SIL value in Table B.1 and added to the ozone design value to demonstrate that the cumulative ozone impact is less than the ozone NAAQS in Table B.4.				

G.2. CLASS II NAAQS

G.2.a. $PM_{2.5}$

Since the project emissions used in the Class II SIL modeling are the same as those used in the Class II NAAQS analysis, the total secondary project impact from Table G.4 above should also be used for Table B.4 (Class II Full Impact Analysis – NAAQS).

G.2.b. Ozone

Since the project emissions used in the Class II SIL analysis are the same as those used in the Class II NAAQS analysis, the total secondary project impact from Table G.6 above should also be used for Table B.4 (Class II Full Impact Analysis – NAAQS).

G.3. CLASS II Increment ($PM_{2.5}$ only)

While secondary impacts from existing sources are accounted for within applied background concentrations in NAAQS analyses, ambient background is NOT included in the PSD Increment analyses. Thus, it is necessary for the facility to address secondary formation from NOx and SO_2 (as appropriate) from existing facility and off-property emissions using an alternative method, i.e., MERPs.

However, no additional secondary impact analysis was conducted for offsite sources. This is because this project will set the MSBD for $PM_{2.5}$ for Colleton County and no offsite sources were required to be included in the increment modeling. Thus, the same secondary impacts for the project sources, shown in Table G.4, were added to the modeled concentrations in Table B.6.

G.4. CLASS II – ADDITIONAL IMPACT ANALYSIS – SOILS & VEGETATION

G.4.a. $PM_{2.5}$

Since the project emissions used in the Class II SIL modeling are the same as those used in the Class II Soils and Vegetation analysis, the total secondary project impact from Table G.4 above should also be used for Table C.1 (Soils and Vegetation Analysis).

G.4.b. Ozone

Since the project emissions used in the Class II SIL analysis are the same as those used in the Class II Soils and Vegetation analysis, the total secondary project impact from Table G.6 above should also be used for Table C.1 (Soils and Vegetation Analysis).

G.5. CLASS I SIL ($PM_{2.5}$ only)

Project emissions are greater than the respective SER threshold for $PM_{2.5}$, SO_2, and NOx as shown in Table A.1. As a result, both the primary project emission impacts (modeled using AERMOD/CALPUFF) and secondary $PM_{2.5}$ project emission impacts (calculated using MERPs) are combined and compared to the appropriate $PM_{2.5}$ Class I SIL as shown in Table D.1.

Distance-weighted MERPs - For Class II modeling purposes, the air quality modeling analysis is performed for "ambient air" locations at and beyond the project facility fence line. For this reason, the highest concentrations at any distance from the hypothetical facility are typically most suitable for Class II project secondary impact calculations. Since a Class I Area (and related Class I receptors) may be rather distant from the project facility/source, the secondary impacts calculated for any distance from the facility may be too conservative. For this reason, distance-weighted MERPs from EPA's hypothetical source modeling can be used to refine the secondary impacts for Class I area analyses.

The project location is 93 km from Cape Romain NWR. For the Class I SIL demonstrations, secondary $PM_{2.5}$ was calculated via linear interpolation between the 80km and 100km MERPs using the distance from the site to Cape Romain. The data and calculations are shown in Tables G.7 and G.8 (below).

Table G.7 PSD CLASS I SECONDARY – DISTANCE WEIGHTED – IMPACTS TO $PM_{2.5}$ FOR HYPOTHETICAL SOURCE IN ALLENDALE COUNTY (1)									
Primary Pollutant		**Hypothetical Source**		**Secondary Impact (μg/m³)**					
				Distance = 80 km		**Distance = 93 km**		**Distance = 100 km**	
		Emissions (TPY)	**Stack Height (m)**	**NOx**	**SO_2**	**NOx**	**SO_2**	**NOx**	**SO_2**
$PM_{2.5}$	**24-hour**	500	10	0.0334	0.1910	0.0268	0.1542	0.0233	0.1344
	Annual	500	10	0.0017	0.0039	0.0013	0.0031	0.0011	0.0027
	24-hour	500	90	0.0244	0.0995	0.0217	0.0866	0.0202	0.0796
	Annual	500	90	0.0012	0.0030	0.0011	0.0026	0.0010	0.0024
1) For the Class I SIL demonstrations, secondary $PM_{2.5}$ was calculated via linear interpolation between the 80km and 100km MERPs using the distance from the site to Cape Romain (93km).									

Table G.8 $PM_{2.5}$ PROJECT SECONDARY IMPACT ANALYSIS - EPA HYPOTHETICAL MODELING (MERPs) FOR CAPE ROMAIN NWR (DISTANCE = 93 KM)					
Secondary Pollutant			**$PM_{2.5}$**		**Units**
			24-hour	**Annual**	
NOx	Emissions (1)	Project (3)	68.22	68.22	TPY
		Hypothetical Source (4)	500	500	TPY
		(A) Project / Hypothetical Source	0.1364	0.1364	None
	Secondary Impact (1)	(B) Hypothetical Source (4)	0.0268	0.0013	$\mu g/m^3$
		(C) Project (5)	0.0037	0.0002	$\mu g/m^3$
	Emissions (2)	Project (3)	665.40	665.40	TPY
		Hypothetical Source (4)	500	500	TPY
		(D) Project / Hypothetical Source	1.3308	1.3308	None
	Secondary Impact (2)	(E) Hypothetical Source (4)	0.0217	0.0011	$\mu g/m^3$
		(F) Project (5)	0.0289	0.0015	$\mu g/m^3$
SO_2	Emissions (1)	Project (3)	0.53	0.53	TPY
		Hypothetical Source (4)	500	500	TPY
		(G) Project / Hypothetical Source	0.0011	0.0011	None
	Secondary Impact (1)	(H) Hypothetical Source (4)	0.1542	0.0031	$\mu g/m^3$
		(I) Project (5)	0.0002	3.410E-06	$\mu g/m^3$
	Emissions (2)	Project (3)	118.32	118.32	TPY
		Hypothetical Source (4)	500	500	TPY
		(J) Project / Hypothetical Source	0.2366	0.2366	None
	Secondary Impact (2)	(K) Hypothetical Source (4)	0.0866	0.0026	$\mu g/m^3$
		(L) Project (5)	0.0205	0.0006	$\mu g/m^3$
Total Secondary $PM_{2.5}$ Project Impact (6)			0.0532	0.0023 (7)	$\mu g/m^3$

***** Due to rounding, TPY emission rates may not equal the same result obtained when the lb/hr rates above are multiplied by 4.38. The facility submitted numbers were conservative and have been used as the final values seen within the "Total Secondary PM2.5 Project Impact" row.

1) Emissions and impacts associated with the MERPs stack height of 10 meters. This includes the three Emergency Generators (EMGEN01-EMGEN03), two Fire Pumps (FP01 & FP02), four Fuel Gas Heaters (HEAT01-HEAT04), Cell Tower Emergency Generator (EMGEN04), and SIP Hut Generator (EMGEN05) sources.

2) Emissions and impacts associated with the MERPs stack height of 90 meters. This includes the Boiler (BOILER01) and three Combustion Turbine units (CT01, CT02 & CT03) sources.

3) Per Table A.1

4) Per Table G.7

5) For NOx, (A) x (B) & (D) x (E); for SO_2, (G) x (H) & (J) x (K)

6) (C) + (F) + (I) + (L). This is added to the primary modeled $PM_{2.5}$ project impact in Table D.1.

7) DES calculated a Total Secondary $PM_{2.5}$ Project Impact annual value of 0.0023 ug/m^3, while the facility's value was 0.0025 ug/m^3. While the SCDES value is shown in this table, the facility value was used in Table D-1. Both values result in the same Total Project Impact Concentration result in Table D-1.

MODELING HISTORY			
Date	**By**	**Reason**	**Description**
Current	BPM/AJF	PSD C/P	Analyses for PSD Class II (SIL, NAAQS, Increment & Soils/Vegetation) and Class I (SIL & AQRV) were performed. Otherwise, Standard 2: compliance was shown using a combination of PSD Class II and SIL results for all pollutants & averaging periods except lead, for which the facility-wide emissions are less than the exemption rate. Standard 8: All combustion emissions are exempt (burning virgin fuel); a de minimis analysis was done for 6 toxics.