Preliminary Determination

October 2023

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City: Atlanta
County: Clayton
AIRS Number: 04-13-063-00105
Application Number: 622776
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Review Conducted by:
State of Georgia - Department of Natural Resources
Environmental Protection Division - Air Protection Branch
Stationary Source Permitting Program

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SUMMARY

The Environmental Protection Division ("Division") has reviewed the application submitted by Delta Air Lines Inc. - Technical Operations Center ("Delta TechOps" or “facility”) for a permit to increase the allowable emission rate for Test Cell No. 5 ("TC5") from 39.5 tons/yr (tpy) NOx to 150 tpy NOx to allow for increased operation of the test cell. Since Delta TechOps is requesting the relaxation of a PSD avoidance limit that was placed on Test Cell No. 5 in the permit to construct, this application will address the PSD requirements as though construction had not yet commenced on the project.

Operation of TC5 will have emissions of particulate matter ("PM/PM_{10}/$PM_{2.5}$"), nitrogen oxides ("NOx"), carbon monoxide ("CO"), sulfur dioxide ("SO_2"), volatile organic compounds ("VOC"), and Total Greenhouse Gases ("Total GHG"). A Prevention of Significant Deterioration ("PSD") analysis was performed for an increase in the allowable emission rate for TC5 from 39.5 tpy NOx to 150 tpy NOx and ancillary equipment for all pollutants to determine if the proposed project would be a major modification for any NSR pollutant and identify pollutants that would exceed the significant emission rate levels. The potential emission of NOx was determined to be above the PSD significant threshold of 40 tpy.

Delta TechOps is located in Clayton County, which is classified as “attainment" for Ozone (O_3), NO_2, SO_2, PM_{10}, $PM_{2.5}$, and CO in accordance with Section 107 of the Clean Air Act, as amended.

The Division's review of the data submitted by Delta TechOps related to the proposed project indicates that the proposed project conforms to all applicable federal standards and Georgia Rules for Air Quality Control. It is also the preliminary determination of the Division that the proposed project provides for the application of Best Available Control Technology ("BACT") for the control of NOx as required by federal PSD regulation 40 CFR 52.21(j).

The Federal Land Manager(s) ("FLM") for PSD Class I areas within 300 km of the facility were contacted, provided preliminary annual emissions data, and given the opportunity for review of additional facility and emissions impact information.

It has been determined through approved modeling techniques that the estimated emissions will not cause or contribute to a violation of any ambient air standard or allowable PSD increment in the area surrounding the facility or in Class I areas located within 300 km of the proposed project. It has further been determined that the proposal will not cause impairment of visibility or detrimental effects on soils or vegetation. Any air quality impacts produced by project-related growth should be inconsequential.

This Preliminary Determination concludes that an Air Quality Permit should be issued to Delta TechOps to increase the allowable emission rate for Test Cell No. 5 ("TC5") from 39.5 tpy NOx to 150 tpy NOx to allow for increased operation of the test cell. This Preliminary Determination also acts as a narrative for the proposed PSD Permit.

1.0 FACILITY INFORMATION & EMISSIONS

The Hartsfield-Jackson Atlanta International Airport (hereinafter "HJAIA"), in general, is owned by the City of Atlanta, and Delta Air Lines, Inc. is one of several companies that operate there. Delta TechOps is located at 1775 MH Jackson Service Rd in Atlanta, Georgia (Clayton County).

Table 1-1 below lists all current Title V permits, all amendments, 502(b)(10) changes, and off-permit changes, issued to Delta TechOps, based on a review of the "Permit" file(s) on the facility found in the Air Branch office.

Table 1-1: List of Current Permits, Amendments, and Off-Permit Changes

Action	Date of Issuance	Description
Permit No. 4512-063-0105-V-04-0 (App # 357160)	July 17, 2020	TV Renewal
Off-Permit Change (App # 27750)	December 14, 2020	Change of chemicals in two of the existing metal finishing tanks (SHEAs 5919 & 5924) in Department 400.
Off-Permit Change (App # 28019)	July 6, 2021	Rebuild burners for Boiler No. 6 (SHEA 4794). This boiler is part of the NSR avoidance groups 6 & 7 and is part of equipment group BF04.
Off-Permit Change (App # 28144)	October 26, 2021	Replacement of a chromium plating tank (SHEA 2580) and associated composite mesh pad (SHEA 6587).
Off-Permit Change (App # 28163)	November 16, 2021	C/O of a temporary boiler (49.3 MMBtu/hr) during the repair of existing Boiler No. 6 with SHEA 4794 (rated at 56 MMBtu/hr).
Off-Permit Change (App # 28214)	December 16, 2021	Replacement of chromium plating tanks (SHEA 0917 and 0919) and associated composite mesh pads.
Off-Permit Change (App # 28858)	June 7, 2023	Installation of a spray paint booth (SHEA 2933) which will be used to control emissions from the spray application of a chemical milling maskant to aircraft parts. The maskant to be used in the booth contains no HAPs, and the booth will be equipped with four stages of filters and will exhaust indoors.
Permit No. 4512-063-0105-V-04-1	August 21, 2023 Draft Issuance	Replacement of control equipment for chrome tanks in Group CP01 and stripping tanks in Group PR01. Updates to Attachment D of the Permit.
Off-Permit Change (App # 28970)	Sept. 18, 2023	Installation of a 40.4 MMBtu/hr temporary boiler while existing Boiler in Equipment Group BF02 is being replaced.
Off-Permit Change (App # 28997)	Sept. 18, 2023	Addition of two parts washers (SHEA 2940 and SHEA 2987)

1.1 Title I (PSD) Status

Delta Air Lines, Inc. (hereinafter "Delta") is composed of the following sites at HJAIA.

Table 1-2: Sites at HJAIA

Site Name	AIRS #	Industrial Group (Two Digit SIC Code)
General Offices	121-00807	45
Worldspan Reservation Center	121-00807	73
Atlanta Station	063-00059	45

Table 1-2: Sites at HJAIA

Site Name	AIRS #	Industrial Group (Two Digit SIC Code)
Technical Operations Center	063-00105	45

Operations at General Offices, Atlanta Station, and the Technical Operations Center comprise one Title I site because they operate under common control; operate under the same industrial grouping (SIC Code 45); and are located on contiguous/adjacent properties.

The Title I Site (excluding Worldspan Reservations Center) is a PSD major source as follows:

- The primary source category (aerospace maintenance, 250 tpy threshold, excludes fugitives) has potential VOC emissions greater than 250 tpy; and
- The nested source category (boilers > 250 MMBtu/hr, 100 tpy thresholds, includes fugitives) has potential emissions of SO_2 and NOx greater than 100 tpy.

The addition of TC5 is a modification to the primary source category (aerospace maintenance).

Table 1-3: Title I Major Source Status of Delta's Operations at HJAIA

Pollutant	Is the Pollutant Emitted?	If emitted, what is the facility's Title I status for the Pollutant?		
		Major Source Status	Major Source Requesting SM Status	Non-Major Source Status
PM	Yes			✓ PTE<250 tpy
PM_{10}	Yes			✓ PTE<250 tpy
$PM_{2.5}$	Yes			✓ PTE<250 tpy
SO_2	Yes	✓ PTE>250 tpy		
VOC	Yes			✓ PTE<250 tpy
NOx	Yes	✓ PTE>250 tpy		
CO	Yes			✓ PTE<250 tpy
TRS	No	--	--	--
H_2S	No	--	--	--
Total GHGs	Yes			✓ PTE<100,000 tpy

1.2 Title V Status

Operations at General Offices, Atlanta Station, the Worldspan Reservation Center, and the Technical Operations Center comprise one Title V site because they operate under common control and are located on contiguous/adjacent properties for emissions of hazardous air pollutants. Table 1-4 specifies the Title V Major Source Status of the Title V site.

Table 1-4: Title V Major Source Status of Delta's Operations at HJAIA

Pollutant	Is the Pollutant Emitted?	If emitted, what is the facility's Title V status for the Pollutant?		
		Major Source Status	Major Source Requesting SM Status	Non-Major Source Status
PM	Yes			✓ PTE<100 tpy
PM_{10}	Yes			✓ PTE<100 tpy
$PM_{2.5}$	Yes			✓ PTE<100 tpy
SO_2	Yes	✓ PTE>100 tpy		
VOC	Yes	✓ PTE>100 tpy		
NOx	Yes	✓ PTE>100 tpy		
CO	Yes	✓ PTE>100 tpy		
TRS	--	--	--	--
H_2S	--	--	--	--
Individual HAP	Yes	✓ PTE> 10 tpy		
Total HAPs	Yes	✓ PTE> 25 tpy		
Total GHGs	Yes			✓ PTE<100,000 tpy

For Title V purposes, the Title V Site is major for SO_2, NOx, VOC, individual HAP, and total HAP emissions.

1.3 Purpose of Application

On March 31, 2023, Delta TechOps submitted an application, assigned Application # 622776, for an air quality permit authorizing an increase in the allowable NOx emission rate for Engine Test Cell No. 5 (SHEA 5898, hereinafter "TC5") from 39.5 tons per year (tpy) to 150 tpy. The potential increase in emissions from the Delta TechOps-TC5 project is due to increased demand for engine testing. On September 7, 2023, Delta TechOps submitted an updated application addressing revised potential emissions of CO, VOC, SO_2, PM, PM_{10}, and $PM_{2.5}$ and added sulfuric acid mist (SAM) emissions.

The proposed increased operation of the Delta TechOps TC5 project will result in increases in VOC emissions from other associated emission units (ancillary equipment) as specified in Table 1-5:

Table 1-5: Associated Emission Units

SHEA ID	Emission Source Description
5936	Preservation Oil Storage Tank
5938	Lubrication Oil Storage Tank

Table 1-5: Associated Emission Units

SHEA ID	Emission Source Description
5890	Diesel Fuel Storage Tank and Pump Station[1]
5893	Used Oil Storage Tank
5894	Jet-A Fuel Storage Tank
5895	Jet-A Fuel Storage Tank
9031	Flush Cleaning Operations
--	General Fugitive Material Usage

Construction and operation of TC5 (and associated ancillary equipment) was authorized in Permit No. 4512-063-0105-V-03-2 (issued July 12, 2017, based on Application # 44147). Operation of Delta Tech Ops TC5 commenced in January 2019. Since Delta TechOps is requesting the relaxation of a PSD avoidance limit that was placed on TC5 in the permit to construct, this application will address the PSD requirements as though construction had not yet commenced on TC5. Therefore, the application and emission calculations have been prepared by Delta TechOps as if TC5 were a new unit, and the PSD avoidance limit for NOx had not been put in place.

Delta TechOps also requested that their air permit be updated to incorporate Division approved Title V Off-Permit Changes as well as equipment removals, and their request is documented in Appendix E of Application # 622776. Table 1-6 summarizes the additions and deletions of equipment in Appendix D of their existing air permit.

Table 1-6: Other Requested Changes to Attachment D of Permit No. 4512-063-0105-V-04-0

SHEA ID	Equipment Group	Action
0081	ET01-Jet Engine Test Cells and APU Test Cells	Jet Engine Test Cell No. 2: Decommissioned in March 2023
0136	DG01-Vapor Degreasers	Removed
0137	DG01-Vapor Degreasers	Removed
0243	PT01-Aerospace Spray Booths	Removed
0363	PT01-Aerospace Spray Booths	Removed
0485	DG01-Vapor Degreasers	Removed
0650	BF03-Process Heaters	Removed
0677	BF03-Process Heaters	Removed
0918	CP01-Chrome Plating Tanks	Removed
0919 & 6588	CP01-Chrome Plating Tanks & Associated Composite Mesh Pads	Removed
0920	CP01-Chrome Plating Tanks	Removed
0935	CP01-Chrome Plating Tanks	Removed
0937	CP01-Chrome Plating Tanks	Removed
0948	CP01-Chrome Plating Tanks	Removed
1501	CP01-Chrome Plating Tanks	Removed
1702	PG01-Aerospace Spray Gun Cleaners	Removed

[1] Note: The fuel pump is used to dispense diesel fuel from the tank to mobile equipment. The pump is electrically driven and does not combust fuel. Therefore, there are no emissions from the pump.

Table 1-6: Other Requested Changes to Attachment D of Permit No. 4512-063-0105-V-04-0

SHEA ID	Equipment Group	Action
1779	PG01-Aerospace Spray Gun Cleaners	Removed
1783	PG01-Aerospace Spray Gun Cleaners	Removed
2940 & 2987	FC01-Aerospace Flush Cleaning (Non-aqueous/Non-semi-aqueous)	**Added** SHEA 2940 & 2987 (Application # 28997, 8/30/2023)
2580 & 6587	CP01-Chrome Plating Tanks & Associated Composite Mesh Pad	**Added** SHEA 2580 and replaced SHEA 6587 (Application # 28144, 9/28/2021)
2933	Spray Booth equipped with four stages of filters and to be exhausted indoors.	**Added** SHEA 2933 per Application # 28858, 5/2/2023
4469	PT01-Aerospace Spray Booths	Removed
4845	DG01-Vapor Degreasers	Removed
4853	FC01-Aerospace Flush Cleaning (Non-Aqueous/Non-Semi-Aqueous)	Removed
9522	CP01-Chrome Plating Tanks	Removed
9926	FC01-Aerospace Flush Cleaning (Non-Aqueous/Non-Semi-Aqueous)	Removed

1.4 Emissions Data

The International Civil Aviation Organization (ICAO) has developed the Engine Emissions Databank (EEDB). The ICAO-EEDB contains information on CO, NOx, and total hydrocarbon (THC) exhaust emissions of production aircraft engines, measured according to the procedures in ICAO Annex 16, Volume II-Aircraft Engine Emissions, and where noted, certified by their States of Design as implemented in their national regulations.

The emissions during standardized Landing-Takeoff ("LTO") cycles are reported as emission indices (EIs) expressed as mass of pollutant per unit mass of fuel burned. The emission indices in the ICAO-EEDB are provided for four phases of flight modes: "take-off", "climb-out", "approach", and "idle". Delta TechOps noted that the different power settings used during engine testing in TC5 do not fit into the four phases of flight modes that are used to normalize the data in the EEDB (each LTO mode). To achieve a more accurate representation of engine testing, Delta TechOps found it necessary to convert these flight mode EI's so that they can be evaluated at all power settings for emissions of CO, NOx, and THC.

Appendix B of Application # 622776 (and updated August 2, 2023, and September 7, 2023, as presented in Appendix A of this Preliminary Determination) includes Delta TechOps' emissions calculations for NOx, CO, PM/PM_{10}/$PM_{2.5}$, SO_2, and CO_2e from the proposed project. Appendix C-Attachment 4 includes Delta's emissions calculations for SAM from TC5.

Emissions of NOx

Using the fuel flow (mass per second) and emissions indices provided in the EEDB, a third-order equation was derived by Delta TechOps using the Least Squares method for computing emissions of NOx per unit mass of fuel combusted per engine type tested per LTO cycle mode. The third-order equations for predicting NOx emissions, based on engine type, are programmed into their Data Acquisition System (DAS) associated with the operation of TC5 for computing and documenting monthly NOx emissions from TC5. The Division agrees with Delta TechOps that this approach provides for conservative NOx emissions rates for the forecasted jet engines to be tested in TC5.

Emissions of CO

Delta TechOps determined the CO emission rates for each of the tested engine models using representative engine model data contained in the ICAO-EEDB. CO emissions are calculated based on a linear interpolation of the four phases of flight mode data per engine type tested.

Potential CO emissions from TC5 are anticipated to be lower than presented in Application # 44147 based on the engine types to be tested in TC5 per this application. The Division agrees with Delta TechOps that this approach provides for a conservative CO emissions rate.

Emissions of Particulate Matter (PM/PM_{10}/$PM_{2.5}$)

The estimation of PM emissions from TC5 employs linear interpolation and involves calculating three separate indices: non-volatile, volatile sulfate, and volatile organic. Calculating these indices is a one-time effort for each engine model, using data from the ICAO-EEDB. Once these three indices are calculated, they are submitted to get the total PM emissions.

Potential PM, PM_{10}, and $PM_{2.5}$ emissions from Delta TechOps TC5 are anticipated to be lower than proposed in Application # 44147 based on the engine types to be tested in TC5.

The Division agrees with Delta TechOps that this approach provides for a conservative PM/$PM_{2.5}$/PM_{10} emissions rate for the revised operating scenario.

Emissions of SO_2

Delta TechOps conservatively estimated the potential SO_2 emission rate for TC5 using the maximum fuel usage per test, the potential number of tests per year, and the maximum sulfur (S) content of jet fuel per ASTM D1655 (0.3%). It was assumed that 100% of S is converted to SO_2 during combustion. The Division agrees with Delta TechOps that this approach provides for a conservative SO_2 emissions rate for the revised operating scenario.

Emissions of Sulfuric Acid Mist (SAM)

Delta TechOps estimated the potential SAM emission rate for TC5 by assuming 2.4% of sulfur (S) in the jet fuel is converted to H_2SO_4 in accordance with the ICAO Airport Air Quality Manual.[2] The maximum fuel usage per test, the potential number of tests per year, and the maximum S content of jet fuel per ASTM D1655 (0.3%) were used to calculate the annual mass of S, which was then converted to the mass of H_2SO4 using the molecular weights of each chemical (32 g/mol for S and 98 g/mol for H_2SO_4).

Emissions of VOCs

Delta TechOps determined the HC emission rates for each of the tested engine models using representative engine model data contained in the ICAO-EEDB. HC emissions are calculated based on a linear interpolation of the four phases of flight mode data per engine type tested. Delta applied the HC to VOC emissions conversion method outlined in Volume IV of the U.S. EPA AP-42 guidance.

Delta TechOps presented detailed VOC emissions calculations for the associated emissions units in Application # 44147-Appendix C and they scaled up these values using a ratio of (150 tpy/39.5 tpy) as part of Application # 622776.

The Division agrees with Delta TechOps that this approach provides for a conservative VOC emissions rate for the revised operating scenario.

Emissions of Carbon Dioxide Equivalent (CO_2e)

The potential CO_2e emissions from TC5 were calculated using the Tier III CO_2 calculation method outlined in 40 CFR 98 Subpart C, the maximum carbon content from sampling data obtained from quarterly Jet-A fuel analysis conducted by Delta over the last two years, and the maximum annual fuel consumption rate.

The Division agrees with Delta TechOps that this approach provides for conservative CO_2e emissions rates for the revised operating scenario.

1.5 Conclusion

The potential emissions increases based on Application # 622776 are summarized in Table 1-7.

Table 1-7: Potential Emissions Increases from the Project

Pollutant	New Unit Emission Increase (tpy)	Existing Units Emission Increases (tpy)	Associated Units Emissions Increases (tpy)	Total Project Emissions Increase (tpy)	PSD Significant Emission Rate (SER) (tpy)	Subject to PSD Review
PM	1.4	0.0	0.0	0.3	25	No
PM_{10}	1.4	0.0	0.0	0.3	15	No
$PM_{2.5}$	1.4	0.0	0.0	0.3	10	No

[2] https://www.icao.int/environmental-protection/Documents/Doc%209889.SGAR.WG2.Initial%20Update.pdf

Pollutant	New Unit Emission Increase (tpy)	Existing Units Emission Increases (tpy)	Associated Units Emissions Increases (tpy)	Total Project Emissions Increase (tpy)	PSD Significant Emission Rate (SER) (tpy)	Subject to PSD Review
VOC	0.13	0.0	5.4	5.5	40	No
NOx	150	0.0	0.0	150	40	Yes
CO	7.2	0.0	0.0	7.2	100	No
SO_2	27.0	0.0	0.0	27.0	40	No
Pb[3]	0	--	--	--	0.6	No
Fluorides[3]	0	--	--	--	3	No
SAM	1.0	--	--	1.0	7	No
H_2S[3]	0	--	--	--	10	No
TRS[3]	0	--	--	--	10	No
Reduced Sulfur Compounds[3]	0	--	--	--	10	No
CO_2e	13,751	--	0.0	13,751	75,000	No

As shown in Table 1-7, Delta TechOps' potential emissions increase of CO, VOC, SO_2, PM, PM_{10}, $PM_{2.5}$, lead, fluorides, SAM, H_2S, TRS, reduced sulfur compounds, and GHG are below the relevant thresholds for PSD applicability. Delta TechOps' proposed project is classified as a major modification to a PSD major stationary source because the potential emissions of NOx are greater than 40 tons per year.

Through its new source review procedure, the Division has evaluated Delta TechOps' proposal for compliance with State and Federal requirements. The findings of the Division have been assembled in this Preliminary Determination.

[3] Emissions of Pb, fluorides, H_2S, TRS, and reduced sulfur compounds were determined to be negligible given that these pollutants are not expected to be emitted from Jet A combustion and there are no established emission factors or emission rates for these pollutants from Jet A combustion.

2.0 PROCESS DESCRIPTION

Delta TechOps performs aircraft maintenance and repair operations. Specific activities conducted at the facility include, but are not limited to, surface coating, solvent cleaning, electroplating, depainting, engine testing, and facilities support activities including boilers, emergency power generators, and fire pumps.

Application # 622776 readdresses the permitting of TC5 which was originally addressed in Application # 44147. Table 2-1 summarizes updates to Application # 44147 as stated in Application # 622776:

Table 2-1: Updates to Application # 44147 as Stated in Application # 622776

Proposed Emissions Units in App # 44147	Description	Note(s) per Application # 622776
SHEA 5938	200-gallon lubrication oil storage tank Classified as a Title V Insignificant Source	Potential increase in VOC emissions.
SHEA 5936	200-gallon preservation oil storage tank Classified as a Title V Insignificant Source	Potential increase in VOC emissions.
SHEA 5890	200-gallon diesel storage tank and fuel pump station Classified as a Title V Insignificant Source	Potential increase in VOC emissions.
SHEA 5893	2,000-gallon used oil storage tank Classified as a Title V Insignificant Source	Potential increase in VOC emissions.
SHEA 5894	25,000-gallon jet-A fuel storage tank Classified as a Title V Insignificant Source	Potential increase in VOC emissions.
SHEA 5895	25,000-gallon jet-A fuel storage tank Classified as a Title V Insignificant Source	Potential increase in VOC emissions.
SHEA 5898	Engine Test Cell No. 5 (SHEA 5898)	Requests a new NOx emissions limit of 150 tpy.
SHEA 5901	40-gallon pneumatic pressure pot with spray gun (i.e., flush cleaning operations) Classified as a Title V Insignificant Source	Potential increase in VOC emissions.

Jet engine test cells are structures designed to hold and operate aircraft engines for the purpose of performing sophisticated monitoring of engine performance under variable pre-flight and flight conditions. Periodic jet engine testing is required to meet Federal Aviation Administration (FAA) regulatory requirements as well as manufacturer specified maintenance to ensure safe and efficient engine operation. As part of the aircraft engine testing operation conducted at Delta TechOps, they currently maintain and operate three jet engine test cells: Test Cell No. 3 (SHEA 0077), Test Cell No. 4 (SHEA 0078), and Test Cell No. 5 (SHEA 5898). Delta TechOps also operates Test Cell with SHEA 1123 for testing and maintenance of auxiliary power units (APUs) which run the electrical systems on aircraft.

The principal components of jet engine test cells are: 1) a building that encloses the engine and instrumentation and provides fuel and structural support during testing; 2) an augmentation tube;

and 3) a blast room and exhaust. During the testing, the engine is operated at various power levels to simulate flight conditions and to test the engine over the full test cycle.

The Delta TechOps permit application and supporting documentation are included in Appendix A of this Preliminary Determination and can be found online at the following URL: https://epd.georgia.gov/psd112gnaa-nsrpcp-permits-database

3.0 REVIEW OF APPLICABLE RULES AND REGULATIONS

Delta TechOps is subject to a number of state rules in Georgia Rule 391-3-1 (PM, SO_2, NOx, VOC, and visible emissions) and federal regulations (40 CFR 60 and 63). This review provides a regulatory review associated with the proposed project.

3.1 State Rules

Georgia Rule 391-3-1-.03(1), Construction Permit, requires that any person prior to beginning the construction or modification of any facility which may result in an increase in air pollution shall obtain a permit for the construction or modification of such facility from the Director upon a determination by the Director that the facility can reasonably be expected to comply with all the provisions of the Act and the rules and regulations promulgated there under.

Georgia Rule 391-3-1-.03(8)(b) continues that no permit to construct a new stationary source of modify an existing stationary source shall be issued unless such proposed source meets all the requirements for review and obtaining a permit prescribed in Title I, Part C of the Federal Act [i.e., Prevention of Significant Deterioration of Air Quality (PSD)], and Section 391-3-1-.02(7) of the Georgia Rules (i.e., PSD).

Georgia Rule 391-3-1-.02(2)(b), Visible Emissions, limits the opacity of visible emissions from any air contaminant source which is subject to some other emission limitation under section (2). The opacity of visible emissions from regulated sources may not exceed 40 percent under this general visible emission standard. It is expected that the opacity of all emissions from the proposed project will be much less than 40 percent.

Georgia Rule 391-3-1-.02(2)(d), Fuel-burning Equipment limits particulate and visible emissions from fuel-burning equipment. Fuel-burning equipment is defined as, "equipment the primary purpose of which is the production of thermal energy from the combustion of any fuel". Because TC5 does not meet this definition, Georgia Rule (d) does not apply.

Georgia Rule 391-3-1-.02(2)(e), Particulate Emission from Manufacturing Processes establishes particulate emissions per process input weight rate formulas. Historically, the Division has not subjected PM emissions from jet engine testing to this state rule because jet engine testing is not considered a manufacturing process. This historical interpretation will continue to be enforced per the proposed project.

Georgia Rule 391-3-1-.02(2)(g), Sulfur Dioxide
Georgia Rule (g)1. applies to the jet engines to be tested in TC5 because the jet engines meet the following criteria:

- Constructed and/or extensively modified after January 1, 1972;
- Are classified as *fuel-burning sources;*
- Have a maximum fossil fuel firing rate exceeding 250 MMBtu/hr heat input; and
- Combust liquid fossil fuel.

Georgia Rule (g)1. establishes an SO_2 emission limit of 0.8 lb/MMBtu. The estimated SO_2 emissions rate from the jet engines to be tested is estimated to be 0.304 lb SO_2/MMBtu heat input (assumes all the fuel sulfur is converted to SO_2 in emissions). The origin of this numerical value is based on the following:

Parameter	Parameter Value	Origin
Max. Fuel Sulfur Content	0.003 lb S/lb fuel	ASTM D1655- Standard Specification for Aviation Turbine Fuels
Heating Value of Jet Fuel	135,000 Btu/gallon	
Density of Jet Fuel A	6.84 lb fuel/gal fuel	
(lb SO_2/MMBtu) = (0.003 lb S/lb fuel)*(2 lb SO_2/lb S)*(gal fuel/0.135 MMBtu)*(6.84 lb fuel/gal fuel) = 0.304 lb SO_2/MMBtu		

Therefore, compliance with Georgia Rule (g)1. is expected.

Georgia Rule (g)2. establishes an allowable sulfur in fuel content on a weight percent basis for TC5. Jet engines to be tested TC5 will have a maximum heat input capacity greater than 100 MMBtu/hr, and therefore the allowable fuel sulfur content, per Georgia Rule (g)2. is limited to less than 3.0 weight percent.

Existing Condition 3.2.12 establishes a maximum fuel sulfur content of 0.3 weight percent for any fuel combusted in TC5 for purposes of compliance with Georgia Rule 391-3-1-.03(8)(c)13.(iv). Note that Georgia Rule 391-3-1-.03(8)(c)13.(iv) was removed in 2018 from Georgia Chapter 391-3-1 and Jet fuel is limited to 0.3 percent sulfur by weight as defined by ASTM D1655, "Standard Specification for Aviation Turbine Fuels". This Condition will be modified to require Delta to only combust jet fuel in TC5 meeting the requirements of ASTM D1655.

Georgia Rule (n), Fugitive Dust establishes allowable opacity and work practice standards to minimize fugitive dust. Due to the nature of the proposed project, the likelihood of violation is minimal.

Georgia Rule 391-3-1-.02(2)(ff) "Solvent Metal Cleaning" establishes the VOC control requirements for the operation of vapor degreasers at Delta TechOps because the facility is located in Clayton County and has potential VOC emissions greater than 15 pounds per day. No revision is necessary to the Permit regarding this state rule based on the proposed project.

Georgia Rule 391-3-1-.02(2)(tt) "VOC Emissions from Major Sources"
Please refer to Section 4 of this Preliminary Determination regarding Georgia Rule (tt) applicability analysis and compliance demonstration review.

Georgia Rule 391-3-1-.02(2)(vv)-"Volatile Organic Liquid Handling and Storage" establishes the VOC requirements associated with the transfer of any volatile organic liquid other than gasoline from any delivery vessel into a stationary storage tank of greater than 4,000 gallons unless the tank is equipped with submerged fill pipes. The requirements of Georgia Rule (vv) apply to tanks in Equipment Group ST01. No revision is necessary to the Permit regarding this state rule based on the proposed project.

Georgia Rule 391-3-1-.02(2)(yy) "NOx Emissions from Major Sources"
Please refer to Section 5 of this Preliminary Determination regarding Georgia Rule (yy) applicability analysis and compliance demonstration review.

Georgia Rule 391-3-1-.02(2)(kkk) "VOC Emissions from Aerospace Manufacturing and Rework Facilities": This state rule applies to particular operations at Delta TechOps because the facility is located in Clayton County; has potential emissions of VOCs exceeding 25 tpy; and meets the definition of an "Aerospace Facility" per Georgia Rule (kkk)17.(v). The requirements of this state rule apply to operations in Equipment Groups DP01, FC01, PG01, PR01, PT01, SC04, and AQ01. No revisions to the Permit regarding this state rule are necessary based on the proposed project.

Georgia Rule 391-3-1-.02(2)(lll) "NOx Emissions from Fuel-Burning Equipment"
This state rule applies to fuel-burning *affected units* in Equipment Group BF04 because the facility is located in Clayton County; and operates fuel-burning equipment permitted after May 1, 1999. No revisions to the Permit regarding this state rule are necessary based on the proposed project.

Georgia Rule 391-3-1-.02(2)(rrr) "NOx Emissions from Small Fuel-Burning Equipment"
This state rule applies to fuel-burning *affected units* in Equipment Group BF02 because the facility is located in Clayton County; and has potential NOx emissions exceeding 25 tpy. No revisions to the Permit regarding this state rule are necessary based on the proposed project.

3.2 Federal Rules

Prevention of Significant Deterioration (40 CFR 52.21): The regulations for PSD in 40 CFR 52.21 require that any new major source or modification of an existing major source be reviewed to determine the potential emissions of all pollutants subject to regulations under the Clean Air Act. The PSD review requirements apply to any new or modified source which belongs to one of the 28 specific source categories having potential emissions of 100 tpy or more of any regulated pollutant, or to all other sources having potential emissions of 250 tpy or more of any regulated pollutant. They also apply to any modification of a major stationary source which results in a significant net emission increase of any regulated pollutant.

Georgia has adopted a regulatory program for PSD permits, which the United States Environmental Protection Agency (U.S. EPA) has approved as part of Georgia's State Implementation Plan (SIP). This regulatory program is in Georgia Rule 391-3-1-.02(7). This means that the Division issues PSD permits for new major sources or major modifications pursuant to the requirements of Georgia's regulations. It also means that the Division considers, but is not legally bound to accept, the U.S. EPA's comments or guidance. A commonly used source of EPA guidance on PSD permitting is EPA's Draft October 1990 New Source Review Workshop Manual for Prevention of Significant Deterioration and Nonattainment Area Permitting (NSR Workshop Manual). The NSR Workshop Manual is a comprehensive guidance document on the entire PSD permitting process.

The PSD regulation (40 CFR 52.21) requires that any major stationary source or major modification subject to the regulation meet the following requirements:

- Application of BACT for each regulated pollutant that would be emitted in significant amounts;
- Analysis of the ambient air impact;
- Analysis of the impact on soils, vegetation, and visibility;
- Analysis of the impact on Class I areas; and
- Public notification of the proposed plant in a newspaper of general circulation.

40 CFR 60 Subpart Dc – Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units: This federal regulation applies to fuel-burning equipment constructed after June 9, 1989 rated at or above 10 MMBtu/hr in Equipment Group BF04. <u>No revisions to the Permit regarding this federal regulation are necessary based on the proposed project.</u>

40 CFR 63 Subpart N – National Emission Standards for Chromium Emissions from Hard and Decorative Chromium Electroplating and Chromium Anodizing Tanks: This federal regulation applies to *affected sources* in Equipment Group CP01 because Delta TechOps performs hard chromium electroplating, decorative chromium electroplating, or chromium anodizing and the facility is a major source of HAPs. <u>No revisions to the Permit regarding this federal regulation are necessary based on the proposed project.</u>

40 CFR 63 Subpart T – National Emission Standards for Halogenated Solvent Cleaning: This federal regulation applies to equipment in Equipment Group DG01 which use a halogenated HAP solvent because the facility is a major source of HAPs. <u>No revisions to the Permit regarding this federal regulation are necessary based on the proposed project.</u>

40 CFR 63 Subpart GG – National Emission Standards for Aerospace Manufacturing and Rework Facilities: The engine cleaning operation (SHEA 5901), which will be affected by the project, is considered a *flush cleaning operation* under Subpart GG. Therefore, this regulation would apply to the engine cleaning operation (SHEA 5901) for TC5, as Delta TechOps and the Division concluded as part of Application # 44147. In addition, Delta TechOps notes that some of the general fugitive material usage operations may also be regulated by this NESHAP. Delta TechOps will continue to comply with the requirements of this regulation as it applies to applicable operations at Delta TechOps. All other emission sources associated with the operation of TC5 are not listed as affected sources under this NESHAP.

<u>No updates to NESHAP Subpart GG applicability are warranted based on the proposed project.</u>

40 CFR 63 Subpart DDDDD – National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters: This federal regulation applies to fuel-burning *affected units* in Equipment Groups BF02 and BF04 that meet the applicable requirements specified in 40 CFR 63.7490 and because the facility is a major source of HAPs. <u>No revisions to the Permit regarding this federal regulation are necessary based on the proposed project.</u>

40 CFR 63 Subpart PPPPP- National Emission Standards for Hazardous Air Pollutants for Engine Test Cells/Stands: Subpart 5P was promulgated in May 2003 and applies generally to internal combustion (IC) engine test cells/stands that are located at major sources of HAP emissions. As a source category, TC5 would be potentially subject to this NESHAP. However, TC5 is exempt from the requirements of this subpart and the NESHAP General Provisions (Subpart A) per 40 CFR 63.9290(d)(1) which exempts "any portion of a new or reconstructed affected source located at a major source" used exclusively for testing combustion turbine engines.

No updates to NESHAP Subpart PPPPP applicability are warranted based on the proposed project.

40 CFR 1031-Control of Air Pollution from Aircraft Engines*:* This federal regulation does not apply specifically to Delta TechOps but to the manufacturers of the jet engines to be tested by Delta TechOps in TC5. The EPA has adopted, by reference in 40 CFR 1031 selected sections of the ICAO Annex 16, Volume II (Aircraft Engine Emissions) and the method of verifying compliance. The Federal Aviation Administration (FAA) sets and administers the Certification Requirements for aircraft engines to demonstrate compliance with the emission standards, per 14 CFR 34. Emissions of CO, NOx, HC, and nvPM (non-volatile PM) in grams of pollutant per kilogram of fuel used for each emissions index ("take-off", "climb-out", "approach", and "idle") must comply with the applicable provisions of 40 CFR 1031 as determined by the FAA.

3.3 Excess Emissions During Startup, Shutdown, and Malfunctions[4]

Excess emission provisions for startup, shutdown, and malfunction are provided in Georgia Rule 391-3-1-.02(2)(a)7. Delta TechOps cannot anticipate or predict malfunctions. However, Delta TechOps is required to minimize emissions during periods of startup, shutdown, and malfunction.

The proposed NOx BACT emissions limit for this project includes all times, including startup and shutdown.

Note: Delta TechOps included NOx emissions from "idling" in the BACT and PSD modeling analyses, and they assert that "idling" emissions upon startup of the jet engine in the test cell can correspond to the "startup" mode covered under Georgia Rule 391-3-1-.02(2)(a)7.

[4] *Policy on Excess Emissions During Startup, Shutdown, Maintenance, and Malfunctions*, EPA Memo from Kathleen M. Bennett, September 28, 1982.

4.0 CONTROL TECHNOLOGY REVIEW OF VOC RACT

4.1. Introduction

Delta TechOps Application # 44147 (Permit No. 4512-063-0105-V-03-2) addressed the needed applicability analysis and compliance demonstration (or negative applicability declaration) for purposes of VOC RACT per Georgia Rule 391-3-1-.02(2)(tt). Georgia Rule(tt) applies to VOC emission sources located in the counties of Cherokee, Clayton, Cobb, Coweta, DeKalb, Douglas, Fayette, Forsyth, Fulton, Gwinnett, Henry, Paulding, and Rockdale which have potential VOC emissions exceeding 25 tpy. Georgia Rule (tt) requires a case-by-case analysis of VOC Reasonably Achievable Control Technology (RACT) for all emission sources not subject to any other more specific VOC requirement contained in other subsections of the Georgia Rule 391-3-1-.02(2).

Because the applicable Title I site for Delta is located in Clayton county, has potential VOC emissions greater than 25 tpy from all sources (aggregated) excluding all VOC emission subject to any other more specified VOC requirements contained in this section, and there are no specific VOC rules applicable to specific emissions units that are part of the TC5 project, VOC emission sources from this project are subject to Georgia Rule (tt)[5].

Table 4-1 specifies those project emissions units subject to a VOC RACT analysis.

Table 4-1: Proposed Project Emissions Units Subject to VOC RACT Analysis

Proposed Emissions Units in App # 44147	Description	Application # 622776
SHEA 5890	200-gallon diesel storage tank and fuel pump station	Delta TechOps anticipates an increase in utilization, thereby increasing VOC emissions.
SHEA 5893	2,000-gallon used oil storage tank	
SHEA 5894	25,000-gallon Jet-A fuel storage tank	
SHEA 5895	25,000-gallon Jet-A fuel storage tank	
SHEA 5936	200-gallon preservation oil storage tank	
SHEA 5938	200-gallon lubrication oil storage tank	
Fuel Pump Package	Provide fuel to the jet engines during testing	
SHEA 5898	Engine Test Cell No. 5 (SHEA 5898)	Delta TechOps treats this emissions unit as "new".

In general, RACT applies to existing stationary sources in nonattainment areas and certain attainment areas that were formerly designated as nonattainment areas and have been redesignated. RACT is the application or use of devices, systems, process modifications, or other apparatus or techniques that are *reasonably* available. A RACT analysis requires implementation of the lowest emission limitation that an emission source is capable of meeting by the application of a control technology that is <u>reasonably</u> available, considering technological and economic feasibility for applicable emissions units in a county that is classified as non-attainment for one or more of the National Ambient Air Quality Standards (NAAQS). A RACT analysis must include the latest information when evaluating control technologies. Control technologies evaluated for a RACT analysis can range from work practices, emission unit design to add-on controls. As part of the

[5] Note that operation of SHEA 5901 (40-gallon pneumatic pressure pot with spray gun (i.e., flush cleaning operations) are subject to Georgia Rule 391-3-1-.02(2)(kkk) rather than Georgia Rule (tt).

RACT analysis, current control technologies already in use for VOC emissions can be taken into consideration. To conduct a Top-Down RACT Analysis the following steps are considered:

Step 1. Identify all reasonably available control technologies.
Step 2. Eliminate technically infeasible control technologies.
Step 3. Rank remaining control technologies based on capture and control efficiencies.
Step 4. Evaluate remaining control technologies on economic, energy, and environmental feasibility.
Step 5. Select RACT.

4.2 VOC RACT Analysis

Delta TechOps presented their VOC RACT analysis in Chapter 5.2 of Application # 622776. The Division updated this analysis for completeness purposes.

Step 1. Identification of Reasonably Available Control Technologies
TC5: Available VOC control technologies include the following:
- Jet Engine Design;
- Concentrate and recover VOCs by condensation, adsorption, or absorption;
- Oxidation by either thermal or biological means

Storage Tanks: Tanks with SHEA ID Nos. 5890, 5893, 5936, and 5938 may experience an increase in utilization based on the proposed project. Tanks with SHEA ID Nos. 5890, 5893, 5936, and 5938 store diesel fuel, lubrication oils, or specification oils. Note that SHEA ID No. 5901 is a 40-gallon pneumatic pressure pot with spray gun for flush cleaning operations and is subject to Georgia Rule (kkk) rather than Georgia Rule (tt).

Available VOC control technologies include the following:
- Tank design (including tank filling options and ventilation).

Jet-A Fuel Storage Tanks (SHEA ID Nos. 5894 and 5895): VOC RACT is typically transfer of material via submerged fill pipe or via bottom filling. These two storage tanks are filled via a fuel line connected to the existing system that fills the storage tanks for the current jet engine test cells via bottom filling. The method of jet fuel transfer is inherently a low VOC emissions design and operation.

Step 2. Elimination of Technically Infeasible Control Technologies
TC5: There is a complex VOC/NOx emissions interrelationship that makes it difficult to simultaneously reduce the mass emissions of both products of combustion. Jet engine design and power setting used by the pilot impacts the fuel efficiency of the jet engine. Per Masiol and Harrison (2014)[6], "The relative amount of exhaust emissions depends upon combustor temperature and pressure, fuel to air ratio and the extent to which fuel is atomized and mixed with inlet air." Typical combustion chemistry shows that NOx emissions increase and VOC/CO emissions decrease as the combustion temperature increases while NOx emissions decrease and VOC/CO emissions increase as combustion temperature decreases. In addition, the rate of VOC emissions

[6] Masiol, Mauro, Harrison, Roy M. "Aircraft engine exhaust emissions and other airport-related contributions to ambient air pollution: A review", Atmospheric Environment 95 (2014) pages 409-455.

from TC5 depends on combustion efficiency (i.e., conversion of the fuel hydrocarbons to carbon dioxide and water). At jet engine idle conditions, much less fuel is consumed and, in the interest of maintaining stable combustion at lower power conditions, some sacrifice in combustion efficiency occurs even though this inefficiency is still only a percent or so, per the FAA. At high power conditions, more than 99% of the fuel is completely combusted thereby converting the fuel hydrocarbons to carbon dioxide and water.

The Division's VOC RACT technical feasibility analysis is documented in Tables 4-2A, B, and C:

Table 4-2A: VOC RACT Technical Feasibility Analysis for TC5

Control Technology	Technically Feasible?	Reason(s)
Combustor design	No	Altering the design will likely significantly affect the performance of the jet engine and engine certification per the FAA.
Condensation	No	Exhaust stream includes numerous VOC species. Not feasible to reduce a volume flow rate well above 2 million cubic feet per minute to a volume flow rate suitable for condensation.
Adsorption	No	Exhaust stream includes numerous VOC species. Not feasible to reduce a volume flow rate well above 2 million cubic feet per minute to a volume flow rate suitable for adsorption.
Absorption	No	Exhaust stream includes numerous VOC species. Not feasible to reduce a volume flow rate above 2 million cubic feet per minute to a volume flow rate suitable for absorption.
Thermal Oxidation	No	Not feasible to reduce a volume flow rate above 2 million cubic feet per minute to a volume flow rate suitable for absorption.
Biological Oxidation	No	Exhaust stream includes numerous VOC species. Not feasible to reduce a volume flow rate well above 2 million cubic feet per minute to a volume flow rate suitable for adsorption.

Table 4-2B: VOC RACT Technical Feasibility Analysis for Storage Tanks with SHEA ID Nos. 5890, 5893, 5936, and 5938

Control Technology	Technically Feasible?	Reason(s)
Tank Design	Yes	These storage tanks store a substance with an inherently low vapor pressure and these tanks are equipped with a fixed roof. Utilization of a fixed roof is commonly used for smaller tanks or tanks containing low vapor pressure materials and is a technically feasible VOC emissions control option.

Table 4-2C: VOC RACT Technical Feasibility Analysis for Storage Tanks with SHEA ID Nos. 5894 and 5895

Control Technology	Technically Feasible?	Reason(s)
Tank Design	Yes	These two storage tanks are filled via a fuel line connected to the existing system that fills the storage tanks for the current jet engine test cells via bottom filling.

Step 3. Rank Remaining Control Technologies

TC5: Based on the analyses in Sections 4.2.1 and 4.2.2 of this document, no control technologies are technically feasible for operation of the jet engine test cells.

Storage Tanks with SHEA ID Nos: 5890. 5893, 5936, and 5938: Based on the analyses in Sections 4.2.1 and 4.2.2 of this document, there is only one control technology feasible for operation of these tanks. Namely tank design.

Storage Tanks with SHEA ID Nos: 5894 & 5895: Based on the analyses in Sections 4.2.1 and 4.2.2 of this document, there is only one control technology feasible for operation of these tanks. Namely tank design

Step 4. Evaluate Remaining Control Technologies on Economic, Energy, and Environmental Feasibility

TC5: Because none of the identified technologies was considered technically feasible, an economic analysis was not performed for any of the technologies identified in Section 4.2.1 (i.e., Step 1).

Storage Tanks with SHEA ID Nos: 5890. 5893, 5936, and 5938: Because the identified technology of tank design (i.e., use of fixed roof tank) is an existing technology at Delta TechOps, an economic analysis was not performed on this technology.

Storage Tanks with SHEA ID Nos: 5894 & 5895: Because the identified technology of tank design (including filling method) is an existing technology at Delta TechOps, an economic analysis was not performed on this technology.

Step 5. Selection of VOC RACT

TC5: Delta TechOps determined that VOC RACT was no control and the Division concurs with this conclusion.

Storage Tanks with SHEA ID Nos: 5890. 5893, 5936, and 5938: Delta TechOps determined that the tank design minimizes VOC emissions for purposes of VOC RACT. The Division concurs with this conclusion.

Storage Tanks with SHEA ID Nos: 5894 & 5895: Delta TechOps determined that the tank design (including tank filling method) minimizes VOC emissions for purposes of VOC RACT. The Division concurs with this conclusion.

5 CONTROL TECHNOLOGY REVIEW FOR NOx RACT/BACT

5.1. Introduction

Delta TechOps Application # 44147 (Permit No. 4512-063-0105-V-03-2) addressed the needed applicability analysis compliance demonstration (or negative applicability declaration) for purposes of NOx RACT per Georgia Rule 391-3-1-.02(2)(yy). Georgia Rule(yy) applies to NOx emission sources located in the counties of Cherokee, Clayton, Cobb, Coweta, DeKalb, Douglas, Fayette, Forsyth, Fulton, Gwinnett, Henry, Paulding, or Rockdale which have potential NOx emissions exceeding 25 tpy. Georgia Rule (yy) requires a case-by-case analysis of NOx RACT for all emission sources not subject to any other more specific NOx requirement contained in other subsections of the Georgia Rule 391-3-1-.02(2).

Test Cell No. 5 is subject to Georgia Rule (yy) because the facility is located in Clayton County, the facility has potential NOx emissions greater than 25 tpy, and Test Cell No. 5 is not subject to any specific NOx rules. This NOx RACT analysis only pertains to Test Cell No. 5 (SHEA 5898) because the facility is requesting an increase in the allowable NOx emissions rate from this test cell.

5.2. RACT vs. BACT

In general, RACT applies to existing stationary sources in nonattainment areas and certain attainment areas that were formerly designated as nonattainment areas and have been redesignated. RACT is the application or use of devices, systems, process modifications, or other apparatus or techniques that are *reasonably* available. EPA's interpretation of the RACT requirement is that it is the lowest emission limitation that a particular source is capable of meeting by the application of control technology that is *reasonably* available considering technological and economic feasibility.

BACT is required on PSD major new stationary source or major modification of a stationary source located in attainment areas. BACT is an emission limitation based on the *maximum* degree of reduction of each applicable pollutant *subject to regulation* emitted or which results from any proposed major stationary source (major source) or major modification. EPA's interpretation of the BACT requirement is that it is the *maximum* degree of reduction that a particular source is capable of meeting considering technological and economic feasibility.

Typically, BACT is considered a more stringent emission standard when compared to that imposed by RACT. The 5-step top-down process for determining BACT (per EPA's NSR Workshop Manual) was utilized by Delta TechOps and this process is identical for a RACT analysis. In general, the Division requires PSD permit applicants to use the top-down process in the BACT analysis, which EPA reviews. The five steps of a top-down BACT review procedure identified by EPA per BACT guidelines are listed below:

- Step 1: Identification of all control technologies;
- Step 2: Elimination of technically infeasible options;
- Step 3: Ranking of remaining control technologies by control effectiveness;
- Step 4: Evaluation of the most effective controls and documentation of results; and
- Step 5: Selection of BACT.

The review was conducted generally using the top-down analysis and five-step process recommended by EPA in their *Draft NSR Workshop Manual* dated October 1990. In some cases, such as trivial sources, the Division exercises its right as a SIP-approved permitting authority to proceed according to the governing regulation, and the plain language of said codified regulations (not draft guidance).

For each pollutant subject to BACT review from each of the emission units or groups or processes, a comprehensive review of potential control technologies was conducted utilizing the following sources:

- The RBLC (RACT/BACT/LAER Clearinghouse);
- Pollution control technology vendors;
- EPA control technology documents;
- Review of recently issued BACT determinations for jet engine test cells elsewhere in the country; and
- Georgia permitting records.

Conclusion: The NOx BACT requirements subsume the NOx RACT requirements, in this case.

5.3. NOx BACT Review

Step 1: Identification of NOx Control Technologies from Combustion
Delta TechOps did not propose any NOx control technologies as part of the Step 1 analysis. The Division's analysis looks at the following NOx Control Technologies from combustion:

- Jet engine design;
- Selective Catalytic Reduction (SCR) with Ammonia Injection;
- Selective Non-Catalytic Reduction (SNCR);
- Reburn NOx Control Technology;
- NOx Sorbent Technology;
- Water and/or Steam Injection; and
- Non-Thermal Plasma Systems.

Step 2. Elimination of Technically Infeasible Control Technologies
Delta TechOps determined that there is no technically feasible NOx control technology for the operation of TC5 based on their review of the U.S. EPA RBLC database. The Division's analysis of technical feasibility is presented in Table 5-1.

Table 5-1: Technical Feasibility Analysis for Controlling NOx Emissions from TC5

Control Technology	Technically Feasible?	Reason(s)
Jet Engine Design	No	NOx emissions from TC5 would be somewhat mitigated if the engine were operated at a high temperature with vendor defined design of proper mixing of the fuel and air. The engine design (i.e., combustion characteristics) of the jet engine itself cannot be altered by Delta TechOps without significantly affecting the performance of the jet engine itself and the certification of the engine under 40 CFR 1031 and 14 CFR 34. ***The Division agrees with Delta TechOps that a temporary or permanent modification to the jet engine combustor design is technically infeasible.***
SCR with NH_3 Injection	No	The test cell stack gas temperatures are well below those required by SCR systems. The required catalyst temperature is approximately 700 deg. F, though some catalysts can operate near 500 deg F. The anticipated test cell stack gas temperature will be less than 200 deg. F. The rapid and frequent changes in engine output would place demands on the SCR controller not found in current (non-jet engine test-cell) installations. Lag time in the response of the ammonia injection system to changes in exhaust gas conditions would result in increased unreacted ammonia emissions and decreased NOx removal efficiency. ***The Division agrees with Delta TechOps that this type of NOx control technology is technically infeasible.***
SNCR	No	Would require substantial reheating with a gas duct burner to maintain the stack exhaust gas temperature within the appropriate temperature range of 1600 deg. F. to 2400 deg. F. The reheat requirements are a function of test cell operating characteristics, which are highly transient and differ depending on the type of engine tested. NOx emissions from the gas fired duct burner may cause an increase in NOx emissions from the test cell (on a net emissions basis). Variance in operation and performance of engines to be tested. ***The Division concurs with Delta TechOps' conclusion that this type of Nox control technology is technically infeasible.***
Reburn NOx Control Technology	No	Exhaust from the jet engine test cell consists of oxygen-rich gas that would require lean reburning, where local fuel-rich conditions occur in an overall fuel-lean exhaust gas. Bench

Table 5-1: Technical Feasibility Analysis for Controlling NOx Emissions from TC5

Control Technology	Technically Feasible?	Reason(s)
		scale studies of reburning in an oxygen-rich gas such as that from a test cell exhaust have been performed. The study showed that lean burn respective removal efficiencies for 1,000 parts per million (ppm) and 500 ppm NOx inlet concentrations were reported at 60 and 30 percent. No studies have been conducted at NOx concentration of 100 ppm that is typical of test cell operation. Until more research and evaluations are performed, the safety and performance issues of this technology cannot be addressed. ***The Division concurs with Delta TechOps' conclusion that this type of NOx control technology is technically infeasible.***
NOx Sorbent Technology	No	This technology has not been demonstrated in practice on a full scale, working test cell. Demonstrated in practice generally means that the control technology has been used in a production situation and has been demonstrated to be successful at achieving the claimed performance. In such a case, the control option would be technically feasible for consideration in the RACT analysis. Bench scale and pilot plant trials alone are generally not sufficient. Until more research and evaluations are performed, the safety and performance issues of this technology cannot be addressed, and thus this was not considered a technically feasible control option. ***The Division concurs with Delta TechOps' conclusion that this type of NOx control technology is technically infeasible.***
Water or Steam Injection	No	The NOx control technologies using water or steam injection and fuel/water emulsions would directly adversely affect the safety, design, structure, operation, or performance of aircraft engines. To apply these technologies, temporary modifications to the engine would be required. For this reason, as well as the effects these technologies would have on performance tests, water or steam injection and fuel/water emulsions should not be considered technically feasible options for application to test cells. ***The Division concurs with Delta TechOps' conclusion that this type of NOx control technology is technically infeasible.***

Table 5-1: Technical Feasibility Analysis for Controlling NOx Emissions from TC5

Control Technology	Technically Feasible?	Reason(s)
Non-Thermal Plasma Systems	No	Non-Thermal Plasma (NTP) is an emerging technology and has only been demonstrated on a field-pilot scale in one test cell in practice. Until more research and evaluations are performed, the safety, operation and performance issues of this technology cannot be addressed, so this was not considered a technically feasible control option. ***The Division concurs with Delta TechOps' conclusion that this type of NOx control technology is technically infeasible.***

Step 3. Rank Remaining Control Technologies

There is no ranking of control technologies because none of the identified technologies were considered technically feasible.

Step 4. Evaluate Remaining Control Technologies on Economic, Energy, and Environmental Feasibility

Because none of the identified technologies was considered technically feasible, an economic analysis was not performed for any of the technologies identified in Step 1.

Step 5. Selection of NOx BACT

Delta TechOps proposes no NOx control as BACT for the operation of TC5. They proposed a NOx BACT emissions limit of 150 tpy based on monthly calculation.

The Division investigated whether the NOx BACT emissions limit should be set on a short-term basis or whether it could be established on a long-term basis for purposes of 40 CFR 52.21(j). Delta TechOps utilized the ICAO-EEDB to estimate the potential NOx emissions from a typical jet engine testing scenario. The total mass of NOx emitted is typically calculated on a pound per test rather than pound per hour. In addition, the pounds of NOx emitted per hour can be highly variable based on fuel flow and jet engine power setting. With that in mind, the Division concurs with Delta TechOps' conclusion that the period for the proposed NOx BACT emissions limit should be annual rather than hourly for purposes of 40 CFR 52.21(j).

The Division's conclusions are noted below:

- Delta TechOps' proposal (and substantiation) that NOx BACT is no control satisfies the requirements of 40 CFR 52.21(j) and NOx RACT requirements specified in Georgia Rule 391-3-1-.02(2)(yy).
- Delta TechOps' proposal (and substantiation) that the NOx BACT limit should be set at 150 tons during any twelve consecutive months satisfies the requirements of 40 CFR 52.21(j) and Georgia Rule 391-3-1-.02(2)(yy).

Conclusion-RACT/BACT for NOx Emissions from TC5:

Table 5-2: NOx BACT/RACT Conclusion

Pollutant	Control Technology	Proposed RACT & BACT Limit	Compliance Determination Frequency	Compliance Determination Method
NOx	None	150 tpy	Monthly	Determine and record NOx emissions using Data Acquisition System and fuel usage.

Delta TechOps must use the existing Data Acquisition System (DAS) which contains the statistical curves based on the ICAO-EEDB as discussed in Section 1.4 of this Preliminary Determination.

6 TESTING AND MONITORING REQUIREMENTS

NOx RACT/BACT Emissions Limit
There are no applicable testing requirements established since it is not possible to generate consistent testing conditions for the proposed test cell.

There are no applicable monitoring requirements required by Georgia Chapter for Air Quality Control Rule 391-3-1 nor by 40 CFR 52.21.

Georgia Rules (b) &(g)
No testing or monitoring is necessary because the likelihood of violation of these state rules is minimal.

Georgia Rule (tt)
There are no applicable testing requirements associated with Georgia Rule (tt) requirements for storage tanks with SHEA ID Nos. 5890, 5893, 5936, and 5938 nor for Jet-A fuel storage tanks with SHEA ID Nos. 5894 and 5895.

7 RECORDKEEPING & REPORTING REQUIREMENTS

Delta TechOps maintains a computer monitoring system (*referred to as the Data Acquisition System (DAS))* with database tools to estimate and tract NOx emissions from jet engine testing operations. This system is a computer software-based tool that calculates and records real-time emissions estimates during engine tests based on engine fuel flow rate data and power setting/emission factor correlations. The software is populated with the ICAO-EEDB data referenced in Section 1.4 of this Preliminary Determination. This allows real-time NOx emissions calculations and recording during engine testing, and provides a robust, and accurate means of estimating emissions.

Multiple fuel flow measurements per minute are made by the DAS, and NOx emissions are calculated and reported in real time based on the programmed function of emission factor versus power setting.

<u>**Example NOx Emissions Calculation:**</u>
NOx Emissions from TC5 (lb/s)=
(NOx Emissions (grams/kg fuel flow))*(Real Time Raw Fuel Flow (kg/s))*(Conversion of grams to pounds)

NOx Emissions from the operation of TC5 (lb/test) =

$$(\sum_{i=1}^{n}(NOx\ Emissions\ \left(\frac{lb}{s}\right)$$

NOx Emissions from the operation of TC5 (tons/month) =

$$(\sum_{i=1}^{n}(NOx\ Emissions\ Per\ Engine\ Tested\ \left(\frac{lb}{test}\right) * (Conversion\ of\ pounds\ to\ tons)$$

Where:

NOx Emissions (grams/kg fuel flow)	=	Third-order equation derived by Delta TechOps using the Least Squares method based on ICAO-EEDB emissions indices per jet engine make & model type based on fuel flow (kg fuel consumed per second for applicable jet engine). Emissions are calculated for every kg/s of fuel flow during the test. The applicable third-order equation is stored in the TC5 DAS.
Real Time Fuel Flow (kg fuel consumed per second)	=	Real time fuel flow tracked via TC5 DAS
n	=	Number of engines tested in TC5, per month.

Delta TechOps is required to maintain the following monthly and consecutive twelve-month records associated with the operation of TC5:

Table 7-1: Additions/Revisions to Existing Recordkeeping Requirements

Existing Condition	Description	Note(s)
6.2.49a.	Maintain monthly records of the quantity and types of engines tested in TC5.	No changes are recommended.
6.2.49b.	Maintain monthly records of the quantity of fuel consumed during test of each engine.	**Modified** Fuel type will be listed as jet fuel since that is the only type of fuel to be combusted in TC5.
6.2.49c.	Maintain monthly records of real time test data from each engine test to include raw data used to calculate NOx EFs as well as NOx emitted.	**Modified** Maintain records of how NOx emission factors were derived for each jet engine make/model.
6.2.49d.	Maintain monthly records of total NOx emissions per tested engine.	**Modified** Maintain monthly records of total NOx emissions per month per tested jet engine.
6.2.49e.	Maintain monthly records of how NOx EFs were derived for each engine tested.	This Condition is **deleted** and its revised language is incorporated in Condition 6.2.49c. for clarity purposes.
6.2.49f.	Maintain monthly records specifying the total number of hours of operation of TC5.	This Condition is **deleted** since there is no longer an operational limit on TC5 for PSD Avoidance purposes.
6.2.49g.	Maintain monthly records specifying the type of fuel used for testing.	This Condition is **deleted** since there is only one fuel type combusted in TC5, namely jet fuel.
6.2.50	Use the NOx emission factors per tested engine required by Condition 6.2.49 to calculate total monthly emissions from TC5.	This Condition is **revised** for clarity purposes.
6.2.51	Use the monthly NOx emissions from TC5 to calculate and record the consecutive twelve-month total NOx emissions from TC5. Notify the Division in writing if this numerical value exceeds 90% of the limit in Condition 3.2.10.	This Condition is **revised** for clarity purposes and to update the numerical value for NOx emissions which triggers notification to the Division.

Table 7-1: Additions/Revisions to Existing Recordkeeping Requirements

Existing Condition	Description	Note(s)
6.2.52	Maintain the 12-month rolling total of hours of engines tested in TC5.	This Condition is **deleted** since there is no longer an operational limit on TC5 for PSD Avoidance purposes.
6.2.53	Maintain records of the type of fuels used in TC5 to verify compliance with Condition 3.2.12 (namely the jet fuel sulfur limit).	Delta is accepting new Condition 3.4.10, which limits the fuel used in TC5 to jet fuel. Therefore, Delta requests **deletion** of this existing requirement as it pertains to the operation of TC5. The Division concurs and **deletes** this existing condition.

8 AMBIENT AIR QUALITY REVIEW

An air quality analysis is required to determine the ambient impacts associated with the increase in allowable NOx emissions from TC5. The main purpose of the air quality analysis is to demonstrate that emissions emitted from the proposed modification, in conjunction with other applicable emissions from existing sources (including secondary emissions from growth associated with the new project), will not cause, or contribute to a violation of any applicable National Ambient Air Quality Standard (NAAQS) and/or PSD increment in accordance with 40 CFR 52.21(k) and 40 CFR 52.21(m). National Ambient Air Quality Standards exist for NO_2, CO, $PM_{2.5}$, PM_{10}, SO_2, ozone (O_3), and lead. PSD increments exist for SO_2, NO_2, $PM_{2.5}$, and PM_{10}.

All estimates of ambient concentrations are to be based upon applicable air quality models, databases, and other requirements specified in Appendix W of 40 CFR 51, *Guideline on Air Quality Models*.

The proposed increase in allowable NOx emissions from TC5 (and associated emission increases) also results in emissions increases in PM, PM_{10}, $PM_{2.5}$, VOC, CO, SO_2, and SAM . PSD modeling is required for NOx emissions since the potential emission increase, from the project, exceeds 40 tpy (the PSD SER per Table 1-7). PSD modeling is also required as follows:

- $PM_{2.5}$ (including the secondary contribution of NOx and SO_2 emissions) in accordance with *Guidance for Ozone and Fine Particulate Matter Permit Modeling* (EPA-454/R-22-005, July 2022).
- Consider the NOx and VOC emissions increases in the secondary formation of ozone.

This section of the Preliminary Determination discusses the Division's review of Delta's PSD ambient air quality analyses.

8.1 Modeling Methodology

Delta's Ambient Air Quality Review is provided in Appendix C of Application # 622776. The Division conducted its own AERMOD model runs for this proposed project and compared its results to those of the applicant. This Preliminary Determination presents the Division's modeling results.

8.3. Modeled NOx Emissions Rate for the Proposed Project

Delta modeled 700 lb NOx/hr from TC5 as part of its Class I and II Ambient Air Quality Review. Delta stated that they anticipate the maximum hourly NOx emission rate would not exceed 700 lb/hr based on the universe of jet engines predicted to be tested in TC5 based on the ICAO-EEDB.

8.3 Class II Ambient Air Quality Review & Results

8.3.1 Class II Significance Impact Analysis

A Class II Significance Analysis was conducted by Delta to determine if the applicable emissions increases for the proposed increase in allowable NOx emissions from TC5, namely direct $PM_{2.5}$, NOx, VOC, and SO_2 emissions, would significantly impact the area surrounding Delta TechOps for purposes of the following NAAQS: NO_2 (Annual average); NO_2 (1-hour average); $PM_{2.5}$ (Annual average); $PM_{2.5}$ (24-hour average); Ozone (8-hour average).

Delta utilized the U.S. EPA's recommended Significant Impact Levels (SILs) for purposes of this Class II Significance Impact Analysis as specified in Table 8-1.

Table 8-1: Summary of Applicable Significance Levels (SILs) & PSD Significant Monitoring Concentrations (SMCs)

Pollutant	Averaging Period	PSD Class II Significant Impact Level for NAAQS Modeling ($\mu g/m^3$)	PSD Significant Monitoring Concentration (SMC) ($\mu g/m^3$)
Ozone	8-Hour	1[7]	--
NO_2	Annual	1	14
	1-Hour	7.5	--
$PM_{2.5}$	Annual	0.2[8]	--[9]
	24-Hour	1.2[6]	--[8]

If a significant impact (i.e., an ambient impact above the SIL) does not result, no further modeling analyses would be conducted for that pollutant as part of the demonstration of compliance with the applicable NAAQS. If a significant impact does result, further cumulative modeling would be completed to demonstrate that the proposed project would not cause or contribute to a violation of the NAAQS or consume more than the available Class II increment.

Table 8-2 shows that the proposed project will not cause significant ambient impacts of ozone (8-hour average); $PM_{2.5}$ (Annual average); $PM_{2.5}$ (24-hour average); and NO_2 (Annual average) since the predicted maximum ground level concentrations (MGLCs) are less than the applicable SIL, therefore, no further PSD modeling analyses were conducted for these pollutants/averaging periods.

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[7] Numerical value taken from Table 11-1. EPA Recommended SIL Values for O_3 and $PM_{2.5}$ NAAQS, *Guidance for Ozone and Fine Particulate Matter Permit Modeling*, EPA-454/R-22-005, July 2022

[8] Numerical value taken from Table 11-2. EPA Recommended SIL Values for O_3 and $PM_{2.5}$ NAAQS, *Guidance for Ozone and Fine Particulate Matter Permit Modeling*, EPA-454/R-22-005, July 2022

[9] The $PM_{2.5}$ SMC was vacated on January 22, 2013 (*Sierra Club v. EPA*, No. 10-1413 (D.C. Circuit), 2013 WL 216018).

The Division's predicted MGLC for NO_2 (1-hour average) exceeds the 1-hour average NO_2 SIL as specified in Table 8-2 and the Division confirms the facility's conclusion for this pollutant/averaging period presented in Appendix C of Application # 622776.

Table 8-2: Class II Significance Analysis Results – Comparison to SILs

Pollutant	Avg Period	MGLC ($\mu g/m^3$)	Secondary Impact ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	SIL ($\mu g/m^3$)	SIA (km)	Receptor UTM Zone: 16	
							Easting (m)	Northing (m)
NO_2	1-hour	14.06269	N/A	14.06269	7.5	9.6	742,307.00	3,727,461.00
	Annual	0.023	N/A	0.023	1	N/A	741,207.0	3,724,761.0
$PM_{2.5}$	24-hour	0.01684	0.0528	0.06964	1.2	N/A	739,807.00	3,724,561.00
	Annual	0.00024	0.0029	0.00314	0.2	N/A	741,207.00	3,724,761.00
Ozone	8-hour	--	0.52	0.52	1	N/A	N/A	N/A

8.3.2 Ambient Monitoring Requirements

A pre-construction air quality analysis using continuous monitoring data may be required for pollutants subject to PSD review per 40 CFR 52.21(m). The Class II Significant Impact Analysis is used to determine whether the increase in allowable NOx emissions (and associated emissions increases) is exempt from pre-construction ambient monitoring requirements. To determine whether pre-construction monitoring should be considered, the MGLCs attributable to the proposed project are assessed against significant monitoring concentrations (SMCs). These SMCs are listed in Table 8-1 for the pollutants of concern in this analysis (NO_2, $PM_{2.5}$, and Ozone). If the predicted MGLC(s) is/are above the applicable SMCs and the Division determines that ambient monitoring is required, the applicant can satisfy the requirement by either (1) establishing a site-specific ambient monitoring network, or (2) using existing ambient monitoring data that is determined to be representative in the area surrounding the proposed project.

The Division's predicted MGLC for NO_2 (Annual average) is less than the SMC level for that pollutant/averaging period and therefore no pre-construction ambient monitoring for NO_2 is required and the Division confirms the facility's qualitative conclusion presented in Appendix C of Application # 622776.

The facility's analysis as presented in Appendix C of Application # 622776 appeared to use the SIL level for $PM_{2.5}$ to assess its compliance demonstration to 40 CFR 52.21(m) rather than the fact that there is no SMC for $PM_{2.5}$. A compliance demonstration is necessary, in this case since there is no SMC for $PM_{2.5}$ however, the Division determined that Delta TechOps may use the Division's existing $PM_{2.5}$ ambient monitoring network nearby to HJAIA to satisfy the requirements of 40 CFR 52.21(m) for this pollutant.

Potential NOx emissions from the proposed project are greater than 100 tpy and therefore Delta TechOps was required to assess how they would comply with the requirements of 40 CFR 52.21(m) for ozone, per 40 CFR 52.21(i). In addition, there is no SMC for ozone. The facility's analysis as presented in Appendix C of Application # 622776 appeared to use the SIL level for this pollutant to assess its compliance demonstration to 40 CFR 52.21(m). The Division determined that Delta TechOps may use the Division's existing ozone ambient monitoring network nearby to HJAIA to satisfy the requirements of 40 CFR 52.21(m) since potential NOx emissions from the proposed project are greater than 100 tpy.

8.3.3 NAAQS Analysis

The primary NAAQS are the maximum concentration ceilings, measured in terms of total concentration of pollutant in the atmosphere, which define the "levels of air quality which the U.S. EPA judges are necessary, with an adequate margin of safety, to protect the public health". Secondary NAAQS define the levels that "protect the public welfare from any known or anticipated adverse effects of a pollutant". The primary and secondary NAAQS are listed in Table 8-3.

Table 8-3: Summary of NAAQS Applicable for the Proposed Project

Pollutant	Averaging Period	NAAQS	
		Primary/Secondary ($\mu g/m^3$)	Primary/Secondary (ppm)
Ozone	8-Hour	--	0.070
NO_2	Annual	100/100	0.053/0.053
	1-Hour	188/None	0.1/None
$PM_{2.5}$	Annual	12/15	--
	24-Hour	35/35	--

If the predicted MGLC from the Class II Significant Impact Analysis exceeds the applicable Class II PSD SIL at an off-property receptor, a NAAQS analysis is required. The NAAQS analysis should include the potential emissions from the Delta Title I site (except from emissions units that are generally exempt from permitting requirements and are normally operated only in emergency situations), allowable emissions of sources included within the regional source inventory (in the Significant Impact Area), and the appropriate ambient background concentration(s).

Delta TechOps determined a Significant Impact Area (SIA) based on the Class II Significant Impact Analysis for NO_2 (1-hour average) of 9.6 km. The SIA is a circular area with a radius extending out to the most distant point where the SIL modeling predicts a significant impact at or above the applicable SIL. The radius of the SIA should not exceed 50 km. The SIA is the area in which the NAAQS and PSD increment analysis is conducted. The refined modeling must analyze receptors within the entire SIA.

Regional Source Inventory for NOx Emissions: Delta TechOps conducted a thorough investigation of which facilities to be included in the regional source inventory within the SIA based on data from the Division's PSD Inventory Tool and other data sources such as the Division's Air Protection Branch permit database and the Division's Air Protection files.

Additionally, pursuant to the "20D Rule"[10], facilities outside the SIA were also excluded from the inventory if the entire group of facilities emissions (expressed in tons per year) were less than 20 times the distance (expressed in kilometers) from the facility to the edge of the SIA. In applying the 20D Rule, facilities in close proximity to each other (within approximately 2 km of each other) were considered as one source.

[10] Letter to Mr. Lewis Nagler (U.S. EPA Region IV) from North Carolina Department of Natural Resources and Community Development, July 22, 1985.

The regional source NOx emissions inventory used in the NAAQS modeling analysis by Delta TechOps are included in Appendix C of Application # 622776.

Note: Delta TechOps included NOx emissions from the Hartsfield-Jackson Atlanta International Airport Resiliency Facility (AIRS # 06300150). Operations at the Resiliency Facility include back-up power of 62.5 MW using diesel-fired generators, and currently these generators are not permitted as "emergency generators". However, the Resiliency Facility has applied for an amendment to its Synthetic Minor operating permit to limit the hours of operation to 500 hours per engine per year. Therefore, these engines have been included in the 1-hour NO2 modeling as “intermittent sources” in accordance with an EPA memorandum issued to guide States and regulated sources in conducting dispersion modeling for the 1-hour NO2 standard, which recommends assuming continuous operations at the maximum hourly NOx emission rate reduced by a ratio reflecting a maximum of 500 hours of operation per year (500/8760)[11].

Treatment of the generators at the Resiliency Facility as intermittent sources in the regional source NOx emissions inventory is allowed if the owner/operator of the Resiliency Facility obtains an air permit which limits hours of operation to 500 hours per year per generator prior to issuance of the Final Determination based on Application # 622776. A permit with this limitation will be issued to the Resiliency Facility before the issuance of this modification for Delta TechOps.

Background Concentration: Section 8.3 of the 2017 *Guideline* provides recommendations for determination of monitored background concentrations to include in cumulative impact assessments for NAAQS compliance, which should account for impacts from existing sources that are not explicitly included in the regional source inventory and natural sources. Permit applicants should assess and document what the background monitoring data represent to the extent possible. Delta TechOps conducted such an analysis and documented their findings in Appendix C of Application # 622776. Delta TechOps used an NO_2 (1-hour average) ambient background concentration of 80.5 $\mu g/m^3$ based on the three-year average value of yearly 98th percentile values (2019-2021) for the Division's ambient monitor labeled as NR-GA Tech (WBAN: 131210056). The Division utilized an NO_2 (1-hour average) ambient background concentration of 89.1 $\mu g/m^3$ based on the three-year average value of yearly 98th percentile values (2020-2022) for the Division's ambient monitor labeled as NR-285 (WBAN-130890003) which is the closest NO_2 ambient monitor to TechOps.

Results: Delta TechOps' NAAQS modeling analysis resulted in a predicted total impact (MGLC plus background) of 194.6 $\mu g/m^3$. The Division's modeling analysis also predicted a total impact of 212.8 $\mu g/m^3$, which is above the NAAQS as presented in Table 8-4.

[11] *Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO2 National Ambient Air Quality Standard*, Memorandum from Mr. Tyler Fox, U.S. EPA to Regional Air Division Directors (March 1, 2011).

Table 8-4: NAAQS Analysis Results

Pollutant	Avg Period	MGLC ($\mu g/m^3$)	Background ($\mu g/m^3$)	Secondary Impact ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Receptor UTM Zone: 16	
							Easting (m)	Northing (m)
NO_2	1-hour	123.66882	89.1	N/A	212.8	188	745,807.00	3,728,861.00

Because the predicted MGLC was above the NAAQS, Delta TechOps must perform a culpability analysis. The purpose of a culpability analysis is to demonstrate whether the facility's contribution to a NAAQS exceedance at a receptor is below the applicable SIL concentration for that pollutant and averaging period at that receptor. If the proposed project does not significantly contribute to the predicted exceedance (it is less than or equal to the SIL) then the proposed project does not contribute to the predicted NAAQS exceedance.

The facility's culpability analysis is presented in Appendix C of Application # 622776 and the result of their analysis shows that the proposed project's projected contribution to the exceedance of the NO_2 NAAQS (1-hour average) is less than the applicable SIL (from rank 8th to rank 13th), namely 7.5 $\mu g/m^3$. The results of the Division's culpability analysis are presented in Table 8-5.

Table 8-5: 1-hour NO_2 NAAQS Culpability Analysis

All Modeled Conc. ($\mu g/m^3$)	MGLC for Proposed Project ($\mu g/m^3$)	Receptor UTM (Zone: 16)		Rank	Remark
		Easting (m)	Northing (m)		
212.7688	0.00755	745,807.00	3,728,861.00	8th	Highest 1-hour NO_2 concentration among all receptors exceeding the 1-hour NO_2NAAQS
196.3763	4.44674	743,007.00	3,726,561.00	9th	Max. 1-hour NO_2 contribution by the proposed project among all receptors and ranks exceeding the 1-hour NO_2 NAAQS level

*The number of receptors which exceeded the 1-hour NO_2 NAAQS level (188 $\mu g/m^3$) was 85 receptors in the culpability analysis modeling output including the background concentration of 89.1 $\mu g/m^3$. The exceedance(s) at each of the NAAQS violation receptors occurred from 8th rank to 39th, but no exceedances afterwards. This refined modeling demonstrates that the proposed project will not cause or contribute a significant impact (i.e., $\geq$ 7.5 $\mu g/m^3$) to the NO_2NAAQS exceedances at the 1-hour averaging period.

8.3.4 PSD Class II Increment Analysis

A PSD Class II Increment analysis is required for each pollutant for which the predicted MGLC is greater than the applicable SIL concentration. In this case, Delta TechOps did not trigger the need to conduct a PSD Class II increment analysis for NO_2 (Annual average); $PM_{2.5}$ (24-hour average); and $PM_{2.5}$ (Annual average). There is no PSD Class II increment for NO_2 (1-hour average). Therefore, no PSD Class II increment analysis is required.

8.4 Class I Ambient Air Quality Review & Results

Federal Class I areas are regions of special national or regional air quality related values from natural, scenic, recreational, or historic perspectives. Class I areas are afforded the highest degree of protection among the types of areas classified under the PSD regulations. The U.S. EPA has established policies and procedures that generally restrict consideration of impacts of a PSD source on Class I PSD increments to facilities that are located near a federal Class I area. Historically, 100 km has been used to define “near”, but more recently, 300 km has been used for all facilities.

Table 8-6 summarizes the applicable Class I areas for this ambient air quality review.

Table 8-6: Class I Areas within 300 km of TechOps

Class I Area	State	Federal Land Mgr.	Distance from TechOps (km)
Cohutta Wilderness	TN-GA	U.S. Forest Service (USFS)	134
Joyce Kilmer Slickrock Wilderness	TN-NC	USFS	194
Great Smoky Mountain Nat ’l Park	TN	National Park Service (NPS)	206
Shining Rock Wilderness	TN	USFS	233
Sipsey Wilderness	AL	USFS	282

8.4.1 Class I Significance Impact Analysis

A Class I Significant Impact Analysis was conducted by Delta TechOps to determine if the applicable emission increases for the project in question, namely direct $PM_{2.5}$, NOx, and SO_2 emissions, would significantly impact the applicable Class I area for purposes of the following NAAQS: NO_2 (Annual average); $PM_{2.5}$ (Annual average); and $PM_{2.5}$ (24-hour average). A Class I Significant Impact Analysis was not required to be conducted for ozone and NO_2 (1-hour average).

Delta TechOps utilized the U.S. EPA’s recommended SILs for purposes of this Class I Significant Impact Analysis as specified in Table 8-7.

Table 8-7: Summary of Applicable Significance Levels (SILs)

Pollutant	Averaging Period	PSD Class I Significant Impact Level (µg/m^3)
NO_2	Annual	0.1
	1-Hour	--
$PM_{2.5}$	Annual	0.05[6]
	24-Hour	0.27[6]

If a significant impact (i.e., an ambient impact above the SIL) does not result, no further modeling analyses would be conducted for that pollutant as part of the demonstration of compliance with the applicable Class I PSD Increment. If a significant impact does result, further cumulative modeling would be completed to demonstrate that the proposed project would not consume more than the available Class I increment.

The facility’s Class I Significant Impact Analysis results are presented in Appendix C of Application # 622776. Table 8-8 presents the results of the Division's Class I Significant Impact Analysis.

Table 8-8: Class I Significant Impact Analysis Results-Comparison to Class I SILs

Pollutant	Avg Period	MGLC (μg/m^3)	Secondary Impact* (μg/m^3)	Total (μg/m^3)	SIL (μg/m^3)	Receptor UTM Zone: 16	
						Easting (m)	Northing (m)
NO_2	Annual	0.00326	N/A	0.00326	0.1	774,606.92	3,688,993.31
$PM_{2.5}$	24-hour	0.00196	0.0166	0.01856	0.27	743,994.82	3,775,439.20
	Annual	0.00003	0.00044	0.00047	0.05	774,606.92	3,688,993.31

*Secondary $PM_{2.5}$ impacts were estimated with the MERP approach using the NOx and SO_2 emissions for TC5.

The proposed emission increases of NOx, direct $PM_{2.5}$, and SO_2 from the proposed project result in a predicted MGLC less than the applicable Class I SILs. Therefore, no PSD Class I Increment Analysis is required.

8.4.2 Class I Visibility Impacts Analysis

Delta TechOps evaluated the need to conduct a Class I Visibility Impacts Analysis for the applicable Class I areas. Delta TechOps followed the most recent Federal Land Managers' Air Quality Related Values Work Group (FLAG) Workshop procedures (USFS, NPS, and USFWS, 2010) and used the Screening Procedure to determine if the proposed project could opt (screen) out of an Air Quality Related Value (AQRV) assessment for visibility and deposition. Following the screening procedures in FLAG, Delta TechOps calculated a numerical value for "Q," (the emissions of NOx, SO_2, PM_{10}, and H_2SO_4 were summed based on maximum 24-hour emission rates for the worst- case emissions scenario) and then divided by the distance (D) to the respective Class I area.

In accordance with the FLAG Guidance, if Q/D is less than 10, then no AQRV analysis is likely required. This conclusion was confirmed by the USFS FLM and NPS FLM as noted in Table 8-9. Delta TechOps' screening analysis summarized below in Table 8-9 for each of the Class I areas located within 300 km of TechOps.

Table 8-9: Class I Federal Land Manager Notifications with Q/D Screening Analysis

Class I Area	D (km)	Q/D	Date FLM notified
Cohutta Wilderness	134	7.5	USFS notified September 7, 2023 FLM responded via e-mail on September 18, 2023, concurring that no AQRV analysis is required. This email is included in Appendix C of this Preliminary Determination.
Joyce Kilmer-Slickrock Wilderness	194	5.2	USFS notified September 7, 2023 FLM responded via e-mail on September 18, 2023, concurring that no AQRV analysis is required. This email is included in Appendix C of this Preliminary Determination.

Table 8-9: Class I Federal Land Manager Notifications with Q/D Screening Analysis

Class I Area	D (km)	Q/D	Date FLM notified
Great Smoky Mountain Nat 'l Park	206	4.9	NPS notified September 7, 2023. NPS response is pending[12].
Shining rock Wilderness	233	4.3	USFS notified September 7, 2023 FLM responded via e-mail on September 18, 2023, concurring that no AQRV analysis is required. This email is included in Appendix C of this Preliminary Determination.
Sipsey Wilderness	282	3.5	USFS notified September 7, 2023 FLM responded via e-mail on September 18, 2023, concurring that no AQRV analysis is required. This email is included in Appendix C of this Preliminary Determination.

[12] NPS was notified on March 24, 2023, and responded via e-mail on May 3, 2023 concurring that no AQRV analysis is required; however, NPS has not responded to the revised notification sent on September 7, 2023.

9 ADDITIONAL IMPACT ANALYSES

The Additional Impacts Analysis requirement under PSD evaluates project impacts pertaining to visibility impairment, soils and vegetation, and associated growth. In addition, the Division required that Delta TechOps prepare and submit a compliance demonstration for the Georgia Air Toxics Guideline for operation of TechOps.

9.1 Industrial, Residential, and Commercial Growth Impacts

Delta's analysis is presented in Appendix C of Application # 622776. Delta TechOps asserts that the infrastructure already exists to support the many operations, including existing operations. Additional staff, if any, will come from the existing community and no additional or industrial services are expected to result from this Project.

In addition, there are no construction activities expected to be associated with this project. Additional growth from this project is not expected.

The Division concurs with the facility's conclusion.

9.2 Soil and Vegetation Impacts

Delta TechOps compared the results from the PSD Class II Significant Impact Analysis with the applicable AQRV screening concentrations provided in Table 3.1 of the U.S. EPA's *A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals* and to the NAAQS secondary standards. The only pollutant of concern, based on Table 3.1, is NO_2.

Table 9-1 presents the applicable data from Table 3.1 and the results of the Division's PSD Class II Significant Impact Analysis per Table 8-2.

Table 9-1: Soils and Vegetation Impacts Analysis

Pollutant	Avg Period	MGLC ($\mu g/m^3$)	AQRV ($\mu g/m^3$)	Secondary NAAQS ($\mu g/m^3$)
NO_2	4-hour	--	3,760	N/A
	8-hour	--	3,760	N/A
	1-month	--	564	N/A
	1-year	0.023	94 (minimum) 188 (maximum)	100

The Division concurs with the facility's conclusion that no impacts to soils and vegetation are expected based on the proposed project.

9.3 Class II Visibility Impairment Analysis

Sources of air pollution can cause visible plumes if emissions of particulates and NOx are sufficiently large. A plume will be visible if its constituents scatter or absorb sufficient light so that the plume is brighter or darker than its viewing background (e.g., the sky or a terrain feature).

The Class II visibility impairment analysis required by the PSD program is intended to address the impacts to visibility at airports, state parks, and scenic vistas located within the applicable SIA. The largest SIA distance for NO_2 (1-hour and annual average) was determined to be 9.6 km from Delta TechOps. The only identifiable vista points within the SIA from the project is expected to be HJAIA. Test Cell No. 5 is located adjacent to the airport runways. Due to the inherent nature of engine testing, the short-term maximum emission rate is expected to exist for less than an hour during a test run of 8 hours total. The test cell also has a very high exhaust flow rate at greater than 14,000,000 actual cubic feet per minute thus causing better dispersion. Therefore, no visible plumes are anticipated. In addition, Delta TechOps asserted that considering the inherent nature of engine testing (tested at its maximum short-term emission rate for less than an hour of its 8-hour testing cycle), the existing visibility analysis models such as VISCREEN may not be representative for the operations. Therefore, Delta TechOps concluded that the proposed project is not expected to have any significant visible plume impacts on the surrounding area. The Division concurs with this conclusion.

9.3 Demonstration of Compliance with the Georgia Air Toxics Guideline (2017)

Delta TechOps submitted a required compliance demonstration associated with the Division's *Guideline for Ambient Impact Assessment of Toxic Air Pollutant Emissions (Revised-2017)* in Appendix C of Application # 622776. The Division determined that Delta TechOps only needed to consider toxic air pollutant (TAP) emissions from Test Cell Nos. 3, 4, and 5 as well as the APU Test Cell at Delta TechOps rather than all of TAP emissions sources at this facility.

9.3.1 Applicability of Minimum Emissions Rates (MERs)

The APU Test Cell does not discharge through an unobstructed vertical discharge release and therefore the established MERs do not apply for that release. Note: The MERs only apply for operating scenarios when at least 80% of the potential to emit of the applicable TAP is discharged to the outdoor atmosphere from an unobstructed vertical discharge. The Division conducted an analysis to learn whether the applicable MER’s apply and the results of this analysis are presented in Table 9-2:

Table 9-2: Does the Applicable MER Apply?

TAP (lb/yr)	Test Cell No. 3	Test Cell No. 4	APU Test Cell	Test Cell No. 5	Total (lb/yr)	% Unobstructed POINT	%OTHER
1,3-butadiene	31.2	49.2	0.337	4.34	85.095	99.60%	0.40%
Acetaldehyde	79	125	0.854	11.00	215.49	99.60%	0.40%
Acrolein	45.3	71.5	0.49	6.31	123.53	99.60%	0.40%
Benzene	31.1	49.1	0.336	4.33	84.792	99.60%	0.40%
Ethylbenzene	3.22	5.08	0.348	0.448	8.777	96.10%	3.90%
Formaldehyde	228	359	2.46	31.7	620.94	99.60%	0.40%
Isopropylbenzene	0.0554	0.0876	0.0006	0.00772	0.151	99.60%	0.40%
Methanol	33.4	52.7	0.361	4.65	91.047	99.14%	0.86%
Naphthalene	10	15.8	0.108	1.39	27.289	99.60%	0.40%
o-xylene	3.07	4.84	0.0332	0.427	8.373	99.60%	0.40%

Table 9-2: Does the Applicable MER Apply?

TAP (lb/yr)	Test Cell No. 3	Test Cell No. 4	APU Test Cell	Test Cell No. 5	Total (lb/yr)	% Unobstructed POINT	%OTHER
Phenol	13.4	21.2	0.145	1.87	36.621	99.60%	0.40%
Propionaldehyde	13.4	21.2	0.145	1.87	36.671	99.60%	0.40%
Styrene	5.71	9.02	0.0618	0.796	15.586	99.60%	0.40%
Toluene	11.9	18.7	0.128	1.65	32.384	99.60%	0.40%
m-xylene	5.21	8.23	0.0564	0.726	14.225	99.60%	0.40%
p-xylene	5.21	8.23	0.0564	0.726	14.225	99.60%	0.40%
Acetone	6.82	10.8	0.0738	0.950	18.613	99.60%	0.40%
n-heptane	1.18	1.87	0.0128	0.165	3.228	99.60%	0.40%
n-pentane	3.66	5.78	0.0396	0.510	9.987	99.60%	0.40%
Propane	1.44	2.28	0.0156	0.201	3.934	99.60%	0.40%
SAM	2,285		94.8	1,986	4,365	99.60%	0.40%

The percentage of potential discharge from unobstructed vertical discharges for each TAP is at least 80% and therefore the applicable MERs apply.

9.3.2 Compliance Demonstration Based on MER Comparison

The Division agrees with the facility's TAP emissions summary presented in Appendix C of Application # 622776 and re-presented in Table 9-3.

Table 9-3: MER Applicability Analysis

TAP (lb/yr)	Test Cell No. 3	Test Cell No. 4	APU Test Cell	Test Cell No. 5	Total (lb/yr)	MER (lb/yr)	Modeled?
1,3-butadiene	31.2	49.2	4.34	4.34	85.095	7.30	Yes
Acetaldehyde	79	125	11.00	11.00	215.49	1,110	No
Acrolein	45.3	71.5	6.31	6.31	123.53	4.87	Yes
Benzene	31.1	49.1	4.33	4.33	84.792	31.6	Yes
Ethylbenzene	3.22	5.08	0.448	0.448	8.777	243,000	No
Formaldehyde	228	359	31.7	31.7	620.94	267	Yes
Isopropylbenzene	0.0554	0.0876	0.00772	0.00772	0.151	97,300	No
Methanol	33.4	52.7	4.65	4.65	91.047	30,100	No
Naphthalene	10	15.8	1.39	1.39	27.289	730	No
o-xylene	3.07	4.84	0.427	0.427	8.373	24,300	No
Phenol	13.4	21.2	1.87	1.87	36.621	2,200	No
Propionaldehyde	13.4	21.2	1.87	1.87	36.671	1,950	No
Styrene	5.71	9.02	0.796	0.796	15.586	243,000	No
Toluene	11.9	18.7	1.65	1.65	32.384	1,220,000	No
m-xylene	5.21	8.23	0.726	0.726	14.225	24,300	No
p-xylene	5.21	8.23	0.726	0.726	14.225	24,300	No
Acetone	6.82	10.8	0.950	0.950	18.613	278,000	No
n-heptane	1.18	1.87	0.165	0.165	3.228	232,000	No
n-pentane	3.66	5.78	0.510	0.510	9.987	342,000	No

Table 9-3: MER Applicability Analysis

TAP (lb/yr)	Test Cell No. 3	Test Cell No. 4	APU Test Cell	Test Cell No. 5	Total (lb/yr)	MER (lb/yr)	Modeled?
Propane	1.44	2.28	0.201	0.201	3.934	209,000	No
SAM	2,285		94.8	1,986	4,365	117	Yes

Delta TechOps asserted that compliance with the applicable acceptable ambient concentrations is assumed for those TAPs whose potential emissions are less than the MER and therefore no modeling is required. The Division concurs with Delta TechOps conclusion.

9.3.3 Compliance Demonstration Based on AERMOD Modeling

Delta TechOps determined the MGLC for TAP emissions of 1,3-butadiene, acrolein, benzene, formaldehyde, and SAM using AERMOD. The Division reviewed the basis for the modeled emissions rates and associated exhaust parameters used by Delta TechOps as part of their AERMOD model runs. The Division's AERMOD model runs assessment is presented in Table 9-4. The potential maximum modeled concentration for each modeled TAP complies with the Georgia Air Toxics Guideline (i.e., less than the applicable AAC) as specified in Table 9-4.

Table 9-4: TAP MGLC Assessment

TAP	Averaging Period	AAC (μg/m^3)	Max Modeled Conc. (μg/m^3)	Receptor UTM Zone: 16	
				Easting (m)	Northing (m)
Acrolein	15-min	23	0.0453816	739,509.19	3,725,940.25
	Annual	0.02	0.00003	739,476.54	3,725,406.20
Benzene	15-min	1,600	0.031152	739,509.19	3,725,940.25
	Annual	0.13	0.00002	739,476.54	3,725,406.20
1,3-Butadiene	15-min	1,100	0.0312708	739,509.19	3,725,940.25
	Annual	0.03	0.00002	739,476.54	3,725,406.20
Formaldehyde	15-min	245	0.2281356	739,509.19	3,725,940.25
	Annual	1.1	0.00015	739,476.54	3,725,406.20
SAM	15-min	300	2.099	739,658.22	3,725,806.20
	24-hour	2.4	0.32578	739,201.38	3,725,524.53

10 EXPLANATION OF DRAFT PERMIT CONDITIONS

The permit requirements for this proposed project are included in draft Permit Amendment # 4512-063-0105-V-04-2 associated with this Preliminary Determination. Delta provided proposed updates to their existing Air Permit as part of Appendix D of Application # 622776.

<u>Modified Existing Condition # 3.1:</u>

Emission Units/Groups	Action Taken
BF03	Removed based on removal of all applicable SHEA activities at Delta TechOps.
ET01	Updated description and removed Test Cell Nos. 2 and 5.
ET02	Added
ST01	Updated description
NSR Avoidance Groups ID No.	**Action Taken**
NSR8	**Updated** description by deleting "pka DG01+SC01"
NSR9	**Updated** description by deleting "pka ET01".
NSR10	**Updated** description by deleting "pka TOC3" since "TOC3" is not defined in Permit No. 4512-063-0105-V-04-0.
NSR11	**Deleted** reference to NSR11 because SHEA ID No. 4845 is deleted based on Application # 622776.
NSR14	**Removed** this reference since the NAA-NSR avoidance limit associated with this group is being removed as part of this permit amendment.

The following tables discuss the additions/deletions/modifications as presented in Permit No. 4512-063-0105-V-04-2:

Table 10-2: Discussion of Applicable Permit Conditions

Condition #	Discussion
3.2.7 6.1.7b.vi. 6.2.9 6.2.10 6.2.11	Existing conditions 3.2.7 and 6.1.7b.vi. are **deleted** because they reference NSR Avoidance Group NSR11 (SHEA# 4845) and the equipment comprising this group has been removed as requested as part of Application # 622776. Existing condition 6.2.9 through 6.2.11 are **updated** to remove reference to NSR11.

Table 10-2: Discussion of Applicable Permit Conditions

Condition #	Discussion
3.2.10 6.2.17b.ix. 6.2.49 6.2.50 6.2.51	Existing condition 3.2.10 is **updated** to reference the NOx RACT/BACT limit of 150 tpy rather than the NOx PSD Avoidance limit of 39.5 tpy. In addition, the legal citation for 3.2.10 is updated. Existing condition 6.2.17b.ix. is **updated** to reference the NOx emissions limit of 150 tpy. Existing conditions 6.2.49 through 6.2.51 are **updated** as discussed in Section 7 of this Preliminary Determination. In addition, reference to NSR Avoidance Group NSR14 is removed.
3.2.11 6.1.7b.xvi. 6.2.52	These conditions are **deleted** since the operational limit on TC5 for PSD Avoidance is no longer necessary.
3.2.12 6.1.7b.xvii. 6.2.53	Existing Condition 3.2.12 is updated since the legal citation reference [Georgia Rule 391-3-1-.03(8)(c)13.(iv)] is no longer incorporated in Georgia Rule Chapter 391-3-1. The requirements of 3.2.12 subsume the requirements of Georgia Rule (g)1. and 2. Existing Condition Nos. 6.1.7b.xvii and 6.2.53 are **deleted** as requested by Delta.
3.3.45	This Condition is **deleted** because Georgia Rule 391-3-1-.03(8)(c)12. is no longer an applicable requirement.
3.4.1	**Added** new Equipment Group ET02 to this Condition which establishes Georgia Rule (b) as an applicable requirement. Reference to Equipment Group BF03 is **removed**.
3.4.4	Reference to Equipment Group BF03 is **removed**.
3.4.6 6.2.43	These Existing conditions reference Equipment Group BF03. Equipment Group BF03 has been removed by Delta as this Equipment Group no longer includes any SHEA IDs. Therefore, these Conditions are **deleted**.

LIST OF EMISSION UNITS PER EQUIPMENT GROUP
(Permit No. 4512-063-0105-V-04-2)

<u>Attachment D – List of Emission Units Per Equipment Group:</u>

REGULATORY GROUPS		
EQUIPMENT GROUP	**DESCRIPTION**	**EMISSION UNIT I.D. NUMBERS**
BF02	Boilers Constructed On or Before January 1, 1972	0634, 0636, 0657, 0658, 0659, 0660
~~**BF03**~~	~~**Process Heaters**~~	~~**0650, 0677**~~
BF04	Large New Boilers	4794
CP01	Chrome Plating Tanks	"Existing affected source" tank (under 40 CFR 63 Subpart N): 9902 New affected source" tank (under 40 CFR 63 Subpart N): 0917 and 2580 (formerly 0918)
DG01	Vapor Degreasers	~~**0136, 0137, 0485, 0924,**~~ 0967**,** ~~**4845,**~~ 8354
DP01	Aerospace Depainting	1235, 1236, 1237, any other depainting conducted facility-wide
ET01	Jet Engine and APU Test Cells	0077, 0078,~~**0081,**~~ 1123~~**, 5898**~~
ET02	**Jet Engine Test Cell(s)**	**5898**
FC01	Aerospace Flush Cleaning (Non-aqueous/Non-semi-aqueous)	0074, 0084, 0088, 0103, 0104, 0220, 0268, 0289, 0290, 0549, ~~**0553,**~~ 0590, 0600, 1776, 1925, 2013, 2039, 2044, 2168, 2173, 2216, 2310, 2488, **2940, 2987,** 4540, 4657, 4844, 4847, ~~**4853,**~~ 4879, 4882, 4972, 5440, 5472, 6227, 7265, 7459, 9406, 9548, ~~**9926**~~
PG01	Aerospace Spray Gun Cleaners	~~**1779, 1702, 1783**~~
PR01	Stripping Tanks	0849, 0853/2964, 0855/2956, 0856/2926, 0860, 0871, 0895, 0896, 0901, 0923, 0941, 7420, 8024
PT01	Aerospace Spray Booths	<u>Existing Booths:</u> ~~**0243, 0363,**~~ 0487, 0490, 0491, 0492, 0500, 1235, 1236, 1237 <u>New Booths:</u> 0174, ~~**4469,**~~ 6321, 9407, 1328, 2304, 2311

REGULATORY GROUPS		
EQUIPMENT GROUP	**DESCRIPTION**	**EMISSION UNIT I.D. NUMBERS**
SC04	Aerospace Hand-wipe Cleaning (Non-aqueous/Non-semi-aqueous)	Facility-wide Aerospace Hand-wipe Cleaning (Non-aqueous/Non-semi-aqueous)
ST01	Volatile Organic Liquid Storage Tanks **Subject to Georgia Rule 391-3-1-.02(2)(vv)**	1494, 1495, 2019, 4542
AQ01	Aerospace Aqueous and Semi-aqueous Hand-wipe and Flush Cleaning	Facility-wide Aerospace Aqueous and Semi-aqueous Hand-wipe and Flush Cleaning

Attachment D – List of Emission Units Per Equipment Group:

Requested update per Delta. The Division reviewed applicable Division files and concurs with Delta TechOps request.

NSR AVOIDANCE GROUPS	
EQUIPMENT GROUP	**EMISSION UNIT I.D. NUMBERS**
NSR6 (pka BF04 for NOx) (Established in Permit No. 4512-063-0105-V-01-1)	**Boiler-**4794
NSR7 (pka BF04 for SO_2) (Established in Permit No. 4512-063-0105-V-01-1)	**Boiler-**4794
NSR8 (Established in the October 30, 1996, amendment to Permit No. 4582-031-4823-0.)	VOC-containing vapor degreasers in Equipment Group DG01 and the solvent cleaners in Equipment Group FC01, with a surface area of 10 square feet or more, that do not use aqueous or semi-aqueous cleaning solvents at any time during the reporting period.
NSR9 (Established prior to Permit No. 4512-063-0105-V-01-0)	**Jet Engine Test Cell-**0077, **Jet Engine Test Cell-**0078
NSR10 (Established prior to Permit No. 4512-063-0105-V-01-0)	Aerospace Depainting & Aerospace Spray Booths-1235, 1236, 1237
~~**NSR11**~~ ~~**(Retroactive NAA-NSR Avoidance Limit established in Permit No. 4512-063-0105-V-02-0)**~~	~~**Vapor Degreaser 4845**~~
NSR12-Paint Booth 6321 (Retroactive NAA-NSR Avoidance Limit established in Permit No. 4512-063-0105-V-02-0)	Paint Booth-6321
NSR13-Paint Booth 9407 (Established in Permit No. 4512-063-0105-V-02-8)	Aerospace Spray Booth-9407

APPENDIX A

Delta Air Lines Inc. - Technical Operations Center
PSD/Title V Significant Modification without Construction
Permit Application and Supporting Application Data

Contents Include:

1. PSD/Title V Significant Modification without Construction Permit Application # 622776, dated March 31, 2023 and updated September 7, 2023 (available at https://epd.georgia.gov/psd112gnaa-nsrpcp-permits-database)
2. Email from Ms. Gisele Majidi-Weese, PE of the U.S. Forest Service
3. Email from Ms. Andrea Stacy of the NPS-Pending
4. Update to Application # 622776 dated August 2, 2023

Email from USFS FLM regarding Class I AQRV Analyses

On Mon, Sep 18, 2023 at 10:21 AM Ghazal Majidi-Weese - FS, Asheville - FS, NC <ghazal.majidi-weese@usda.gov> wrote:

Good morning, Pilar:

You have USFS concurrence that the increased emission rates will not significantly impact the Q/d ratio or the Air Quality Related Values for the USFS administered Class I areas listed in the updated table below.

Class I Area	Distance to Facility (km)	Annual Emissions (tpy [1])
Cohutta Wilderness	134	1000
Joyce Kilmer-Slick Rock Wilderness	194	1000
Shining Rock Wilderness	233	1000
Sipsey Wilderness	282	1000

1. Sulfur dioxide, nitrogen oxides, total fine particulate matter (PM, PM_{10}, and $PM_{2.5}$), and sulfuric acid mist.

Thank you again for keeping us informed of revisions to your proposed project. Please let me know if you have any questions or concerns.

Regards,

Gisele

Gisele Majidi-Weese, PE (she/her)
Air Resource Specialist

Environmental Engineer

Forest Service

Southern Region

mobile: 828-337-2323

ghazal.majidi-weese@usda.gov

Asheville, NC 28801
www.fs.fed.us

Caring for the land and serving people

From: Pilar Johansson <pejohansson@montrose-env.com>
Sent: Thursday, September 7, 2023 4:09 PM
To: Ghazal Majidi-Weese - FS, Asheville - FS, NC <ghazal.majidi-weese@usda.gov>
Cc: Tommy Sweat <tsweat@montrose-env.com>; Pitrolo, Melanie - FS, NC <melanie.pitrolo@usda.gov>; Kuoh, Dika E <dika.kuoh@delta.com>; Santosh Chandru <schandru@montrose-env.com>; Steve.Allison2@dnr.ga.gov; Byeong.Kim@dnr.ga.gov; Shepherd, Lorinda <Shepherd.Lorinda@epa.gov>; Bae, Estelle <Bae.Estelle@epa.gov>; Jenkins, Susan <Susan.Jenkins@dnr.ga.gov>; howard.chris@epa.gov; gillam.rick@epa.gov
Subject: Re: [EXTERNAL]]Delta Air Lines, Inc. Test Cell No. 5 PSD Permit Application Notification

Good Afternoon,

Montrose submitted a letter dated March 24, 2023, to your attention on behalf of Delta Air Lines, Inc. – Technical Operations Center (Delta TechOps) located at 1775 M H Jackson Service Road, Atlanta, GA 30354 regarding the proposed increase to the allowable emission rate for Test Cell No. 5 (SHEA5898) from 39.5 tons per year to 150 tons per year NOx to allow for increased operation of the test cell. There have been insubstantial changes to the emission calculations previously submitted. This letter serves as a revised notification, and changes are indicated by blue underlined font.

We respectfully request a written feedback letter or email from your office upon concurring that there are still no adverse impacts on Class I areas from the proposed project.

Please contact us with any questions.

Thank you,

Pilar Johansson

Principal – Southeast Region

Montrose Environmental

Atlanta, GA | US Eastern Time

Mobile: 202-460-1825

pejohansson@montrose-env.com | montrose-env.com

On Thu, Apr 27, 2023 at 5:16 PM Ghazal Majidi-Weese - FS, Asheville - FS, NC <ghazal.majidi-weese@usda.gov> wrote:

Dear Tommy:

Thank you for sending the information regarding the Delta Air Lines, Inc. – Technical Operations Center proposed project in Atlanta, GA. Based on the emission rates and distances from the Class I areas listed below, the United States Department of Agriculture (USDA) anticipates that modeling would not show any significant additional impacts to Air Quality Related Values (AQRV) at the Class I areas administered by the USDA Forest Service. Therefore, we are not requesting that a Class I AQRV analysis be included in the PSD permit application. Our screening of this analysis does not indicate agreement with any AQRV analysis protocols or conclusions applicants may make independent of Federal Land Manager review. Please note that we are specifically addressing the need for an AQRV analysis for Class I areas managed by the USDA Forest Service.

Class I Area	**Distance to Facility (km)**	**Annual Emissions (tpy [1])**
Cohutta Wilderness	134	907
Joyce Kilmer-Slick Rock Wilderness	194	907
Shining Rock Wilderness	233	907
Sipsey Wilderness	282	907

1. Sulfur dioxide, nitrogen oxides, total fine particulate matter (PM, PM_{10}, and $PM_{2.5}$), and sulfuric acid mist.

The state and/or EPA may have a different opinion regarding the need for a Class I increment analysis. Should the emissions or the nature of the project change significantly, please contact myself, Gisele Majidi-Weese (ghazal.majidi-weese@usda.gov, 828-337-2323) of the USDA Forest Service so that we might re-evaluate the project proposal.

Thank you for keeping us informed and involving the USDA Forest Service in the project review.

Regards,

Gisele

Gisele Majidi-Weese, PE (she/her)
Air Resource Specialist / Engineer

Forest Service

Southern Region

mobile: ~~828-337-2323~~

ghazal.majidi-weese@usda.gov

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https://urldefense.com/v3/__https://www.facebook.com/pages/US-Forest-Service/1431984283714112__;!!HWVSVPY!hPVf-vBn2cQFMSNTQMhQAiCt2xsvOwi8bAKFlQnYof1crq01N_51-zJm3zb2XDI-zmb2h7I1H5-pHR7KXaddgYc1mROiBI_b$

Caring for the land and serving people

From: Tommy Sweat <tsweat@montrose-env.com>
Sent: Thursday, March 30, 2023 7:50 PM
To: Ghazal Majidi-Weese - FS, Asheville - FS, NC <ghazal.majidi-weese@usda.gov>; Pitrolo, Melanie - FS, NC <melanie.pitrolo@usda.gov>; Kuoh, Dika E <dika.kuoh@delta.com>; Santosh Chandru <schandru@montrose-env.com>; Pilar Johansson <pejohansson@montrose-env.com>; Tommy Sweat <tsweat@montrose-env.com>; Byeong.Kim@dnr.ga.gov; Steve.Allison2@dnr.ga.gov
Subject: [EXTERNAL: Suspicious Link]Delta Air Lines, Inc. Test Cell No. 5 PSD Permit Application Notification

Gisele and Melanie,

Delta Air Lines, Inc. - Technical Operations Center is submitting a PSD Permit Application for Test Cell No. 5 to the Georgia Environmental Protection Division. Attached is a notification letter to your attention. We request a written feedback letter or email from your office upon concurring that there are no adverse impacts on Class I areas from the proposed project.

Please contact us with any questions.

Thanks,

Tommy Sweat, P.E.

Senior Principal - Permitting & Compliance

Professional Engineer Licensed in AL, FL, GA, IA, LA, MI, MO, NC, NY, OH, PA, SC, and TX

T: 678.336.8530 | M: 678.362.5104

tsweat@montrose-env.com

MONTROSE
ENVIRONMENTAL

Application # 622776 Update: August 2, 2023

Methodology – Nitrogen oxides (NO_x), Carbon Monoxide (CO), total hydrocarbons (THC), AND particulate matter (PM)

NOx, CO, THC, and PM emissions for an engine test are calculated using the real-time equation evaluation method. NO_x uses the third-order equation, while CO, THC, and PM are linearly interpolated. At each interval of the test cell Data Acquisition System (DAS) data capture (e.g., 10 Hz or 10 data points per second), the appropriate equation is evaluated for the instantaneous fuel flow measured by the DAS (ref Eqs. 1,2). The result of the evaluated equation is an emission rate per unit mass of fuel used (grams of emission per kilogram of fuel used) for the evaluated data point. The fuel burned is calculated by taking the average of the fuel flow (kilograms of fuel per second) for the evaluated time point and the time point immediately preceding it and multiplying that average by the elapsed time between those two time points (Eq. 3). This is then multiplied by the emission rate from Eqs. 1 or 2 to get the amount of emissions for the evaluated time interval (ref Eq. 4). This is repeated in real-time for the entirety of the test, with each of these small intervals being added up to arrive at the total emissions for a full engine test (Eq 5).

$$NO_x \rightarrow emission\_rate_n = Awf_n^{\,3} + Bwf_n^{\,2} + Cwf_n + D \qquad \text{(Eq. 1)}$$

$$\text{CO, THC, and PM} \rightarrow emission\_rate_n = function(wf_n) \qquad \text{(Eq. 2)}$$

where n = time scan
wf_n = raw fuel flow at time n (kg/s)

$$fuel\_burned_n = \frac{wf_n + wf_{n-1}}{2}\Delta t \qquad \text{(Eq. 3)}$$

where $wf_{n,n-1}$ = real-time raw fuel flow (kg/s) at time $n,n-1$
Δt = time elapsed between $n,n-1$ in seconds

$$emissions_n = emission\_rate_n \times fuel\_burned_n \qquad \text{(Eq. 4)}$$

$$emissions_{total} = \sum_{t=0}^{n} emissions_n \qquad \text{(Eq. 5)}$$

Emissions index derivation – particulate matter (PM)

The Emissions Index (EI) used in the calculation for PM (as described in Eq. 2 of section above), comes from the First Order Approximation v3.0 Method For Estimating Particulate Matter Emissions from Aircraft Engines (FOA3.0). This derivation was developed by the International Civil Aviation Organization (ICAO) and is available in their Airport Air Quality Manual[13]. The process involves calculating three separate indices; non-volatile, volatile sulfate, and volatile organic. Calculating these indices is a one-time effort for each engine model, using data from the ICAO Engine Emissions Data Bank (EEDB) as well as some assumptions where certain data isn't available. Once these three indices are calculated, they are summed to get the total emissions indices for PM (ref Eq. 8). Using these total PM indices, the PM emissions can then be calculated

[13] 2016 ICAO – Doc 9889 Airport Air Quality Manual at https://www.icao.int/environmental-protection/Documents/Doc%209889.SGAR.WG2.Initial%20Update.pdf

using the method described in Section VII. The calculation details, as given in the FOA3.0 document mentioned above, are described below for each set of indices.

$$EI_{PM} = EI_{PMnvol} + EI_{PMvol-FSC} + EI_{PMvol-FuelOrganics} \quad \textit{(Eq. 8)}$$

Non-Volatile PM (EI_{PMnvol})

The emission indices for non-volatile PM are made up of two terms multiplied together (ref Eq. 9). The first term, carbon index (CI), is a statistical correlation based on smoke number (SN). The second term, exhaust flow rate (Q_{oore}), is based on air-fuel ratio (AFR) which is not provided in the EEDB. However, during the development of FOA3.0 by the ICAO's emissions committee, the values shown in Table 2 were agreed upon by the three major engine manufacturers (General Electric, Pratt & Whitney, and Rolls Royce) as representative.

Power Setting	AFR
7% (Idle)	106
30% (Approach)	83
85% (Climb-Out)	51
100% (Takeoff)	45

Table 2. Representative AFRs by Power Setting

$$EI_{PMnvol} = CI \times Q_{core} = (0.06949 \times SN^{1.234}) \times (0.776 \times AFR + 0.877) \quad \textit{(Eq. 9)}$$

Volatile Sulfate PM ($EI_{PMnvol-FSC}$)

The emissions indices for volatile sulfate PM are made up of two terms that are dependent on the fuel sulfur content (FSC) and sulfur conversion efficiency ε (ref Eq. 10). A global average FSC of 0.03 weight percent can be used if actual FSC is unknown. There is a fair amount of uncertainty around the conversion process of sulfur in aviation engines from SO_2 (S^{IV}) to SO_3 (S^{VI}); the conversion varies with FSC and engine operating conditions. As a result, when the actual efficiency factor isn't known, a default value of 2.4 weight percent (0.024) provided by the ICAO emissions subcommittee may be used.

$$EI_{PMvol-FSC} = 10^6 \left(\frac{FSC \times \varepsilon \times 96}{32}\right) = (30^6) \times (0.003) \times (0.024) \quad \textit{(Eq. 10)}$$

Volatile Organic Aerosol ($EI_{PMvol-FuelOrganics}$)

The emissions indices for organic volatile PM are calculated from data obtained from NASA's Aircraft Particle Emission Experiment 1 (APEX1) along with THC data from the EEDB. The APEX1 data was used to develop a ratio from CFM56-2-C5 engine data, which is the closest engine model to that used in the APEX1 testing. The ratios are shown in Table 3. The indices are the ratio, δ, multiplied by the emissions indices for THC from the EEDB (ref Eq. 11).

Power Setting	δ (mg/g)
7% (Idle)	6.17
30% (Approach)	56.25
85% (Climb-Out)	76
100% (Takeoff)	115

Table 3. Ratio values of $EI_{PMvol\text{-}orgCFM56}$ and $EI_{HCCFM56}$

$$EI_{PMvol-FuelOrganics} = \delta \times EI_{HC} \qquad (Eq.\ 11)$$

Definition of terms:

Abbreviation	Description
AFR	Air-to-fuel ratio (mass basis)
CI	Carbon index. A measure of the black carbon mass per standard volume of flow. The volume is in standard cubic meters Standard atmosphere is defined as the volume occupied at 273.15 degrees Kelvin and 1 atmosphere of absolute pressure) (mg/m3 produced by burning 1 kg of fuel).
DAS	Data Acquisition System
EI	Emission index. A pollutant emission rate based on one kilogram of fuel burned. The units of an EI are normally given as g/kg of fuel.
EI_{PM}	Total particulate matter emission index for both volatile and non-volatile components (mg/kg of fuel)
EI_{PMnvol}	Emission index for non-volatile particulate matter primarily consisting of black carbon (mg/kg of fuel)
$EI_{PMvol\text{-}FSC}$	Emission index for volatile sulfate particulate matter due to fuel sulfur (mg/kg of fuel)
$EI_{PMvol\text{-}FuelOrganics}$	Emission index for organic volatile particulate matter primarily due to incomplete combustion of fuel (mg/kg of fuel)
EI_{HC}	Emission index for total hydrocarbons as listed in the ICAO EEDB (g/kg of fuel)
$EI_{HCCFM56}$	Emission index for total hydrocarbons for the CFM56-2-C5 engine as listed in the ICAO EEDB (g/kg of fuel)
$EI_{PMvol\text{-}orgCFM56}$	Emission index for CFM56-2-C5 engine as derived in the APEX1 measurements (mg/kg of fuel)
FSC	Fuel sulfur content (mass fraction)
Q_{core}	Exhaust volumetric flow rate as related to fuel burn (m3/kg fuel)

Abbreviation	Description
SN	Smoke number. The methodology in this document is based on smoke numbers as defined in Appendix 2 of ICAO Annex 16.
ε	Fuel sulfur conversion efficiency (mass fraction) from SO_2 (S^{IV}) to SO_3 (S^{VI}) due to oxidation
δ	$\text{Ratio of } EI_{PMvol-FuelOrganics} = \frac{EI_{PMvol-orgCFM56}}{EI_{HCCFM56}}$

APPENDIX B

Georgia EPD Air Protection Branch Planning & Support Program Data & Modeling Unit (DMU) Modeling Review Reports

Contents Include:

1. DMU Modeling Review Report-PSD
2. DMU Modeling Review Report-TAP

DMU Modeling Review Report – PSD

General Information

Application #	622776
AIRS #	063-00105
Applicant	Delta Air Lines, Inc. Technical Operations Center
Application Receipt Date	06/20/2023 & 09/07/2023
Modeling Review Request Date	06/27/2023 and 09/12/2023
Assigned SSPP PM1	Jeng-Hon Su
Assigned Permit Engineer	Susan Jenkins
Date of Review Report Submission	09/28/2023
Assigned DMU Modeler	Byeong-Uk Kim Olliander Beucler Sarah Ray
Approved by DMU PM1	10/05/2023
List of Reviewed Pollutants	Ozone, $PM_{2.5}$ and NO_2

Review Summary

Are the modeled concentrations of all pollutants below SIL for Class I and Class II areas?	☐ Yes	☒ No
If "No" for the question above, list all pollutants whose modeled impacts were greater than or equal to the applicable SIL.	Class II 1-hour NO_2	
If cumulative modeling (i.e., Increment and NAAQS) is performed, are all pollutant below their applicable PSD Increment thresholds and NAAQS?	☐ Yes	☒ No
If "No" for the question above, list all pollutants whose modeled impacts were greater than applicable PSD Increment threshold and/or NAAQS.	Class II 1-hour NO_2 NAAQS **Note: Facility contributions are below the corresponding SILs.**	
Did the AQRV analysis show compliance?	☒ Yes	☐ No

Modeling Results

Table 1. Class II Significant Impact Levels Modeling

Pollutant	Averaging Period	Max Modeled Conc. (µg/m³)	Secondary Impact (µg/m³)*	Total (µg/m³)	SIL (µg/m³)	SIA (km)	Receptor UTM Zone: 16	
							Easting (meter)	Northing (meter)
NO_2	1-hour	14.06269	N/A	**14.06269**	7.5	9.6	742,307.00	3,727,461.00
	Annual	0.023	N/A	0.023	1	N/A	741,207.00	3,724,761.00
$PM_{2.5}$	24-hour	0.01684	0.0528	0.06964	1.2	N/A	739,807.00	3,724,561.00
	Annual	0.00024	0.0029	0.00314	0.2	N/A	741,207.00	3,724,761.00

* Secondary $PM_{2.5}$ impacts were estimated with the MERP approach using the NO_X and SO_2 emissions at the proposed facility.

Table 2. Class I Significant Impact Levels Modeling

Pollutant	Averaging Period	Max Modeled Conc. (µg/m³)	Secondary Impact (µg/m³)*	Total (µg/m³)	SIL (µg/m³)	Receptor UTM Zone: 16	
						Easting (meter)	Northing (meter)
NO_2	Annual	0.00326	N/A	0.00326	0.1	774,606.92	3,688,993.31
$PM_{2.5}$	24-hour	0.00196	0.0166	0.01856	0.27	743,994.82	3,775,439.20
	Annual	0.00003	0.00044	0.00047	0.05	774,606.92	3,688,993.31

* Secondary $PM_{2.5}$ impacts were estimated with the MERP approach using the NO_X and SO_2 emissions at the proposed facility.

Table 3. NAAQS Modeling

Pollutant	Averaging Period	Max Modeled Conc. (µg/m³)	Background (µg/m³)	Secondary Impact (µg/m³)	Total (µg/m³)	NAAQS (µg/m³)	Receptor UTM Zone: 16	
							Easting (meter)	Northing (meter)
NO_2	1-hour	123.66882	89.1	N/A	**212.8**	188	745,807.00	3,728,861.00

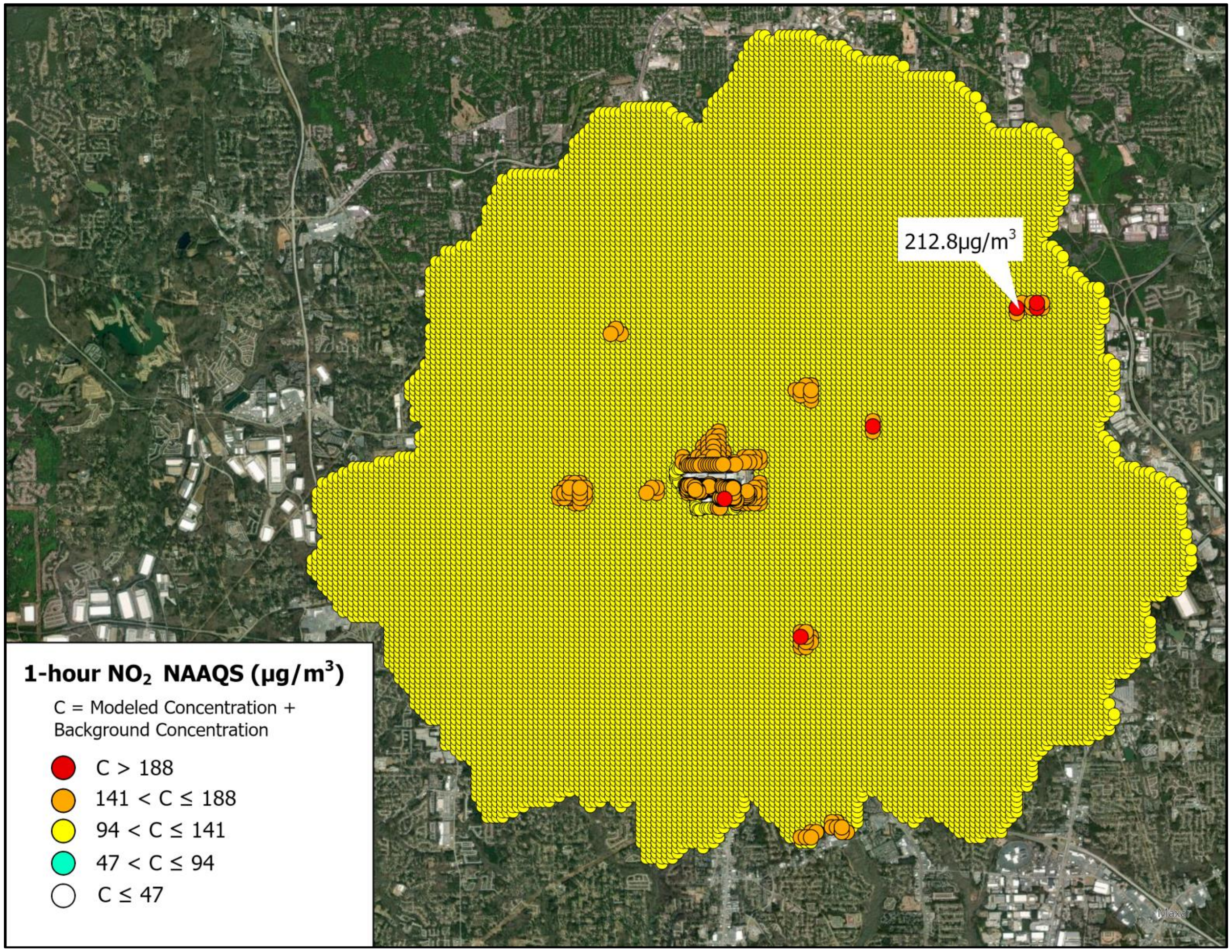

Figure 1. Spatial distribution of modeled NO_2 concentrations at all 1-hour NO_2 NAAQS modeling receptors. In the south region of the map where concentrations are between 141 µg/m^3 and 188µg/m^3 (i.e., orange dots) and at NAAQS violating receptors (i.e., red dots), the Delta contribution is below 7.5 µg/m^3. Therefore, the DMU did not expand receptor grids.

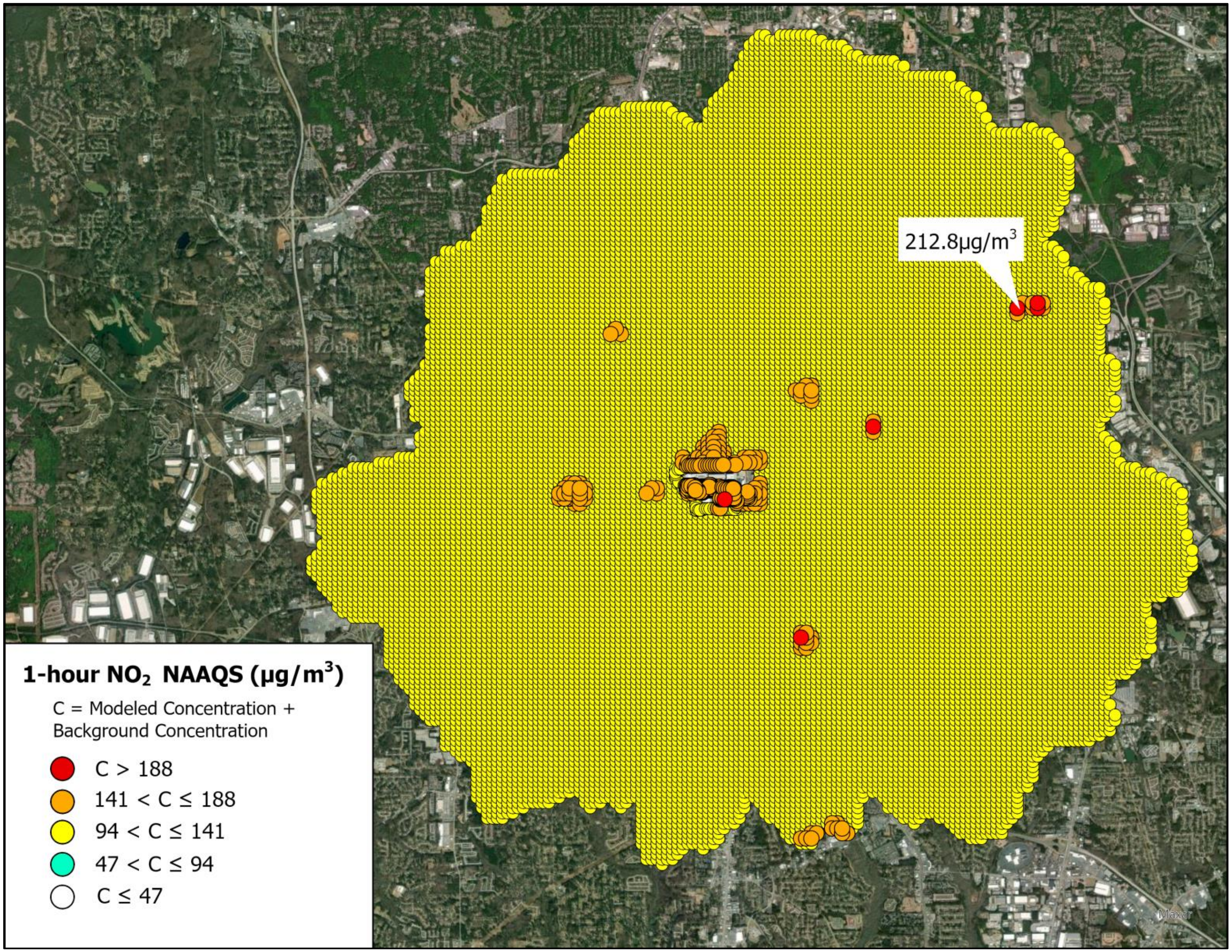

Figure 2. Zoomed-in map of spatial distribution of modeled NO_2 concentrations at 1-hour NO_2 NAAQS modeling receptors around the facility. For the red dot site of 189.4 μg/m^3, the Delta contribution is below 7.5 μg/m^3.

Table 4. 1-hour NO_2 NAAQS Contribution Analysis

All Modeled Conc. (µg/m^3)*	MGLC for Delta (µg/m^3)	Receptor UTM (Zone: 16) Easting (meter)	Receptor UTM (Zone: 16) Northing (meter)	Rank	Remark
212.7688	0.00755	745,807.00	3,728,861.00	8th	Highest 1-hour NO_2 concentration among all receptors exceeding the 1-hour NO_2 NAAQS level
196.3763	4.44674	743,007.00	3,726,561.00	9th	Maximum 1-hour NO_2 Contribution by the proposed project among all receptors and ranks exceeding the 1-hour NO_2 NAAQS level

* The number of receptors exceeded the 1-hour NO_2 NAAQS level (188 µg/m^3) was 85 receptors in the culpability analysis modeling output including the background concentration of 89.1 µg/m^3. The exceedance(s) at each of NAAQS violation receptors occurred from 8th rank up to 39th, but no exceedances afterwards. This refined modeling demonstrates that Delta TechOps will not cause or contribute a significant impact (i.e., ≥ 7.5 µg/m^3) to the NO_2 NAAQS exceedances at the 1-hour averaging period.

Table 5. Additional Analysis

Analysis	Results
Ozone Impact	The significant impact of ozone is 0.52 ppb, which is less than the ozone SIL (1 ppb). The DMU calculated this value using MERPs from the Fulton County hypothetical source. Therefore, the applicant did not need to conduct a cumulative ozone analysis.*
Significant Monitoring Concentration	No preconstruction monitoring is required for annual NO_2 as the maximum modeled concentration does not exceed the significant monitoring concentration. See Table 2-10: Significant Monitoring Concentrations [40 CFR 52.21(i)(5)(i)] of the application for additional details.
AQRV	No adverse comments were received from the applicable FLMs. During its review, the DMU confirmed that Q/D values for all Class I areas within 300 km were less than 10. This analysis demonstrates that the expected project impact on Class I AQRVs will be negligible.
Others	Based on information provided in the application, the DMU agreed with the applicant's decision not to perform a Class II visibility analysis. Soils and vegetation analysis showed no detrimental effects. Economic growth analysis showed no detrimental effects.

*See the Preliminary Determination for details.

DMU Modeling Review Report – TAP

General Information

Application #	622776
AIRS #	063-00105
Applicant	Delta Air Lines, Inc. Technical Operations Center
Application Receipt Date	06/20/2023 & 09/07/2023
Modeling Review Request Date	06/27/2023 & 09/12/2023
Assigned SSPP PM1	Jeng-Hon Su
Assigned Permit Engineer	Susan Jenkins
Date of Review Report Submission	09/19/2023
Assigned DMU Modeler	Sarah Ray
Approved by DMU PM1	09/20/2023
List of Reviewed Pollutants	acrolein, benzene, 1,3-butadiene, formaldehyde, and sulfuric acid mist

Review Summary

Maximum Ground Level Concentrations (MGLCs) of all TAPs below Acceptable Ambient Concentrations (AACs)?	☒ Yes	☐ No

Modeling Results

Table 1. TAP MGLC Assessment

TAP	Averaging Period	AAC ($\mu g/m^3$)	Max Modeled Conc. ($\mu g/m^3$)	Receptor UTM Zone: 16	
				Easting (m)	Northing (m)
Acrolein	15-min	23	0.0453816	739,509.19	3,725,940.25
	Annual	0.02	0.00003	739,476.54	3,725,406.20
Benzene	15-min	1,600	0.031152	739,509.19	3,725,940.25
	Annual	0.13	0.00002	739,476.54	3,725,406.20
1,3-Butadiene	15-min	1,100	0.0312708	739,509.19	3,725,940.25
	Annual	0.03	0.00002	739,476.54	3,725,406.20
Formaldehyde	15-min	245	0.2281356	739,509.19	3,725,940.25
	Annual	1.1	0.00015	739,476.54	3,725,406.20
SAM	15-min	300	2.099	739,658.22	3,725,806.20
	24-hour	2.4	0.32578	739,201.38	3,725,524.53