GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

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NARRATIVE

TO: Cynthia Dorrough

FROM: Jada Levers

DATE: August 24, 2023

Facility Name:	**Morning Hornet, LLC**
AIRS No.:	217-00072
Location:	Social Circle, GA (Newton, Morgan, Walton Counties)
Application #:	28974
Date of Application:	August 2, 2023

Background Information

Morning Hornet, LLC was issued Permit No. 7374-217-0072-S-01-0 on December 14, 2017, as a greenfield site located south of Highway 278 NE and Shire Parkway, and north of Cooper Road in Social Circle, Georgia 30025 (Newton County). On August 22, 2018, Permit Amendment 7374-217-0072-S-01-1 was issued to allow the facility to add two [2] additional diesel-fired emergency generators under a new "Group 2". On October 17, 2019, Permit Amendment 7374-217-0072-S-01-2 was issued to allow the facility to remove twenty-two [22] Group 1 generators and change the manufacturer, make, and model for fourteen [14] of the Group 1 generators, which will now be referred to as "Group 3" generators. On March 3, 2020, Permit Amendment 7374-217-0072-S-01-3 was issued for the revision of model specifications and emission rate for fourteen [14] previously permitted emergency generators and revision of emission rates for thirty-six [36] other previously permitted emergency generators. On December 4, 2020, NPR was issued to add one Group 3 generator and to relocate three permitted Group 3 generators. On March 4, 2022, Permit Amendment 7374-217-0072-S-01-4 was issued for the addition of thirty-six [36] Group 4 generators and one [1] fire pump diesel fired engine.

Following the last permit, the data center is now located in Newton County, Morgan County, and Walton County which are each considered attainment areas for all criteria pollutants. The facility is equipped with diesel-fired emergency generators to supply power during readiness testing, system maintenance and emergencies. In summary, the facility is currently permitted to have a total of ninety [90] engines, thirty-six [36] with a design capacity of 28.4 MMBtu/hr referred to Group 1, two [2] engines with a design capacity of 10 MMBtu/hr referred to as Group 2, fifteen [15] engines with a design capacity of 28.4 MMBtu/hr referred to as Group 3, thirty-six [36] emergency generators referred to as Group 4, and one [1] diesel fire pump. Morning Hornet, LLC is a synthetic minor source since the facility had accepted a NOx limit of 99.9 tons per year.

Purpose of Application

Application No. 28974 was dated August 2, 2023, and received August 4, 2023, for the installation and operation of eighteen [18] additional emergency generators in Group 4 equipped with selective catalytic reduction (SCR) and the installation of SCR on one of the previously permitted "Group 2" generators, Group

2b. Group 2 will be separated as “Group 2a”, without the SCR, and “Group 2b”, equipped with the SCR. The facility is also requesting to rename the Group 4 emergency generators as a nomenclature preference. The number of engines, make/model of the engines, and control devices associated with the engines will remain the same and the generator group will continue to be referred to as “Group 4” in this permit. Public Advisory was not issued for this application.

Updated Equipment List

Emission Units				Associated Control Devices	
Source Code	**Description**	**Installation Date**	**Construction Date**	**Source Code**	**Description**
NCG1EG-1 through NCG1EG-3, NCG1EG-5 through NCG1EG-10, NCG1EG-12 through NCG1EG-14, NCG1EG-N1 through NCG1EG-N4, NCG1EG-1R, NCG1EG-2R, NCG2EG-1 through NCG2EG-3, NCG2EG-5 through NCG2EG-10, NCG2EG-12 through NCG2EG-14, NCG2EG-N1 through NCG2EG-N4, NCG2EG-1R, NCG2EG-2R	28.4 MMBtu/hr Diesel- Fired Emergency Generators	2018	2019	--	--
NCGEG-A1	**10.0 MMBtu/hr Diesel- Fired Emergency Generator**	**2018**	**2019**	**--**	**--**
MWGEG-A1	**10.0 MMBtu/hr Diesel- Fired Emergency Generator**	**2023***	**2023***	**MWGSCR-A1***	**SCR***
NCG3EG-RA through NCG3EG-RC, NCG3EG-N1 through NCG3EG-N4, NCG5EG-N1 through NCG5EG-N4, NCG6EG-N1 through NCG6EG-N4	28.4 MMBtu/hr Diesel- Fired Emergency Generators	2020 (NCG3EG-RA through NCG3EG-RC, NCG3EG-N1 through NCG3EG-N4, NCG5EG-N1 through NCG5EG-N4) **2021* (NCG6EG-N1 through NCG6EG-N4)**	2020 (NCG3EG-RA through NCG3EG-RC, NCG3EG-N1 through NCG3EG-N4, NCG5EG-N1 through NCG5EG-N4) **2021* (NCG6EG-N1 through NCG6EG-N4)**	--	--

	Emission Units			Associated Control Devices	
Source Code	**Description**	**Installation Date**	**Construction Date**	**Source Code**	**Description**
MWG1EG-1 through MWG1EG-12, MWG1EG-N1 through MWG1EG-N4, MWG1EG-1R, MWG1EG-2R **MWG2EG-1 through MWG2EG-12, MWG2EG-N1 through MWG2EG-N4, MWG2EG-1R, MWG2EG-2R** **MWG6EG-1 through MWG6EG-12, MWG6EG-N1 through MWG6EG-N4 MWG6EG-1R, MWG6EG-2R***	**28.4 MMBtu/hr Diesel- Fired Emergency Generators**	**2023***	**2023***	**MWG1SCR-1 through MWG1SCR-12, MWG1SCR-N1 through MWG1SCR-N4, MWG1SCRG-1R, MWG1SCR-2R** **MWG2SCR-1 through MWG2SCR-12, MWG2SCR-N1 through MWG2SCR-N4, MWG2SCR-1R, MWG2SCR-2R** **MWG6SCR-1 through MWG6SCR-12, MWG6SCR-N1 through MWG6SCR-N4 MWG6SCR-1R, MWG6SCR-2R***	**SCR***
DFP-1	1.2 MMBtu/hr Diesel Fire Pump	2022	2022	--	--

*proposed within current application

Emissions Summary

Operation of the diesel-fired emergency generator engines will result in emissions of Nitrogen Oxides (NOx), carbon monoxide (CO), volatile organic compounds (VOCs), sulfur dioxide (SO_2), particulate matter (PM, $PM_{10,}$ and $PM_{2.5}$), hazardous air pollutants (HAPs), and greenhouse gases (GHGs). The potential hourly emissions from each emergency generator were based on engine-specific emission factors provided by the manufacturer for NOx, VOCs (hydrocarbons), CO, and filterable PM and used to estimate the emissions of the pollutants at each generator load. Potential emissions were conservatively calculated based on the manufacturer's not-to-exceed emissions data. All particulate matter present in engine exhaust is assumed to be $PM_{2.5}$. For Group 2b and Group 4 emergency generators, load-specific NOx emission reduction percentages provided by the SCR manufacturer were applied to the NOx emission rates to account for SCR controls. The SCR manufacturer specification sheet is included in Appendix 3 of Application No. 28974. Diesel fuel emission factors presented in AP-42, Section 3.4, Large Stationary Diesel and All Stationary Dual-fuel Engines (October 1996) were used for emissions of condensable PM, SO_2, and HAPs. GHG emission factors and global warming potentials provided in 40 CFR Part 98 were used to estimate emissions of CO_2e from diesel fuel combustion.

Potential annual emissions from the emergency generators are based on a facility-wide NOx limitation of 99.9 tons per year on an aggregate, 12-month rolling basis. NOx is the criteria pollutant with the highest hourly emissions at each load. As such, limiting the total NOx emissions from all generators also inherently limits the potential emissions of all other pollutants. The ratio of specific pollutant emissions to NOx emissions was estimated (pounds per hour of pollutant emitted/pounds per hour of NOx emitted) at each load for each engine type (i.e., Group 1, Group 2a, Group 2b, Group 3, and Group 4) using the emission factors described above. Consistent with previous submittals, potential annual emissions from the generators were based on the lower of either:

1) The maximum ratio of pollutant emissions to NOx emissions at any load (for Group 1, Group 2a, Group 3 engines[1], whichever is higher) multiplied by the requested NOx emission limitation of 99.9 tpy, or,

2) The sum of emissions from each individual generator operating at its maximum hourly pollutant emission rate up to 200 hours annually.

Actual annual emissions from the emergency generators were calculated using 2022 actual emission values provided by the facility via email exchange on Friday, October 13, 2023, and the pollutant-to-NOx ratios provided on page 5 of the SIP Permit Modification Application No. 28974. The addition of 18 new diesel fired emergency generators will cause an increase in each air pollutant emitted from the facility and thus will cause an increase in emissions facility-wide.

Operation of the diesel-fired fire water pump will result in emissions of products of combustion. The potential hourly emissions from the diesel fired water pump were based on emission factors for NOx, CO, PM_{10}, and VOC and were obtained from the manufacturer specifications. Diesel fuel emission factors for all other pollutants except CH_4 and N_2O were obtained from AP-42, Section 3.3, Gasoline and Diesel Industrial Engines (October 1996). GHG emission factors and global warming potentials provided in 40 CFR Part 98 were used to estimate emissions of CO_2e from diesel fuel combustion. Potential annual emissions from the diesel-fired fire water pump were estimated assuming 500 hours per year of operation. These values are further detailed in Appendix 4 of Application No. 28974. Potential emissions from fuel storage associated with the fire pump are expected to be de minimis.

Emissions of VOCs from the diesel belly tanks will result from standing and working losses. Any potential HAP emissions from the operation of the diesel belly tanks are expected to be de minimis. These emissions were estimated using USEPA's TANKS 4.0.9.d program, which incorporates the equations from AP-42, Section 7.1, Organic Liquid Storage Tanks (November 2006). The maximum annual fuel throughput for each belly tank was based on:

1) The maximum hourly diesel fuel consumption for each Group 1, Group 2a, Group 2b, Group 3, or Group 4 generator, per the manufacturer's specifications; and,

2) A maximum of 200 hours of operation per engine annually.

The TANKS program output files are also included in Appendix 4 of Application No. 28974. A summary of the potential emissions for the facility is provided in the following table and indicate the facility will remain a synthetic minor source with the existing facility-wide NOx emissions limitation of 99.9 tpy.

[1] The "Ratio of Pollutant Emissions to NOX Emissions" specifically excludes the ratios associated with the Group 2b and Group 4 engines. See Appendix 4 of Application No. 28974.

Facility-Wide Emissions
(in tons per year)

Pollutant	Potential Emissions			Actual Emissions		
	Before Mod.	After Mod.	Emissions Change	Before Mod.	After** Mod.	Emissions Change
$PM/PM_{10}/PM_{2.5}$	17.32/17.5/ 17.5	17.32/17.5/ 17.5	0/0/0	0.92***	1.10	0.19
NOx	99.9*	99.9*	0	35.95	37.23	1.29
SO_2	0.15	0.15	0	0.03	0.04	0.01
CO	69.73	69.73	0	10.15	12.24	2.09
VOC	29.54	29.54	0	4.23	5.10	0.87
Max. Individual HAP	0.04	0.04	0	0.04	0.02	3.61E-03
Total HAP	0.09	0.09	0	0.02	0.04	7.31E-03
Total GHG (if applicable)	9,099	9,099	0	3,704	4,464	760

* 99.9 tpy NOx permit limit
** Actual emissions calculations based on 20 hr/yr of operation and provided by Ramboll UK Consulting.
*** Facility assumed $PM=PM_{10}=PM_{2.5}$

Regulatory Applicability

40 CFR 60 Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines
Subpart IIII applies to manufacturers, owners, and operators of new, modified, and reconstructed compression ignition (CI) internal combustion engines (ICE). Since the additional eighteen [18] engines were manufactured after April 1, 2006, and construction of the engines commenced after July 11, 2005, for CI ICE that are not fire pump engines, these emergency generators are subject to this regulation. The proposed generators meet the definition of emergency stationary ICE in 40 CFR 60.4219 and are subject to Subpart IIII under 40 CFR 60.4200(a)(2)(i).

40 CFR 63 Subpart ZZZZ – National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines
Subpart ZZZZ applies to new and existing stationary reciprocating internal combustion engines (RICE) located at both major and area sources of HAP emissions. The facility must operate the additional eighteen [18] emergency stationary RICE according to the requirements of 40 CFR 63.6640(f), which coincide with emergency generator requirements of Subpart IIII.

Georgia Rule 391-3-1-.02(2)(b) – Visible Emissions
Rule (b) limits visible emissions from all sources to no more than 40% opacity, unless a source has another opacity limitation elsewhere in the Georgia rules. This limitation is applicable to the proposed emission units to be located at the facility, and the facility will comply with this limitation through the exclusive use of ULSD fuel in its generator engines and fire pump, which will result in negligible visible emissions.

Georgia Rule 391-3-1-.02(2)(tt) – VOC Emissions from Major Sources
Rule (tt) applies to sources located in specific counties that have potential emissions of VOC exceeding 100 tons per year. Potential VOC emissions from the facility are approximately 29.5 tpy, which is much less than the 100 tpy major source threshold in Newton and Walton Counties. As such, the provisions of Rule (tt) do not currently apply to this facility.

Georgia Rule 391-3-1-.02(2)(yy) – Emissions of Nitrogen Oxides from Major Sources
Rule (yy) applies to sources located in specific counties that have potential emissions of NOx exceeding 100 tons per year. The facility has requested a synthetic minor limit in order to maintain potential NOx emissions from the facility to less than 100 tpy, which is the major source threshold in Newton and Walton Counties. As such, the provisions of Rule (yy) do not currently apply to this facility.

Georgia Rule 391-3-1-.02(2)(mmm) – NOx Emissions from Stationary Gas Turbines and Stationary Engines used to Generate Electricity
Rule (mmm) provides NOx emission limitations for stationary gas turbines and stationary engines located in certain Atlanta metropolitan area counties, including Newton and Walton Counties. This regulation is applicable to the proposed new emergency generators. The emergency generators will meet the definition of an emergency stationary standby generator under this rule, as they will operate for emergency events, for non-emergency events as specified in Condition No. 2.3 of this permit, for routine maintenance/testing, and will each not operate for more than 200 hours annually. Therefore, the emergency generators are exempt from the NOx emission limitations under Rule (mmm) per Rule 391-3-1-.02(2)(mmm)(7).

Permit Conditions

Modified Condition 2.3 allows the operation of each emergency generator for emergency operation, maintenance check and readiness testing, and operation in non-emergency situations. The verbiage has been modified to match more closely to 40 CFR 60.4211(f).

Modified Condition 5.3 requires the Permittee to install, calibrate, operate, and maintain SCR devices on all Group 4 generators and the Group 2b generator.

Modified Condition 7.6 requires the Permittee to calculate monthly NOx emissions, each calendar month, from all emergency generators.

Modified Condition 7.8 requires the Permittee to record each fault condition and each alarm condition on the Group 2b and Group 4 Generators as well as their accompanying SCRs.

Toxic Impact Assessment

Georgia EPD's Guideline for Ambient Impact Assessment of Toxic Air Pollutant Emissions (Guideline) provides requirements for assessing the impacts of toxic air pollutant (TAP) emissions from a proposed facility. The Guideline defines a TAP as any substance which may have an adverse effect on public health, excluding any specific substance that is covered by a state or federal ambient air quality standard. If a facility's emissions of a specific TAP are less than the minimum emission rate (MER), no further analysis is required for that pollutant. Otherwise, an air dispersion modeling analysis is required to demonstrate that the facility's emissions of the TAP will not exceed the pollutant's acceptable ambient concentration (AAC). Appendix A of the Guideline provides a list of state TAPs, as well as their respective MERs and AACs.

A comparison of the potential emissions of each TAP from the proposed facility to the MERs is provided in the following table, which indicates that a toxic impact assessment (TIA) is required for benzene only.

Pollutant (CAS No.)	Facility-Wide Potential Emissions (lb/yr)	Georgia MER (lb/yr)	TIA Required?
Benzene (71-43-2)	86.41	31.63	**Yes**
Toluene (108-88-3)	31.33	1,216,650	No
Xylenes (1330-20-7)	21.52	24,333	No
Formaldehyde (20-00-0)	9.45	267.00	No
Acetaldehyde (75-07-0)	3.26	1,107	No
Acrolein (107-02-8)	0.93	4.87	No
Naphthalene (91-20-3)	14.43	729.99	No

A toxic impact assessment (TIA) was conducted for benzene using the US EPA's SCREEN3 modeling software (version 13043), which evaluates the maximum 1-hour average impact. The facility prepared a model run for a single emergency generator in each generator Group. The single emergency generator used for the model run was based on the engine at the site in that Group located nearest to the fence line and an emission rate of 1 g/s for each engine. The fire pump is exempt from SIP construction permitting requirements per Georgia Rules for Air Quality Control 391-3-1-.03(6)(b)(13). Further, the fire pump will not be a significant source of emissions, and as such, the fire pump has been excluded from the TIA.

Per Appendix A of the Guideline, benzene has both a short-term (15-minute average) AAC and a long-term (annual average) AAC. Since the proposed generators will not be permitted to operate continuously throughout the year, separate short-term and long-term modeled benzene emission rates were developed. The short-term emission rate is equivalent to the potential hourly emissions per generator (lb/hr/gen). The long-term emission rate was developed based on the assumption that each generator operates for the maximum permitted number of hours per year (200 hrs/year), using the following equation:

$$\textit{Long-Term Modeled Emission Rate per Generator } (lb/hr/gen) = \frac{\textit{Short-term emission rate } \left(\frac{lb}{hr-gen}\right) \times \left(200\frac{hr}{yr}\right)}{\left(8{,}760\frac{hrs}{yr}\right)}$$

The modeled emission rates were converted from units of lb/hr to g/s, and the facility-wide maximum 1-hour modeled impact was then calculated as follows:

$$\textit{Facility-Wide Max. 1-Hr Impact } (\mu g/m^3) = \textit{Max. 1-Hr Impact from a Single Generator at 1 } g/s \ (\mu g/m^3) \times \textit{Number of Generators} \times \textit{Emission Rate per Generator } (g/s/gen)$$

Separate 1-hour modeled impacts were developed for the short-term and for the long-term averaging periods, and individual model runs were conducted for each Group of engine type, respectively. In accordance with the Guideline, the short-term 1-hour modeled impact (summed for the two engine types) was converted to a 15-minute impact by multiplying by a factor of 1.32, and the long-term 1-hour modeled impact was converted to an annual impact by multiplying by a factor of 0.08.

The results of the TIA are presented in the following table and demonstrate that the benzene impacts from the Morning Hornet, LLC will be less than the AACs. Detailed calculations and the SCREEN3 model output files supporting this TIA are provided in Appendix 5 of Application No. 28974.

Pollutant	15-Minute Modeled Impact (µg/m³)	15-Minute AAC (µg/m³)	Exceeds AAC?	Annual Modeled Impact (µg/m³)	Annual AAC (µg/m³)	Exceeds AAC?
Benzene	74.46	1,600	No	0.10	0.13	No

Summary & Recommendations

Based on the above considerations, I recommend issuing Permit No. 7374-217-0072-S-01-5 to Morning Hornet, LLC for the installation of eighteen [18] additional emergency generators including eighteen [18] respective SCRs in Group 4 and the separation of Group 2 into "Group 2a", without SCR, and "Group 2b", equipped with SCR. Public advisory was not required for this application. The facility will remain a synthetic minor source located within the Northeast District (Athens) for the purposes of compliance responsibility and the submittal of reports.

Addendum to Narrative

The 30-day public review started on November 8, 2023, and ended on December 8, 2023. Comments were not received by the Division.