GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

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# NARRATIVE

TO: Cynthia Dorrough

FROM: Alexander Lagunas

DATE: August 12, 2024

| | |
|---|---|
| Facility Name: | **QTS Fayetteville I, LLC** |
| AIRS No.: | 113-00073 |
| Location: | Fayetteville, GA (Fayette County) |
| Application #: | 29366 |
| Date of Application: | June 17, 2024 |

## Background Information

QTS Fayetteville I, LLC (hereafter the facility) is a data center, permitted under Permit No. 7374-113-0073-S-01-0, issued on October 11, 2023. It is located in Fayetteville, Fayette County, which is in attainment for all criteria pollutants. The facility consists of seven buildings (DC1, DC2, DC3, DC4, DC5, DC9, and DC10) that contain 205 diesel-fired emergency generators as backup and one diesel-fired fire pump with a limit of 670,000 gallons of diesel fuel per year to be a synthetic minor with respect to Title V. The facility submitted App. #29080 for the construction and operation of two additional diesel-fired emergency generators, for a total of 207 diesel-fired emergency generators, and Permit No. 7374-113-0073-S-01-1 was issued on February 16, 2024.

## Purpose of Application

QTS Fayetteville I, LLC submitted expedited App. #29366, dated July 17, 2024 and received July 22, 2024, for the construction and operation of 28 additional diesel-fired emergency generators and one (1) additional diesel-fired fire pump. No changes in permitted fuel use or allowable emissions were requested. The Public Advisory period expired on August 30, 2024, and no comments were received.

## Updated Equipment List

| Emission Units | | | Associated Control Devices | |
|---|---|---|---|---|
| **Source Code** | **Description** | **Installation Date** | **Source Code** | **Description** |
| EG001 – EG205 | Emergency Generator 001 through 205<br>Main Generators<br>Diesel-fired emergency generator, each rated at 2.5 MWe (Caterpillar Model 3516C) or 2.25 MWe (MTU DS2250) | 2023 | -- | -- |
| **EG206 - EG229** | **Emergency Generator 206 through 229**<br>**Diesel-fired emergency generator, each rated at 2.5 MWe (Caterpillar 3516C) or 2.25 MWe (MTU DS2250)** | **2024*** | -- | -- |
| EG230 & EG231 | Emergency Generator 230 & 231<br>Diesel-fired emergency generator, each rated at 1.25 MWe (Caterpillar C32)<br>Formerly EG206 & EG207 | 2024 | -- | -- |
| **EG232 – EG235** | **Emergency Generator 230 through 235**<br>**Diesel-fired emergency generator, each rated at 1.25 MWe (Caterpillar C32)** | **2024*** | -- | -- |
| FP001 | Diesel-fired Fire Pump<br>Diesel-fired fire pump, rated at 121 HP (Clarke JU4H-UFADPO) | 2023 | -- | -- |
| **FP002** | **Diesel-fired Fire Pump**<br>**Diesel-fired fire pump, rated at 121 HP (Clarke JU4H-UFADPO)** | **2024*** | -- | -- |

*proposed within current application

Note: The emergency generators with Source Code: EG206 and EG207, added in Permit No. 7374-133-0073-S-04-1 have been renamed EG230 & EG231 in order to group the engine types together. The change in renaming does not affect any condition.

### Storage Tanks

| Source Code | Capacity (gallons) | Contents | Installation Date | True Vapor Pressure (psia) |
|---|---|---|---|---|
| -- | 9,000 | 229 Diesel fuel tanks for emergency generators EG001-EG229 | 2023 | ~0.77 |
| -- | 140 | Two (2) Diesel fuel tanks for fire pumps | 2023 | ~0.77 |
| -- | 4,200 | Six (6) diesel fuel tanks for emergency generators EG230-EG235 | 2024* | ~0.77 |

*proposed within current application

**Emissions Summary**

Potential-to-emit is based on the fuel consumption limit of 670,000 gallons of diesel fuel combined, fired in all emergency generators and the fire pump, as established in Condition 2.1 of Permit No. 7374-133-0073-S-01-0. The table below demonstrates the PTE for $NO_X$ for each engine type that the diesel fuel may be fired in. $NO_X$ emissions were calculated if all 670,000 gallons were fired in that engine type exclusively.

| Engine | Fuel Limit (gal/yr) | $NO_X$ emission rate (lb/gal) | Total $NO_X$ emissions (tons/yr) |
|---|---|---|---|
| 2.5 MW Caterpillar 3516C | 670,000 | 0.298 | 99.93 |
| 2.25 MW MTU DS2250 | 670,000 | 0.285 | 95.48 |
| 1.25 MW Caterpillar C32 | 670,000 | 0.293 | 98.16 |
| Fire Pump | 670,000 | 0.083 | 27.81 |

The table demonstrates the worst-case scenario where all fuel is fired in the engine type with the highest $NO_X$ emissions, in this case, the 2.5 MW Caterpillar 3516C. Under this worst-case scenario, all criteria pollutants will be under the major source threshold of 100 tpy. This allows the facility to be a synthetic minor source with respect to Title V.

There is no change in emissions with this modification because the addition of new emergency generators does not affect the fuel limitation. No new engine types were added so the 2.5 MW Caterpillar 3516C remains the engine type with the highest $NO_X$ emissions, which has been demonstrated to be below the major source threshold with the 670,000-gallon limit. The emissions from all other criteria pollutants also remained lower than the major source threshold.

**Facility-Wide Emissions**
(in tons per year)

| Pollutant | Potential Emissions | | | Actual Emissions | | |
|---|---|---|---|---|---|---|
| | Before Mod. | After Mod. | Emissions Change | Before Mod. | After Mod. | Emissions Change |
| $PM/PM_{10}/PM_{2.5}$ | 5.81 | 5.81 | 0 | -- | -- | -- |
| NOx | 99.93 | 99.93 | 0 | -- | -- | -- |
| $SO_2$ | 0.0695 | 0.0695 | 0 | -- | -- | -- |
| CO | 50.60 | 50.60 | 0 | -- | -- | -- |
| VOC | 18.05 | 18.05 | 0 | -- | -- | -- |
| Max. Individual HAP | 0.0356 | 0.0356 | 0 | -- | -- | -- |
| Total HAP | 0.0723 | 0.0723 | 0 | -- | -- | -- |
| Total GHG (if applicable) | 7511 | 7511 | 0 | -- | -- | -- |

**Regulatory Applicability**

*40 CFR 60 Subpart IIII – "Standards of Performance for Stationary Compression Ignition Internal Combustion Engines"*

Applicable to the emergency generators (Source Codes: EG208 through EG235) and the fire pumps (Source Codes: FP001 and FP002).

This subpart applies to the stationary combustion ignited (CI) internal combustion engines (ICE) that commenced construction after July 11, 2005 and manufactured after April 1, 2006.

The emergency generators will be constructed after July 11, 2005 and thus are subject to this subpart. The emergency generators must comply with the emission standards for new nonroad CI engines for the life of the engine. The fuel fired must meet the requirements of 40 CFR 1090.305 for nonroad diesel fuel. The engines must also meet the requirements to be considered emergency stationary ICE under this subpart.

The fire pumps will be constructed after July 1, 2006 and thus are subject to this subpart. The fire pumps must comply with emission standards found in Table 4 of this subpart for the life of the engine. The fuel fired must meet the requirements of 40 CFR 1090.305 for nonroad diesel fuel. The fire pumps must also meet the compliance requirements by purchasing, installing, and configuring according to manufacturer's instructions.

*40 CFR 63 Subpart ZZZZ – "National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines"*

Applicable to the emergency generators (Source Codes: EG208 and EG235) and the fire pumps (Source Codes: FP001 and FP002).

This subpart applies to stationary ICE at major and area sources of HAP emissions.

The emergency generators and the fire pump are located at an area source of HAP emissions and thus subject to this subpart. The emergency generators and fire pumps are considered *new* because they are constructed on or after July 12, 2006 at an area source of HAP emissions. *New* stationary ICE located at an area source meet the requirements of this subpart by meeting the requirements of 40 CFR 60 Subpart IIII. No further requirements apply to the emergency engines and fire pumps.

*Georgia Rules 391-3-1-.02(2)(b) – "Visible Emissions"*

Applicable to the emergency generators (Source Codes: EG208 through EG235) and the fire pumps (Source Codes: FP001 and FP002).

This rule applies to source that are subject to other emission limitations under the Georgia rules. The emergency generators are subject to Rule (g) and (mmm) and thus subject to this rule. The generators may not emit emissions with opacity of which is equal to or greater than 40 percent. The fire pumps are subject to Rule (g) and thus subject to this rule.

*Georgia Rule 391-3-1-.02(2)(g) – "Sulfur Dioxide"*

Applicable to the emergency generators (Source Codes: EG208 through EG235) and the fire pumps (Source Codes: FP001 and FP002).

This rule applies to fuel-burning sources. The emergency generators and fire pumps fire diesel fuel and thus are subject to this rule. The emergency generators and fire pumps may not burn fuel containing more than 2.5 percent sulfur by weight.

*Georgia Rule 391-3-1-.02(2)(yy) – "Emission of Nitrogen Oxides from Major Sources"*

Not applicable.

This rule applies to sources of $NO_X$ emission above the threshold in a listed county. The facility is located in Fayette County, one of the listed counties with a threshold of 25 tons per year. $NO_X$ emissions from this facility are greater than 25 tpy and thus the emergency generators are subject to this rule, triggering RACT. However, this rule does not apply to sources subject to Rules (jjj), (lll), (mmm), or (nnn). The emergency generators (Source Codes: EG001 through EG235 are subject to Rule (mmm), and therefore they are not subject to this rule.

*Georgia Rules 391-3-1-.02(2)(mmm) – "$NO_X$ Emissions from Stationary Gas Turbines and Stationary Engines used to Generate Electricity"*

Applicable to the emergency generators (Source Codes: EG208 through EG235).

This rule applies to stationary gas engines used to generate electricity. The emergency generators generate electricity and thus are subject to this rule. Stationary engines located at date centers are not used to the emission limit if they meet the following criteria: operate only for routine testing and maintenance, operate for less than 500 hours per year, operate for routine testing and maintenance within a certain time frame, and maintain records of all operation.

The fire pumps are not used to generate electricity and thus are not subject to this rule.

**Permit Conditions**

Condition 2.1 was modified to include the additional emergency generators (Source Codes: EG206 through EG235) and fire pump (Source Codes: FP002). This condition limits the amount of fuel fired in all emergency generators and fire pumps, per Avoidance of Part 70.

Condition 2.2 was modified to include the additional emergency generators (Source Codes: EG206 through EG235) and the fire pumps (Source Codes: FP001 and FP002). This condition establishes the applicability of 40 CFR 60 Subpart A and Subpart IIII to the emergency generators and the fire pumps.

Condition 2.5 was modified to include the additional emergency generators (Source Codes: EG206 through EG235) and the fire pumps (Source Codes: FP001 and FP002). This condition sets fuel content standards per 40 CFR 60 Subpart IIII and subsumes Rule (g).

Condition 2.6 was modified to remove Rule (yy) as a citation.

Condition 2.8 was modified to include the additional emergency generators (Source Codes: EG206 through EG235). This condition limits the operation of the emergency generators to be considered emergency generators under Georgia Rula (mmm)8.

Condition 2.9 was modified to include the additional emergency generators (Source Codes: EG206 through EG235) and the fire pumps (Source Codes: FP001 and FP002). This condition establishes the applicability of 40 CFR 63 Subpart A and Subpart ZZZZ to the emergency generators.

Condition 2.10 was modified to include the additional emergency generators (Source Codes: EG206 through EG235) and the fire pumps (Source Codes: FP001 and FP002).). This condition limits emission with opacity equal to or greater than 40 percent, per Rule (b).

Condition 2.12 is new. This condition sets the emission standards for the fire pumps (Source Codes: FP001 and FP002), per 40 CFR 60 Subpart IIII.

Condition 2.13 is new. This condition requires the Permittee to comply with the emission standards for the fire pumps (Source Codes: FP001 and FP002) as stated in Conditions 2.4 and 2.13 by buying an engine certified to those standards, per 40 CFR 60 Subpart IIII.

Condition 4.2 is new. This condition requires the operation and maintenance of the fire pumps (Source Codes: FP001 and FP002) according to the manufacturer's written specifications, per 40 CFR 60 Subpart IIII.

Condition 5.1 was modified to include the additional emergency generators (Source Codes: EG206 through EG235) and the fire pumps (Source Codes: FP001 and FP002). This condition requires a non-resettable continuous monitoring system or device on the emergency generators, per 40 CFR 60 Subpart IIII.

Condition 7.2 was modified to include the additional emergency generators (Source Codes: EG206 through EG235) and the fire pumps (Source Codes: FP001 and FP002). This condition requires records for the emergency generators, per 40 CFR 60 Subpart IIII.

Condition 7.4 was modified to include the additional emergency generators (Source Codes: EG206 through EG235) and the fire pumps (Source Codes: FP001 and FP002). This condition requires monthly records of the fuel burned in the emergency generators and fire pumps to demonstrate compliance with Condition 2.1.

Condition 7.5 was modified to removed language and citation of 40 CFR 63 Subpart ZZZZ as no requirements from Subpart ZZZZ are applicable because it meets the requirements by meetings the requirements of 40 CFR 60 Subpart IIII.

## Toxic Impact Assessment

The facility conducted a Toxic Impact Assessment and identified benzene because the minimum emission rate (MER) was above the Acceptable Ambient Concentrations (AAC).

| Pollutant | Facility-wide Potential Annual Emission (lb/yr) | Minimum Emission Rate (lb/ry) | Modeling Required? |
|---|---|---|---|
| Benzene | 71.24 | 32 | Yes |

The facility used SCREEN3 to model the 15-minute and annual average concentrations of benzene to determine if they were below the AAC. All sources located within 100 meters of each other were co-located into a single stack, resulting in seven modeled stacks. These seven stacks correlate with the seven buildings located at the facility. Because there are several engine types, the parameters associated with less dispersion were selected as the worse-case parameters and used for the modeling.

| Stack # | Averaging Time | Maximum Facility-Wide Concentration ($\mu g/m^3$) | AAC ($\mu g/m^3$) | Exceeds AAC? |
|---|---|---|---|---|
| 1 | Annual | 7.71e-2 | 1.3e-1 | No |
| | 15-Minute | 661.19 | 1600 | No |
| 2 | Annual | 4.48e-2 | 1.3e-1 | No |
| | 15-Minute | 384.6 | 1600 | No |
| 3 | Annual | 6.75e-2 | 1.3e-1 | No |
| | 15-Minute | 579.43 | 1600 | No |
| 4 | Annual | 7.97e-2 | 1.3e-1 | No |
| | 15-Minute | 683.31 | 1600 | No |
| 5 | Annual | 6.00e-2 | 1.3e-1 | No |
| | 15-Minute | 514.56 | 1600 | No |
| 9 | Annual | 5.31e-2 | 1.3e-1 | No |
| | 15-Minute | 455.71 | 1600 | No |
| 10 | Annual | 2.72e-2 | 1.3e-1 | No |
| | 15-Minute | 233.34 | 1600 | No |

The table average lists the maximum concentration for each stack and its AAC. The maximum concentration at all stacks for both annual and 15-minute averaging periods were below the AAC.

## Summary & Recommendations

I recommend that Permit No. 7374-113-0073-S-01-2 be issued to QTS Fayetteville I, LLC for the construction and operation of 28 additional emergency generators and fire pump. The facility will remain a synthetic minor source with respect to Title V as there are no changes to fuel or emission limitations.

**Addendum to Narrative**

The 30-day public review started on September 11, 2024 and ended on October 11, 2024. Comments were not received by the Division.