

**NORTH CAROLINA DIVISION OF  
AIR QUALITY**

**Application Review**

**Issue Date:**

**Region:** Washington Regional Office  
**County:** Wayne  
**NC Facility ID:** 9600017  
**Inspector's Name:** Robert Bright  
**Date of Last Inspection:** 11/10/2021  
**Compliance Code:** 3 / Compliance - inspection

<b>Facility Data</b>	<b>Permit Applicability (this application only)</b>
<p><b>Applicant (Facility's Name):</b> Duke Energy Progress, LLC - H.F. Lee Steam Electric Plant</p> <p><b>Facility Address:</b>                  Duke Energy Progress, LLC - H.F. Lee Steam Electric Plant                  1199 Black Jack Church Road                  Goldsboro, NC 27530</p> <p><b>SIC:</b> 4911 / Electric Services  <b>NAICS:</b> 221112 / Fossil Fuel Electric Power Generation</p> <p><b>Facility Classification: Before:</b> Title V <b>After:</b> Title V  <b>Fee Classification: Before:</b> Title V <b>After:</b> Title V</p>	<p><b>SIP:</b> 15A NCAC 02D .1111, 02Q .0501(c)(l)  <b>NSPS:</b> NA  <b>NESHAP:</b> NA  <b>PSD:</b> NA  <b>PSD Avoidance:</b> NA  <b>NC Toxics:</b> 02D .1100  <b>112(r):</b> NA  <b>Other:</b> NA</p>

<b>Contact Data</b>	<b>Application Data</b>						
<table border="1"> <tr> <td style="text-align: center;"><b>Facility Contact</b></td> <td style="text-align: center;"><b>Authorized Contact</b></td> <td style="text-align: center;"><b>Technical Contact</b></td> </tr> <tr> <td>                     Mike Graham                      Lead EHS Professional                      (919) 722-6551                      1199 Black Jack Church Road                      Goldsboro, NC 27530                 </td> <td>                     Jeffery Hines                      General Manager II                      (919) 722-6450                      1199 Black Jack Church Road                      Goldsboro, NC 27530                 </td> <td>                     Erin Wallace                      Lead Environmental Specialist                      (919) 546-5797                      410 South Wilmington Street                      Raleigh, NC 27601                 </td> </tr> </table>	<b>Facility Contact</b>	<b>Authorized Contact</b>	<b>Technical Contact</b>	Mike Graham Lead EHS Professional (919) 722-6551 1199 Black Jack Church Road Goldsboro, NC 27530	Jeffery Hines General Manager II (919) 722-6450 1199 Black Jack Church Road Goldsboro, NC 27530	Erin Wallace Lead Environmental Specialist (919) 546-5797 410 South Wilmington Street Raleigh, NC 27601	<p><b>Application Number:</b> 9600017.21B  <b>Date Received:</b> 10/07/2021  <b>Application Type:</b> Modification  <b>Application Schedule:</b> TV-Significant</p> <p style="text-align: center;"><b>Existing Permit Data</b></p> <p><b>Existing Permit Number:</b> 01812/T48  <b>Existing Permit Issue Date:</b> 08/02/2021  <b>Existing Permit Expiration Date:</b> 09/30/2025</p>
<b>Facility Contact</b>	<b>Authorized Contact</b>	<b>Technical Contact</b>					
Mike Graham Lead EHS Professional (919) 722-6551 1199 Black Jack Church Road Goldsboro, NC 27530	Jeffery Hines General Manager II (919) 722-6450 1199 Black Jack Church Road Goldsboro, NC 27530	Erin Wallace Lead Environmental Specialist (919) 546-5797 410 South Wilmington Street Raleigh, NC 27601					

Total Actual emissions in TONS/YEAR:							
CY	SO2	NOX	VOC	CO	PM10	Total HAP	Largest HAP
2020	58.58	1051.41	20.18	313.12	153.29	3.85	2.56 [Formaldehyde]
2019	14.52	954.55	16.78	110.42	151.74	4.08	2.70 [Formaldehyde]
2018	17.25	1203.89	32.57	151.05	173.90	6.28	3.91 [Formaldehyde]
2017	15.73	1095.41	16.93	73.22	163.87	4.29	2.83 [Formaldehyde]
2016	15.59	1060.46	35.69	223.78	159.34	6.30	4.25 [Formaldehyde]

<p><b>Review Engineer:</b> Ed Martin</p> <p><b>Review Engineer's Signature:</b> _____ <b>Date:</b> _____</p>	<p style="text-align: center;"><b>Comments / Recommendations:</b></p> <p>Issue 01812/T49  <b>Permit Issue Date:</b> _____  <b>Permit Expiration Date:</b> _____</p>
--	---

**Chronology**

- October 7, 2021 Application 9600017.21B was received and considered complete for processing on this date.
- April 21, 2022 Sent the draft permit to Supervisor.
- April 21, 2022 Sent the draft permit to the Stationary Source Compliance Branch, Applicant and Washington Regional Office.
- May 5, 2022 Received Duke’s comments on the draft permit (testing condition only at this time).
- TBD Sent the draft permit to 30-day public notice and 45 day EPA review.
- TBD Public notice period ended.
- TBD EPA’s comment period ended.
- TBD Permit was issued.

**I. Facility Description**

Duke Energy’s H. F. Lee Steam Electric Plant is an electric utility facility that generates electrical power. The main emission sources are five No. 2 fuel oil/natural gas-fired simple-cycle internal combustion turbines (Lee IC Unit Nos. 10, 11, 12, 13 and 14), and three nominal 170 MW natural gas/No. 2 fuel oil-fired simple/combined-cycle internal combustion turbines (Lee IC Unit Nos. 1A, 1B and 1C). Other sources include: one natural gas-fired auxiliary boiler (AB1), three natural gas-fired dew point heaters (DPH1, DPH2 and DPH3), one multi-cell wet surface air cooler with drift eliminators (CT1), one multi-package/multi-cell turbine inlet chiller with drift eliminators (CT2), and one No. 2 fuel oil fixed-roof storage tank with atmospheric vents (ST3).

**II. Purpose of Application**

Duke Energy Progress (DEP) is requesting reclassification from a major source of hazardous air pollutants (HAPs) to an area source of HAPs. As a result, the following maximum achievable control technology (MACT) standards no longer apply and have been removed as follows:

MACT Standard	Affected Emission Sources
15A NCAC 02D .1111: MAXIMUM ACHIEVABLE CONTROL TECHNOLOGY (40 CFR 63 Subpart YYYY - National Emissions Standards for Hazardous Air Pollutants for Stationary Combustion Turbines)	Lee IC Unit No. 14, Lee IC Unit No. 1A, Lee IC Unit No. 1B and Lee IC Unit No. 1C.
15A NCAC 02D .1111: MAXIMUM ACHIEVABLE CONTROL TECHNOLOGY (40 CFR PART 63, SUBPART DDDDD - National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters)	AB1, DPH1, DPH2, DPH3, I-ES-45A, I-ES-45B, I-ES-45C, I-ES-46A, I-ES-46B, and I-ES-4C.

In addition, sources I-ASH-1, I-ES-39B, I-ES-39D, I-ES-40B, I-ES-44A through I-ES-44F and I-ES-FWP1 from “MACT ZZZZ” to “GACT ZZZZ” have been reclassified from MACT ZZZZ to GACT ZZZZ.

This is a one-step significant permit modification that contravenes or conflicts with a condition in the existing permit, following the procedures in 15A NCAC 02Q .0501(c)(l).

There are no changes to equipment.

### III. Permit Changes

The following changes were made to Air Permit No. 01812T48:

Old Page	Old Section	New Page	New Section	Description of Changes
Cover				Added new cover letter with new format. Amended permit numbers and dates.
various	2.1 A, C, D, E, F, H, I, J and K	various	2.1 A, C, D, E, F, H, I, J and K	Added 15A NCAC 02Q .0317 (avoidance for 02D .1111) to each applicable regulations table.
3-4	1, table of permitted emission sources	4-5	1, table of permitted emission sources	Removed "MACT YYYY" identifier for Lee IC Unit No. 14, Lee IC Unit No. 1A, Lee IC Unit No. 1B and Lee IC Unit No. 1C.  Removed "MACT DDDDD" identifier for AB1, DPH1, DPH2 and DPH3.
15	2.1 C, regulation table	15	2.1 C, regulation table	Removed 15A NCAC 02D .1111 MACT (40 CFR Part 63 Subpart YYYY)
21	2.1 C.4	20	2.1 C.4	Removed and reserved.
23	2.1 D regulation table	21	2.1 D regulation table	Removed 15A NCAC 02D .1111 MACT (40 CFR Part 63 Subpart YYYY)
26	2.1 D.4	23	2.1 D.4	Removed and reserved.
28	2.1 E regulation table	24	2.1 E regulation table	Removed 15A NCAC 02D .1111 (40 CFR Part 63, Subpart DDDDD)
29	2.1 E.5	25	2.1 E.5	Removed and reserved.
32	2.1 F regulation table	26	2.1 F regulation table	Removed 15A NCAC 02D .1111 (40 CFR Part 63, Subpart DDDDD)
	2.1 F.4	26	2.1 F.4	Removed and reserved.
--	--	45	2.2 C.1	Added this HAP Facility-wide demonstration testing condition.
--	Insignificant Activities List	48	3	Created this new section for insignificant activities.  Reclassified I-ASH-1, I-ES-39B, I-ES-39D, I-ES-40B, I-ES-44A through I-ES-44F and I-ES-FWP1 from "MACT ZZZZ" to "GACT ZZZZ".  Removed "MACT DDDDD" identifier for I-ES-45A, I-ES-45B, I-ES-45C, I-ES-46A, I-ES-46B, and I-ES-4C.

Old Page	Old Section	New Page	New Section	Description of Changes
57-66	3	50-58	4	Created this new section and moved General Conditions to this section.  Updated General Conditions to version 6.0, dated 01/07/2022).

#### IV. Regulatory Evaluation

To be reclassified as an area source under Section 112, the facility’s potential to emit considering controls must be less than 10 tons per year for any single HAP and less than 25 tons per year for any combination of HAPs.

DEP has undertaken an effort to refine potential-to-emit (PTE) calculations utilizing site-specific data, where available. Fuel oil sampling was performed at the facility, and the results were incorporated into the PTE calculations. DEP states that the majority of the metals analyzed resulted in a value that was less than the respective detection limit. For conservatism, the full detection limit was used for each of the metal HAPs to calculate the PTE emissions where the results were less than the detection limit, as compared to the previously used AP-42 values for metals, dating back to 1993, which do not account for the reduction in metals emitted due to EPA requiring lower sulfur content fuel oil to be 15 ppm or less. Metals in the fuel oil are lower due to the co-benefit during the hydrodesulfurization refining process.

Based on the updated PTE analysis, DEP proposes that the facility qualifies to be reclassified as an area source of HAPs. As shown in the application, the maximum single HAP emissions are 5.86 tpy and the total emissions of all HAPs are 24.57 tpy. The revised calculations and fuel oil analysis results are shown in Attachments 1 and 2 of the application.

However, total HAPs are close to the 25 tons per year limit for any combination of HAPs. Also, the emission factors used for formaldehyde in the application, which are based on stack tests at several Florida Power & Light facilities and at Dominion Possum Point Units 6A and 6B, are much lower than those in AP-42. The emission factors used were 6.12E-5 pounds per million Btu for natural gas (compared to 7.1E-4 pounds per million Btu in AP-42) and 1.00E-5 pounds per million Btu for fuel oil (compared to 2.8E-4 pounds per million Btu in AP-42).

Therefore, DAQ is adding an enforceable 02Q .0317 avoidance condition for 02D.1111 MACT for stack testing to determine facility-wide HAP emissions. The testing will determine formaldehyde emission factors for one of the simple-cycle turbines and one of the combined-cycle turbines, when burning natural gas. These factors will be used to represent formaldehyde emitted from all the turbines (simple-cycle and combined-cycle) at the facility. According to the final turbine MACT YYYY federal register dated March 5, 2004, the HAP emitted from turbines in the largest quantity is formaldehyde.

After completing the required emission testing, if the results of any test indicate a formaldehyde emission factor greater than 6.12 E-5 pounds per million Btu (as included in application 9600017.21B) when burning natural gas, the Permittee shall submit a permit application pursuant to 15A NCAC 02Q .0514 “Administrative Permit Amendments”, within 60 days of conducting a test, to demonstrate that the tested emission factor does not result in an exceedance of the 10/25 ton per year emission limits. If, however, the results of any test indicate a formaldehyde emission factor is less than 6.12 E-5 pounds per million Btu when burning natural gas, the Permittee may request to revise the formaldehyde emission factor pursuant to 15A NCAC 02Q .0515 “Minor Permit Modifications”.

Monitoring is based on the tested formaldehyde factor, the maximum design heat inputs from the permit, and complying with the maximum annual hours of operation in the existing PSD conditions for the simple-cycle turbines (ID Nos. Lee IC Unit No. 10, Lee IC Unit No. 11, Lee IC Unit No. 12 and Lee IC Unit No.

13) in Section 2.1 A.2.e (2,000 full load equivalent hours per calendar year) and for the simple-cycle turbine (ID No. Lee IC Unit No. 14) in Section 2.1 C.3.d (2,000 full load equivalent hours per rolling consecutive 12-month period). The recordkeeping in PSD Sections 2.1 A.2.e and 2.1 C 3.e shall be sufficient to demonstrate compliance with the hourly requirements. Reporting is required for the actual number of hours of operation being recorded for the simple-cycle turbines. The operating hours for each combustion turbine must be calculated for each of the consecutive 12-months period over the previous 17 months. The combined-cycle turbines do not have any operational restrictions on the annual number of hours.

The Permittee will be deemed in noncompliance with 15A NCAC 02D .1111 if the actual HAP emissions show an exceedance of 10 tons per year for any single HAP or the 25 tons per year for any combination of HAPs.

The test condition is in Section 2.2 C.1 of the permit.

Therefore, the following MACT standards which only apply to major sources of HAPs and do not apply to area sources and are being removed:

15A NCAC 02D .1111: MAXIMUM ACHIEVABLE CONTROL TECHNOLOGY (40 CFR 63 Subpart YYYY - National Emissions Standards for Hazardous Air Pollutants for Stationary Combustion Turbines)

Subpart YYYY establishes national emission limitations and operating limitations for HAP emissions from stationary combustion turbines located at major sources HAP emissions as specified in 40 CFR 63.6080. Therefore, as an area source of HAPs, this standard no longer applies to combustion turbines Lee IC Unit No. 14, Lee IC Unit No. 1A, Lee IC Unit No. 1B and Lee IC Unit No. 1C.

15A NCAC 02D .1111: MAXIMUM ACHIEVABLE CONTROL TECHNOLOGY (40 CFR PART 63, SUBPART DDDDD - National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters)

This subpart establishes national emission limitations and work practice standards for hazardous air pollutants (HAP) emitted from industrial, commercial, and institutional boilers and process heaters located at major sources of HAP as specified in 40 CFR 63.7480. Therefore, as an area source of HAPs, this standard no longer applies to the auxiliary boiler AB1, the natural gas fired heaters DPH1, DPH2, DPH3; and the natural gas-fired heaters I-ES-45A, I-ES-45B, I-ES-45C, I-ES-46A, I-ES-46B, and I-ES-4C. In addition, these natural gas-fired sources are not subject to 40 CFR Subpart JJJJJ - National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources as specified in 40 CFR 63.11195(e).

## **V. Public Notice**

Pursuant to 15A NCAC 02Q .0521, a notice of the draft Title V Operating Permit will be published on the DAQ website to provide for a 30-day comment period with an opportunity for a public hearing. Copies of the draft (proposed) permit, review and public notice will be sent to EPA for their 45-day review, to persons on the Title V mailing list, to the Washington Regional Office, and to the Permittee.

## **VI. Other Requirements**

### PE Seal

A PE seal is not required since there are no air pollution capture or control systems being added in accordance with 02Q .0112.

### Zoning

There is no expansion of the facility, therefore zoning consistency is not needed.

### Fee Classification

The facility fee classification before and after this modification will remain as "Title V".

## **VII. Comments on Draft Permit**

The draft permit and review were sent to Erin Wallace at DEP, to Robert Bright at the Washington Regional Office, and to Samir Parekh with the Stationary Source Compliance Branch on April 21, 2022.

DEP Comments (email to Ed Martin from Erin Wallace dated May 5, 2022, June 17, 2022, and June 27, 2022)

DEP submitted several comments regarding the minor HAP testing condition in Section 2.2 C which was in turn revised several times to address DEP's comments regarding which pollutants required testing, the number of turbines to test, which fuels were to be tested, how to demonstrate that the tested emission factor does not result in an exceedance of the 10/25 ton per year emission limits (with monthly emission calculations or using the restricted hours of operation), and the frequency of testing.

SSCB Comments (email to Ed Martin from Samir Parekh dated April 27, 2022)

SSCB had no comments.

FRO Comments (email to Ed Martin from Robert Bright dated April 22, 2022)

FRO had no comments.

## **VIII. Recommendations**

TBD