NORTH CAROLINA DIVISION OF AIR QUALITY

Application Review

Issue Date:

Region: Fayetteville Regional Office
County: Cumberland
NC Facility ID: 2600094
Inspector's Name: Evangelyn Lowery-Jacobs
Date of Last Inspection: 09/03/2020
Compliance Code: 3 / Compliance - inspection

Facility Data

Applicant (Facility's Name): Public Works Commission Butler-Warner Generation Plant

Facility Address:
Public Works Commission Butler-Warner Generation Plant
2274 Custer Avenue
Fayetteville, NC 28312

SIC: 4931 / Elec & Other Services Combined
NAICS: 221112 / Fossil Fuel Electric Power Generation

Facility Classification: Before: Title V **After:** Title V
Fee Classification: Before: Title V **After:** Title V

Permit Applicability (this application only)

SIP: 02D .0516, 02D .0521, 02D .0605, 02D .1425, 02Q .0508(j)
NSPS: Subpart GG
NESHAP:
PSD:
PSD Avoidance:
NC Toxics:
112(r):
Other: 40 CFR 97, Subpart AAAAA
40 CFR 97, Subpart CCCCC

Contact Data

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Application Data

Application Number: 2600094.21A
Date Received: 06/16/2021
Application Type: Renewal
Application Schedule: TV-Renewal

Existing Permit Data
Existing Permit Number: 03029/T20
Existing Permit Issue Date: 02/07/2020
Existing Permit Expiration Date: 04/30/2022

Total Actual emissions in TONS/YEAR:

CY	SO2	NOX	VOC	CO	PM10	Total HAP	Largest HAP
2020	0.1000	8.42	0.0600	0.3300	0.1800	0.0267	0.0184 [Formaldehyde]
2019	0.3400	31.25	0.2100	1.21	0.6500	0.0997	0.0688 [Formaldehyde]
2018	0.9200	148.81	0.5600	32.60	4.67	0.5641	0.2216 [Formaldehyde]
2017	0.7600	27.46	0.1700	9.89	0.7000	0.0983	0.0585 [Formaldehyde]
2016	0.2900	20.72	0.1400	9.34	0.4800	0.0708	0.0475 [Formaldehyde]

Review Engineer: Urva Patel

Review Engineer's Signature: **Date:**

Comments / Recommendations:
Issue 03029/T21
Permit Issue Date:
Permit Expiration Date:

1. Purpose of Application

Currently, Public Works Commission Butler – Warner Generation Plant holds Title V Permit No. 03029T20 with an expiration date of April 30, 2022. The Title V renewal permit application (**Application No. 2600094.21A**) was received on June 16, 2021, which was at least six months prior to the expiration date of the Title V permit. Therefore, the existing permit shall not expire until the renewal permit has been issued or denied. All terms and conditions of the existing permit shall remain in effect until the renewal permit has been issued or denied.

2. Facility Description

The Public Works Commission Butler – Warner Generation Plant located in Fayetteville, Cumberland County, North Carolina. (Standard Industrial Classification [SIC] Code 4931 – Elec & Other Services Combined) is a 280-megawatt capacity plant with eight turbine generators available for electricity generation. This facility provides electric generation for Duke Energy. The facility is staffed 24 hours per day, 7 days per week, 52 weeks per year.

Each turbine generator produces approximately 26-29 megawatts of power, total approximately 208 megawatts.

All eight turbine generators utilize a water-injection system for the reduction of adiabatic flame temperatures resulting in lowered thermal NOx (nitrogen oxides) generation. Only the turbine (**ID No. GT-8**) requires concurrent operation of its associated water injection at all times.

3. History / Background / Application Chronology

Permit History since last renewal

May 1, 2017	Air Quality Permit No. 03029T19 issued with an expiration date of April 30, 2022 for renewal of the air permit.
February 27, 2020	Air Quality Permit No. 03029T20 issued with an expiration date of April 30, 2022. This minor modification included approval of a permit condition limiting sulfur content to 0.0015% (15ppm) for fuel oil.

Application Chronology

June 16, 2021	Received this application for renewal (2600094.21A).
June 17, 2021	Sent acknowledgement letter indicating that the application (2600094.21A) for permit modification was complete.
July 6, 2022	Requested information on PTE for each turbine and NSPS Subpart GG concerns.
July 7, 2022	Received response on NSPS Subpart GG concerns.
August 24, 2022	Requested CAM Plan from the facility for turbine 8 (**ID No. GT-8**).

4. Summary of Changes to the Existing Permit (Permit No. 03209T20)

Page No.	Section	Description of Changes
Cover Letter	N/A	• Updated cover letter with application number, permit numbers, dates, fee class, PSD increment statement, and Director name.
Permit Cover	N/A	• Inserted new issuance and complete application date, application number, facility information.
4	Section 1 Table	• Removed minor modification footnote for emission sources (**ID No. GT-1 through GT-8**).
5-10	2.1.A	• Simplified permit consolidating all requirements of the existing Section 2.1 B into Section 2.1 A. All requirements were identical under both sections.
6	2.1 A.3	This condition allows for the turbines to operate with or without their associated water injection systems. The condition was revised to: • Clarify its intent • Add recordkeeping consistent with TV permitting policy and requirements • Cite the appropriate regulatory authority
7-10	existing Section 2.1 B	• To Simplify the permit and eliminate redundancy the existing Section 2.1 B was consolidated into Section 2.1 A
5 7 9 13	2.1 A. Table 2.1 C. Table 2.2 A.1	• Removed 40 CFR 97, Subpart BBBBB as it no longer applies • Removed "Federal-enforceable Only" qualifier
8	2.1 B.2	The NSPS Subpart GG condition for SO2 was revised as follows: • Updated and added correct regulatory references consistent with 02Q .0508(a) • Simplified the sulfur dioxide emission limit to the option used by the Permitee (i.e. fuel sulfur limit) • Added excess emissions reporting as required by the rule • Revised reporting layout to clarify reporting deadlines • Added non compliance statements consistent with current DAQ permitting policy
9	2.1 B.3	The NSPS Subpart GG condition for NOx was revised as follows: • Updated and added correct regulatory references consistent with 02Q .0508(a) • Simplified the NOx emission limit presentation as described in the review • Revised reporting layout to clarify reporting deadlines • Added non compliance statements consistent with current DAQ permitting policy
10	2.1 B.4	• Added a condition addressing 15A NCAC 02D .0614 (CAM).
11	2.2 A.2	• The fuel oil sulfur limit permit condition was revised substantially to make it consistent with current DAQ TV permitting policy as described in the review. Monitoring, recordkeeping, and reporting was added.
11	2.2 A.3	• Added a condition addressing the newly applicable 15A NCAC 02D .1425: NOx SIP CALL BUDGET
Permit	Section 3	• Updated General Conditions from version 5.3 to current shell version 6.0 (01/07/2022)

5. Compliance Status

The DAQ has reviewed the compliance status of this facility. During the most recent inspection conducted on September 3, 2020, Evangelyn Lowery-Jacobs of the Fayetteville Regional Office indicated that the facility appeared to be in compliance with all applicable requirements. Additionally, a signed Title V Compliance Certification (Form E5) was submitted with Application No. 2600094.21A on June 16, 2021 indicating that the facility was in compliance with all applicable requirements.

Five-year Compliance History:
The facility was inspected on April 12, 2022 and appeared to be in compliance with all applicable air quality regulations.
The facility was inspected on September 3, 2020 and appeared to be in compliance with all applicable air quality regulations.
The facility was inspected on June 4, 2020 and appeared to be in compliance with all applicable air quality regulations.
The facility was inspected on July 2, 2019 and appeared to be in compliance with all applicable air quality regulations.
The facility was inspected on June 28, 2018 and appeared to be in compliance with all applicable air quality regulations.
The facility was inspected on August 9, 2017 and appeared to be in compliance with all applicable air quality regulations.

6. New/Modified Equipment/Changes in Emissions

This application is submitted as a Title V renewal. There are no modifications/changes associated with this permit application.

7. Regulatory Review

Public Works Commission Butler-Warner Generation Plant is subject to following regulations. Unless specifically noted, a detailed discussion of the following list of applicable permit conditions is not included as applicability status as a result of this application has not changed. For some regulations below, more discussion is provided for clarification and background, as necessary. DAQ has reviewed the regulations and other than the changes discussed below or presented in Section 4, no changes to the permit are required. The facility is expected to be in continued compliance.

15A NCAC 02D .0516 "Sulfur Dioxide Emissions from Combustion Sources"
This regulation applies to any source of combustion that emits sulfur dioxide, which is formed by the combustion of sulfur in fuels, wastes, ores, and other substances. Emissions of sulfur dioxide from these sources shall not exceed 2.3 pounds per million Btu heat input. This regulation does not apply to sources subject to sulfur dioxide standards in NSPS and MACT standards under 02D .0524 and .1111, respectively.

Seven of the eight turbines (ID Nos. GT-1 through GT-7) are subject to this regulation: Turbine (ID No. GT-8) is subject to a sulfur dioxide standard pursuant to NSPS Subpart GG (see discussion elsewhere) and hence not subject to this regulation.

All of these seven turbines are permitted to combust natural gas and No. 2 fuel oil. Using the AP-42 emission factor for natural gas combustion of 0.60 lb per million standard cubic feet (Table 1.4-2) and assuming an average heating value of natural gas of 1,020 million Btu (MMBtu) per million standard cubic feet yields 5.88E-04 lb/MMBtu. Thus, the SO_2 emissions from the combustion of natural gas are expected to be orders of magnitude less than the 2.3 pounds per million Btu heat input limit. For No.2 fuel oil combustion, the AP-42 emission factor is 142 times the percent (%) sulfur by weight in units of pounds per 1000 gallons (Table 1.3-1). Assuming an average heating value of No. 2 fuel oil of 1,040 MMBtu per 1000 gallons, the sulfur content of the fuel oil must be close to 2.3% before the 2.3 pounds per million Btu heat input limit is reached. The Permittee has a federally enforceable fuel sulfur limit of 15 ppm by weight, or 0.0015% (see discussion elsewhere in this review). Thus, the SO_2 emissions from the combustion of No. 2 fuel oil are expected to be orders of magnitude less than the allowable limit.

Consistent with current DAQ permitting policy, no monitoring, recordkeeping or reporting is required when natural gas or No.2 fuel oil is being combusted for purposes of compliance with 02D .0516. No changes are necessary to the existing permit conditions.

15A NCAC 02D .0521 "Control of Visible Emissions" (20% Opacity)
This regulation applies to fuel burning operations and industrial processes where visible emissions can be reasonably expected to occur. Sources subject to visible emissions standards under specifically identified rules under 02D (including .0508, .0524, and .1111) are required to meet the standards of those rules instead of the standards in 02D .0521.

Emission sources manufactured after July 1, 1971, have a visible emissions limit of 20 percent opacity when averaged over a 6-minute period. The 6-minute averaging periods may exceed 20 percent if no 6-minute period exceeds 87 percent opacity, no

more than one six-minute period exceeds 20 percent opacity in one hour, and no more than four 6-minute periods exceed 20 percent in any 24-hour period.

All eight turbines (ID Nos. GT-1 through GT-8) were constructed after July 1, 1971 and therefore are subject to the 20% opacity limit.

As visible emissions are expected to be negligible when firing natural gas, no monitoring, recordkeeping or reporting is required when firing natural gas only, consistent with current DAQ permitting policy.

With respect to firing No. 2 fuel oil, the current permit requires the following:

> To ensure compliance, the Permittee shall observe the emission points of these sources for any visible emissions above normal when the cumulative number of hours firing No. 2 fuel oil only exceeds more than 950 hours but less than 1,050 hours and for each 1,000 hours of operation thereafter. If visible emissions from these sources are observed to be above normal, the Permittee shall either:
> i. take appropriate action to correct the above-normal emissions as soon as practicable and within the monitoring period and record the action taken as provided in the recordkeeping requirements below, or
> ii. demonstrate that the percent opacity from the emission points of the emission source in accordance with 15A NCAC 02D .2610 (Method 9) for 12 minutes is below the limit given above.
> If the above-normal emissions are not corrected per i above or if the demonstration in ii above cannot be made, the Permittee shall be deemed to be in noncompliance with 15A NCAC 02D .0521.

This language was revised in permit revision no. T17, issued November 12, 2012. The language that existed in the previous permit revision no.T16 was originally added to permit revision no. T10 issued December 19, 2002.

It read as follows:

> To assure compliance, the Permittee shall perform a Method 9 test for 1 hour in accordance with 15A NCAC 02D .0501(c)(8) when the cumulative number of hours firing of No. 2 fuel oil only by this source exceeds more than 950 hours but less than 1050 hours. This monitoring protocol shall be repeated after each 1000 hours of operation. No monitoring is required while this source fires natural gas. The Permittee shall be deemed in noncompliance if the prescribed monitoring is not implemented or performed .

Note that the language was revised from requiring a Method 9 test to doing a simple observation of the emissions and comparing to what is "normal." This type of monitoring is consistent with sources whose visible emissions are expected to be well below the 20% limit and is typically used on a daily or weekly basis, where a comparison to what is considered "normal" can be made.

For these sources, however, the target of 950 cumulative hours of operation when firing no. 2 fuel oil has not been met to date (See email correspondence of 09/27/2022 or recent compliance inspection reports). Also note that the monitoring did not require the initial establishment of a "normal." Clearly, one cannot compare a subject visible emissions observation with a previous one that has yet to be made or expect (assuming that No.2 fuel oil will continue to be fired rarely) any future observations spread out over 20 years or so to satisfy the intent of this type of monitoring.

To remedy the situation, the monitoring will be revised to again require that a Method 9 for one hour be conducted. It should be noted that this type of monitoring is consistent with other relatively older combustion turbines. (See the Duke Energy Progress, LLC - H. F. Lee Steam Electric Plant, permit no. 01812T49 for a representative example). The monitoring will be revised to read as follows:

> To ensure compliance, when the cumulative number of hours firing No. 2 fuel oil in each source exceeds more than 950 hours but less than 1,050 hours, the Permittee shall perform a Method 9 test for 1 hour in accordance with a testing protocol approved by the DAQ. Details of the testing and reporting requirements can be found in General Condition JJ. Subsequent Method 9 tests shall be performed on each source for each 950 to 1,000 hours of operation on No. 2 fuel oil thereafter. If these monitoring requirements are not met or the results of a test are above the limit given. above, the Permittee shall be deemed in noncompliance with 15A NCAC 02D .0521.

In summary, the existing monitoring will be revised to provide an objective method of monitoring when firing No. 2 fuel oil.

15A NCAC 02D .0524 "New Source Performance Standards (40 CFR Part 60 Subpart GG)" for NOx and SO_2

According to 40 CF60.330(b), this rule applies to all stationary combustion turbines constructed after October 3, 1977. Of all the turbines at this facility, only (ID No.GT-8) is subject to this rule. Turbines GT-1 through GT-7 are not subject to NSPS Subpart GG because they were constructed prior to the applicability date of October 3, 1977.

The rule has emission limits for NOx and SO_2. The requirements for each pollutant will be discussed separately.

SO_2

Pursuant to 40 CFR 60.333:

> On and after the date on which the performance test required to be conducted by § 60.8 is completed, every owner or operator subject to the provision of this subpart shall comply with one or the other of the following conditions:
>
> (a) No owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from any stationary gas turbine any gases which contain sulfur dioxide in excess of 0.015 percent by volume at 15 percent oxygen and on a dry basis.
> (b) No owner or operator subject to the provisions of this subpart shall burn in any stationary gas turbine any fuel which contains total sulfur in excess of 0.8 percent by weight (8000 ppmw).

The Permittee has chosen to comply with the fuel sulfur limit at 40 CFR 60.333(b). For natural gas the Permittee in the past has made a demonstration that the natural gas meets the definition natural gas at 40 CFR 60.331(u). Thus, as allowed at 40 CFR 60.334(h)(3), no monitoring is required for the combustion of natural gas.

For No.2 fuel oil, the permit contains a custom fuel monitoring schedule as allowed under 40 CFR 60.334(i)(3). A review of the rules suggests that a simpler method for ensuring compliance with the fuel sulfur limits may be possible. The Permittee however requested the existing fuel monitoring plan in the permit for NSPS compliance remain unchanged.

The rule requires excess emissions reporting as required by the rule. These requirements were missing from the existing permit and will be added to the revised draft permit.

As discussed elsewhere, the Permittee recently requested a 15 parts per million by weight (ppmw) facility-wide fuel sulfur restriction (See Section 3). This 15 ppmw fuel sulfur restriction is much lower than the 8000 ppmw limit as allowed by this rule. Thus, continued compliance with the fuel sulfur limits under this rule are expected.

The rule requires excess emissions reporting. These requirements were missing from the existing permit and will be added to the revised draft permit. Other changes will be made to the existing permit condition to bring it up to current permitting standards, including adding regulatorily citations and adding noncompliance statements as appropriate. See Section 4 for a listing of changes.

NOx

The Permittee is subject to the following NOx limit pursuant to 40 CFR 60. 332(a).

$$STD = 0.0075\frac{14.4}{Y} + F$$

> where:
>
> STD = allowable ISO corrected (if required as given in 40 CFR 60.335(b)(1)) NOX emission concentration (percent by volume at 15 percent oxygen and on a dry basis),
>
> Y = manufacturer's rated heat rate at manufacturer's rated load (kilojoules per watt hour) or, actual measured heat rate based on lower heating value of fuel as measured at actual peak load for the facility. The value of Y shall not exceed 14.4 kilojoules per watt hour (kJ/W-hr), and
>
> F = NOX emission allowance for fuel-bound nitrogen as defined in paragraph (a)(4) of this section.

Based on correspondence from the Permittee (email received August 17, 2012) and previous reviews, the "Y" values are as follows:

Natural gas – 12.18 kJ/W-hr
No.2 fuel oil – 12.07 kJ/W-hr

In an email dated September 29, 2022, the Permittee confirmed that PWC does not wish to claim the emission allowance for fuel bound nitrogen for either fuel. Thus, in the equation above for both fuels F equals zero.

As a result, the following fuel specific NOx emission limits apply to the turbine.

STD for natural gas - 8.89E-03 % by volume at 15 % oxygen or 89 ppmv at 15% oxygen
STD for No. 2 fuel oil - 8.94E-03 % by volume at 15 % oxygen or 89 ppmv at 15% oxygen

Note that the current permit shows 117 ppmv for No. 2 fuel oil. A review of the August 17, 2012 correspondence shows that this value would be correct if the Permittee intended or intends to use the fuel bound nitrogen allowance. The permit will be revised to show the correct emissions limitation when burning No. 2 fuel oil with no fuel bound nitrogen allowances.

As the Permittee does not wish to use the fuel bound nitrogen allowance for either fuel, no monitoring of fuel nitrogen is required for natural gas or No. 2 fuel oil pursuant to 40 CFR 60.334(h)(2).

The permit will be simplified by removing the removing the general equation and including the applicable numerical emission limits. Since fuel bound nitrogen is not tracked the equation adds no compliance flexibility to the permit.

The Permitee uses a water injection to comply with the NOx emission limits. Compliance with the NOx limit is demonstrated by using monitoring systems to track and record the water-to-fuel ratio and fuel consumption. The permittee is required to report periods of excess emissions and monitor down time.

Other changes will be made to the existing permit condition to bring it up to current permitting standards, including adding regulatorily citations and adding noncompliance statements as appropriate. See Section 4 for a listing of changes. Continued compliance is expected with this rule.

15A NCAC 02D .1400 NITROGEN OXIDES
Amendments to the following rules became effective May 1, 2022:

- 15A NCAC 02D .1401 "Definitions" – the definitions for "EGU", "Large non-EGU", and "NOx ozone season budget" were added to the list of definitions.
- 15A NCAC 02D .1402 "Applicability" - It was revised to include the new rules 15A NCAC 02D .1424 and .1425 to the list of rules that apply statewide.

The following new rules were adopted by the DAQ and became effective May 1, 2002:

- 15A NCAC 02D .1424 "Large Non-Electric Generating Units" – It includes an option for large non- electric generating units (EGUs) to request alternative monitoring for determining NOx emissions during the ozone season if they are not required to monitor NOx for another rule.
- 15A NCAC 02D .1425 "NOx SIP Call Budget" - It includes the NOx ozone season budgets for EGUs and large non-EGUs and to require reporting of the NOx emissions to the DAQ for the ozone season.

As a result of these changes, a revised applicability analysis of the 02D .1400 rules needs to be conducted at this time. The following background narrative is provided to add explanation for these new potentially applicable requirements.

Background
(The following discussion was excerpted from the "Regulatory Impact Analysis for Revisions to the Monitoring Provisions for the NOx SIP Call" conducted by Carrie Pickett and Bradley Nelson of the DAQ Rules Development Branch. It was included in the docket for the 02D .1400 rules that were amended or adopted and effective as of May 1, 2022)

> The U.S. Environmental Protection Agency (EPA) issued the NOx SIP Call on October 27, 1998 (63 FR 57356). The NOx SIP Call was designed to assist areas in attaining the 1979 1-hour ozone National Ambient Air Quality Standards (NAAQS) by reducing the transport of ozone and precursor emissions from upwind states. The EPA developed a cap and trade system for NOx emissions referred to as the Federal NOx Budget Trading Program (NBTP). The NBTP was codified in 40 Code of Federal Regulations (CFR) Part 97*.
>
> In 2002, the DAQ established requirements for a NOx cap and trade program involving both the EGU and non-EGU sources. These requirements were codified in the DAQ rules under 15A NCAC 2D .1400.

The rule included NOx allocations for each affected source and a total state budget along with a demonstration that North Carolina would achieve the required emission reductions in accordance with timelines set forth in the state's SIP. As part of demonstrating compliance, these sources had to install and operate a CEMS or other approved monitoring methods under the EPA's 40 CFR Part 75 monitoring requirements.

A new federal NOx and sulfur dioxide (SO2) trading program, called the Clean Air Interstate Rule (CAIR), was promulgated by the EPA in 2005, which replaced the previous NOx SIP Call budget trading program. The CAIR was promulgated to address transport under both the 1997 8-hour ozone and PM2.5 NAAQS. States could choose to implement annual and ozone season NOx reductions through this federal allowance trading program. North Carolina chose to comply by participating in the federal allowance trading program and by "opting-in" non-EGU sources into the program. The CAIR requirements and budgets for the non-EGUs were identical to the NOx SIP Call, and were codified in the DAQ rules under 15A NCAC 2D .2400 in July of 2006.

In subsequent years, the CAIR was remanded without vacatur by the D.C. Circuit, and replaced with the EPA's Cross-State Air Pollution Rule (CSAPR) on August 8, 2011 (76 FR 48208). The CSAPR requires states to improve air quality by reducing EGU emissions crossing state lines and contributing to both ozone and fine particle pollution in other states starting initially in 2012, but implementation did not begin until 2015. The non-EGUs were excluded from the CSAPR NOx budget trading program because the EPA concluded that these sources did not reduce NOx emissions as a result of being included in the previous trading programs and that these sources, as a group, had allowances they did not need for compliance. The first set of emissions requirements under the CSAPR took effect on January 1, 2015. The CAIR provisions expired on February 1, 2016 as a result of the DAQ's periodic review and expiration of existing rules (G.S. 150B-21.3A).

Although the non-EGU sources have no federal requirements to monitor or reduce emissions under the CSAPR, the EPA has stated that the anti-backsliding provisions of 40 CFR 51.905(f) require the provisions of the NOx SIP Call, including the statewide NOx emission budgets for non-EGUs, be maintained. Furthermore, the requirements of the NOx SIP Call continue to be permanent and enforceable, including all state regulations developed to implement the requirements of the NOx SIP Call (77 FR 45259). In a very brief "frequently asked questions" (FAQ) document posted on the agency's CSAPR web site, titled "NOx SIP Call Transition for Large non-EGUs", the EPA states that:
(1) CSAPR does not preempt or replace the requirements of the NOx SIP Call,
(2) NOx SIP Call budgets remain in place for non-EGUs, and
(3) 40 CFR Part 75 monitoring, recordkeeping and reporting requirements must be retained.

*The EPA also issued regulations for states to implement a NOx Budget Trading Program at 40 CFR Part 96 as the "NOx Budget Trading Program for State Implementation Plans."

Revised 02D .1400 applicability analysis

15A NCAC 02D .1402: APPLICABILITY
The rules in 02D .1400 do not apply except as specifically set out in this rule. The requirements in this section only apply from May 1 to September 30 of each year. PWC is located in Cumberland County. As PWC is not located in one of the counties identified in paragraph (e) of this rule, the only potentially applicable rules under 02D .1400 are the following rules (or specific sections of the rules) as indicated in 02D .1402(c):

- 15A NCAC 02D .1409(c): STATIONARY INTERNAL COMBUSTION ENGINES
- 15A NCAC 02D .1418: NEW ELECTRIC GENERATING UNITS, BOILERS, COMBUSTION TURBINES, AND I/C ENGINES
- 15A NCAC 02D .1423: LARGE INTERNAL COMBUSTION ENGINES
- 15A NCAC 02D .1424: LARGE NON-ELECTRIC GENERATING UNITS
- 15A NCAC 02D .1425: NOX SIP CALL BUDGET

Each rule will be discussed separately below.

15A NCAC 02D .1409(c): STATIONARY INTERNAL COMBUSTION ENGINES
This rule at paragraph(c) identifies engines at three specific facilities which does not include PWC. Therefore, this rule does not apply to PWC.

15A NCAC 02D .1418: NEW ELECTRIC GENERATING UNITS, BOILERS, COMBUSTION TURBINES, AND I/C ENGINES

This rule applies pursuant to 02D .1418(a) as follows:

> (a) Electric generating units. Emissions of NOx from any fossil fuel-fired stationary boiler, combustion turbine, or combined cycle system permitted after October 31, 2000, serving a generator with a nameplate capacity greater than 25 megawatts electrical and selling any amount of electricity shall ***:

All combustion turbines PWC were permitted prior to October 31, 2000. Therefore, this rule does not apply to PWC.

15A NCAC 02D .1423: LARGE INTERNAL COMBUSTION ENGINES
No sources at PWC meet any of the applicability requirements under this rule. Thus, this rule does not apply to PWC.

15A NCAC 02D .1424: LARGE NON-ELECTRIC GENERATING UNITS
No sources at PWC meet any of the applicability requirements under this rule. Thus, this rule does not apply to PWC.

State-enforceable only
15A NCAC 02D .1425: NOX SIP CALL BUDGET
Pursuant to 15A NCAC 02D .1401 "Definitions," each combustion turbine at PWC meets the definition of a "EGU."

Pursuant to 02D .1425(b), PWC must submit a report to the DAQ no later than January 30 of the calendar year after the NOx SIP Call control period listing the NOx emissions from each EGU (i.e., each combustion turbine) during the NOx SIP Call control period. The NOx SIP control period is defined under 02D .1401 as:

> "NOx SIP Call control period" for the purposes of the NOx SIP Call budgets in 15A NCAC 02D .1425 means the period May 1 through the end of September 30.

The NOx emissions in this report shall be determined in accordance with 40 CFR Part 75 for EGUs and large non-EGUs subject to 15A NCAC 02D .1418, or in accordance with 15A NCAC 02D .1424 for large non-EGUs using alternative monitoring. Thus, each combustion turbine shall determine its NOx emissions in accordance with 40 CFR Part 75. Note that the combustion turbines, which are subject to CSAPR Subpart AAAAA discussed below, are required to determine NOx emissions as well as meet the monitoring recordkeeping and reporting requirements consistent with 40 CFR Part 75 Subpart H. Thus, the electronic report being submitted to the EPA electronically will now also be submitted to the DAQ once per year.

A permit condition will be placed into the permit to address this rule. As the rule has not been incorporated into the state implementation plan (SIP), it will be considered state enforceable only.

Cross State Air Pollution Rule (CSAPR; 40 CFR Part 97)
CSAPR requires fossil fuel-fired electric generating units at coal-, gas-, and oil-fired facilities in 27 states in the eastern US to reduce emissions to help downwind areas attain fine particle and/or ozone national ambient air quality standards (NAAQS).

CSAPR requirements have been promulgated to address interstate transport for the 2006 24-hour fine particulate NAAQS, 1997 annual fine particulate NAAQS, 1997 8-hour ozone NAAQS, and 2008 ozone NAAQS, resulting in the creation of several air quality-assured trading programs for states in the CSAPR region:

The CSAPR NOx annual trading program;	Subpart AAAAA
The CSAPR NOx ozone season Group 1 trading program;	Subpart BBBBB
The CSAPR SO_2 Group 1 trading program;	Subpart CCCCC
The CSAPR SO_2 Group 2 trading program;	Subpart DDDDD
The CSAPR NOx ozone season Group 2 trading program	Subpart EEEEE

CSAPR is implemented in NC by the US EPA directly as a Federal Implementation Plan (FIP). 40 CFR 52.1784 indicates the FIP requirements for NOx, which references Subparts AAAAA and BBBBB, and 40 CFR 52.1785 indicates the FIP requirements for SO_2, which references Subpart CCCCC.

40 CFR 52.1784 was revised October 26, 2016 (as described in the Federal Register (FR) at 81 FR 74504 and 74599) to only require compliance with Subpart BBBBB with regard to emissions occurring in 2015 and 2016. These FR references describe basically that NC does not contribute significantly to nonattainment in or interference with maintenance of the 1997, 2005 or 2015 ozone standards for any other states. Therefore, North Carolina is currently only subject to the NOx annual trading program (Subpart AAAAA) and the SO_2 group 1 trading program (Subpart CCCCC). This conclusion is documented by EPA on their website (See the EPAs webpage "States that are affected by CSAPR" at https://www.epa.gov/csapr/overview-cross-state-air-pollution-rule-csapr). Reference to Subpart BBBBB will be removed from the revised permit.

No state rules address CSAPR. In general, CSAPR requires tracking and trading emission credits across multiple facilities, including facilities not within the state of North Carolina. Oversight of the CSAPR is managed directly by the US EPA. As such, no specific compliance requirements, including monitoring recordkeeping or reporting requirements are included in the TV permit.

The existing permit condition will also be revised to remove the "Federal Enforceable Only" indicator. Although oversight of the CSAPR is managed directly by the US EPA, the DAQ and citizens retain rights to enforce CSAPR as well.

"Applicability of General Conditions"

The existing permit contains language similar to the following at Sections 2.1 A.3 and 2.1 B.3.

> **Applicability of General Conditions**
> The facility may operate any of these turbine generators (ID Nos. GT-1 through GT-7) while firing natural gas or No. 2 fuel oil, without the concurrent operation of its associated water injection system.

Note this permit condition does not address turbine (ID No. GT-8).

These conditions were added to permit revision no. T11 because of the following general condition:

F. **Circumvention** - STATE ENFORCEABLE ONLY
The facility shall be properly operated and maintained at all times in a manner that will effect an overall reduction in air pollution. Unless otherwise specified by this permit, no emission source may be operated without the concurrent operation of its associated air pollution control device(s) and appurtenances.

It was noted in the review at that time that no applicable NOx standards applied to these sources and hence operation of the controls were not necessary to comply with any applicable requirements. That conclusion is still valid at this time. However, General Condition F required their continuous use unless specified elsewhere in the permit. Therefore, to satisfy the requirements of General Condition F, these conditions were added to the permit to allow the Permittee to operate the controls on an optional basis.

Upon review, these conditions as written are inconsistent with current permitting policy and with 15A NCAC 02Q .0508, "Permit Content" notably at paragraph (j). Paragraph (j) requires:

(j) A permit shall state the terms and conditions for reasonably anticipated operating scenarios identified by the applicant in the application. These terms and conditions shall:
(1) require the permittee, contemporaneously with making a change from one operating scenario to another, to record in a log at the permitted facility a record of the operating scenario in which it is operating;
(2) extend the permit shield described in 15A NCAC 02Q .0512 to all terms and conditions in each such operating scenario; and
(3) ensure that each operating scenario meets all applicable requirements of Subchapter 02D of this Chapter and of this Section.

For these turbines, the operating scenarios of concern are:
A. operating a turbine with the concurrent operation of its water injection system or
B. operating a turbine without the concurrent operation of its water injection system.

All applicable requirements have been considered and it has been concluded that these control systems are not required to meet any applicable requirements. As such the intent of 02Q .0508(j)(3) has been addressed.

General Condition R addresses the permit shield. The permit shield, upon permit issuance after this renewal will apply to all terms and conditions of the applicable requirements included in the TV permit. As such the intent of 02Q .0508(j)(2) will have been addressed upon permit issuance.

The permit condition will be revised to:

- state the purpose of the permit condition for clarification of intent
- identify the operating scenarios
- include adequate recordkeeping to address 02Q .0508(j)(1)
- cite appropriate regulatory references:

In conclusion, the permit conditions will be revised to make them consistent with 15A NCAC 02Q .0508 and current DAQ permitting policy. No changes in intent were made.

Facility-wide fuel sulfur limitation

As seen in Section 3 above the facility obtained a facility wide fuel oil sulfur limitation in permit revision no. T20 issued February 7, 2020. The language added to the permit reads as follows"

> **40 CFR 75.19(c)(1)(i) – Alternative Fuel Oil Sulfur Content Requirement**
> Pursuant to 40 CFR 75.19(c)(1)(i), the Permittee shall limit the sulfur content of all fuel oil fired in emission source (ID Nos. GT-1 through GT-8) to no more than 0.0015% by weight (15 ppm).

40 CFR 75.19 is entitled "Optional SO_2, NO_X, and CO_2 emissions calculation for low mass emissions (LME) units." The Permittee is subject to Part 75 requirements via its compliance obligations under the 40 CFR Part 97 Cross State Air Pollution Rule (CSAPR) trading programs discussed above.

> **40 CFR 75.19(c)(1)(i) states:**
> ***
> Alternatively, for fuel oil combustion, a lower, fuel-specific SO2 emission factor may be used in lieu of the applicable emission factor from Table LM-1, if a federally enforceable permit condition is in place that limits the sulfur content of the oil.
> **

Thus, the intent of this permit condition was to provide a federally enforceable limit in the permit to allow the Permittee to base its SO2 emissions on 15 ppm fuel sulfur content instead of the "one size fits all" more conservative value in Table LM-1.

Note that although the limitation was requested so the Permittee could avail itself of the specific SO2 emissions calculation methodology at 40 CFR 75.19(c)(1)(i), the regulation itself does not limit the fuel oil sulfur. The permit will be revised with respect to the cited regulatory authority (i.e, 02Q .0508(f)).

It should also be noted that in 2021, the DAQ had developed a policy for including fuel oil sulfur limits with respect to defining potential emissions (See January 14, 2021 email entitled "Defining PTE for Use of ULSD.") This policy will be leveraged to create the requested fuel oil sulfur restriction and not limit it for the sole purpose of 40 CFR 75.19(c)(1)(i).

To be federally enforceable, a permit condition needs to meet the TV permit content requirements of 02Q .0508, which includes appropriate monitoring recordkeeping and reporting. To address this deficiency, the permit will be revised to require adequate monitoring, recordkeeping and reporting to make the fuel oil sulfur restriction practically enforceable. This includes maintain records of fuel oil supplier certifications and submitting semiannual reports that include responsible official certifications that only ultra-low sulfur No.2 fuel was fired in the combustion turbines.

8. NSPS, NESHAP/MACT, NSR/PSD, 112(r), CAM

NSPS

The following NSPS rules are potentially applicable to sources at PWC:

40 CFR 60, Subpart GG "Standards of Performance for Stationary Gas Turbines"

According to 40 CF60.330(b), this rule applies to all stationary combustion turbines constructed after October 3, 1977. Of all the turbines at this facility, only GT-8 is subject to this rule. Turbines GT-1 through GT-7 are not subject to NSPS Subpart GG because they were constructed prior to the applicability date of October 3, 1977.

See full discussion in Section 7 above.

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

According to 40 CFR 60.4200(a)(2), this rule applies to engines that were manufactured after April 1, 2006 or were modified after July 11, 2005.

All of the engines at this facility were manufactured before the applicability date and have not been modified after the applicability date. Therefore, NSPS Subpart IIII does not apply. The facility is expected to be in continued compliance.

40 CFR 60, Subpart KKKK "Standards of Performance for Stationary Combustion Turbines"

According to 40 CFR 60.4300, this rule applies to stationary combustion turbines constructed or modified after February 18, 2005. All of the turbines at this facility were constructed before this date, and none of the turbines have been modified after this date. Therefore, NSPS Subpart KKKK does not apply.

NESHAP/MACT

This facility is an area source of HAP emissions. This permit renewal does not affect this status.

40 CFR 63, Subpart YYYY "National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines"

According to 40 CFR 63.6085(a), this rule applies to gas turbines at HAP-Major sources. This facility is not a HAP major source. Therefore, MACT Subpart YYYY does not apply.

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

This rule applies to all stationary internal combustion engines. The requirements of the rule vary based on the size of the engine, major/area source status, and other factors. All of the engines at this facility are "existing" and "emergency-use".

For these types of engines, the only requirements are to perform regular maintenance and operate with good air pollution control practices. The engines can only be operated for maintenance and emergency scenarios.

This rule only applies to sources on the "Insignificant Activities" list. Therefore, the permit will not include a specific condition for this rule. The facility is expected to be in continued compliance.

NSR/PSD

Public Works Commission - Butler-Warner Generation Plant (PWC) is a major source under Prevention of Significant Deterioration (PSD) program [PTE (Potential-To-Emit) of all criteria pollutants above emission thresholds]. The facility is located in Cumberland County which is currently designated as attainment or unclassified for all PSD regulated pollutants. Cumberland County is triggered for PM_{10} and SO_2 emissions with respect to minor source baseline dates according to the memo "North Carolina Counties with Triggered PSD Minor Baseline Dates for PM10, SO2 and NOx.". See https://files.nc.gov/ncdeq/Air%20Quality/permits/psd/docs/PSD_County_Minor_Baseline_Dates_20200814.pdf

This permit renewal does not affect these triggered pollutants.

112(r)

This facility is not subject to the requirements of the Chemical Accident Release Prevention Program, Section 112(r) of the Clean Air Act requirements because it does not store any of the regulated substances in quantities above applicability thresholds. But the facility is subject to the General Duty requirements of 112(r).

Compliance Assurance Monitoring (CAM)

Compliance assurance monitoring (CAM) is intended to provide a reasonable assurance of compliance with applicable requirements under the Clean Air Act (CAA) for large emission units that rely on pollution control device equipment to achieve compliance. The CAM rule at 40 CFR Part 64 is implemented via the state rule 15A NCAC 02D .0614.

02D .0614(a) states:

> (a) General Applicability. Except as set forth in Paragraph (b) of this Rule, the requirements of this Paragraph shall apply to a pollutant-specific emissions unit at a facility required to obtain a permit pursuant to 15A NCAC 02Q .0500 if the unit:
> (1) is subject to an emission limitation or standard for the applicable regulated air pollutant, or a surrogate thereof, other than an emission limitation or standard that is exempt pursuant to Subparagraph (b)(1) of this Rule;
> (2) uses a control device to achieve compliance with any such emission limitation or standard; and
> (3) has potential pre-control device emissions of the applicable regulated air pollutant that are equal to or greater than 100 percent of the amount, in tons per year, required for a source to be classified as a major source. For purposes of this Subparagraph, "potential pre-control device emissions" means the same as "potential to emit" as defined in 15A NCAC 02Q .0103, except that emission reductions achieved by the applicable control device shall not be taken into account.

02D .0614(b), which closely mirrors 40 CFR 64.2(b), includes exemptions to the CAM rule. These will be discussed as necessary below. Note that a pollutant-specific emissions unit (PSEU) is defined at 40 CFR 64.1 as an emissions unit considered separately with respect to each regulated air pollutant.

The only control devices employed at the facility are water injection systems for NOx control. Each of the eight turbines have potential pre-control device emissions of greater than 100 tpy of NOx. However, seven of the turbines (ID Nos. GT-1 through GT-7) only use the control devices for purposes of controlling emissions under 40 CFR Part 97, the CSAPR rule which is an emissions trading program (See Section 7 above). CSAPR meets the exemption at 40 CFR 64.2(b)(iv) which states:

> (b) *Exemptions* -
>
> (1) *Exempt emission limitations or standards.* The requirements of this part shall not apply to any of the following emission limitations or standards:
>
> ***
>
> (iv) Emission limitations or standards or other applicable requirements that apply solely under an emissions trading program approved or promulgated by the Administrator under the Act that allows for trading emissions within a source or between sources.
>
> ***
>
> (vi) Emission limitations or standards for which a part 70 or 71 permit specifies a continuous compliance determination method, as defined in §64.1.
>
> **

Thus, CAM does not apply to the turbines (ID Nos. GT-1 through GT-7).

For the turbine (ID No. GT-8), the water injection system is also used to comply with the NOx emission limitation under NSPS Subpart GG. In previous reviews, it was determined that CAM did not apply with respect to NSPS Subpart GG because the facility utilized a "continuous compliance determination method (CCDM)" and therefore met the exemption at 40 CFR 64.2(b)(vi) as shown above. Upon review it was determined that the monitoring required in the permit for NSPS Subpart GG did not meet the definition of CCDM. CCDM is defined at 40 CFR 64.1 as follows:

> Continuous compliance determination method means a method, specified by the applicable standard or an applicable permit condition, which:
> (1) Is used to determine compliance with an emission limitation or standard on a continuous basis, consistent with the averaging period established for the emission limitation or standard; and
> (2) Provides data either in units of the standard or correlated directly with the compliance limit.

The permit will be revised to include a CAM plan with respect to NSPS Subpart GG. The plan is closely modeled on the CAM plan implemented on the combustion turbines (ID Nos. ES-1 through ES-16) in the Duke Energy Corporation LCTS permit (permit no. 07171T14, issued January 5, 2022). The plan will define an "exceedance" as periods of excess emissions as defined under NSPS Subpart GG. Pursuant to NSPS Subpart GG at 40 CFR 60.335(j)(1), periods of excess emissions are defined as follows:

> (A) An excess emission shall be any unit operating hour for which the average steam or water to fuel ratio, as measured by the continuous monitoring system, falls below the acceptable steam or water to fuel ratio needed to demonstrate compliance with 40 CFR 60.332, as established during the performance test required in 40 CFR 60.8. Any unit operating hour in which no water or steam is injected into the turbine shall also be considered an excess emission.

In the event of any exceedance, the Permittee shall take appropriate action to correct the exceedance as soon as practicable.

Typical Title V semi-annual reporting will also be required which includes, pursuant to 40 CFR 64.9, summaries of all exceedances and monitor downtime incidents.

9. Facility-Wide Air Toxics

The facility is NOT currently subject to the NC Air Toxics Program as implemented pursuant to 15A NCAC 02Q .0700 and 02D .1100. This permit renewal does not trigger review pursuant to these rules.

10. Facility Emissions Review

This permit renewal is not expected to change the potential emissions from this facility. Actual emissions for 2016 through 2020 are reported in the header of this permit review.

12. Public Notice/EPA and Affected State(s) Review

A notice of the DRAFT Title V Permit shall be made pursuant to 15A NCAC 02Q .0521. The notice will provide for a 30-day comment period, with an opportunity for a public hearing. Consistent with 15A NCAC 02Q .0525, the EPA will have a concurrent 45-day review period. Copies of the public notice shall be sent to persons on the Title V mailing list and EPA. Pursuant to 15A NCAC 02Q .0522, a copy of each permit application, each proposed permit and each final permit shall be provided to EPA. Also, pursuant to 02Q .0522, a notice of the DRAFT Title V Permit shall be provided to each affected State at or before the time notice is provided to the public under 02Q .0521 above.

Notice of the DRAFT Title V Permit to Affected States ran from XXXX YY, 2022 to XXXX YY, 2022. ***Summarize comments from Affected States.***

Public Notice of the DRAFT Title V Permit ran from XXXX YY, 2022 to XXXX YY, 2022. ***Summarize comments from the public***.

EPA's 45-day review period ran concurrent with the 30-day Public Notice, from XXXX YY, 2022 to XXXX YY, 2022. ***Summarize comments from*** EPA and U.S. EPA Region 4 ***that were received regarding the DRAFT Title V Permit***.

13. Other Regulatory Considerations

- A Permit Application fee for Permit Application No. 2600094.21A is NOT required.
- A P.E. Seal is NOT required for Permit Application No. 2600094.21A.
- A Zoning Determination is NOT required for Permit Application No. 2600094.21A.
- A 30-day public notice and 45-day EPA review is required for Permit Application No. 2600094.21A.

14. Recommendations/Conclusions

TBD