NORTH CAROLINA DIVISION OF AIR QUALITY

Application Review

Issue Date: TBD

Region: Mooresville Regional Office
County: Rowan
NC Facility ID: 8000163
Inspector's Name: Emily Supple
Date of Last Inspection: 01/27/2022
Compliance Code: 3 / Compliance - inspection

Facility Data

Applicant (Facility's Name): Plant Rowan County

Facility Address:
Plant Rowan County
5755 NC 801 Highway
Salisbury, NC 28147

SIC: 4911 / Electric Services
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: .0503, .0515, .0516, .0521, .0524, .0530, .0530(u), .1109, .1111, .1407, .1425
02Q: .0400
NSPS: Subparts Dc, GG
NESHAP: Subparts YYYY, DDDDD
PSD: Major Source
PSD Avoidance: n/a
NC Toxics: n/a
112(r): n/a
Other: CSAPR, Acid Rain Permit

Contact Data

Facility Contact	Authorized Contact	Technical Contact
Rebecca Young Compliance Team Leader (704) 278-6657 5755 NC 801 Highway Salisbury, NC 28147	Jesse English Plant Manager (704) 278-6601 5755 NC 801 Highway Salisbury, NC 28147	Scott McMillan Project Manager (205) 992-0057 3535 Colonnade Parkway Birmingham, AL 35243

Application Data

Application Number: 8000163.23B (.23A and .23C consolidated)
Date Received: 03/06/2023
Application Type: Renewal
Application Schedule: TV-Renewal

Existing Permit Data
Existing Permit Number: 08758/T27
Existing Permit Issue Date: 06/17/2022
Existing Permit Expiration Date: 09/30/2023

Total Actual emissions in TONS/YEAR:

CY	SO2	NOX	VOC	CO	PM10	Total HAP	Largest HAP
2021	9.70	239.67	27.43	292.64	74.27	16.71	11.53 [Formaldehyde]
2020	9.60	204.30	27.03	285.55	82.87	16.29	11.25 [Formaldehyde]
2019	10.11	236.51	29.27	310.60	81.60	17.71	12.22 [Formaldehyde]
2018	10.20	243.72	29.31	311.12	81.51	17.92	12.18 [Formaldehyde]
2017	9.00	199.02	26.08	272.74	68.82	15.59	10.72 [Formaldehyde]

Review Engineer: Russell Braswell

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

Comments / Recommendations:
Issue 08758/T28
Permit Issue Date: TBD
Permit Expiration Date: TBD+5 years

1.0 Purpose of Applications

- Application 8000163.23B

  Plant Rowan County (PRC; the facility) operates a power plant in Rowan County, North Carolina under Title V permit 08758T27 (the existing permit). The existing permit is set to expire on September 30, 2023. Per General Condition K of the existing permit, PRC submitted this permit application in order to renew the Title V permit.

  Because the application for permit renewal was received at least six months before the expiration date of the existing permit, the existing permit will remain in effect, regardless of expiration date, until the renewed Title V permit is issued.

  The renewal application also requested the removal of the natural gas-fired heater ES-8. DAQ had previously approved this request with applicability determination #3862, issued September 30, 2022.

- Application 8000163.23C

  The existing permit includes a Title IV acid rain permit. The acid rain permit has the same expiration date as the Title V permit. PRC has submitted this application in order to renew the acid rain permit. The expiration date of the renewed Title V and acid rain permits will be the same. As with the Title V permit, the current Title IV permit will remain in effect, regardless of expiration date, until the renewed Title IV permit is issued.

  DAQ will consolidate this application into application .23B.

- Application 8000163.23A

  The existing permit includes Specific Condition 2.1 B.6, which requires PRC to submit an application for significant modification per 02Q .0501(b)(2). When submitting the renewal application, PRC also included the required application for significant modification and paid the appropriate fee for permit modification.

  DAQ will consolidate this application into application .23B.

2.0 Facility Description

This facility is a power plant that operates three simple-cycle combustion turbines and two combined-cycle combustion turbines manufactured by General Electric. Each turbine can operate on natural gas, and all but Unit 5 can operate on No. 2 fuel oil. Each turbine is equipped with low-NOx burners and water injection. Units 4 and 5 are equipped with selective catalytic reduction (SCR) units. The primary fuel for this facility is natural gas, but four of the turbines can also burn No. 2 fuel oil.

In addition to the turbines, PRC operates several sources that support the turbines, such as a cooling tower and an auxiliary boiler.

3.0 Permit History Following Previous Title V Permit Renewal

Date	Permit Revision	Application Type	Notes
October 22, 2018	T21	Renewal	This revision renewed the Title V and acid rain permits.
April 4, 2019	T22	Administrative Amendment	This revision corrected errors in the T21 permit.
November 7, 2029	T23	Significant Modification (1st step)	This revision allowed PRC to make minor upgrades to Unit 2. PRC used 02D .0530(u) to demonstrate these upgrades were not major modifications for PSD. In addition, minor corrections were made to the permit.
February 4, 2021	T24	Significant Modification (1st step)	This revision allowed PRC to make minor upgrades to Units 1 and 3. PRC used 02D .0530(u) to demonstrate these upgrades were not major modifications for PSD. In addition, minor corrections were made to the permit.
June 14, 2021	T25	Significant Modification (2nd step)	This revision completed the two-step significant modification for Unit 2 initiated with the T23 revision. Also made minor corrections to the permit
February 1, 2022	T26	Significant Modification (1st step)	This revision allowed PRC to make minor upgrades to Units 4 and 5. PRC used 02D .0530(u) to demonstrate these upgrades were not major modifications for PSD. In addition, minor corrections were made to the permit.
June 17, 2022	T27	Significant Modification (2nd step)	This revision completed the two-step significant modification for Units 1 and 3 initiated with the T26 revision. Also made minor corrections to the permit.

4.0 Application Chronology

Date	Event
March 6, 2023	Applications .23A, .23B, and .23C received.
April 12, 2023	An initial draft of the Title V permit and application review were sent to DAQ Permits staff for review.
May 2, 2023	A revised draft of the Title V permit and application review were sent to DAQ MRO staff, DAQ SSCB staff, and PRC staff.
May 24, 2023	A request for additional information was sent via email to PRC staff regarding a proposed minor revision to CEMS language. PRC responded by email the same day confirming that the proposed language was acceptable.
XXXXX	Public notice / EPA review
XXXXX	Permit issued.

5.0 Summary of Changes

Page No.	Section	Description of Changes
Throughout	Throughout	• Updated permit formatting to match current DAQ standard. There should be no changes in compliance requirements as a result of formatting changes. • Updated dates and permit numbers.
4	1	• Removed references to 02Q .05015(b)(2) because the Permittee has completed this requirement. • Removed ES-8 at Permittee's request (see applicability determination #3862)
7	2.1 A.2.c	• Corrected testing requirement. Previously, this requirement referenced General Condition JJ. This has been replaced with the appropriate testing requirement under NSPS Subpart GG.
12	2.1 A.3.l.ii.(A)	• Changed the definition of "valid hourly emission rate" to reference 40 CFR 60.13(h)(2).
16	2.1 B.2.c	• Corrected testing requirement. Previously, this requirement referenced General Condition JJ. This has been replaced with the appropriate testing requirement under NSPS Subpart GG.
n/a	2.1 B.4 (former)	• Removed specific condition for 02D .0530(u) because the Permittee has completed the 5-year reporting requirement. • Renumbered subsequent conditions.
21	2.1 B.4 (current)	• Noted reporting years for 02D .0530(u).
n/a	2.1 B.6 (former)	• Removed specific condition for 02Q .0504 because the Permittee has completed the application submittal requirement.
n/a	2.1 E. (former)	• Removed this section because ES-8 has been removed from the permit.
29	2.2 (new)	• Added this section for conditions that apply to all turbines. • Added specific condition for 40 CFR Part 63, Subpart YYYY. This change is only to clarify that each turbine is subject to this rule as an "existing stationary combustion turbine" per 40 CFR 63.6090(a)(1). This change is only for clarity and does not reflect a physical change at this facility. This change is not intended to affect the Permittee's compliance requirements. • Added specific condition for 02D .1425. This rule became effective May 2022.

* This list is not intended to be a detailed record of every change made to the permit but a summary of those changes.

6.0 Regulatory Review

Applicable rules: PRC is subject to the following State Implementation Plan (SIP) rules, in addition to the General Conditions:

- 15A NCAC 02D .0503 "Particulate Emissions from Fuel Burning Indirect Heat Exchangers"
- 15A NCAC 02D .0515 "Particulates from Miscellaneous Industrial Processes"
- 15A NCAC 02D .0516 "Sulfur Dioxide from Combustion Sources"
- 15A NCAC 02D .0521 "Control of Visible Emissions"
- 15A NCAC 02D .0524 "New Source Performance Standards" (NSPS)
- 15A NCAC 02D .0530 "Prevention of Significant Deterioration" (PSD)
- 15A NCAC 02D .0530(u) Use of Projected Actual Emissions to Avoid Applicability of PSD

- 15A NCAC 02D .1111 "Maximum Achievable Control Technology" (MACT)
- 15A NCAC 02D .1407 "Boilers and Indirect Process Heaters"
- 15A NCAC 02D .1425 "NOx SIP Call Budget" [state-enforceable only]
- 15A NCAC 02Q .0400 "Acid Rain Procedures"

In addition to the above SIP rules, PRC is also subject to the Cross State Air Pollution Rule (CSAPR; 40 CFR Part 97, Subparts AAAAA and CCCCC). CSAPR is not directly referenced by North Carolina's SIP.

Nonapplicable rules:

- The existing permit includes a reference to 15A NCAC 02Q .0504 "Option for Obtaining Construction and Operation Permit." As discussed below, references to this rule will be removed from the new permit. This rule will no longer apply to this facility.

- As discussed in Section 7.5, 15A NCAC 02D .0614 and CAM do not apply to this facility.

- As discussed in Section 6.10, 15A NCAC 02D .1418 "New Electric Generating Units, Boilers, Combustion Turbines, and I/C Engines" does not apply to this facility.

6.1 15A NCAC 02D .0503 "Particulate Emissions from Fuel Burning Indirect Heat Exchangers"

Applicability: This rule applies to all indirect heat exchangers (such as boilers). The boiler ES-6 is subject to this rule.

Emission limit: This rule limits PM emitted from boilers. The emission limit for this rule is calculated by $E = 1.090 \times Q^{-0.2594}$, where E is the particulate emission limit in lb/MMBtu and Q is the combined heat input of each emission source subject to this rule. Q is determined when an emission source is added to the permit, and is not subsequently recalculated when other sources subject to this rule are added to the permit. For the boiler ES-6, E is 0.53.

The subject source at this facility can burn only natural gas. In order to calculate PM emissions from the combustion of natural gas, the emission factors published by EPA in AP-42 can be applied. The published emission factors are not in units of pounds per million Btu, so the emission factor must be converted:

PM from natural gas (AP-42 Chapter 1.4, Table 1.4-2; PM [Total]):

$$\frac{7.6 \text{ lb}}{\text{million scf}} \times \frac{1 \text{ scf}}{1{,}020 \text{ Btu}} = \frac{\mathbf{0.007 \text{ lb}}}{\mathbf{\text{million Btu}}}$$

Therefore, natural gas is expected to comply with the PM limit by a wide margin.

Monitoring, Recordkeeping, and Reporting: Based on the wide margin of compliance for natural gas, DAQ has determined that no monitoring, recordkeeping, or reporting is required to demonstrate compliance with 15A NCAC 02D .0503. DAQ has reviewed this analysis for the existing permit and agrees with this analysis.

Compliance: PRC is expected to remain in compliance with this rule.

6.2 15A NCAC 02D .0515 "Particulates from Miscellaneous Industrial Processes"

Applicability: This rule applies to emission sources that exhaust through a stack and are not subject to another particulate matter (PM) emission limit. This rule is generally not applied to combustion sources because they don't have a process rate. Therefore, this rule does not apply to the turbines or boiler.

The cooling tower (Tower 1) is subject to a PM emission limit under 02D .0530. However, that limit is specifically for filterable particulate.[1] When demonstrating compliance with the PM limit under this rule, condensable PM must also be included (i.e., the limit is effectively for total PM),[2] and therefore this rule applies to the cooling tower.

Emission limit: The PM emission limit for this rule is based on the process rate of the emission source in question, based on the following equations: $E = 4.10 \times P^{0.67}$ (for $P \leq 30$) or $E = 55.0 \times P^{0.11} - 40$ (for $P > 30$), where P is the process rate in tons per hour and E is the PM emission limit in pounds per hour.

Monitoring, Recordkeeping, and Reporting: DAQ has determined that no monitoring, recordkeeping, or reporting is required for the cooling tower to demonstrate compliance with this rule. DAQ has reviewed this analysis for the existing permit and agrees with this analysis.

Compliance: PRC is expected to remain in compliance with this rule.

6.3 15A NCAC 02D .0516 "Sulfur Dioxide from Combustion Sources"

Applicability: This rule applies to combustion sources that are not subject to an SO_2 emission limit under NSPS or MACT. The turbines are subject to an SO_2 limit under NSPS Subpart GG are therefore not subject to this rule. The boiler ES-6 is subject to NSPS Subpart Dc, but does not have an SO_2 emission limit under that rule; therefore the boiler is subject to this rule.

Emission limit: In all cases, the emission limit is 2.3 pounds of SO_2 per million Btu of heat input. In general, SO_2 emitted by combustion sources is a function of the amount of sulfur present in the fuel. The boiler ES-6 can burn only natural gas. In order to calculate SO_2 emissions from the combustion of these fuels, the emission factors published by EPA in AP-42 can be applied. The published emission factors are not in units of pounds per million Btu, so the emission factor must be converted:

SO_2 from natural gas (AP-42 Chapter 1.4, Table 1.4-2; SO_2):

$$\frac{0.6 \text{ lb}}{\text{million scf}} \times \frac{1 \text{ scf}}{1{,}020 \text{ Btu}} = \frac{\mathbf{0.001 \text{ lb}}}{\mathbf{\text{million Btu}}}$$

Therefore, natural gas is expected to comply with the SO_2 limit by a wide margin.

Monitoring, Recordkeeping, and Reporting: Based on the wide margin of compliance for natural gas, DAQ has determined that no monitoring, recordkeeping, or reporting is required to demonstrate compliance with 15A NCAC 02D .0516. DAQ has reviewed this analysis for the existing permit and agrees with this analysis.

[1] The initial PSD review for this facility occurred before 2011. According to 40 CFR 51.166(b)(49)(i)(*a*), condensable PM was not considered when establishing PM limits in PSD permits prior to this date.
[2] According to 15A NCAC 02D .2609(a), compliance with PM emission standards is determined using test Method 5 (filterable PM) *and* Method 202 (condensable PM).

Compliance: PRC is expected to remain in compliance with this rule.

6.4 15A NCAC 02D .0521 "Control of Visible Emissions"

Applicability: This rule applies to sources of visible emissions (VE) that are not subject to another VE standard under 02D .0500. Generally, this rule is not applied to sources that are not expected to produce any VE (*e.g.*, a cooling tower). Each source at this facility (except the cooling tower) is subject to this rule.

Emission limits: The VE limit for this rule depends on the construction date of the individual source in question. At this facility, the VE limit is 20% for each source subject to this rule. The rule allows for one exceedance of the specific limit per hour, and four exceedances per 24-hour period.

Monitoring: Monitoring for this rule depends on the specific source:

- Turbines: DAQ generally does not require monitoring, recordkeeping, or reporting for VE from well-operated combustion turbines and other natural gas-fired sources due to the low possibility of VE from those activities. While the turbines are firing fuel oil, PRC must observe the turbines for VE above normal. PRC must perform the observation once every 1,100 hours of operation of fuel oil.

- Boiler: No VE is expected from the boiler while firing natural gas. The boiler can only fire natural gas, so no monitoring, reporting, or recordkeeping is required for VE from the boiler.

Recordkeeping, and Reporting: PRC must keep records of VE observations of the turbines while they are firing fuel oil. PRC must submit a semiannual summary report.

Compliance: Based on the most recent inspection report, PRC appears to be in compliance with this rule. Continued compliance will be determined with subsequent inspections and reports.

6.5 15A NCAC 02D .0524 "New Source Performance Standards" (NSPS)

This rule incorporates the NSPS rules in 40 CFR Part 60 into North Carolina's SIP. See Section 7.1 for a discussion of NSPS rules that apply to this facility.

6.6 15A NCAC 02D .0530 "Prevention of Significant Deterioration" (PSD)

Applicability: This rule incorporates the PSD requirements in 40 CFR Part 51.166 into North Carolina's SIP. PRC is a major source for PSD, so this rule applies to this facility. The permit includes best achievable control technology (BACT) limits for each turbine and the cooling tower. The boiler ES-6 was added after the initial PSD review, and is not subject to this rule.

Emission limits: The permit includes BACT emission limits for the turbines and cooling tower. In addition to the BACT limits, PRC must:

- Comply with annual and summer operating limits for the turbines,
- Minimize periods of excess emissions during startup and shutdown, and
- Operate the selective catalytic reduction (SCR) systems for Units 4 and 5 (note that these turbines have stricter BACT limits).

The BACT emission limits are the result of the initial PSD review, and have not been modified since at least the R05 permit revision.[3]

Monitoring: PRC operates a NOx continuous emission monitoring system (CEMS) for the turbines to demonstrate compliance with the NOx emission limits. PRC must also ensure the sulfur content of fuel oil burned in the turbines. There are no monitoring requirements for the cooling tower.

Recordkeeping and reporting: PRC must keep records of turbine operation, NOx CEMS data, and fuel sulfur content. PRC must submit a semiannual summary report of the recordkeeping activities.

Compliance: Based on the most recent inspection report, PRC appears to be in compliance with this rule. Continued compliance will be determined with subsequent inspections and reports.

Changes to the existing permit: The existing permit includes Specific Condition 2.1 A.3.l.ii.(A), which governs how PRC determines a "valid hourly emission rate" when using a NOx CEMS to demonstrate compliance with the BACT emission limits for the turbines. The existing permit only requires two data points for a valid hour. This is not correct; in general, a valid hour for CEMS requires four data points. The permit will be updated as follows:

2.1 A.3. 15A NCAC 02D .0530: PREVENTION OF SIGNIFICANT DETERIORATION

…

Reporting [15A NCAC 02Q .0508(f)]

l. The Permittee shall submit in writing a report postmarked on or before January 30 of each calendar year for the preceding three-month period between October and December, April 30 of each calendar year for the preceding three-month period between January and March, July 30 of each calendar year for the preceding three-month period between April and June, and October 30 of each calendar year for the preceding three-month period between July and September. The quarterly report shall include the following:

…

ii. periods of excess emissions for nitrogen oxides, defined as:

(A) for any 24-hour rolling averaging period during which the concentrations exceed 0.045 lb/million Btu (10.5 ppmvd) when firing natural gas and 0.176 lb/million Btu (42 ppmvd) when firing No. 2 fuel oil, as determined by Section 2.1 A.3.k.ii above. The 24-hour rolling average is calculated using only actual operating hours (periods of zero emissions when not operating are not included) at loads above 50 percent. A valid hourly emission rate shall be calculated as per 40 CFR 60.13(h)(2). ~~A valid hourly emission rate shall be calculated for each hour in which at least two NOx concentrations are obtained at loads above 50 percent at least 15 minutes apart.~~

6.7 15A NCAC 02D .0530(u) Use of Projected Actual Emissions

Applicability: When an existing PSD major source makes a modification, the applicant may opt to show the modification is not a PSD-major modification by comparing the pre-modification baseline emissions of that source to the projected actual emissions (PAE) of the source after the modification. If the difference in the projected and baseline emissions is less than the threshold for a significant emission increase (as defined in

[3] The R05 permit revision was issued on April 12, 2002. This is the earliest available permit in DAQ's database.

40 CFR 51.166), the modification is not PSD-major. The PAE method is specified in 15A NCAC 02D .0530(u).

If a facility chooses to use the PAE method to avoid a major modification, the facility must keep records of actual emissions post-modification to show that the PAE were reasonable compared to the actual emissions. PRC has used the PAE method several times in the past, so the existing permit includes several references to this rule.

Requirements: In order to use the PAE method to demonstrate a modification is not major, a facility must estimate (i.e., "project") the change in emissions that will result from that modification. The permit includes the emission estimates from several recent modifications performed by PRC. Note that these emission estimates are not emission limits; if PRC were to exceed the original estimates, PRC may be required to redo the original demonstration to show that there has not been a significant emission increase.

Reporting: PRC is required to submit an annual report that shows the emissions from each modification that used the PAE method. These reports are only required for five calendar years following the completion of the modification.

Compliance: Based on the most recent inspection report, PRC appears to be in compliance with this rule. Continued compliance will be determined with subsequent inspections and reports.

Changes to the existing permit:

- The existing permit includes a reporting requirement for Units 4 and 5 that began in CY2018 and ended in CY2022 (initiated by application .16C). PRC has submitted the CY2022 report; therefore there will be no further requirements for Units 4 and 5 as a result of the .16C application. This condition will be removed from the permit. Note that PRC has made a separate modification to Units 4 and 5 using the PAE method (see below), so Units 4 and 5 will still be subject to this rule.

- The existing permit includes an additional reporting requirement for Units 4 and 5 (initiated by application .21A). According to application .23A, this modification has been completed in May 2022, and therefore the five-year reporting requirement has begun. The first reporting year will by CY2023, and the last reporting year will be CY2027. These dates will be added to the permit.

6.8 15A NCAC 02D .1111 "Maximum Achievable Control Technology" (MACT)

This rule incorporates the MACT rules in 40 CFR Part 63 into North Carolina's SIP. See Section 7.2 for a discussion of MACT rules that apply to this facility.

Changes to the existing permit: A specific condition for MACT Subpart YYYY will be added to the renewed permit. As discussed in Section 7.2, PRC has no requirements under this rule. Adding this specific condition is only for clarity, and does not reflect any physical change or modification at PRC.

6.9 15A NCAC 02D .1407 "Boilers and Indirect Process Heaters"

Applicability: This rule applies to boilers located in counties specifically listed in 02D .1402. PRC is located in Rowan County, which is listed in 02D .1402. Therefore, the boiler ES-6 is subject to this rule.

Requirements: The boiler ES-6 has a capacity less than 50 million Btu per hour. Therefore, per 02D .1407(b), PRC must perform annual tune-ups of the boiler according to 02D .1414. PRC must keep records of the tune-ups, and submit a semiannual summary report.

Compliance: Based on the most recent inspection report, PRC appears to be in compliance with this rule. Continued compliance will be determined with subsequent inspections and reports.

6.10 15A NCAC 02D .1418 "New Electric Generating Units, Boilers, Combustion Turbines, and I/C Engines" [not applicable]

Applicability: This rule applies to electric generating units (EGUs) permitted after October 31, 2000. Each turbine at this facility was constructed before that date. Therefore, this rule does not apply to this facility.

6.11 15A NCAC 02D .1425 "NOx SIP Call Budget" [state-enforceable only]

Applicability: This rule applies to electric generating units (EGU) and large non-EGUs as defined in 02D .1401. Each turbine at this facility is subject to this rule. This rule became effective May 1, 2022.

Monitoring, Recordkeeping, and Reporting: This rule does not include a specific emission limit. Instead, PRC must calculate the total NOx emissions from the four turbines during the summer ozone period and submit a NOx report annually. PRC must use data gathered in accordance with 40 CFR Part 75 to prepare the report.

Changes to the existing permit: The existing permit does not include a specific condition for this rule. A specific condition for this rule will be added to the new permit. Compliance will be determined when the first annual NOx report is received.

6.12 15A NCAC 02Q .0400 "Acid Rain Procedures"

Applicability: This rule requires electric generating facilities to comply with 40 CFR Part 72 and obtain an acid rain permit (a.k.a. a Title IV permit).

The acid rain permit limits NOx and SO_2 emissions and requires annual reporting of those emissions. Generally, compliance with these limits is determined by US EPA, not DAQ. The Title V permit includes a reference to the acid rain permit.

Renewal: PRC submitted application .23C in order to renew the Title IV permit. The permit term will be the same as the Title V permit.

6.13 15A NCAC 02Q .0504 "Option for Obtaining Construction and Operation Permit" [not applicable]

Background: A facility may choose to make a significant modification to a Title V permit using a "two-step" process as allowed by 15A NCAC 02Q .0501(b)(2). When a facility uses the two-step process, the facility must submit a second permit application within 12 months of commencing operation of the modified sources.

Applicability: PRC used the two-step process to make modifications to two turbines (Units 4 and 5). Therefore, the existing permit includes a permit condition that requires PRC to submit a second permit application. PRC initiated the two-step significant modification with application .21A (received October 22, 2021). DAQ issued the T26 permit revision in response to application .21A.

Requirements: PRC was required to submit the second-step permit application within 12 months of completing the modification to Units 4 and 5. According to application .23A, PRC completed the modification in May 2022. Therefore, this application was submitted on-time.

PRC did not request any changes to the permit as part of the second step. See Attachment 1 for DAQ's review of application .21A and the T26 permit revision.

Changes to the existing permit: Because PRC has completed the application submittal requirement, references to this rule will be removed from the permit.

7.0 NSPS, NESHAP/MACT, PSD, §112(r), CAM, CSAPR

7.1 New Source Performance Standards (NSPS; 40 CFR Part 60)

7.1.1 NSPS Subpart Dc "Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units"

Applicability: This rule applies to "steam generating units" (defined by the rule) that were constructed/modified/reconstructed after June 9, 1989 and have a heat input capacity between 10 and 100 million Btu per hour, except as provided in §60.40c(e)-(i). The boiler ES-6 is subject to this rule.

Requirements: The requirements of this rule differ based on the size, fuel types, and construction date of the boiler in question. The boiler ES-6 is a gas-fired boiler with capacity less than 30 million Btu per hour heat input. The rule includes emission limits for SO_2, PM, and VE, but none of those limits apply to this boiler:

- SO_2 emission limit: This rule includes limits for SO_2, but none of those limits apply to exclusively gas-fired boilers (see 40 CFR 60.42c).
- PM emission limit: This rule includes PM emission limits, but none of those limits apply to exclusively gas-fired boilers (see 40 CFR 60.43c).
- VE emission limit: This rule includes a VE limit, but that limit does not apply to exclusively gas-fired boilers (see 40 CFR 60.43c(c)).

Monitoring, recordkeeping, and reporting: The rule requires PRC to keep records of the amount of fuel burned in the boilers. While the rule normally requires the fuel usage to be recorded daily, gas-fired boilers need only record fuel usage on a monthly basis (see 40 CFR 60.48c(g)(2)). No other monitoring, recordkeeping, or reporting is required.

Compliance: Based on the most recent inspection report, PRC appears to be in compliance with this rule. Continued compliance will be determined with subsequent inspections.

7.1.2 NSPS Subpart GG "Standards of Performance for Stationary Gas Turbines"

Applicability: This rule applies to stationary combustion turbines constructed, reconstructed, or modified after October 3, 1977 (see 40 CFR 60.330(b)). Each of the turbines are subject to this rule.

Standards: This rule includes limits for NOx and SO_2:

- NOx emission limit: The NOx limit is determined by the equation in 40 CFR 60.332(a)(1). The limit was initially calculated as 110 ppmvd for each turbine. PRC does not claim any credit for *F* in the NOx emission limit equation.

- SO_2 emission limit: Either 0.015 percent by volume (40 CFR 60.333(a)) or fuel with a sulfur content less than 0.8 percent by weight (40 CFR 60.333(b))

Monitoring, recordkeeping, and reporting: In general, the facility demonstrates compliance with the NOx limits by operating a NOx CEMS, and demonstrates compliance with the SO_2 limit by monitoring the sulfur content of the fuel in the turbines. The rule requires PRC to keep records of CEMS data, excess emissions, and fuel sulfur content. PRC must submit a semiannual report of the monitoring activities.

Compliance: Based on the most recent inspection report, PRC appears to be in compliance with this rule. Continued compliance will be determined with subsequent inspections.

Changes to the existing permit: The existing permit requires emission testing according to General Condition JJ, which in turn references 15A NCAC 02D .2600. This is incorrect because 15A NCAC 02D .2601(c) exempts tests performed under NSPS, NESHAP, and MACT; facilities are required to perform testing as required by the NSPS instead. The permit will be corrected to require testing according to 40 CFR 60.335 instead of General Condition JJ.

7.1.3 NSPS Subpart KKKK "Standards of Performance for Stationary Combustion Turbines" [not applicable]

Applicability: This rule applies to stationary combustion turbines constructed, reconstructed, or modified after February 18, 2005 (see 40 CFR 60.4300). Each turbine was constructed before that date, and has not been modified or reconstructed after that date. Therefore, this rule does not apply to this facility.

Note that the upgrades allowed by application .21A and permit revision T26 (application review attached) do not constitute a modification or reconstruction as defined in 40 CFR 60.14 and 60.15.

7.1.4 NSPS Subpart TTTT "Standards of Performance for Greenhouse Gas Emissions for Electric Generating Units" [not applicable]

Applicability: This rule applies to electric generating units constructed, reconstructed, or modified after January 8, 2014 (see 40 CFR 60.5508). Each turbine was constructed before that date, and has not been modified or reconstructed after that date. Therefore, this rule does not apply to this facility.

Note that the upgrades allowed by application .21A and permit revision T26 (application review attached) do not constitute a modification or reconstruction as defined in 40 CFR 60.14 and 60.15.

7.2 National Emission Standards for Hazardous Air Pollutants (NESHAP; 40 CFR Part 61) and Maximum Achievable Control Technology (MACT; 40 CFR Part 63)

NESHAP: There are no NESHAP rules that apply to PRC. Therefore, the permit does not include a specific condition for 15A NCAC 02D .1110.

MACT: The MACT rules apply to facilities based on if a facility a "major source" or "area source" of hazardous air pollutants (as defined in 40 CFR 63.2). For the purposes of MACT applicability, PRC is a major source of HAP because it has potential emissions of HAP greater than the thresholds listed in 40 CFR 63.2.

Because this facility is a major source of HAP, rules that apply exclusively to area sources of HAP (e.g., Subpart JJJJJJ "National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources") categorically do not apply to this facility.

7.2.1 MACT Subpart YYYY "National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines"

Applicability: This rule applies to stationary combustion turbines located at major sources of HAP. PRC is a major source of HAP, therefore each turbine at this facility is subject to this rule.

Requirements: The requirements of this rule are based on the specific subcategory of turbine. For the purposes of this rule, each turbine at the facility is in the "existing" subcategory because they were constructed before January 14, 2003, and have not been reconstructed after that date (see 40 CFR 63.6090(a)(1)). Note that the upgrades allowed by application .21A and permit revision T26 (application review attached) do not constitute "reconstruction" as defined in 40 CFR 63.2.

Emission limits, monitoring, recordkeeping, and reporting: Existing turbines do not have to meet the requirements of this rule (see 40 CFR 63.6090(b)(4)).

Compliance: Because the turbines at this facility are not required to meet the requirements of this rule, compliance with this rule is assumed.

Changes to the existing permit: The existing permit includes a reference to this rule, but no specific condition. A specific condition will be added to the permit that clarifies each turbine's status as an existing unit. This change is only for clarity and will not affect PRC's compliance requirements.

7.2.2 MACT Subpart DDDDD "National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters"

Applicability: This rule applies to boilers and process heaters (defined by 40 CFR 63.7575) located at major sources of HAP. The boiler ES-6 is subject to this rule.

Requirements: The requirements of this rule are based on the specific subcategory of boiler. The boiler ES-6 is in the subcategory "Units designed to burn gas 1 fuels" subcategory (a.k.a. "gas 1 boilers" (see 40 CFR 63.7499(l)).

For gas 1 boilers, the rule requires:

- Operate with good work practices [40 CFR 63.7500(a)(3)],
- Conduct tune-ups every year [40 CFR 63.7540(a)(10)]
- Conduct an initial, one-time energy assessment. [40 CFR 63.7500(a)(1), Table 3]

Monitoring, recordkeeping, and reporting: The facility must keep records of the tune-ups and other maintenance activities and submit regular reports.

Compliance: During DAQ's most recent inspection, PRC appeared to be in compliance with this rule. Continued compliance will be determined during subsequent inspections and reports.

7.3 Prevention of Significant Deterioration (PSD)

Background: In general, for the purposes of PSD, a facility is a "major source" if it has actual or potential emissions of a regulated NSR pollutant (defined in 40 CFR 51.166(b)(49) greater than 100 tpy and activities at the facility are included in the list of source categories in 40 CFR 51.166(b)(1)(i). PRC is a fossil fuel-fired steam electric plant with more than 250 million Btu per hour heat input,[4] which is one of the categories in that list. Because this facility is a major source for PSD, the permit includes PSD requirements such as BACT limits (discussed in Section 6.6).

PRC has made several modifications following the initial PSD review. For those modifications, PRC demonstrated that those modifications would not be a major modification using the projected actual emissions method (discussed in Section 6.7).

7.4 Section 112(r) of the Clean Air Act (and 15A NCAC 02D .2100 "Risk Management Program")

This rule requires facilities that store materials above the threshold quantities in 40 CFR 68.130 above their respective thresholds to prepare and submit a risk management plan (RMP). In application .23A, on Form A3, PRC indicated that an RMP is not required for this facility. Because no RMP is required, the permit does not include a specific condition for 15A NCAC 02D .2100.

Note that other parts of §112(r), such as the general duty clause, may still apply to this facility. However, those requirements are outside the purview of the Title V permit.

7.5 Compliance Assurance Monitoring (CAM; 40 CFR Part 64)

Applicability: The compliance assurance monitoring (CAM) rule requires owners and operators to conduct monitoring to provide a reasonable assurance of compliance with applicable requirements under the act. Per 02D .0614(a), this rule potentially applies to any facility required to obtain a permit under 02Q .0500 (i.e., a Title V permit). This facility is required to obtain a permit under 02Q .0500. Therefore, CAM applicability must be examined.

Monitoring focuses on emissions units that rely on pollution control device equipment to achieve compliance with applicable standards. An emission unit is subject to CAM, under 40 CFR Part 64, if all of the following four conditions are met:

I. The unit is subject to any (non-exempt, e.g., pre-November 15, 1990, Section 111 or 112 standard) emission limitation or standard for the applicable regulated pollutant.
II. The unit uses any active control device to achieve compliance with any such emission limitation or standard.
III. The unit's pre-control potential emission rate exceeds 100 percent of the amount required for a source to be classified as a major source, i.e., either 100 tpy (for criteria pollutants) or 10 tpy of any individual/25 tpy of any combination of HAP.

Each control device at this facility is used to control NOx. The table below examines CAM applicability for each control device:

[4] The use of a heat recovery steam generator for Units 4 and 5 mean that this facility falls into the category of steam electric plant. See the EPA memo *Determining Prevention of Significant Deterioration (PSD) Applicability Thresholds for Gas Turbine Based Facilities*, issued February 2, 1993.

Emission Source	Control Device	Pollutant	Emission Limit	Triggers CAM?	Notes
Units 1, 2, and 3	Water injection (fuel oil firing only)	NOx	02D .0524 (NSPS Subpart GG)	No	1
			02D .0530 (PSD)	No	
Units 4 and 5	Water injection (fuel oil firing only) And Selective catalytic reduction			No	
			02D .1425 (NOx SIP Call)	No	2
			02Q .0400 (Acid rain permit)	No	3
			40 CFR Part 97 (CSAPR)	No	4

Notes:

1. PRC demonstrates compliance with the NOx limits using a NOx CEMS. A CEMS constitutes a CCDM per 15 NCAC 02D .0614(b)(1)(F), and therefore these limits are exempt.
2. This rule is state-enforceable only, and is therefore not an applicable requirement for CAM.
3. This rule is part of the Acid Rain Program and therefore is an exempt standard per 15A NCAC 02D .0614(b)(1)(C).
4. This rule is an emission trading program and therefore is an exempt standard per 15A NCAC 02D .0614(b)(1)(D).

Based on the above analysis, CAM does not apply to this facility.

7.6 Cross State Air Pollution Rule (CSAPR; 40 CFR Part 97, Subparts AAAAA and CCCCC)

Applicability: This rule applies to power plants that produce electricity for sale. CSAPR was originally scheduled to take effect on January 1, 2012. This rule was planned as a replacement for CAIR. However, CSAPR was challenged in court and initially vacated by the DC Circuit Court. Legal issues were finally resolved in April 2014, when the US Supreme Court reversed that decision. Because the regulation was delayed by court proceedings, the effective date of the rule was moved to January 1, 2015.

Under this rule, each of the turbines at the facility is considered a "large electric generating unit" per 40 CFR 52.34. In general, compliance with this rule is determined by US EPA, not DAQ. The Title V permit includes a reference to CSAPR, but no specific requirements.

8.0 North Carolina Toxic Air Pollutants

This facility has not triggered TAP requirements under 02Q .0711 or 02D .1100. Note that the turbines and boiler are each subject to a rule under 40 CFR Part 63, and therefore exempt from TAP requirements per 02Q .0702(a)(27)(B).

As part of the upgrades of Units 4 and 5, PRC performed air dispersion modeling to demonstrate that no acceptable ambient limit (AAL) listed in 02D .1104 would be exceeded. DAQ approved the modeling demonstration on January 19, 2022. The results of the modeling demonstration showed that no AAL would be exceeded based on the operation of all five turbines at this facility.

9.0 Compliance Status and Other Regulatory Concerns

Compliance status: This facility was most recently inspected on January 27, 2022 by Emily Supple. PRC appeared to be in compliance with the Title V permit at the time of that inspection.

Compliance history: The Title V permit was most recently renewed on October 22, 2018. Since that date, PRC has been issued one NOV. On October 19, 2021, DAQ issued an NOV to PRC because of excessive monitor downtime for one of the NOx CEMS. DAQ considered the matter resolved as of April 28, 2022. No fine was levied or enforcement action taken.

Application fee: An application fee is required when a facility submits an application for permit modification. PRC submitted the appropriate application fee via ePay for application .23C. Applications for Title V and Title IV permit renewals do not require an application fee.

PE Seal: Pursuant to 15A NCAC 02Q .0112 "Application requiring a Professional Engineering Seal," a professional engineer's seal (PE Seal) is required to seal technical portions of air permit applications for new sources and modifications of existing sources as defined in 15A NCAC 02Q .0103. A PE Seal was not required for this 2nd-step significant modification. A PE Seal is not required for Title V or Title IV permit renewals.

Zoning: A Zoning Consistency Determination per 15A NCAC 02Q .0304(b) was not required for this 2nd-step significant modification. This determination is not required for Title V or Title IV permit renewals.

10.0 Facility Emissions Review

Title V: This facility is classified as a major source for Title V because it has actual emissions of criteria pollutants greater than the major source threshold. These applications for permit renewal and modification will not affect PRC's status as a major source for Title V.

HAP: This facility is classified as a major source for HAP emissions because it has actual emissions of an individual HAP greater than 10 tpy. These applications for permit renewal and modification will not affect PRC's status as a major source for Title V.

PSD: This facility is classified as a major stationary source for PSD because it has actual emissions of regulated NSR pollutants greater than the major source threshold. These applications for permit renewal and modification will not affect PRC's status as a major source for Title V.

11.0 Draft Permit Review Summary

Initial draft: An initial draft of the Title V permit and this application review were sent to DAQ Permits staff (Rahul Thaker) on April 12, 2023. Comments were received on April 27, 2023:

DAQ Permits Comment 1: The comments pointed out typos in the draft permit and application review.

Response: The indicated issues were corrected.

DAQ Permits Comment 2: Ensure that each reporting requirement in the permit requires that deviations be clearly indicated.

Response: This has been added to each reporting requirement.

DAQ Permits Comment 3: The noncompliance statements in Sections 2.1 A.3.k and 2.1 B.3.k should include the fuel oil and operating limits in Sections 2.1 A.3.g, h and i, and 2.1 B.3.f, g, and h.

Response: This has been added to the indicated noncompliance statements.

DAQ Permits Comment 4: The application review should include additional discussion of the emission limits under NSPS Subpart GG and the definition of "modification" and "reconstruction" under NSPS Subpart KKKK and MACT Subpart YYYY.

Response: This has been added to the application review.

Subsequent draft: A subsequent draft of the Title V permit and application review were sent to DAQ MRO staff (Jennifer Manning, Denise Hayes), DAQ SSCB staff (Samir Parekh), and PRC staff (Scott McMillan, Corey Ladner) on May 2, 2023. MRO and PRC staff reviewed the drafts and had no comments. DAQ SSCB had one comment:

DAQ SSCB Comment 1: The comment suggested the following change to Specific Condition 2.1 A.3.l.ii.(A):

…for any 24-hour rolling averaging period during which the concentrations exceed 0.045 lb/million Btu (10.5 ppmvd) when firing natural gas and 0.176 lb/million Btu (42 ppmvd) when firing No. 2 fuel oil, as determined by Section 2.1 A.3.k.ii above. The 24-hour rolling average is calculated using only actual operating hours (periods of zero emissions when not operating are not included). ~~A valid hourly emission rate shall be calculated for each hour in which at least two NO_x concentrations are obtained at loads above 50 percent at least 15 minutes apart.~~ A valid hourly emission rate shall be calculated as per 40 CFR 60.13(h)(2).

Response: The existing permit currently requires that the operating load be above 50 percent, which is not reflected in this proposed language. A slightly different version of this language will be added to the new permit which both requires 50 percent operating load and the procedure in 40 CFR 60.13(h)(2). PRC agreed with this proposed revision.

12.0 Public Notice and EPA 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 .0518(b), the EPA will have a 45-day review period. Based on an agreement between DAQ and EPA, this period will generally coincide with the 30-day public notice 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. DAQ voluntarily provides notice to each bordering State (Virginia, Tennessee, Georgia, and South Carolina).

- The Public Notice and EPA Review periods began on XXXX
- The Public Notice period ended on XXXX
- The EPA Review period ended on XXXX

13.0 Recommendations

This permit application has been reviewed by NC DAQ to determine compliance with all procedures and requirements. NC DAQ has determined that this facility appears to be complying with all applicable requirements.

DAQ recommends issuance of Permit No. 08758T28. MRO, SSCB, and PRC have received a draft copy of the permit and application review, and all submitted comments were incorporated as described in Section 11.0.

Attachment to Review of application 8000163.23A
Plant Rowan County
Review of Application 8000163.21A

(page numbers in this attachment may differ from the original document due to formatting changes)

Review Engineer: Russell Braswell **Review Engineer's Signature:** **Date:** *Russell Braswell* January 31, 2022	**Comments / Recommendations:** **Issue** 08758/T26 **Permit Issue Date:** February 1, 2022 **Permit Expiration Date:** September 30, 2023 (no change)

1. **Purpose of Application:**

Plant Rowan County (PRC; the facility) currently operates a facility in Rowan County under Title V permit 08758T25. This facility is a power plant that consists of five combustion turbines (Units 1 through 5).

PRC plans to upgrade the first stage of the compressor associated with each of Units 4 and 5. As a result, annual emission rates and utilization of Units 4 and 5 are projected to change. PRC has submitted this application in order to implement this proposed upgrade. In the application, PRC demonstrates that the proposed upgrade will not trigger the requirements of Prevention of Significant Deterioration (PSD) or New Source Review (NSR), will not count as a modification for the purposes of New Source Performance Standards (NSPS), will not count as reconstruction under Maximum Achievable Control Technology (MACT), and will not exceed any acceptable ambient limits in 02D .1104.

This application was submitted as the first part of a two-part significant modification as allowed by 15A NCAC 02Q .0501(b)(2). For such applications, no Public Notice or EPA Review period is required. PRC will be required to submit a second Title V permit application, and the Title V permit will go through the Public Notice and EPA Review processes at that time.

2. **Facility Description:**

This facility is a power plant that produces electricity for sale to the grid. The facility consists of three simple-cycle gas turbines (Units 1, 2, and 3) and two combined-cycle gas turbines that operate as a single system (Units 4 and 5). The primary fuel source for the facility is natural gas, although Units 1 through 4 can also operate with No. 2 fuel oil.

3. **Application Chronology:**

- October 22, 2021 Application received.
- November 10, 2021 Email to Scott McMillan regarding the use of water injection in the turbines Units 1 through 4. He responded via email the same day.
- November 16, 2021 Initial draft permit and application review sent to RCO Title V supervisor (Heather Sands).
- January 11, 2022 Response received to initial draft. For a summary of comments received, see Section 9.

- January 14, 2022 A draft of the permit and application review were sent to RCO SSCB (Samir Parekh), MRO staff (Jennifer Manning, Emily Supple), and PRC staff (Scott McMillan, Jesse English). See Section 9 for a discussion of comments received.

- February 1, 2022 Permit issued.

4. Changes to the Existing Permit:

- A specific condition for 02D .0530(u) has been added to the permit based on this application. The basis and requirements for this condition are discussed in Section 6 below.

- The specific condition for 02D .0530(u) that applied to Unit 1 and Unit 3 (specific condition 2.1 A.7 in the existing permit) has been removed from the permit because PRC has completed the application submittal requirement when application 8000163.22A was received. That application will be processed separately from this application.

- A specific condition for 02Q .0504 has been added to the permit because PRC submitted this application as the first part of a two-part significant modification allowed by 02Q .0501(b)(2). This condition requires PRC to submit an additional application for permit modification within 12 months of completing the upgrade project discussed in Section 6 below.

- References to 40 CFR Part 97, Subpart BBBBB have been removed because this rule no longer applies in North Carolina. See 40 CFR 52.1784 and 81 FR 74586 for details regarding the non-applicability of this rule in North Carolina.

- The description of turbines Units 1 through 4 have been corrected in the permit. These turbines use water injection to control NOx emissions while firing fuel oil, but the description of these turbines in Section 1 of the permit did not reflect this. It should be noted that this change does not reflect a physical change at the facility, and is only to ensure the Title V permit correctly reflect operations at the facility. The following corrections have been made (additions underlined):

Emission Source ID No.	Emission Source Description	Control Device ID No.	Control Device
Unit 1, Unit 2, and Unit 3 **PSD BACT, NSPS GG, MACT YYYY**	Three natural gas/No. 2 fuel oil-fired simple-cycle internal combustion turbines (1,628 million Btu per hour heat input rate each, when firing natural gas, 1,875 million Btu per hour heat input rate each, when firing No. 2 fuel oil), each equipped with dual fuel dry Low-NOx combustors and having water injection capability for NOx control	CD-U1, CD-U2, and CD-U3	Water injection for NOx control when firing fuel oil (one per turbine)
Unit 4 **PSD BACT, NSPS GG, MACT YYYY**	One natural gas/No. 2 fuel oil-fired combined-cycle internal combustion turbine (1,628 million Btu per hour heat input rate, when firing natural gas, 1,875 million Btu per hour heat input rate, when firing No. 2 fuel oil), equipped with a heat recovery steam generator and a steam turbine, dual fuel dry Low-NOx combustors and having water injection capability for NOx control, and inlet air evaporative coolers	CD-U4	Water injection for NOx control when firing fuel oil

Emission Source ID No.	Emission Source Description	Control Device ID No.	Control Device
		Unit 4 SCR	Selective catalytic reduction

- The following table summarizes the changes made to the Title V permit: Update before final draft

Page No.	Section	Description of Changes
Throughout	Throughout	• Updated dates and permit numbers • Fixed formatting where appropriate • Corrected formatting and updated wording to current DAQ standard where appropriate. There are no changes to compliance requirements based on these corrections and updates.
4	1	• Noted that Units 1 through 4 are controlled with water injection when firing fuel oil. Note that this change does not reflect a change in operations at the facility, and is only intended to ensure that the Title V permit represents activities at the facility. • Noted that the Permittee must submit a second-step application for Units 4 and 5 based on application .21A. • Removed footnotes relating to submitting a permit application for Unit 1 and Unit 3 because the Permittee has completed this requirement by submitting application 8000163.22A.
n/a	2.1 A.7 (former)	• Removed this section because the Permittee has completed the permit application requirement by submitting application 8000163.22A.
22	2.1 B.5	• Added this condition based on application .21A.
23	2.1 B.6	• Added this condition based on application .21A.
26	2.1 D.4	• Updated condition to reflect latest DAQ wording. This change does not reflect a change in compliance requirements.
34	2.3	• Removed reference to "Federally-enforceable only". • Removed references to 40 CFR Part 97, Subpart BBBBB because this rule does not apply in North Carolina.
35	2.4	• Added this section. • Moved list of insignificant activities to this section (formerly attachment to the cover letter).
36	3.	• Updated General Conditions to v6.0

* This list is not intended to be a detailed record of every change made to the permit but a summary of those changes.

5. Regulatory Overview:

PRC is subject to several rules, but the only rule affected by the proposed upgrades is 02D .0530 "Prevention of Significant Deterioration." Because the proposed upgrade does not meet the definition of modification

or reconstruction, PRC's requirements under 02D .0524 "New Source Performance Standards" and 02D .1111 "Maximum Achievable Control Technology" will not be affected (see Section 6.d for details). Compliance with other rules in the permit will not be affected by the proposed project.

6. Discussion:

a. Project description:

In the permit application, PRC described the need and nature of the proposed upgrades to each unit as:

> "The equipment manufacturer has recommended replacement of one stage of compressor blades on the Units 4&5 combustion turbines along with a control system adjustment ("the Project")…and it will involve the replacement of the first stage of compressor blades with the most up-to-date version of the equipment, specifically GE's High Output Row 0 (HOR0) package of improved compressor blades and stator vanes designed for optimized performance…The Project is expected to incrementally increase air flow at higher ambient temperatures, which will result in increased fuel usage, exhaust flow, megawatt (MW) output, and overall efficiency of the combustion, while performance at low ambient temperatures is anticipated to decrease slightly due to steam turbine related limitations on Unit 4&5. The Project may also increase the unit's hourly emission rates at higher temperatures, but it is not expected to exceed the unit's existing maximum achievable hourly emission rates or its potential to emit." (application at 1)

b. Applicability of Prevention of Significant Deterioration:

The prevention of significant deterioration (PSD) regulations apply to new major stationary sources or existing major sources that propose a major modification. PRC is a major source under PSD because its potential emissions are greater than the 100 tpy threshold listed in 40 CFR 51.166(b)(1)(i)(*a*).

A project is considered a major modification if there is a physical change in or a change in the method of operation of a major stationary source that would result in both a significant emissions increase and a significant net emissions increase. A significant increase in emissions of a regulated PSD pollutant is projected to have occurred if the difference between the emissions after the project and the emissions before the project are greater than the significant emission rate for that pollutant.

c. Use of Projected Actual Emissions to Avoid PSD:

Under 40 CFR 51.166(r)(6) and 15A NCAC 02D .0530(u), for projects involving existing emissions units at a major stationary source, an applicant may elect to use projected actual emissions (PAE) to represent the emissions after the project. Projected actual emissions mean the maximum annual rate, in tons per year, at which an existing emissions unit is projected to emit a regulated pollutant in any one of the 5 years (12-month period) following the date the unit resumes regular operation after the project, or in any one of the 10 years following that date, if the project involves increasing the emissions unit's design capacity or its potential to emit that regulated NSR pollutant.

The emissions prior to the project are baseline actual emissions (BAE). As required by 15A NCAC 02D .0530, baseline actual emissions are calculated as the average rate, in tons per year, at which the emissions unit

actually emitted the pollutant during any consecutive 24-month period selected by the owner or operator within the five-year period immediately preceding the date that a complete permit application is received. When determining BAE, an applicant must also aggregate changes made from all substantially related[1] modifications at this facility.

Sections 6.c.1 through 4 below examine the PAE method as it applies to this project.

1. Aggregation of Other Projects for PSD Permitting:

As a general rule, projects that are not substantially related should be considered separately when determining applicability of PSD. In order to determine if two or more projects are substantially related, EPA has suggested examining the different factors regarding the specific projects, such as the timing of activities and the technical and economic dependencies of the projects.

When considering the time between projects, EPA has stated "once three years have passed, it is difficult to argue that they are *substantially* related and constitute a single project" (74 FR 2380). In the previous three years, PRC has been issued five Title V permits. Table 1 shows a brief overview of these permits and the reason for their issuance:

Table 1: Recent Permit Revisions

Permit Revision	Description
T21 issued October 22, 2018	This permit revision renewed the Title V permit and Title IV permit.
T22 issued April 4, 2019	This permit revision was issued to administratively correct errors in the permit introduced in the T21 revision.
T23 issued November 17, 2019	This permit revision allowed for upgrades to Unit 2 while demonstrating that a PSD review was not required.
T24 issued February 4, 2021	This permit revision for the same upgrades allowed by the T23 permit to be applied to Units 1 and 3. Similarly to T23, a PSD review was not required.
T25 issued June 13, 2021	This permit revision completed the two-part significant modification initiated by the T23 permit. Corrections were made to the permit, but no modification was made to permitted emission sources.

Of all of the recent permit revisions, only the upgrades allowed by the T23 and T24 revisions resulted in a change of emissions from the facility. Therefore, only these actions will be examined for potential aggregation with the current application.

It should be noted that EPA has qualified the three-year guideline. EPA has stated "Previous agency statements can be taken out of context or misunderstood when reviewing projects having a different set of facts. For example, while the [3M Memo] was considered by some as the EPA's guiding policy on project aggregation, parties could certainly misconstrue portions of that statement to suggest that all projects

[1] EPA initially suggested the term "intrinsic relationship" as a test for requiring project aggregation in a memorandum from John B. Rasnic to EPA Region 5, titled "Applicability of New Source Review Circumvention Guidance to 3M—Maplewood, Minnesota" (a.k.a. "the 3M memo"). Subsequently, EPA has suggested the synonymous term "substantially related" instead (see 83 FR 57331). EPA has affirmed this term initially on January 15, 2009 (see 74 FR 2376) and reaffirmed this term on November 15, 2018 (see 83 FR 57324).

occurring within the same timeframe should be aggregated…" (83 FR 57330, emphasis added). Therefore, the fact that the T23 and T24 permit revisions were issued fewer than three years ago is, by itself, not sufficient evidence to require project aggregation. The technical and economic dependencies of these projects must also be examined.

When determining the technical and economic dependencies of two projects, EPA has stated "activities occurring in unrelated portions of a major stationary source (e.g., a plant that makes two separate products and has no equipment shared among the two processing lines) [may] not be substantially related", and "[t]o be 'substantially related,' there should be an apparent interconnection—either technically or economically—between the physical and/or operational changes…" (74 FR 2378). Additionally, EPA has stated "Such an approach—i.e., to aggregate projects simply because they may occur close in time or may support the same overall purpose of the facility—fails to take proper account of the actual interrelationship of activities" (83 FR 57330).

At this facility, Units 4 and 5 operate independently of Units 1, 2, and 3. There are no common parts between Units 4 and 5 and the other units. The successful upgrade of Units 4 and 5 does not depend on the previous upgrades performed on Units 1, 2, and 3. Therefore, there appears to be no technical dependence between the two projects.

Based on the lack of technical dependence between the two projects, DAQ concludes that no other previous modifications should be aggregated with the current application for PSD permitting.

2. Calculate the Project Baseline Emissions

Because no other modifications will be aggregated with the proposed upgrades to Units 4 and 5, the baseline actual emissions need only be calculated for Units 4 and 5.

15A NCAC 02D .0530(b)(1) defines the baseline actual emissions as the average annual emission rate of that pollutant during "…any consecutive 24-month period selected by the owner or operator within the five-year period immediately preceding the date that a complete permit application is received by the Division…" The application establishes the baseline period as May 2018 – April 2020. Table 2 calculates the baseline actual emissions for Units 4 and 5:

Table 2: Baseline Actual Emissions for Units 4 and 5[2]

Pollutant	Emission Factor (lb/MMBtu)	Baseline Actual Emissions (ton/yr)
NOx	0.0102	152.0
CO	0.0180	268.4
PM*	0.0045	67.1
PM10	0.0045	67.1
PM2.5	0.0045	67.1
VOC	0.0017	25.3
SO_2	0.0006	9.0

Baseline Heat Input (MMBtu/yr)	
Unit 4+5	29,816,558

* "PM" is the sum of filterable and condensable particulate

Example calculation, NOx:

$$\frac{0.0102\ \text{lb}}{\text{MMBtu}} \times \frac{29{,}816{,}558\ \text{MMBtu}}{\text{yr}} \times \frac{1\ \text{ton}}{2{,}000\ \text{lb}} = 152.0\ \text{ton/yr}$$

During the baseline periods, Units 4 and 5 burned almost exclusively natural gas (Application at 3). PRC derived the emission factors used in the analysis based on CEMS data, vendor data, permit limits, and AP-42. See Attachment 1 for details regarding the baseline period and Attachment 2 for details regarding the emission factors used in the application.

3. Calculate the Projected Actual Emissions

PRC estimated the expected growth in utilization of the facility based on its proprietary dispatching model, which its parent company Southern Power Company uses to predict utilization and make suitable business decisions. PRC used the dispatching model to analyze the next five years. Based on the dispatching model, the 12-month highest heat input for Units 4 and 5 is predicted to be June 2022 through May 2023.

According to the application, the upgrade "is not anticipated to affect annual average emissions rates on a lb/MMBtu basis" (Application at 3). In other words, PRC does not expect the upgrades to have any effect on emission factors, so the projected change in emissions will be based solely on heat input. PRC estimates that the maximum annual heat input for Units 4 and 5 will be 26,429,023 MMBtu. Using this information, projected actual emissions are calculated in Table 3:

[2] Note that 02D .2609(a) requires that particulate emissions be determined using EPA Methods 5 *and* 202. i.e., "PM" and "particulate matter" is the sum of filterable and condensable particulates.

Table 3: Projected Change in Emissions for Units 4 and 5

Pollutant	Emission Factor (lb/MMBtu)	Projected Actual Emissions (ton/yr)
NOx	0.010	134.7
CO	0.0180	237.9
PM*	0.0045	59.5
PM10	0.0045	59.5
PM2.5	0.0045	59.5
VOC	0.0017	22.5
SO_2	0.0006	7.9

Projected Heat Input (MMBtu/yr)	
Unit 4+5	26,429,023

* "PM" is the sum of filterable and condensable particulate

Example calculation, NOx:

$$\frac{0.0102 \text{ lb}}{\text{MMBtu}} \times \frac{26{,}429{,}023 \text{ MMBtu}}{\text{yr}} \times \frac{1 \text{ ton}}{2{,}000 \text{ lb}} = 134.7 \text{ ton/yr}$$

4. Compare the Projected Change in Emissions to the Significance Level

A "significant emissions increase" is defined as any increase in emissions greater than the threshold listed in 40 CFR 52.166(b)(23). Table 4 compares the change in projected actual emissions for each pollutant to its respective threshold:

Table 4: Projected Change in Emissions from Units 4 and 5

Pollutant	Baseline Emissions (ton/yr)	Projected Emissions (ton/yr)	Projected Change in Emissions (ton/yr)	Significant Emissions Increase (ton/yr)	Over Threshold?
NOx	152.0	134.7	-17.3	40	No
CO	268.4	237.9	-30.5	100	No
PM	67.1	59.5	-7.6	25	No
PM10	67.1	59.5	-7.6	15	No
PM2.5	67.1	59.5	-7.6	10	No
VOC	25.3	22.5	-2.9	40	No
SO_2	9.0	7.9	-1.0	40	No

Based on Table 4, the project will not increase emissions of any pollutant greater than the threshold, and therefore no PSD review is required.

Note that the projected change in emissions from this project is negative for each pollutant. In the application, PRC states that "The emission decreases are the result of other independent factors and may not be directly related to the project," and "Other independent factors can include change in unit demand driven by higher fuel cost, load demand, availability of other units, etc." (application at 4).

15A NCAC 02D .0530(u) does not require a permit application if the change in emissions is less than 50% of the applicable threshold for each pollutant. Based on Table 4, no permit application was required. However, this exemption was added to the rule on October 1, 2020; previous versions of the rule did not include this exemption. In this application, PRC notes that the EPA has not yet added the new version of 15A NCAC 02D .0530(u) to North Carolina's State Implementation Plan, and therefore submitted this application to comply with the earlier, Federally-approved version of the rule (application at 1).

5. Compliance Requirements for Use of Projected Actual Emissions

In order to demonstrate that the projected actual emissions included in the application were accurate, PRC will monitor emissions from Units 4 and 5 for five years following the completion of the upgrade on each individual unit. The annual emissions will be compared to the projected emissions. If there is a discrepancy, PRC may be required to again demonstrate that the upgrade project did not trigger a PSD review. Recordkeeping will begin after the resumption of normal operations for the first modified unit.

The Title V permit will be modified to include a new specific condition for 15A NCAC 02D .0530(u) "Use of Projected Actual Emissions" for Units 4 and 5. The projected annual emissions calculated in Table 3 will be included in the permit for future comparison. Note that this does not constitute an emission limit, and that an exceedance of these projected emissions does not necessarily indicate a violation.

d. Modification and Reconstruction under New Source Performance Standards (NSPS) and Maximum Achievable Control Technology (MACT)

Units 4 and 5 are currently not subject to NSPS Subpart KKKK because they were constructed before February 18, 2005 and have not been reconstructed or modified since that date (see 40 CFR 60.4305(a)). The proposed project could potentially meet the definition of either reconstruction or modification under NSPS.

Units 4 and 5 are currently considered existing stationary turbines under MACT Subpart YYYY because they were constructed before January 14, 2003 and have not been reconstructed since that date (see §63.6090(a)(1)). Such sources do not have to meet the requirements of the MACT (see §63.6090(b)(4)). The proposed project could potentially meet the definition of reconstruction under MACT.

1. Modification under NSPS:

The NSPS rules define "modification" in §60.14(a) as:

"Except as provided under paragraphs (e) and (f) of [§60.14], any physical or operational change to an existing facility which results in an increase in the emission rate to the atmosphere of any pollutant to which a standard applies shall be considered a modification within the meaning of section 111 of the Act." Although PRC projects an overall decrease in emissions as a result of the proposed project (see Table 4 above), most of the projected decrease is a result of decreased annual fuel usage. PRC states in the application "The Project may also increase the unit's hourly emission rates at higher temperatures…" (application at 1) Because this project has the possibility for an increase in hourly emission rates, this project could potentially meet the definition of modification under NSPS.

The NSPS rules allow for some changes to not be considered modifications. Specifically, §60.14(e)(2) exempts "An increase in production rate of an existing facility, if that increase can be accomplished without a capital expenditure on that facility." In §60.2, NSPS defines a "capital expenditure" as "an expenditure for a physical or operational change to an existing facility which exceeds the product of the applicable "annual asset guideline repair allowance percentage" specified in the latest edition of Internal Revenue Service (IRS) Publication 534[3] and the existing facility's basis, as defined by section 1012 of the Internal Revenue Code…" If the cost of the project is less than the threshold calculated by the annual asset guideline repair allowance, then the project will not be considered to be an increase in production without a capital expenditure, and therefore will not be considered a modification.

In the application, PRC estimates the cost basis for Units 4 and 5 based on the US Energy Information Agency's document "Assumptions to the Annual Energy Outlook 2001," as 176.1 million dollars and 221.1 million dollars, respectively (application at 5). According to the IRS publication, the repair allowance percentage is 4%, meaning that any project that costs less than 4% of 176.1 million dollars (i.e., 7.0 million dollars) would therefore not be a capital expenditure. PRC estimates that the proposed upgrade will cost 2.8 million dollars per unit, and therefore a capital expenditure is not required to increase production. Because this project does not require a capital expenditure resulting in an increase in hourly emissions, it is not considered a modification under NSPS per §60.14(e)(2).

2. Reconstruction under NSPS and MACT:

NSPS defines "reconstruction" in §60.15(b) as the replacement of components of an existing facility such that the total cost of the new components exceeds 50% of the cost of constructing a comparable new facility. MACT uses a similar definition in §63.2.

The application estimates the total cost of the proposed upgrade with be 2.8 million dollars, which is far less than 50% of a new comparable unit (221.1 million dollars, see Section 6.d.1 above). Therefore, this project will not be considered reconstruction under either NSPS or MACT.

3. Compliance Requirements for NSPS and MACT:

Because the status of Units 4 and 5 will not change under either NSPS or MACT, no change to the permit requirements for either of these rules will be necessary.

7. Compliance Status and Other Regulatory Concerns:

- *Compliance status:* This facility was most recently inspected on November 9, 2020 by Emily Supple. PRC appeared to be in compliance with the Title V permit at the time of that inspection.

- *Compliance history:* Since the previous Title V permit renewal, PRC has been issued one Notice of Violation. On October 19, 2021, DAQ notified PRC that a required audit on the NOx/O_2 CEMS for Unit 2 had not been performed.

[3] The current version of IRS Publication 534 does not include this term. The most recent version that included the term appears in Revenue Procedure 83-35 (published May 16, 1983). In published applicability determinations, EPA has used this method after it was dropped from the IRS publication. For example, see EPA Applicability Determination Index, control number 0600027, issued February 9, 2001.

- *Application fee:* Applications for significant modification require an application fee. The appropriate fee was received electronically on October 28, 2021.

- *PE Seal*: Pursuant to 15A NCAC 02Q .0112 "Application requiring a Professional Engineering Seal," a professional engineer's seal (PE seal) is required to seal technical portions of air permit applications for new sources and modifications of existing sources as defined in Rule .0103 of this Section that involve:

(1) design;
(2) determination of applicability and appropriateness; or
(3) determination and interpretation of performance; of air pollution capture and control systems.

A PE Seal was NOT required for this application because the proposed project does not involve any of the points discussed in (1)-(3) above.

- *Zoning:* A zoning consistency determination per 02Q .0304(b) was required for this application. PRC submitted a request for zoning consistency determination to the Rowan County Planning and Development Director on October 22, 2021.

8. Facility Emissions Review

The application states that the upgrade project "is not expected to exceed the unit's existing maximum achievable hourly emission rates or its potential to emit." (application at 2) Therefore, potential emissions from this facility are not expected to change. Actual emissions are expected to change by the amounts calculated in Table 4.

This facility previously calculated the initial PSD Increment Tracking based on the facility-wide maximum potential operations, which are not expected to change. Therefore, PSD Increment Tracking will not be affected by the proposed upgrade.

As part of the application, PRC submitted air dispersion modeling for toxic air pollutants. The modeling information was examined by DAQ AQAB.[4] The result of the modeling showed that none of the acceptable ambient limits in 02D .1104 were exceeded.

9. Draft Permit Review Summary:

Initial draft: A draft of the permit and this application review were sent to RCO staff on November 16, 2021. Below is a summary of comments received.

RCO comment 1: Typos throughout the draft permit and review.

Response: The indicated issues will be corrected.

RCO comment 2: The review should have a better explanation of PSD and PSD avoidance.

Response: That section of the review has been expanded and clarified.

[4] See memo from Nancy Jones, AQAB to Russell Braswell, RCO, dated January 19, 2022.

RCO comment 3: The review should have a better explanation of why the NSPS modification analysis is necessary.

Response: That section of the review has been expanded to clarify that, although there is a projected emission decrease, there is still the potential for an hourly increase and therefore the NSPS modification analysis is necessary.

Revised draft: A revised draft of the permit and this application review were sent to MRO staff (Jennifer Manning, Emily Supple), SSCB staff (Samir Parekh), and PRC staff (Scott McMillan, Jesse English). Below is a summary of comments received:

SSCB response: No comments on the draft.

MRO response: No response received.

PRC response:

PRC comment 1: Typos throughout the draft permit and review.

Response: The indicated issues will be corrected.

PRC comment 2: Clarify "particulate" and "PM" in the new 02D .0530(u) condition and throughout the application review. Suggest using value calculated in application, or specifying "filterable+condensable."

Response: The term "filterable+condensable" will be added where appropriate.

PRC comment 3: The draft permit references the 02Q .0501(b)(2) application requirement for Unit 1 and Unit 3. The Title V application was filed on January 13, 2022. Should these references be removed?

Response: Yes. These references should be removed. A section discussing this change has been added to the application review (see Section 4).

PRC comment 4: The application review should note that "vendor data" is one of the sources of emission factors for the turbines.

Response: Agreed.

PRC comment 5: The specific condition for NSPS Subpart Dc was modified. Fuel recordkeeping was changed from monthly to daily, and references to 40 CFR 60.48c(i) were removed.

Response: This was an oversight that has been corrected.

PRC comment 6: The application review should discuss the modeling demonstration PRC submitted on October 29, 2021.

Response: This was an oversight that has been corrected.

Final draft: A final draft of the permit and this application review that addressed the comments above were sent to PRC staff on January 28, 2022. On January 31, 2022, PRC staff confirmed that there were no additional comments.

10. Public Notice, EPA Review, and Affected State(s) Review

Public notice, EPA review, and affected states review is not required for applications submitted as the first part of a two-part significant modification as allowed by 15A NCAC 02Q .0501(b)(2).

A public notice, EPA review, and affected states review period will be required when PRC submits the required second application.

11. Recommendations

This permit application has been reviewed by NC DAQ to determine compliance with all procedures and requirements. NC DAQ has determined that this facility appears to be complying with all applicable requirements.

Recommend issuance of Permit No08758T26. MRO has received a copy of this permit as described in Section 9.

Attachment 1 to Review of Plant Rowan County Application 800163.21A: Baseline Emission Calculations

The following table was created by Plant Rowan County and included in application 800163.21A as "Attachment A"

CEMS Heat input (mmBtu) and NOx (tons)			
Year	Month	NOx tons	Heat Input
2018	May	13.01	231737
2018	June	12.14	171537
2018	July	13.01	76401
2018	August	12.98	9779
2018	September	11.71	35780
2018	October	13.43	0
2018	November	13.15	65
2018	December	14.30	0
2019	January	14.27	116403
2019	February	12.63	183868
2019	March	14.26	188633
2019	April	6.36	328467
2019	May	12.97	406302
2019	June	12.17	259703
2019	July	12.84	8535
2019	August	13.03	14967
2019	September	11.17	26804
2019	October	11.90	35777
2019	November	13.27	42355
2019	December	13.66	43876
2020	January	13.57	378579
2020	February	12.60	287494
2020	March	13.34	501057
2020	April	12.18	339526
Annual Average	May 2018 – April 2020	151.97	29,816,558

Attachment 2 to Review of Plant Rowan County Application 800163.21A: Emission Factor Calculations

The following table was created by Plant Rowan County and included in application 800163.21A as "Attachment B"

Rowan County 4&5 Emission Factors

Pollutant	Emission Factor (lb/mmBtu)	Emission Factor Source/Notes:
NOx	0.0102	CEMS - 24-month annual average from May 2018 to April 2020 - (See Appendix A)
SO2	0.0006	CEMS - 24-month annual average from May 2018 to April 2020
CO	0.0180	Permit Limit for NG[11]
VOC	0.0017	Permit Limit for NG[11]
PMf	0.0019	AP-42 for NG[11]
PM10	0.0045	AP-42 (filterable) + Vendor data (condensable) for NG[11]
PM2.5	0.0045	AP-42 (filterable) + Vendor data (condensable) for NG[11]

lb/MMBtu Emission Factor Calculations

Fuel Type	Baseline data (May 2018 - April 2020)	Permit Limit (lb/mmBtu)		Vendor Data (lb/mmBtu)	AP-42 Table 3.1 (lb/mmBtu)	(lb/mmBtu)
	mmBtu	CO	VOC	PM_cond.	PM ("front half")	PM10/PM2.5
Natural Gas	29,816,558	0.018	0.0017	0.0026	0.0019	0.0045

Example Calculations:

lb/mmBtu (PM10 & PM2.5) = AP-42 lb/mmBtu gas + Vendor PM cond. lb/mmBtu gas

lb/mmBtu (PM10 & PM2.5) = 0.0019 + 0.0026 = 0.0045 lb/mmBtu

[11] The permit limit, AP-42, and vendor factors for natural gas operations were used because historical fuel usage is deemed representative of projected future fuel usage. Historical fuel oil represented less than 0.01% of fuel usage over the years 2006-2020.