

## Application Review

**Issue Date:** DRAFT

**Region:** Raleigh Regional Office  
**County:** Person  
**NC Facility ID:** 7300029  
**Inspector's Name:** Dawn Reddix  
**Date of Last Inspection:** 04/12/2022  
**Compliance Code:** 3 / Compliance - inspection

<p style="text-align: center;"><b>Facility Data</b></p> <p><b>Applicant (Facility's Name):</b> Duke Energy Progress, LLC - Roxboro Steam Electric Plant</p> <p><b>Facility Address:</b>                  Duke Energy Progress, LLC - Roxboro Steam Electric Plant                  1700 Dunnaway Road                  Semora, NC 27343</p> <p><b>SIC:</b> 4911 / Electric Services  <b>NAICS:</b> 221112 / Fossil Fuel Electric Power Generation</p> <p><b>Facility Classification:</b> Before: Title V After: Title V  <b>Fee Classification:</b> Before: Title V After: Title V</p>	<p style="text-align: center;"><b>Permit Applicability (this application only)</b></p> <p><b>SIP:</b> N/A  <b>NSPS:</b> N/A  <b>NESHAP:</b> N/A  <b>PSD:</b> N/A  <b>PSD Avoidance:</b> N/A  <b>NC Toxics:</b> N/A  <b>112(r):</b> N/A  <b>Other:</b> N/A</p>
--	---

Contact Data			Application Data
<p style="text-align: center;"><b>Facility Contact</b></p> Robert Howard Lead EHS Professional (336) 598-4077 1700 Dunnaway Road Semora, NC 27343	<p style="text-align: center;"><b>Authorized Contact</b></p> Tom Copolo General Manager III (336) 597-7307 1700 Dunnaway Road Semora, NC 27343	<p style="text-align: center;"><b>Technical Contact</b></p> Erin Wallace Manager-Permitting and Compliance (919) 546-5797 411 Fayetteville Street Raleigh, NC 27601	<p><b>Application Number:</b> 7300029.22A  <b>Date Received:</b> 08/22/2022  <b>Application Type:</b> Modification  <b>Application Schedule:</b> TV-Sign-501(b)(2) Part II</p> <p style="text-align: center;"><b>Existing Permit Data</b></p> <p><b>Existing Permit Number:</b> 01001/T57  <b>Existing Permit Issue Date:</b> 06/25/2021  <b>Existing Permit Expiration Date:</b> 09/30/2023</p>

**Total Actual emissions in TONS/YEAR:**

CY	SO2	NOX	VOC	CO	PM10	Total HAP	Largest HAP
2021	2959.43	3670.53	69.01	578.57	376.48	14.69	7.16 [Hydrogen chloride (hydrochlori)]
2020	2637.52	3601.12	66.17	554.80	346.27	14.04	6.82 [Hydrogen chloride (hydrochlori)]
2019	4141.52	4885.67	86.65	725.93	366.09	19.30	9.71 [Hydrogen chloride (hydrochlori)]
2018	3603.79	5613.55	74.50	625.78	374.69	16.77	8.47 [Hydrogen chloride (hydrochlori)]
2017	3413.61	5774.33	73.26	616.33	371.61	15.63	7.45 [Hydrogen chloride (hydrochlori)]

<p><b>Review Engineer:</b> Connie Horne</p> <p><b>Review Engineer's Signature:</b> _____ <b>Date:</b> DRAFT</p>	<p style="text-align: center;"><b>Comments / Recommendations:</b></p> <p><b>Issue</b> 01001/T58  <b>Permit Issue Date:</b> DRAFT  <b>Permit Expiration Date:</b> September 30, 2023</p>
---	---

## 1. Purpose of Application

This permit action is for Part II of a two-step process allowed under 15A NCAC 02Q .0501(b)(2). The Rule states:

*(b) With the exception in Paragraph (c) of this Rule, the owner or operator of an existing facility, new facility, or modification of an existing facility (except for minor modifications under Rule .0515), including significant modifications that would not contravene or conflict with a condition in the existing permit, subject to the requirements of this Section shall not begin construction without first obtaining:*

*(1) ..., or*

*(2) a construction and operation permit following the procedures set forth in 15A NCAC 02Q .0504 and filing a complete application within 12 months after commencing operation to modify the construction and operation permit to meet the requirements of this Section.*

The Permittee was last issued a construction and operation permit on June 25, 2021 (01001T57).

According to the Part II application received on August 22, 2022 (7300029.22A), Duke Energy Progress, LLC - Roxboro Steam Electric Plant commenced excavation in the East Ash Basin as a part of the Closure Project on August 26, 2021. Therefore, the Part II application was received within the 12-month period after commencing operation, as required. The technical review for the Part I application (7300029.21A) is attached to this document.

## 2. Facility Description

The Roxboro Plant consists of six coal- and oil-fired utility boilers (Units 1, 2, 3A, 3B, 4A, and 4B). The boilers are each equipped with electrostatic precipitators for particulate emissions control, low-NOx burners combined with selective catalytic reduction (SCR) systems for nitrogen oxides (NOx) emissions control, and wet limestone flue gas desulfurization (FGD) scrubbers for sulfur dioxide (SO<sub>2</sub>) control. Ancillary equipment and activities include fuel oil and other petroleum storage tanks, coal handling and storage, gypsum handling and storage, limestone handling and storage, and emergency engines. The Roxboro Plant is located in Person County, North Carolina approximately 7.5 miles northwest of the city of Roxboro.

## 3. Application Chronology

August 22, 2022	Part II application (.22A) for the Closure Project received and deemed complete
August 24, 2022	ePayment of \$1002 received
February 9, 2023	Draft to applicant and Raleigh Regional Office (RRO)
DRAFT	Draft to public notice and EPA
DRAFT	Public comment period expires
DRAFT	EPA Comment period expires
DRAFT	Final Permit issued

## 4. Permit Modifications/Changes

The table below outlines the proposed changes to the current permit (01001T57):\*

Page No.	Section	Description of Changes
Cover Letter	---	Modified to reflect current permit number, issue and effective dates
All	Headers	Amended permit revision number
1-66	Entire permit, where applicable	Modified to reflect current permit number, issue and effective dates

Page No.	Section	Description of Changes
8	Section 1	Removed footnote pertaining to the requirement to file a Title V Air Quality Permit Application on or before 12 months after commencing operation. This application satisfies that requirement.
52	2.2 D.1.a.iv	Corrected “Projected Actual Emissions” for PM and PM <sub>10</sub>
53	2.2 D.2.a	Removed “15A NCAC 02Q .0504: OPTION FOR OBTAINING CONSTRUCTION AND OPERATION PERMIT”. This requirement was satisfied with the application (.22A) received August 22, 2022.
56-57	Section 3	Moved Insignificant Activities list from attachment to Section 3
58-66	Section 4	Updated General Conditions to version 6.0 (01/07/2022) and moved to Section 4.

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

#### 5. Other Regulatory Requirements

- An application fee of \$1002 is required and was received by DAQ on 8/24/22.
- The appropriate number of application copies was received with the submittal of this application.
- Person County has triggered increment tracking under PSD for PM<sub>10</sub> and SO<sub>2</sub>. Any increment changes associated with this modification were addressed in the Part I permit application No. 7300029.21A.
- 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.
- The associated dates are listed in the Application Chronology section above.

#### 6. Facility Compliance Status/Compliance History:

DAQ has reviewed the compliance status of this facility with respect to its Title V Air Permit. The most recent inspection of the facility was conducted on April 12, 2022, by Ms. Dawn Reddix with the Raleigh Regional Office (RRO). According to the Inspection Report, “Duke Energy Progress-Roxboro power plant appeared to be in compliance with all requirements outlined in their air permit”.

#### 7. Conclusions, Comments and Recommendations

The issuance of Air Quality Permit No. 01001T58 to Duke Energy Progress, LLC - Roxboro Steam Electric Plant is recommended.

## Application Review

Issue Date: 06/25/2021

**Region:** Raleigh Regional Office  
**County:** Person  
**NC Facility ID:** 7300029  
**Inspector's Name:** Matthew Mahler  
**Date of Last Inspection:** 09/19/2019  
**Compliance Code:** 3 / Compliance - inspection

<p style="text-align: center;"><b>Facility Data</b></p> <p><b>Applicant (Facility's Name):</b> Duke Energy Progress, LLC - Roxboro Steam Electric Plant</p> <p><b>Facility Address:</b>                  Duke Energy Progress, LLC - Roxboro Steam Electric Plant                  1700 Dunnaway Road                  Semora, NC 27343</p> <p><b>SIC:</b> 4911 / Electric Services  <b>NAICS:</b> 221112 / Fossil Fuel Electric Power Generation</p> <p><b>Facility Classification: Before:</b> Title V <b>After:</b> Title V  <b>Fee Classification: Before:</b> Title V <b>After:</b> Title V</p>	<p style="text-align: center;"><b>Permit Applicability (this application only)</b></p> <p><b>SIP:</b> 02D .0530(u)  <b>NSPS:</b> NA  <b>NESHAP:</b> NA  <b>PSD:</b> NA  <b>PSD Avoidance:</b> NA  <b>NC Toxics:</b> 02D .1100  <b>112(r):</b> NA  <b>Other:</b> NA</p>
--	--

<b>Contact Data</b>			<b>Application Data</b>	
<b>Facility Contact</b>	<b>Authorized Contact</b>	<b>Technical Contact</b>	<p><b>Application Number:</b> 7300029.21A  <b>Date Received:</b> 01/21/2021  <b>Application Type:</b> Modification  <b>Application Schedule:</b> TV-Sign-501(b)(2) Part I</p> <p style="text-align: center;"><b>Existing Permit Data</b></p> <p><b>Existing Permit Number:</b> 01001/T56  <b>Existing Permit Issue Date:</b> 11/27/2018  <b>Existing Permit Expiration Date:</b> 09/30/2023</p>	
Robert Howard Lead EHS Professional (336) 598-4077 1700 Dunnaway Road Semora, NC 27343	Tom Copolo General Manager III (336) 597-7307 10660 Boston Road Roxboro, NC 27574	Erin Wallace Lead Environmental Specialist (919) 546-5797 410 South Wilmington Street Raleigh, NC 27601		

**Total Actual emissions in TONS/YEAR:**

CY	SO2	NOX	VOC	CO	PM10	Total HAP	Largest HAP
2019	4141.52	4885.67	86.65	725.93	366.09	19.30	9.71 [Hydrogen chloride (hydrochlori)]
2018	3603.79	5613.55	74.50	625.78	374.69	16.77	8.47 [Hydrogen chloride (hydrochlori)]
2017	3413.61	5774.33	73.26	616.33	371.61	15.63	7.45 [Hydrogen chloride (hydrochlori)]
2016	8052.62	5480.98	96.28	806.85	460.94	20.21	9.41 [Hydrogen chloride (hydrochlori)]
2015	10544.03	7120.18	104.26	883.20	528.85	27.12	11.59 [Hydrogen chloride (hydrochlori)]

<p><b>Review Engineer:</b> Ed Martin</p> <p><b>Review Engineer's Signature:</b> <i>Edward L Martin</i></p> <p style="text-align: right;"><b>Date:</b> 06/25/2021</p>	<p style="text-align: center;"><b>Comments / Recommendations:</b></p> <p><b>Issue</b> 01001/T57  <b>Permit Issue Date:</b> 06/25/2021  <b>Permit Expiration Date:</b> 09/30/2023</p>
--	--

## Chronology

January 21, 2021	Application received and considered complete on this date.
March 19, 2021	In a letter received from Mr. James Wells, Vice President EHS Programs & Environmental Sciences, Duke Energy requested that the 02D .0536 rule be removed from the permit since the rule was repealed effective November 1, 2020 and no longer applies. In addition, Duke Energy requests that, since the affected units are subject to the MATS regulation under 02D .1111, all references to a Malfunction Abatement Manual be removed from the permit since 02D .0535 no longer applies to the boilers.
March 23, 2021	Toxics memo received from Mark Yoder showing compliance with the Acceptable Ambient Levels (AALs).
March 30, 2021	The draft permit and review were sent to Erin Wallace at DEP, Matthew Mahler at the Raleigh Regional Office (RRO) and Samir Parekh with SSCB for review.
May 6, 2021	A notice of public hearing was published in the <i>Roxboro Courier-Times</i> , and on the DAQ website. The public comment period was from May 6, 2021 through June 9, 2021.
June 7, 2021	The public hearing was held virtually via WebEx at 6:00 PM.
June 24, 2021	Michael Koerschner's Hearing Officer's Report was issued and recommends that the Director issue the permit as drafted.
June 25, 2021	A memorandum from Michael A. Abraczinskas, Director, Division of Air Quality, to Mark Cuilla, Permitting Section Chief, approved the issuance of the air permit.
June 25, 2021	The permit was issued.

### **I. Purpose of Application**

Duke Energy Progress, LLC (DEP) is requesting authorization to excavate the Roxboro Plant East Ash Basin and West Ash Basin (the Ash Basins) and place the excavated coal combustion residuals (CCR) in a lined expansion of the existing Ash Landfill (the Expanded Landfill). The project will result in increased emissions of particulate matter (PM), PM less than 10 micrometers and PM less than 2.5 micrometers in diameter (PM<sub>10</sub> and PM<sub>2.5</sub>, respectively), NO<sub>x</sub>, SO<sub>2</sub>, CO, VOCs, lead, carbon dioxide as CO<sub>2e</sub>, and air toxics.

The following changes are proposed:

- Add the East Ash Basin and West Ash Basin, referred to in this application collectively as the Ash Basins, as permitted sources (emissions source ID No. EASHBASIN and WASHBASIN) to account for emissions from wind-erosion and ash handling activities during excavation of the Ash Basins.
- Move the Ash Landfill from the insignificant activities list (emissions source ID No. IS- 36) to the permitted emissions source list and increase the size from 25 to 101 acres, referred to as the Expanded Landfill in this application (emissions source ID No. LAND).
- Add generated ash handling, excavated ash handling, and gypsum handling emissions sources at the Expanded Landfill (included in emissions source ID No. LAND).
- Move the haul roads from the insignificant activities (part of emissions source ID No. IS-36) list to the permitted emissions source list to reflect the additional haul roads in the Ash Basins and Expanded Landfill (emissions source ID No. ES-Haul Roads).

- Move the Coal Storage Pile from the insignificant activities list (part of emissions source ID No. IS-36) to the permitted emissions source list (emissions source ID No. COALPILE) to reflect the revised wind-erosion emissions calculation methodology.
- Delete emissions source ID No. IS-29 (vacuum cleaner outside near the dry fly ash silos) from the insignificant activities list because IS-29 is a duplicate of emissions source ID No. ES-SVS1 (stationary vacuum system for housekeeping).
- Delete emissions source ID No. IS-36 (fugitive emissions from coal handling/storage, plant parking lots, paved roads, unpaved roads, coal pile and ash handling) from the insignificant activities list because the emissions sources previously covered by IS-36 will now be covered by permitted sources.
- Add FGD filter cake handling as an insignificant activity (emissions source ID No. ISFGDC).
- Add the existing limestone storage pile as an insignificant activity (emissions source ID No. IS-LSSP).
- Add a 300-kilowatt (kW), diesel-fired emergency generator for emergency power at the Expanded Landfill to the insignificant activities list (emissions source ID No. IS-LANDEGEN).

Historically, ash generated from coal combustion was sluiced and sent to the Ash Basins along with various other waste streams; however, modifications were completed to convert from wet to dry ash handling and ash is currently collected and deposited in the Ash Landfill. The Roxboro Plant ceased all waste flows to the Ash Basins in 2019.

In order to comply with the North Carolina Coal Ash Management Act of 2014, as amended (CAMA), the Federal Disposal of Coal Combustion Residuals from Electric Utilities rule (CCR Rule) and the North Carolina Department of Environmental Quality (NC DEQ) April 1, 2019 Closure Determination mandating closure of the Ash Basins via excavation, DEP plans to dewater and excavate material from the existing Ash Basins. DEP will deposit excavated ash, along with generated ash, off-specification gypsum, and FGD filter cake in the Ash Landfill. As part of the project, DEP will expand the Ash Landfill in order to deposit all the excavated material. For the purposes of this application, the post-project expanded Ash Landfill is referred to as the Expanded Landfill. Project emissions and associated emissions calculations are described in Section 3.0 of this application.

Expansion of the Ash Landfill is currently scheduled to begin in the fourth quarter of 2021 with land clearing activities for office trailers and equipment laydown. Excavation of the Ash Basins is scheduled to begin in the first quarter of 2023. Excavation of ash from the Ash Basins will continue through 2035. Once the Ash Basins are closed, the Expanded Landfill will be finished by grading, seeding, and stabilizing. The site arrangement is shown in Figure 1 below.

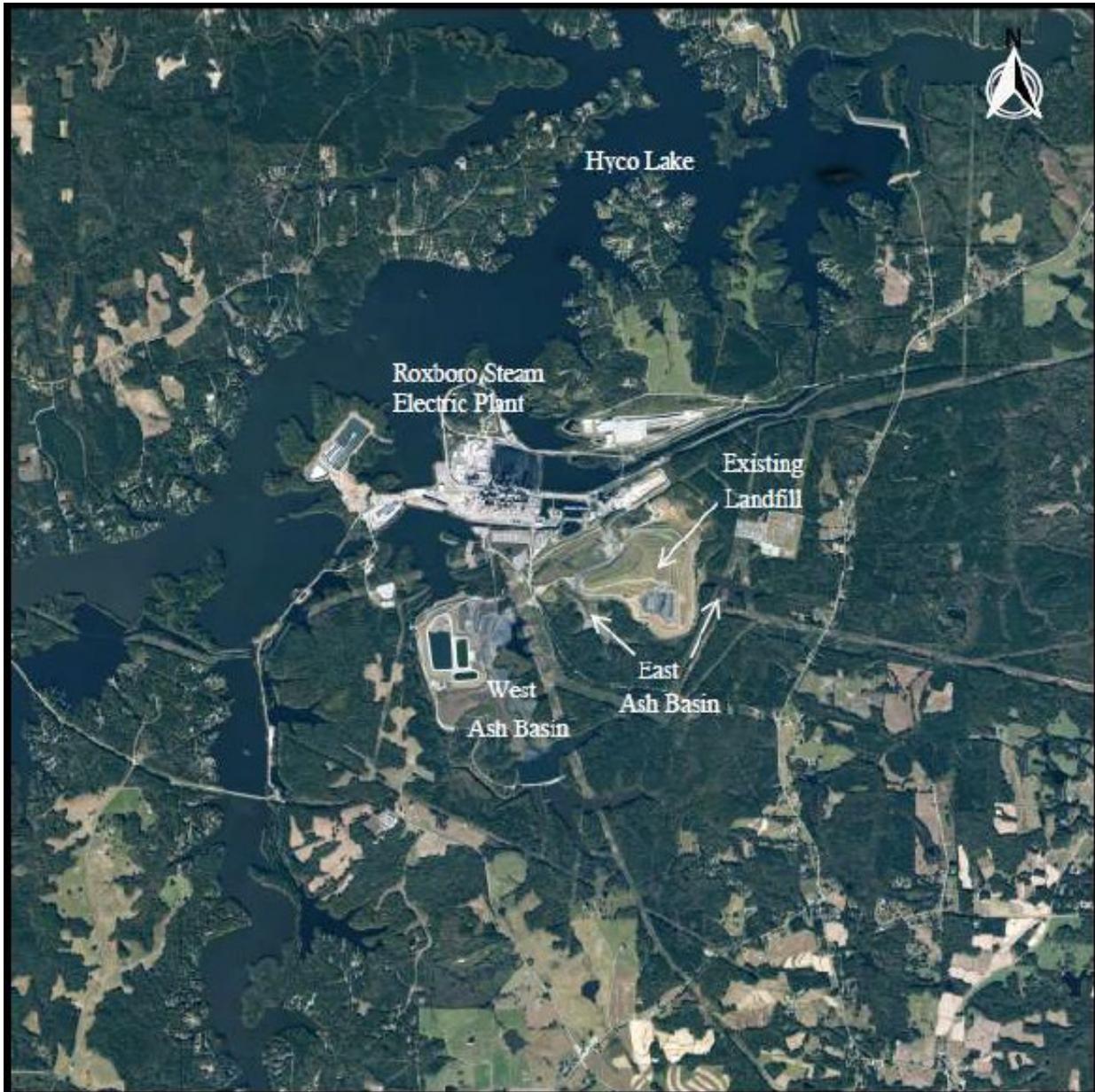


Figure 1 – Roxboro Site Arrangement

This is the first step of a significant permit modification pursuant to rule 15A NCAC 02Q .0501(b)(2). Public notice of the draft permit for Title V purposes is not required at this time. The Permittee must file a Title V Air Quality Permit Application pursuant to 15A NCAC 02Q .0504 for these changes within 12 months after the first excavation of ash from the Ash Basins, or the first placement of generated ash or off-specification gypsum in the Expanded Landfill (whichever occurs first), in accordance with General Condition NN.1 of the permit, at which time the changes will go through the second step of the 15A NCAC 02Q .0501(b)(2) Title V permitting process. The permit shield described in General Condition R does not apply to these changes. The only public notice at this time is a notice of public hearing pursuant to the construction and operating permit under rule 15A NCAC 02Q .0300 and the CAMA.

## II. DEQ Coal Combustion Residuals Surface Impoundment Closure Determination

The following is taken from the Executive Summary of the Roxboro Steam Station “DEQ Coal Combustion Residuals Surface Impoundment Closure Determination” of April 1, 2019.

*The Coal Ash Management Act (CAMA) establishes criteria for the closure of coal combustion residuals (CCR) surface impoundments. Pursuant to N.C. Gen. Stat. § 130A-309.213(d)(1), the CCR surface impoundments located at Duke Energy’s Roxboro Steam Station (Roxboro) in Person County, NC received a low-risk classification. Therefore, according to N.C. Gen. Stat. § 130A-309.214(a)(3), the closure option for CCR surface impoundments is at the election of the North Carolina Department of Environmental Quality (DEQ or Department). CAMA provides three principal closure pathways: (a) closure in a manner allowed for a high-risk site, such as excavation and disposal in a lined landfill [CAMA Option A]; (b) closure with a cap-in-place system similar to the requirements for a municipal solid waste landfill [CAMA Option B]; or (c) closure in accordance with the federal CCR rule adopted by EPA [CAMA Option C].*

*In preparing to make its election, DEQ requested information from Duke Energy related to closure options. By November 15, 2018, Duke Energy provided the following options for consideration: closure in place, full excavation, and a hybrid option that included some excavation with an engineered cap on a smaller footprint of the existing impoundments. DEQ held a public information session on January 24, 2019 in Roxboro, NC where the community had the opportunity to learn about options for closing CCR surface impoundments and to express their views about proposed criteria to guide DEQ’s coal ash closure decision making process. To evaluate the closure options, the Department considered environmental data gathered as part of the site investigation, permit requirements, ambient monitoring, groundwater modeling provided by Duke Energy and other data relevant to the CAMA requirements.*

***DEQ elects the provisions of CAMA Option A that require movement of coal ash to an existing or new CCR, industrial or municipal solid waste landfill located on-site or off-site for closure of the CCR surface impoundments at Roxboro in accord with N.C. Gen. Stat. § 130A-309-214(a)(3). In addition, DEQ is open to considering beneficiation projects where coal ash is used as an ingredient in an industrial process to make a product as an approvable closure option under CAMA Option A.***

*DEQ elects CAMA Option A because removing the coal ash from unlined impoundments at Roxboro is more protective than leaving the material in place. DEQ determines that CAMA Option A is the most appropriate closure method because removing the primary source of groundwater contamination will reduce uncertainty and allow for flexibility in the deployment of future remedial measures.*

*Duke Energy will be required to submit a final Closure Plan for the CCR surface impoundments at Roxboro by August 1, 2019. The Closure Plan must conform to this election by DEQ.*

### III. Permit Changes

The following changes were made to the Duke Energy Progress, LLC - Roxboro Plant Air Permit No. 01001T56:

Page	Section	Description of Change(s)
Cover	--	Amended permit numbers and dates.
--	Insignificant Activities list	Deleted IS-29 and IS-36. Added ISFGDC, IS-LSSP and IS-LANDEGEN.
8-9	1, table of permitted emission sources	Added LAND, EASHBASIN, WASHBASIN, ES-Haul Roads and COALPILE.  Added footnote f and g.
10-11	2.1.A, table of applicable regulations	Removed 02D .0536 for particulate matter and visible emissions and removed 02D .0535.
13	2.1.A.4	Removed and reserved.
13	2.1.A.5	Removed and reserved.
13	2.1.A.6	Removed and reserved.
14	2.1.A.7.a	Removed footnote ***. The %EE and %MD in this footnote when the operating hours are less than 2200 hours during the quarter are addressed when DAQ reviews the quarterly EERs on a case-by-case basis.
46-52	2.2.A.1.a	Revised toxic emission limits.
52	2.2.A.1.b	Added condition for the approved AQAB review memo.
63-64	2.2.D.1	Added 15A NCAC 02D .0530(u) condition.
64	2.2.D.2	Added 02Q .0504 condition for obtaining the Part II permit.
68-77	3	Updated General Conditions to version 5.5, 08/25/2020.

### IV. Facility Description

The Roxboro Plant consists of six coal- and oil-fired utility boilers (Units 1, 2, 3A, 3B, 4A, and 4B). The boilers are each equipped with electrostatic precipitators for particulate emissions control, low-NOx burners combined with selective catalytic reduction (SCR) systems for nitrogen oxides (NOx) emissions control, and wet limestone flue gas desulfurization (FGD) scrubbers for sulfur dioxide (SO<sub>2</sub>) control. Ancillary equipment and activities include fuel oil and other petroleum storage tanks, coal handling and storage, gypsum handling and storage, limestone handling and storage, and emergency engines. The Roxboro Plant is located in Person County, North Carolina approximately 7.5 miles northwest of the city of Roxboro.

### V. Emissions

Emissions increases were calculated for purposes of evaluating whether the modifications trigger Prevention of Significant Deterioration (PSD) and to determine whether air toxics modeling is required. Detailed emission calculations are presented in Appendix B and Appendix D of the application.

#### Haul Roads

PM emissions, including PM10 and PM2.5, will increase as a result of the project because excavated ash will be hauled from the Ash Basins to the Expanded Landfill. DEP calculated emissions from the following haul road activities:

- Hauling generated ash and off-specification gypsum to the existing Ash Landfill
- Hauling generated ash, off-specification gypsum, and FGD filter cake to the Expanded Landfill
- Hauling excavated ash from the Ash Basins to the Expanded Landfill

Emissions from haul roads were calculated using Section 13.2.2 for unpaved roads of the U.S. Environmental Protection Agency's (U.S. EPA's) Compilation of Air Pollutant Emissions Factors (AP-42). DEP used the average silt content of plant roads at a coal mining site, the fleet average vehicle weight, and the haul road distances presented in Figures B-1 and B-2 of Appendix B of the application to calculate emissions.

For purposes of evaluating whether the project emissions increase triggers PSD review, DEP determined baseline actual emissions (BAE) for existing haul roads used to transport generated ash and off-specification gypsum to the Ash Landfill. DEP determined projected actual emissions (PAE) from haul roads used to transport generated ash, off-specification gypsum, and FGD filter cake to the Expanded Landfill. Pre- and post-project vehicle miles traveled for hauling generated ash and off-specification gypsum were calculated using the existing and post-project haul road distances, the average mass of generated ash and off-specification gypsum deposited in the Ash Landfill in 2018 and 2019, the average fleet capacity of the transport trucks, and 260 operating days per year. DEP began placing FGD filter cake in the Ash Landfill in mid-2020; therefore, no BAE were calculated for hauling FGD filter cake. PAE from hauling FGD filter cake were calculated using the post-project haul road distances, the average mass of FGD filter cake expected to be placed in the Expanded Landfill annually, the average fleet capacity of the transport trucks, and 260 operating days per year.

DEP calculated the potential to emit (PTE) from new haul roads used to transport excavated ash from the Ash Basins to the Expanded Landfill based on post-project vehicle miles calculated using the maximum potential tonnage of excavated ash deposited in the Expanded Landfill on an annual basis, the average fleet capacity of the transport trucks, and 260 operating days per year.

For all haul roads, emissions were calculated for the "round-trip" accounting for both the unloaded and loaded portion of the haul route.

#### Material Handling

DEP calculated emissions of PM, PM10, PM2.5, lead, and air toxics from material handling operations associated with the proposed project. These material handling operations include the following:

- Unloading of generated ash and off-specification gypsum at the Ash Landfill
- Unloading of generated ash, off-specification gypsum, and FGD filter cake at the Expanded Landfill
- Excavation, handling, and loading of ash from the Ash Basins
- Unloading of excavated ash at the Expanded Landfill

Emissions from material handling were calculated using Section 13.2.4 for aggregate handling and storage piles from the U.S. EPA's AP-42. DEP used the average windspeed from 2014 to 2018 recorded at the Danville Meteorological Station and a conservative moisture content of 10% to calculate an emissions factor in pounds per ton of material handled. Emissions of HAP and toxic air pollutants (TAP) were calculated using elemental analysis for the ash and gypsum. FGD filter cake was assumed to have the same concentration profile as gypsum.

For evaluating PSD applicability, PAE were set equal to BAE for handling generated ash and off-specification gypsum. Generated ash and off-specification gypsum handling rates were calculated using the average tonnage of generated ash and off-specification gypsum deposited in the existing Ash Landfill in 2018 and 2019. DEP began placing FGD filter cake in the Ash Landfill in mid-2020; therefore, no BAE were calculated for handling FGD filter cake. PAE from handling FGD filter cake were calculated using the average mass of material expected to be placed in the Expanded Landfill annually. DEP calculated the PTE from handling excavated ash. Excavated ash handling rates were based on the maximum potential tonnage of excavated ash deposited in the Expanded Landfill annually.

For TAPs, DEP calculated the PTE from all the handling sources using the maximum generation rates of ash, off-specification gypsum, and FGD filter cake, and the maximum potential tonnage of excavated ash.

#### Wind Erosion

For evaluating PSD applicability and to determine whether TAP modeling is required, DEP calculated emissions of PM, PM10, PM2.5, and air toxics as a result of wind erosion at the Ash Landfill/Expanded Landfill and the Ash Basins.

To evaluate PSD applicability, DEP calculated BAE from wind erosion at the existing Ash Landfill and PTE for the Expanded Landfill and the Ash Basins. Emissions were calculated using the methodology presented in the document titled "Air/Superfund National Technical Guidance Study Series – Volume III – Estimate of Air Emissions from Cleanup Activities at Superfund Sites – Interim Final," by U.S. EPA Office of Air Quality Planning and Standards (EPA-450/1-89-003). The methodology is also presented in the Western Regional Air Partnership (WRAP) Fugitive Dust Handbook dated September 7, 2006. Speciation of PM emissions to PM10 and PM2.5 was performed using size fractions from U.S. EPA's AP-42 emissions factors for industrial wind erosion. HAP and TAP emissions were calculated based on elemental analyses of the ash because ash comprises the majority of material in the Ash Landfill/Expanded Landfill and Ash Basins.

#### Expanded Landfill Emergency Generator

For evaluating PSD applicability and to calculate emissions rates for air toxics modeling, the PTE of the new Expanded Landfill Emergency Generator was calculated using a combination of applicable emissions limits from the Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (40 CFR Part 60, Subpart IIII) and U.S. EPA's AP-42 emissions factors for diesel-fired engines. Annual emissions were based on 500 hours per year of operation.

## **VI. Regulatory Evaluation**

#### PSD Applicability

The Roxboro Steam Electric Plant is an existing Prevention of Significant Deterioration (PSD) "major stationary source" of criteria air pollutants as defined under PSD, per 40 CFR 51.166(b)(1)(i)(a), and is classified as one of the 28 named source categories under the category of "fossil fuel-fired steam electric plants of more than 250 million Btu per hour heat input," which emits or has a potential to emit (PTE) 100 tons per year of any regulated pollutant.

Because the existing facility is a major stationary source, any physical change or a change in the method of operation as calculated pursuant to 40 CFR 51.166(a)(7)(iv) which results in a *net emissions increase* for regulated pollutants in the amounts equal or greater than the significance levels, is subject to PSD review and must meet certain review requirements. Thus, the net emission increase as a result of this modification must be compared to the "significance levels" as listed in 40 CFR 51.166(b)(23)(i) to determine which pollutants must undergo PSD review.

The Permittee has performed a PSD applicability analysis for the project to determine whether the project results in an emission increase of any regulated NSR pollutant above the applicable significance thresholds listed in 40 CFR 51.166(b)(23)(i). The PSD applicability analysis evaluated all PSD-regulated air pollutants to be emitted, including PM (filterable), PM<sub>10</sub>, PM<sub>2.5</sub>, NO<sub>x</sub>, SO<sub>2</sub>, CO, VOCs, lead, and carbon dioxide as CO<sub>2e</sub>. The following describes the methodology used to determine the increases for the project for the existing and new sources (see Table 1 below). As shown in Table 3, the calculations demonstrate that the PSD requirements are not triggered because project increases are below the PSD significant emissions rates.

Since the project involves both existing and new emission sources, the "hybrid test for projects that involve multiple types of emissions units" is used in accordance with 40 CFR 51.166(a)(7)(iv)(f). A significant emissions increase of a regulated NSR pollutant is projected to occur if the sum of the emissions increases for each source, using the "actual-to-projected actual applicability test" for the existing sources in accordance with 40 CFR 51.166(a)(7)(iv)(c) and the "actual-to-potential test" for the new sources in

accordance with 40 CFR 51.166(a)(7)(iv)(d), equals or exceeds the significant amount for that pollutant as defined in paragraph 40 CFR 51.166(b)(23) as follows:

A. PSD Applicability Test for Existing Sources

DEP has elected to use the “actual-to-projected actual applicability test” to compare the difference between the *projected actual emissions* (post project), and the *baseline actual emissions* (pre project) in accordance with 40 CFR 51.166(a)(7)(iv)(c) for the existing sources.

For existing emissions sources (i.e., handling and hauling of generated ash and gypsum and wind erosion from the existing Ash Landfill) emissions increases were calculated by comparing BAE to PAE following the project.

BAE for Existing Sources

In accordance with 15A NCAC 02D .0530(b)(1)(A), *baseline actual emissions* for an existing emissions source are calculated as the average rate, in tons per year, at which the emissions source 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. However, the Director shall allow a different time period, not to exceed 10 years immediately preceding the date on which a complete permit application is received by the Division, if the owner or operator demonstrates that it is more representative of normal source operation. A different consecutive 24-month period for each regulated NSR pollutant may be used for each regulated NSR pollutant. *Baseline actual emissions* represent the highest historical 24-month average annual emissions in tons per year for each pollutant. For this project, the baseline period is 2018-2019. Table 1 below shows the baseline actual emissions for the existing sources.

PAE for Existing Sources

In accordance with 40 CFR 51.166(b)(40)(i), *projected actual emissions* means the maximum annual rate, in tons per year, at which an existing emissions unit is projected to emit a regulated NSR 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, and full utilization of the unit would result in a significant emissions increase, or a significant net emissions increase at the major stationary source.

To determine the maximum annual rate, a source must consider all relevant information, including historical operational data, the company's expected business activity, and the company's highest projections of business activity for the five-year period after implementation of the project. PAE were set equal to BAE for handling generated ash and off-specification gypsum because the operating rate, and thus the material generation rates, are not being modified and will not be impacted by the project. PAE for hauling generated ash, off-specification gypsum, and FGD filter cake were calculated using the post-project haul road distances. PAE from handling FGD filter cake were calculated using the average mass of material expected to be placed in the Expanded Landfill annually. DEP has calculated the PAE for the existing sources as shown in Table 2 below.

B. PSD Applicability Test for New Sources

Emissions for new sources are calculated under the “actual-to-potential test” as the difference between the potential to emit (post-project) as defined by 40 CFR 51.166(b)(4), and the baseline actual emissions (pre-project) as defined by 40 CFR 51.166(b)(47)(iii). Potential to emit means the maximum capacity to emit under its physical and operational design. For a new emissions sources, BAE are zero.

PTE for New Sources

To evaluate emissions for the proposed Project, DEP calculated the PTE for excavating ash from the Ash Basins, hauling the ash to the Expanded Landfill, and depositing the excavated ash in the

Expanded Landfill using the maximum tonnage of ash projected to be excavated and transported in a year. PTE from wind erosion at the Expanded Landfill and Ash Basins was calculated based on the maximum active and inactive areas of operation. PTE for the Expanded Landfill Emergency Generator was calculated using an annual operation of 500 hours per year. DEP has calculated the PTE for the new sources as shown in Table 2 below.

**Table 1 – Source-by-Source BAE Emission Rates for Existing (tpy)**

	PM	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	VOC	CO <sub>2e</sub>	Lead
Source	BAE for existing sources (2018-2019)								
Existing Ash Haul Roads – Loaded	0.13	3.37E-02	3.38E-03	--	--	--	--	--	--
Existing Gypsum Haul Roads – Loaded	0.31	8.01E-02	8.02E-03	--	--	--	--	--	--
Unloading of Generated Ash at the Ash Landfill (Truck to Pile)	1.13E-02	1.13E-02	1.13E-02	--	--	--	--	--	1.02E-06
Unloading of Off-Specification Gypsum at the Ash Landfill (Truck to Pile)	6.28E-02	6.28E-02	6.28E-02	--	--	--	--	--	1.26E-07
Wind Erosion at the Ash Landfill	3.92	1.96	0.29	--	--	--	--	--	9.27E-04
Existing Ash Haul Roads – Unloaded	8.66E-02	2.23E-02	2.24E-04	--	--	--	--	--	--
Existing Gypsum Haul Roads – Unloaded	2.06E-01	5.31E-02	5.32E-03	--	--	--	--	--	--
Total BAE	4.73	2.23	0.381	--	--	--	--	--	9.28E-04

**Table 2 – Source-by-Source PAE and PTE Emission Rates for Existing and New Sources (tpy)**

	PM	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	VOC	CO <sub>2e</sub>	Lead
<b>POST PROJECT EMISSIONS (PAE and PTE)</b>									
<b>PAE for existing sources</b>									
FGD Filter Media Haul Roads - Loaded	1.56E-01	4.01E-02	4.03E-03	--	--	--	--	--	--
Ash Generation to Expanded Ash Landfill Haul Roads – Loaded	1.49E-01	3.85E-02	3.86E-03	--	--	--	--	--	--
Post Gypsum Haul Roads - Loaded	4.14E-01	1.07E-01	1.07E-02	--	--	--	--	--	--
Transfer and Unloading of FGD Filter Media at the Expanded Landfill (Truck to Pile)	3.01E-03	3.01E-03	3.01E-03	--	--	--	--	--	6.01E-09
Unloading of Generated Ash at the Expanded Landfill (Truck to Pile)	1.13E-02	1.13E-02	1.13E-02	--	--	--	--	--	1.02E-06
Unloading of Off-Specification Gypsum at the Expanded Landfill (Truck to Pile)	6.28E-02	6.28E-02	6.28E-02	--	--	--	--	--	1.26E-07
FGD Filter Media Haul Roads – Unloaded	1.03E-01	2.66E-02	2.67E-03	--	--	--	--	--	--
Ash Generation to Expanded Landfill Haul Roads – Unloaded	9.90E-02	2.55E-02	2.56E-03	--	--	--	--	--	--
Existing Gyp Haul Roads – Unloaded	2.74E-01	7.08E-02	7.10E-03	--	--	--	--	--	--
Total PAE	1.27E+00	3.85E-01	1.08E-01	--	--	--	--	--	1.15E-06
<b>PTE for new sources</b>									
Excavation of East Ash Basin	0.38	0.38	0.38	--	--	--	--	--	3.44E-05
Excavation of West Ash Basin	1.28	1.28	1.28	--	--	--	--	--	1.15E-04
New Haul Roads – Loaded	4.40	1.13	0.11	--	--	--	--	--	--
Unloading of Dewatered Ash at the Expanded Landfill (Truck to Pile)	0.41	0.41	0.41	--	--	--	--	--	3.73E-05
Wind Erosion at the Expanded Ash Landfill	4.81	2.41	0.36	--	--	--	--	--	1.54E-03
Expanded Landfill Emergency Generator	3.31E-02	3.31E-02	3.31E-02	1.09E-03	0.66	0.58	0.25	115	6.34E-06
new Haul Roads – Unloaded	3.04	0.78	7.85E-02	--	--	--	--	--	--
Wind Erosion at the East Ash Basin	4.32	2.16	0.32	--	--	--	--	--	1.02E-03
Wind Erosion at the West Ash Basin	5.77	2.89	0.43	--	--	--	--	--	2.20E-03
Total PTE	24.44	11.47	3.40	1.09E-03	0.66	0.58	0.25	115	5.13E-03

Table 3 shows a summary of the net emissions increases for the project based on the BAE, PAE and PTE emissions shown in Tables 1 and 2 above. The change in emissions resulting from the proposed project was calculated by subtracting the BAE from the total post project emissions (PAE emissions for existing sources and PTE emissions for new sources). DEP has demonstrated that the total project emission increases are less than the *significant emissions increase* (as defined by 40 CFR 40 51.166(b)(23)) and therefore a PSD review is not required for this project.

**Table 3 – PSD Applicability Analysis Summary (tpy)**

	PM	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	VOC	CO <sub>2e</sub>	Lead	
Baseline Actual Emissions (BAE)	4.73	2.23	0.381	--	--	--	--	--	9.28E-04	
Post Project Emissions	PAE for existing sources	1.27	0.385	0.11	--	--	--	--	1.15E-06	
	PTE for new sources	24.44	11.47	3.40	1.09E-03	0.66	0.58	0.25	115	5.13E-03
	Total Post Project	25.71	11.85	3.51	1.09E-03	0.66	0.58	0.25	115	5.13E-03
Project emissions increase (PAE + PTE - BAE)	20.98	9.62	3.12	1.09E-03	0.66	0.58	0.25	115	4.20E-03	
PSD Significant Emissions Rate	25	15	10	40	40	100	40	75,000	0.6	
Is pollutant subject to PSD review?	No	No	No	No	No	No	No	NA	No	

15A NCAC 02D .0530(u) Condition

DEP has elected to use *projected actual emissions* to determine applicability with PSD requirements. Under the 15A NCAC 02D .0530(u) rule, if the *projected actual emissions*, calculated pursuant to 40 CFR 51.166(b)(40)(ii)(a) and (b), minus baseline actual emissions, is 50 percent or greater of the amount that is a significant emissions increase, without reference to the amount that is a significant net emissions increase, for the regulated NSR pollutant, then a permit condition is required for monitoring, recordkeeping and reporting of the annual emissions related to the project in tons per year, for 10 years following resumption of regular operations after the change if the project involves increasing the emissions unit's design capacity or its potential to emit for the regulated NSR pollutant; otherwise, these records shall be maintained for five years following resumption of regular operations after the change.

All relevant information, including historical operational data, the company's expected business activity, and the company's highest projections of business activity for the five-year period after implementation of the project, along with fugitive emissions, have been considered by DEP. As stated previously, PAE were set equal to BAE for handling generated ash and off-specification gypsum because the operating rate, and thus the material generation rates, are not being modified and will not be impacted by the project. All fugitive emissions have been included. Therefore, PAE has been calculated pursuant to 51.166(b)(40)(ii)(a) and (b).

Since, this project does not involve increasing the ash and gypsum generation (design capacity) from the boilers, monitoring is required for five years. DEP's use of PAE in determining applicability with PSD requirements means that the total post project emissions (PAE for existing sources and PTE for new sources) are subject to the above reporting requirement. Since the PAE minus BAE for PM and PM<sub>10</sub> is 50 percent or greater of the amount that is a significant emissions increase, these pollutants are required to be included in the 02D .0530(u) condition. Accordingly, the following condition is being placed in the permit.

15A NCAC 02D .0530(u): USE OF PROJECTED ACTUAL EMISSIONS TO AVOID APPLICABILITY OF PREVENTION OF SIGNIFICANT DETERIORATION REQUIREMENTS

Monitoring/Recordkeeping/Reporting

The Permittee has used projected actual emissions to avoid applicability of prevention of significant deterioration requirements, pursuant to Application 7300029.21A, for the ash basin closure project shown below. The Permittee shall perform the following:

- i. The Permittee shall maintain records of annual emissions in tons per year, on a calendar year basis related to the ash basin closure project, for five years following first placement of ash in the Expanded Landfill after the change is made.

- ii. The Permittee shall submit a report to the director within 60 days after the end of each calendar year during which these records must be generated. The report shall contain the items listed in 40 CFR 51.166(r)(6)(v)(a) through (c).
- iii. The Permittee shall make the information documented and maintained under this condition available to the Director or the general public pursuant to the requirements in 40 CFR 70.4(b)(3)(viii).
- iv. The reported actual emissions (post-construction emissions) for each of the five calendar years will be compared to the projected actual emissions (pre-construction projection) as included below:

<b>Regulated NSR Pollutant</b>	<b>Projected Actual Emissions* (tons per year)</b>
PM	20.98
PM <sub>10</sub>	9.62

\* The projected actual emissions are not enforceable limitations. If the reported actual emissions exceed the projected actual emissions, the Permittee shall include in its annual report an explanation as to why actual emissions exceeded the projected actual emissions. These projected actual emissions include total post project emissions (projected actual emissions for existing sources and potential to emit emissions for new sources) as used in the application.

Repeal of 02D .0536 “Particulate Emissions from Electric Utility Boilers”

In a letter received March 19, 2021, from Mr. James Wells, Vice President EHS Programs & Environmental Sciences, Duke Energy requested that the annual average opacity, particulate matter limits, and the requirement to implement a Malfunction Abatement Plan (Malfunction Abatement Manual) as detailed in 02D .0536 be removed from the permit for the boilers (Units 1, 2 and 3) since the rule was repealed effective November 1, 2020 and no longer applies. In addition, since the affected units are subject to the MATS regulation under 02D .1111, the provisions of 02D .0535 no longer apply to the boilers and Duke Energy requests that all references to a Malfunction Abatement Plan be removed from the permit. DAQ agrees that 02D .0536 and 02D .0535 no longer apply and are being removed from the permit.

**VII. Facility-wide Toxics Demonstration**

State-Only Requirement

15A NCAC 02D .1100 CONTROL OF TOXIC AIR POLLUTANTS

As a result of this modification to excavate the East Ash Basin and West Ash Basin and place the excavated ash in the Expanded Landfill), which results in an increase in emissions in several toxic air pollutants, a facility-wide toxics modeling demonstration is triggered.

In accordance with 15A NCAC 02Q .0709(a), the owner or operator of a source who is applying for a permit or permit modification to emit toxic air pollutants shall:

- i. demonstrate to the satisfaction of the Director through dispersion modeling that the emissions of toxic air pollutants from the facility will not cause any acceptable ambient level listed in 15A NCAC 02D .1104 to be exceeded beyond the premises (adjacent property boundary); or
- ii. demonstrate to the satisfaction of the Commission or its delegate that the ambient concentration beyond the premises (adjacent property boundary) for the subject toxic air pollutant shall not adversely affect human health (e.g., a risk assessment specific to the facility) though the concentration is higher than the acceptable ambient level in 15A NCAC 02D .1104.

As required by NCAC 02Q .0706(b), the owner or operator of the facility shall submit a permit application to comply with 15A NCAC 02D .1100 if the modification results in:

- i. a net increase in emissions or ambient concentration of any toxic air pollutant that the facility was emitting before the modification; or
- ii. emissions of any toxic air pollutant that the facility was not emitting before the modification if such emissions exceed the levels contained in 15A NCAC 02Q .0711.

As required by NCAC 02Q .0706(c), the permit application shall include an evaluation for all toxic air pollutants (TAPs) covered under 15A NCAC 02D .1104 for which there is:

- i. a net increase in emissions of any toxic air pollutant that the facility was emitting before the modification; and
- ii. emission of any toxic air pollutant that the facility was not emitting before the modification if such emissions exceed the levels contained in 15A NCAC 02Q .0711.

All sources at the facility, excluding sources exempt from evaluation in 15A NCAC 02Q .0702, emitting these toxic air pollutants shall be included in the evaluation.

Note, source WWTBR does not emit a compound affected by this project and therefore it was not modeled. The WWTBR toxic emission rate for H<sub>2</sub>S had previously been modeled and that emission rate has been included in the emission rate condition.

DEP performed a facility-wide air toxics analysis, for all permitted existing sources, including the Maximum Achievable Control Technology (MACT) sources. Air toxics emissions for the sources in this permit subject to a Part 63 MACT are exempt from air permitting, pursuant to 02Q .0702(a)(27)(B) and the Permittee is not required to model exempt MACT sources. Nevertheless, the Permittee has volunteered to include emissions for all such exempt sources in the modeling analysis.

The proposed project will result in an increase in the maximum daily and annual emissions rates of several TAPs. In addition, certain TAP emissions from the facility exceed the 15A NCAC 02Q .0711 Toxic Pollutant Emission Rates (TPERs) requiring a permit. Therefore, a facility-wide air toxics analysis was performed for these TAPs and the TPER analysis indicates the following:

- Arsenic and Inorganic Arsenic Compounds– Annual (Carcinogens) TPER exceeded
- Beryllium (7440-41-7) – Annual (Carcinogens) TPER exceeded
- Cadmium (7440-43-9) – Annual (Carcinogens) TPER exceeded
- Soluble Chromate Compounds, as Chromium (VI) Equivalents – Daily (Chronic Toxicants) TPER exceeded
- Manganese and Compounds – Daily (Chronic Toxicants) TPER exceeded
- Mercury – Daily (Chronic Toxicants) TPER exceeded
- Nickel (7440-02-0) – Daily (Chronic Toxicants) TPER exceeded

#### Toxics Modeling Analysis

The first step in the toxics analysis, as stated above, is to determine if the modification results in a net increase in emissions or ambient concentration of any toxic air pollutant that the facility was emitting before the modification, or if the modification results in emissions of any toxic air pollutant that the facility was not emitting before the modification if such emissions exceed the levels contained in 15A NCAC 02Q .0711. Table 4 shows the potential emissions for the short-term and annual pollutants for the TAPs for which the modification results in a net increase in emissions that the facility was emitting before the modification. There are no new TAPs being emitted for which the facility was not emitting before the modification.

#### TEPR Analysis

Once it was determined which TAP emissions were being increased due to the modification, the next step of the modeling analysis is to perform a TPER analysis using total facility-wide potential emissions from the proposed modification (Table 4) to determine if the TPERs in rule 02Q .0711 are exceeded for each TAP emission being increased.

**Table 4  
Toxic Pollutant Emission Rate (TPER) Analysis**

Compound	Facility-wide Potential Emission Rates			TPER			TPER Exceeded?		
	lb/hr	lb/day	lb/yr	lb/hr	lb/day	lb/yr	lb/hr	lb/day	lb/yr
Arsenic			323			0.053			yes
Beryllium			13.1			0.28			yes
Cadmium			26.7			0.37			yes
Chromium VI		0.29			0.013			yes	
Manganese		23.0			0.630			yes	
Mercury		0.64			0.013			yes	
Nickel		4.55			0.13			yes	

Air Toxics AAL Analysis

After the toxics exceeding their TPERs were identified (Table 4), a facility-wide air dispersion modeling analysis was completed using potential emissions to determine the resulting modeled ambient concentrations for comparison to the Acceptable Ambient Levels (AALs) in 15A NCAC 02D .1104.

To maximize operational flexibility and to possibly reduce the need for future TAP modeling analyses for these sources at the facility, DEP requested permit limits based on “optimized” emission rates. That is, based on the resulting concentrations from the potential model run, the potential emission rates for each source were increased to optimized rates which result in ambient concentrations that are a greater percent (approximately 98%) of the AALs than for the baseline (potential) model run while still staying below 100% the AALs. Results of the baseline and optimized modeling analyses are shown in Table 5 and Table 6 respectively, with the resulting impacts and associated averaging period as a percent of the applicable AAL for each toxic.

**Table 5  
Results of Baseline Modeled Toxics Impacts**

Pollutant	Year	Averaging Period	Maximum Impact ( $\mu\text{g}/\text{m}^3$ )	AAL ( $\mu\text{g}/\text{m}^3$ )	Percent of AAL (%)
Arsenic	2017	Annual	3.87E-04	2.1E-03	18.44
Beryllium	2017	Annual	7.31E-05	4.1E-03	1.78
Cadmium	2017	Annual	1.60E-05	5.5E-03	0.29
Chromium VI	2015	24-hour	1.37E-03	0.62	0.22
Manganese	2017	24-hour	3.60E-02	31	0.12
Mercury	2017	24-hour	1.00E-03	0.6	0.18
Nickel	2015	24-hour	8.00E-03	6	0.13

**Table 6**  
**Results of Optimized Modeled Toxics Impacts**

Pollutant	Year	Averaging Period	Maximum Impact ( $\mu\text{g}/\text{m}^3$ )	AAAL ( $\mu\text{g}/\text{m}^3$ )	Percent of AAAL (%)
Arsenic	2017	Annual	2.06E-03	2.1E-03	98.10
Beryllium	2017	Annual	4.0E-03	4.1E-03	98.05
Cadmium	2017	Annual	5.4E-03	5.5E-03	98.0
Chromium VI	2015	24-hour	6.1E-01	0.62	98.0
Manganese	2015	24-hour	30.4	31	98.0
Mercury	2014	24-hour	0.59	0.6	98.0
Nickel	2015	24-hour	5.9	6	98.0

DEP's toxics dispersion modeling analysis was approved by Mark Yoder, AQAB, (see memo to Ed Martin dated March 23, 2021) and adequately demonstrates compliance with the AAALs outlined in 15A NCAC 02D.1104, on a source-by-source basis.

No toxics monitoring, recordkeeping, or reporting is required since the resulting impacts and percent of the AAAL for all toxics for the potential (baseline) modeling are significantly below the AAALs.

Detailed toxic emission rates (baseline and optimized) for each source are shown in DEP's application. The permit toxic limits for all sources modeled, except for the MACT sources, which are exempt from toxics permitting, are shown below in Table 7 and in permit condition 2.2.A.1.a.

**Table 7**  
**Permit Toxic Emission Limits**

Permit Source ID	Source Description	Toxic Air Pollutant	Emissions Limit	
			(lb/yr)	(lb/day)
ES-WWTFBR	Wastewater treatment facility (bio-reactor)	HYDROGEN SULFIDE		5.41E+01
ES-FA Silo 4	Flyash conveying system storage and handling silo	ARSENIC	2.35E+00	
		BERYLLIUM	5.26E+00	
		CADMIUM	4.02E+00	
		CHROMIUM VI		1.68E-01
		MANGANESE		4.29E+00
		MERCURY		8.92E-04
		NICKEL		1.63E+00
ES-FA Silo 3, ES-S-3L2	Flyash conveying system storage and handling silo, mineral-rich flyash loadout system	ARSENIC	2.35E+00	
		BERYLLIUM	5.26E+00	
		CADMIUM	4.02E+00	
		CHROMIUM VI		1.68E-01
		MANGANESE		4.29E+00
		MERCURY		8.92E-04
		NICKEL		1.63E+00
ES-FA Silo 2	Flyash conveying system storage and	ARSENIC	2.35E+00	
		BERYLLIUM	5.26E+00	

Permit Source ID	Source Description	Toxic Air Pollutant	Emissions Limit	
			(lb/yr)	(lb/day)
	handling silo, electrostatic flyash separation system and mineral-rich product load-out silo	CADMIUM	4.02E+00	
		CHROMIUM VI		1.68E-01
		MANGANESE		4.29E+00
		MERCURY		8.92E-04
		NICKEL		1.63E+00
ES FA-Silo 1	Flyash conveying system storage and handling silo	ARSENIC	2.35E+00	
		BERYLLIUM	5.26E+00	
		CADMIUM	4.02E+00	
		CHROMIUM VI		1.68E-01
		MANGANESE		4.29E+00
		MERCURY		8.92E-04
		NICKEL		1.63E+00
ES-LS Convey 4A, 4B, 5, 6, 7 and ES-LS Silo A,B,C + Mayo Silo + Truck Spout	Five limestone conveyors, four limestone silos, truck loading spout	ARSENIC	1.09E-01	
		BERYLLIUM	1.21E-01	
		CADMIUM	1.43E+00	
		CHROMIUM VI		
		MANGANESE		2.72E+00
		MERCURY		1.86E-04
		NICKEL		1.01E-01
ES-EFSS1, 2	Two electrostatic flyash separation systems and associated conveying systems	ARSENIC	1.59E+00	
		BERYLLIUM	3.56E+00	
		CADMIUM	2.72E+00	
		CHROMIUM VI		1.14E-01
		MANGANESE		2.90E+00
		MERCURY		6.04E-04
		NICKEL		1.10E+00
ES-S-3L	Electrostatic flyash separation system and mineral-rich product load-out silo	ARSENIC	1.59E+00	
		BERYLLIUM	3.56E+00	
		CADMIUM	2.72E+00	
		CHROMIUM VI		1.14E-01
		MANGANESE		2.90E+00
		MERCURY		6.04E-04
		NICKEL		1.10E+00
ES-Coal Conv 2	4,800 tph coal conveyor	ARSENIC	5.24E-02	
		BERYLLIUM	1.40E-01	
		CADMIUM	9.63E-02	
		CHROMIUM VI		
		MANGANESE		6.64E-02
		MERCURY		2.14E-04
		NICKEL		4.51E-02

Permit Source ID	Source Description	Toxic Air Pollutant	Emissions Limit	
			(lb/yr)	(lb/day)
ES-Coal Conv 1	4,800 tph coal conveyor	ARSENIC	5.24E-02	
		BERYLLIUM	1.40E-01	
		CADMIUM	9.63E-02	
		CHROMIUM VI		
		MANGANESE		6.64E-02
		MERCURY		2.14E-04
		NICKEL		4.51E-02
ES-37A	375 tph coal conveyor	ARSENIC	5.24E-02	
		BERYLLIUM	1.40E-01	
		CADMIUM	9.63E-02	
		CHROMIUM VI		
		MANGANESE		6.64E-02
		MERCURY		2.14E-04
		NICKEL		4.51E-02
ES-37B	375 tph coal conveyor	ARSENIC	5.24E-02	
		BERYLLIUM	1.40E-01	
		CADMIUM	9.63E-02	
		CHROMIUM VI		
		MANGANESE		6.64E-02
		MERCURY		2.14E-04
		NICKEL		4.51E-02
ES-39A	375 tph coal conveyor	ARSENIC	4.53E-01	
		BERYLLIUM	1.21E+00	
		CADMIUM	8.32E-01	
		CHROMIUM VI		
		MANGANESE		5.74E-01
		MERCURY		1.85E-03
		NICKEL		3.89E-01
ES-39B	375 tph coal conveyor	ARSENIC	4.53E-01	
		BERYLLIUM	1.21E+00	
		CADMIUM	8.32E-01	
		CHROMIUM VI		
		MANGANESE		5.74E-01
		MERCURY		1.85E-03
		NICKEL		3.89E-01
ES-Coal Hopper	4,800 tph coal unloading hopper	ARSENIC	4.53E-01	
		BERYLLIUM	1.21E+00	
		CADMIUM	8.32E-01	
		CHROMIUM VI		
		MANGANESE		5.74E-01

Permit Source ID	Source Description	Toxic Air Pollutant	Emissions Limit	
			(lb/yr)	(lb/day)
		MERCURY		1.85E-03
		NICKEL		3.89E-01
ES-LS Rail	2,200 tph limestone rail unloading station	ARSENIC	1.53E-02	
		BERYLLIUM	1.69E-02	
		CADMIUM	2.00E-01	
		CHROMIUM VI		
		MANGANESE		3.81E-01
		MERCURY		2.61E-05
		NICKEL		1.41E-02
ES-SVS1	Stationary vacuum system for housekeeping	ARSENIC	7.75E-02	
		BERYLLIUM	1.73E-01	
		CADMIUM	1.33E-01	
		CHROMIUM VI		5.55E-03
		MANGANESE		1.41E-01
		MERCURY		2.94E-05
		NICKEL		5.37E-02
ES-LS Unload A, B, ES-LS Feeder 1, ES-LS Convey 2, ES-LS Reclaim A, B, ES-LS Feeder 3A, 3B	Two limestone unloading hoppers, three feeders, one limestone conveyor, two limestone reclaim hoppers,	ARSENIC	7.64E-02	
		BERYLLIUM	8.47E-02	
		CADMIUM	1.00E+00	
		CHROMIUM VI		
		MANGANESE		1.91E+00
		MERCURY		1.30E-04
		NICKEL		7.07E-02
ES-FA Silo 5	Flyash conveying system storage and handling silo No. 5	ARSENIC	2.35E+00	
		BERYLLIUM	5.26E+00	
		CADMIUM	4.02E+00	
		CHROMIUM VI		1.68E-01
		MANGANESE		4.29E+00
		MERCURY		8.92E-04
		NICKEL		1.63E+00
ES-FA Handling 4A	Unit 4 dry flyash pneumatic transfer systems and filter separators	ARSENIC	1.58E-01	
		BERYLLIUM	3.53E-01	
		CADMIUM	2.70E-01	
		CHROMIUM VI		1.13E-02
		MANGANESE		2.88E-01
		MERCURY		6.00E-05
		NICKEL		1.09E-01
ES-FA Handling 4B	Unit 4 dry flyash pneumatic transfer systems and filter separators	ARSENIC	1.58E-01	
		BERYLLIUM	3.53E-01	
		CADMIUM	2.70E-01	

Permit Source ID	Source Description	Toxic Air Pollutant	Emissions Limit	
			(lb/yr)	(lb/day)
		CHROMIUM VI		1.13E-02
		MANGANESE		2.88E-01
		MERCURY		6.00E-05
		NICKEL		1.09E-01
ES-FA Handling 4C	Unit 4 dry flyash pneumatic transfer systems and filter separators	ARSENIC	1.58E-01	
		BERYLLIUM	3.53E-01	
		CADMIUM	2.70E-01	
		CHROMIUM VI		1.13E-02
		MANGANESE		2.88E-01
		MERCURY		6.00E-05
		NICKEL		1.09E-01
ES-FA Handling 3A	Unit 3 dry flyash pneumatic transfer systems and filter separators	ARSENIC	1.45E-01	
		BERYLLIUM	3.24E-01	
		CADMIUM	2.48E-01	
		CHROMIUM VI		1.04E-02
		MANGANESE		2.64E-01
		MERCURY		5.50E-05
		NICKEL		1.00E-01
ES-FA Handling 3B	Unit 3 dry flyash pneumatic transfer systems and filter separators	ARSENIC	1.45E-01	
		BERYLLIUM	3.24E-01	
		CADMIUM	2.48E-01	
		CHROMIUM VI		1.04E-02
		MANGANESE		2.64E-01
		MERCURY		5.50E-05
		NICKEL		1.00E-01
ES-Surge Bin 3	Unit 3 dry flyash pneumatic transfer systems and filter separators	ARSENIC	1.45E-01	
		BERYLLIUM	3.24E-01	
		CADMIUM	2.48E-01	
		CHROMIUM VI		1.04E-02
		MANGANESE		2.64E-01
		MERCURY		5.50E-05
		NICKEL		1.00E-01
ES-FA Handling 1	Unit 1 dry flyash pneumatic transfer system, Unit 1 surge bin	ARSENIC	1.67E+00	
		BERYLLIUM	3.74E+00	
		CADMIUM	2.86E+00	
		CHROMIUM VI		1.20E-01
		MANGANESE		3.05E+00
		MERCURY		6.34E-04
		NICKEL		1.16E+00
ES-WWTF Silo	Wastewater treatment	ARSENIC	2.24E-03	

Permit Source ID	Source Description	Toxic Air Pollutant	Emissions Limit	
			(lb/yr)	(lb/day)
	facility lime storage silo	BERYLLIUM	2.48E-03	
		CADMIUM	2.93E-02	
		CHROMIUM VI		
		MANGANESE		5.57E-02
		MERCURY		3.81E-06
		NICKEL		2.07E-03
E-S-1, 4, 5	Load out 4, Load out 1, Load out 2, Load out 5	ARSENIC	2.30E-02	
		BERYLLIUM	5.13E-02	
		CADMIUM	3.93E-02	
		CHROMIUM VI		4.30E-03
		MANGANESE		1.09E-01
		MERCURY		2.28E-05
		NICKEL		4.16E-02
IS-FGDC	FGD Filter Cake Loadout, Unloading of Generated FGD Filter Cake at the Ash Landfill	ARSENIC	1.62E-04	
		BERYLLIUM		
		CADMIUM	2.57E-03	
		CHROMIUM VI		
		MANGANESE		7.09E-03
		MERCURY		3.80E-06
		NICKEL		1.03E-04
IS-38, 40, 41, 44, 45, 46, 48, 49	East Gypsum Sources, West Gypsum Sources	ARSENIC	2.36E-02	
		BERYLLIUM		
		CADMIUM	3.74E-01	
		CHROMIUM VI		
		MANGANESE		1.03E+00
		MERCURY		5.53E-04
		NICKEL		1.50E-02
COALPILE	Coal Pile - Active Area and Inactive Area	ARSENIC	2.58E+01	
		BERYLLIUM	6.90E+01	
		CADMIUM	4.75E+01	
		CHROMIUM VI		
		MANGANESE		3.27E+01
		MERCURY		1.05E-01
		NICKEL		2.22E+01
IS-LSSP	Limestone Storage Pile - Active Area and Inactive Area	ARSENIC	3.99E+00	
		BERYLLIUM	4.42E+00	
		CADMIUM	5.23E+01	
		CHROMIUM VI		
		MANGANESE		9.94E+01
		MERCURY		6.80E-03

Permit Source ID	Source Description	Toxic Air Pollutant	Emissions Limit	
			(lb/yr)	(lb/day)
		NICKEL		3.69E+00
IS-45, 46	Gypsum Pile - Active Area and Inactive Area	ARSENIC	1.24E+01	
		BERYLLIUM		
		CADMIUM	1.97E+02	
		CHROMIUM VI		
		MANGANESE		5.42E+02
		MERCURY		2.91E-01
		NICKEL		7.89E+00
EASHBASIN	East Ash Basin - Excavation, Active Area, and Inactive Area	ARSENIC	2.15E+02	
		BERYLLIUM	4.80E+02	
		CADMIUM	3.67E+02	
		CHROMIUM VI		1.54E+01
		MANGANESE		3.92E+02
		MERCURY		8.16E-02
		NICKEL		1.49E+02
WASHBASIN	West Ash Basin - Excavation, Active Area, and Inactive Area	ARSENIC	3.93E+02	
		BERYLLIUM	8.79E+02	
		CADMIUM	6.73E+02	
		CHROMIUM VI		2.82E+01
		MANGANESE		7.18E+02
		MERCURY		1.49E-01
		NICKEL		2.73E+02
LAND	Ash Landfill - Unloading of Generated Ash, Off-Spec Gypsum, and Relocated Ash, Active Area, and Inactive Area	ARSENIC	2.75E+02	
		BERYLLIUM	6.15E+02	
		CADMIUM	4.70E+02	
		CHROMIUM VI		1.97E+01
		MANGANESE		5.01E+02
		MERCURY		1.04E-01
		NICKEL		1.91E+02

### VIII. Public Hearing on the Draft Permit

In accordance with the CAMA (HOUSE BILL 630) §130A-309.203, the Department shall hold a public hearing and accept written comment on the draft permit decision for a period of not less than 30 or more than 60 days after the Department issues a draft permit decision.

A notice of public hearing was posted in the *Roxboro Courier-Times* and on the DAQ website on May 6, 2021. The public comment period was from May 6, 2021 through June 9, 2021. Copies of the air quality permit application, permit application review and draft air permit were also placed on the DAQ website for public review. Copies of the air quality permit application and related documents were also available for public review in DAQ's Raleigh Regional Office (RRO) and Raleigh Central Office (RCO) throughout the public comment period. The public hearing was held virtually via WebEx at 6:00 PM on June 7, 2021.

One commenter provided oral comments at the hearing and the same commenter provided email comments regarding Environmental Justice; that a facility is only required to apply for a Title V permit to comprehensively account for all air emissions from the facility up to 12 months AFTER operations begin; and the lack of adequate emission control, monitoring, recordkeeping, and reporting. These comments are addressed in the Hearing Officer's Report.

The Hearing Officer's Report, dated May 4, 2021, recommends the permit be issued as drafted.

A draft Environmental Justice Report, dated May 11, 2021, was prepared and is discussed in the Hearing Officer's Report.

## **IX. Other Requirements**

### PE Seal

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

### Zoning

A Zoning Consistency Determination form was received November 20, 2020, signed by Lori Oakley, Person County Planning Department, stating that the application had been received and that the proposed operation is consistent with applicable zoning ordinances.

### Fee Classification

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

### Increment Tracking

Person County has been triggered for PSD Increment Tracking for PM<sub>10</sub> and SO<sub>2</sub>. This permit modification will result in an increase of 2.20 pounds per hour of PM<sub>10</sub> and an increase of 0.0044 pounds per hour of SO<sub>2</sub> based on the following:

The emissions increase of PM<sub>10</sub> is 9.62 tpy and the increase of SO<sub>2</sub> is 0.00109 tpy as shown in Table 3 above. For PM<sub>10</sub>, the increase is due to various sources including mostly wind erosion at the Ash Basin and Closure Landfill; therefore, the increase is averaged over 8760 hours per year. For SO<sub>2</sub>, the increase is due only to the Closure Landfill Emergency Generator; therefore, the increase is based on the worse case hourly operation of 500 hours per year.

For PM<sub>10</sub>:  $(9.62 \text{ tons/yr} \times 2000 \text{ lb/ton}) / 8760 \text{ hr/yr} = 2.20 \text{ lb/hr}$

For SO<sub>2</sub>:  $(0.00109 \text{ tons/yr} \times 2000 \text{ lb/ton}) / 500 \text{ hr/yr} = 0.0044 \text{ lb/hr}$

## **X. Comments on Draft Permit**

The draft permit and review were sent to Erin Wallace at DEP, Matthew Mahler at RRO and Samir Parekh with SSCB on March 30, 2021 for review.

### DEP Comments

The following comments were received from DEP on April 6, 2021:

1. Change the RO's title to from General Manager II to General Manager III in the permit cover letter and review. DAQ's records showed the title as General Manager II, so the records were changed to General Manager III. The application A Form was unreadable and appeared to show General Manager II.
2. Where sections 2.1.A.4, 5 and 6 were removed, leave the section numbers shown as "reserved" to facilitate monitoring and recordkeeping as the section numbers are referenced in their database.

3. DEP asked whether 02D .0606 in Section 2.1.A.7.a for PM still applies to PM/Opaicity with the removal of the 02D .0536 PM limits. The PM monitor was being used as a surrogate for AAO monitoring, which has now been removed. The remaining 40% opacity limit under 0521 has no monitoring, recordkeeping or reporting requirement. Additionally, DEP understood that the good O&M of the ESP stemmed from the Malfunction Abatement Manual requirement, which now does not apply.

DAQ's Response

SSCB (Samir Parekh and Gary Saunders) was consulted and they responded that, although the PM limit in 02D .0536 is removed, the use of PM CEMS for the 02D .0606 Appendix P requirement to demonstrate good O&M has its own monitoring requirement, using PM CEMS as a surrogate for opacity, regardless of the other applicable opacity rules such as AAO or 02D .0521 and remains unchanged and therefore should not be removed.

4. Back in the Mayo Monofill permitting times, a footnote was added to the table of permitted sources that mentioned if the division of solid waste allows a material to be placed, the air permit allows it as well. Can we please add a footnote conveying that same message to the Roxboro draft permit?

Comments 1, 2 and 4 above were changed as requested.

SSCB Comments

The following footnote on page 14 of the permit was removed from the draft permit under 02D .0606 based on a recent SSCB comment on the Marshall draft permit since %EE and %MD in this footnote when the operating hours are less than 2200 hours during the quarter are addressed when DAQ reviews the quarterly EERs on a case-by-case basis:

\*\*\* If a source operates less than 2,200 hours during any quarter, the source may calculate the %EE and/or %MD using all operating data for the current quarter and the preceding quarters until 2,200 hours of data are obtained. [N.C.G.S. 143-215.110]

Samir was asked if it was correct to remove the footnote. Samir responded on April 5, 2021, that it could be removed.

RRO Comments

No comments were received.

**XI. Recommendations**

Permit issuance is recommended.