

**DEPARTMENT OF ENVIRONMENTAL QUALITY  
DIVISION OF WATER RESOURCES  
FACT SHEET FOR NPDES PERMIT DEVELOPMENT  
NPDES No. NC0005088**

Facility Information			
Applicant/Facility	Duke Energy Carolinas, LLC / Rogers Energy Complex		
Applicant Address:	526 Church St., Charlotte, NC 28202		
Facility Address:	573 Duke Power Road, Mooresboro, NC 28024		
Permitted Flow (MGD):	Not limited		
Type of Waste:	Industrial & domestic		
Facility Classification:	II		
Permit Status:	Renewal		
County:	Rutherford & Cleveland		
Miscellaneous			
Receiving Stream:	Broad River	State Grid:	G11NE
Stream Classification:	WS-IV	USGS Quad:	Chesnee
Drainage Area (mi <sup>2</sup> ):	849 - Broad River	Basin/Subbasin:	Broad/03-08-02
Summer 7Q10 (cfs)	287 Broad River	303(d) Listed?	No
Winter 7Q10 (cfs):	440 Broad River	HUC:	03050105
30Q2 (cfs)	635 Broad River	Regional Office:	Asheville
Average Flow (cfs):	1460 Broad River	Permit Writer:	Teresa Rodriguez
IWC (%):	7.7 (002) 3.1 (005)	Date:	4/3/2018

**SUMMARY**

Duke Energy Carolinas operates the Rogers Energy Complex (REC); formerly known as Cliffside Steam Station; a two-unit coal fired steam electric generating facility. Units 1-4 have been removed from service. The station now operates only two units; Units 5 and 6. The total combined output is 1500 megawatts. Each unit has a Flue Gas Desulfurization (FGD) system. The site has an industrial landfill for combustion byproducts where fly ash, bottom ash, gypsum and WWTP sludge is deposited.

Water for cooling is withdrawn from the Broad River. Both units use cooling towers for heat dissipation. Blowdown from Unit 5 is discharged to the ash basin. Blowdown from Unit 6 can be used in the unit's make up water or discharged to the ash basin.

The receiving water is the Broad River, class WS-IV waters in the Broad River Basin. Previous permits had this section classified as C. The correct classification is WS-IV and it will be modified in the permit.

REC is subject to EPA effluent guideline limits per 40 CFR 423 - Steam Electric Power Generating Point Source Category. The facility is also subject to the Cooling Water Intake Structures Rules (40

CFR 125) effective October 14, 2014 and to the North Carolina Senate Bill 729 - Coal Ash Management Act.

### Outfall Descriptions:

#### **Outfall 002 - Ash basin**

The ash basin receives wastewaters collected in the Yard Drainage Basin (effluent from the domestic WWTP, cooling tower blowdown from Unit 5, landfill leachate, floor drains, treated FGD wet scrubber water, limestone unloading and storage area, and stormwater), sluiced ash, cooling tower blowdown from Unit 6, equipment backwashes, boiler blowdown, drainage from recirculating cooling systems, demineralizing resin, cooling water from heat exchangers, rinse water from limestone unloading and storage area, stormwater, and miscellaneous waste streams. This outfall discharges to the Broad River.

#### **Outfall 002A - Emergency Yard Drainage Overflow**

This outfall was closed in 2016. This was an emergency outfall from the yard drainage basin.

#### **Internal Outfall 004 - FGD**

If the wastewater from the FGD system is not used in Unit 6 it is treated in the FGD WWTS which consists of equalization tank, reaction tank, flocculating clarifier, and gravity filters. The effluent is discharged to the Yard Drainage Basin. A new treatment system will be installed for the FGD wastewaters. The effluent of the treatment system will be combined with the effluent from proposed outfall 005 before discharging to the Broad River.

#### **Proposed Outfalls:**

#### **Outfall 005 - New Wastewater Treatment System**

A new treatment system will be installed to treat wastewaters from the holding basin effluent (Outfall 002C - fly ash silo sump, coal, gypsum and limestone piles runoff), Basement Basin effluent (RO reject, stormwater and Unit 6 sanitary system), Unit 6 cooling tower blowdown, landfill leachate, Unit 6 process sump (mechanical drag chain overflow, and low volume waste) Unit 5 process sump (sanitary system, low volume wastes, mechanical drag chain overflow and cooling tower blowdown), and ash basin dewatering/decanting. The FGD WWTS discharge (Internal Outfall 004) and heat exchanger non-contact cooling water will be combined with the discharge from the WWTS before discharge to the Broad River. The treatment system will be a physical/chemical treatment system with flow equalization, pH neutralization, coagulation and flocculation, and filters. This outfall will discharge to the Broad River.

#### **Outfall 002B - Basement Basin**

This will be an emergency outfall from the Basement Basin if a significant rain event overflows the system. An existing structure will be used as a holding cell for process wastewater, treated sanitary wastewater and stormwater that currently go to the P-5 yard basin. The effluent from this holding cell will be pumped to the ash basin during normal operations. When the new WWTS starts operations the holding cell will receive stormwater runoff from Unit 6, RO reject wastewater, Unit 6 treated sanitary wastewater and process and stormwater from Unit 5. Effluent will be pumped to the new WWTS. An auxiliary basin will hold excess water during storm events. The emergency outfall will discharge to the Broad River.

#### **Outfall 002C - Holding Basin**

This will be an emergency outfall from a new holding basin if a significant rain event overflows the system. This holding basin will receive stormwater, coal pile runoff, gypsum pile runoff, limestone pile runoff and flows from the holding cell auxiliary basin (stormwater runoff from Unit 6, RO reject wastewater, treated sanitary wastewater and process and stormwater from Unit 5). The effluent from

this holding basin will be pumped to the new WWTS. The emergency overflow will discharge to the Broad River.

**Outfalls 104 and 106 Constructed Seeps**

Outfalls 104 and 106 discharge seepage from the ash basin into the Broad River. A Special Order by Consent (“Special Order”), EMC SOC 17-009, also addresses Outfalls 104 and 106. In this Special Order, these outfalls are called “engineered seeps.” Duke Energy shall follow the requirements of the Special Order with regard to these engineered seeps, including but not limited to the requirement that if any of the engineered seeps are not dispositioned (as described in EMC SOC 17-009 § 2(c)(3)) following decanting of the ash basins (as described in EMC SOC 17-009 § 1(a)) at Rogers Energy Complex, Duke Energy shall submit an amendment to its groundwater Corrective Action Plan and/or Closure Plan for the Rogers Energy Complex describing how any of the non-dispositioned engineered seeps will be remediated in a manner sufficient to protect public health, safety, and welfare, the environment, and natural resources (as described in EMC SOC 17-009 § 2(d))

COMPLIANCE REVIEW/PROPOSED ACTIONS

**Outfall 002 - Ash Basin - Decanting/Normal Operations**

This outfall is subject to the Effluent Limitations Guidelines (ELG) in Table 1.

Table 1. ELG Outfall 002

Pollutant	Daily Maximum (DM)	Monthly Average (MA)	ELG
TSS	50 mg/l	30 mg/l	40 CFR 423(b)(4) (monthly average) 423(b) (9) (daily max)
Oil & Grease	20 mg/l	15 mg/l	40 CFR 423.12 (b) (4)
pH	6 to 9 SU		40 CFR 423.12 (b) (1)

As per 40 CFR 423.13 (h) (1) (i) and (k) (1) (i) bottom ash and fly ash transport water shall not be discharged, compliance with this section shall be as soon as possible beginning on November 1, 2018 for fly ash and November 1, 2020 for bottom ash, but no later than December 31, 2023. Duke has submitted the following proposed schedule for meeting the rule:

Bottom ash: An underneath the boiler mechanical drag system will be installed and will be operational by November 1, 2020. This technology will not generate bottom ash.

Fly ash: dry fly ash is handled dry at this facility.

DMR review:

DMR data were review for the period of January 2011 to April 2016. There were no violations of permit limits.

Table 2. DMR Summary Outfall 002

Parameter	Average	Maximum	Minimum
Flow (MGD)	6.753	29.8	0.40
TSS (mg/l)	6.8	18	< 5
Temperature °F	66.4	88.3	45.5
O & G (mg/l)	< 5	< 5	< 5
Total Nitrogen (mg/l)	0.93	1.5	0.54

Total Phosphorus (mg/l)	0.09	0.19	0.01
pH (S.U.)	7.4	8.6	6.1

RPA Outfall 002:

The need for toxicant limits is based upon a demonstration of reasonable potential to exceed water quality standards, a statistical evaluation that is conducted during every permit renewal utilizing the most recent effluent data for each outfall. The RPA is conducted in accordance with 40 CFR 122.44 (d) (i). The NC RPA procedure utilizes the following: 1) 95% Confidence Level/95% Probability; 2) assumption of zero background; 3) use of 1/2 detection limit for "less than" values; and 4) streamflows used for dilution consideration based on 15A NCAC 2B.0206. Effective April 6, 2016, NC began implementation of dissolved metals criteria in the RPA process in accordance with guidance titled *NPDES Implementation of Instream Dissolved Metals Standards*, dated June 10, 2016.

The current permit included monitoring for various metals to evaluate the impact from FGD wastewaters. A reasonable potential analysis was performed for arsenic, cadmium, chlorides, chromium, copper, fluoride, lead, molybdenum, nickel, selenium, silver, zinc, antimony, barium, sulfates and thallium. A reasonable potential analysis was conducted on effluent toxicant data collected between January 2011 and May 2016. Pollutants of concern for the decant wastewater included toxicants with positive detections and associated water quality standards/criteria. None of the parameters presented reasonable potential.

TOXICITY TESTING:

Current Requirement: Outfall 002 - Chronic P/F @ 7.14% using Ceriodaphnia  
 Recommended Requirement: Outfall 002 - Chronic P/F @ 7.7% using Ceriodaphnia  
 Instream waste concentration is based on the maximum monthly flow during the previous permit cycle.

This facility has passed 21 out of 21 toxicity tests during previous permit cycle.

Mercury Evaluation:

Table 3. Mercury Data Evaluation

	2011	2012	2013	2014	2015
# of Samples	18	12	12	13	12
Annual Average, ng/L	3.1	1.8	1.7	1.5	1.1
Maximum Value, ng/L	11.30	3.50	3.10	3.90	2.30
TBEL, ng/L	47				
WQBEL, ng/L	159.1				

Annual averages are below the TBEL and WQBEL, no limit is required for mercury.

Table 4. Monitoring Requirements/Proposed Changes Outfall 002

Parameter	Monitoring requirements	Changes	Basis
Flow	Monitor	No changes	15A NCAC 2B.0505
TSS	30 mg/l MA 100 mg/l DM	Daily maximum for TSS changed to 50 mg/L	MA - 40 CFR 423.12(b)(4) DM - 40 CFR 423 (b) (9) coal pile runoff is discharged through this outfall
Oil & Grease	15 mg/l MA 20 mg/l DM	No changes	40 CFR 423.12(b)(4)

Total iron	1 mg/l MA 1 mg/l DM	No changes	40 CFR 423.12(b)(5) Only monitored during discharge of metal cleaning wastes
Total cooper	1 mg/l MA 1 mg/l DM	101 µg/l MA 111 µg/l DM	State WQ standards, 15A NCAC 2B .0200. Only monitored during discharge of metal cleaning wastes. Water quality limits more stringent than ELG.
Total chromium	Monitoring	0.2 mg/L MA 0.2 mg/L DM	40 CFR 423.13 (d)(1)
Total zinc	Monitoring	1.0 mg/L MA 1.0 mg/L DM	40 CFR 423.13 (d)(1)
Total nickel, total silver	Monitor weekly	Eliminate monitoring	Previous permit had monitoring to evaluate impact from FGD. There is no ELG for these parameters and no reasonable potential to exceed wqs.
Total cadmium	Monitor weekly	Monitor Monthly	Maximum predicted concentration greater than 50% of the allowable
Total selenium,	Monthly monitoring	Monitor Monthly	Pollutant of concern for ash.
Total arsenic	Monthly monitoring	Monitor Monthly	Pollutant of concern for ash.
Total thallium, total lead	No requirement	Monitor Monthly	Reasonable potential to exceed EPA water quality criteria.
Total mercury	Monitor monthly	No changes	Pollutant of concern for ash.
Total Hardness	No requirement	Quarterly monitoring	Collect data for RPA
BOD5	No requirement	30 mg/L MA 45 mg/L DM	Outfall discharges treated domestic wastes
Fecal Coliform	No requirement	200/100 mL MA 400/100 mL DM	Outfall discharges treated domestic wastes
Total Nitrogen Total Phosphorus	Quarterly Monitoring	No changes	15A NCAC 2B .0500
pH	6 to 9 SU	No changes	State WQ standards, 15A NCAC 2B .0200

### **Outfall 002 - Ash Basin Dewatering**

To meet the requirements of the Coal Ash Management Act of 2014, the facility needs to dewater the ash pond by removing the interstitial water and excavate the ash to deposit it in landfills. The facility's highest discharge rate from the dewatering process will be 1 MGD. The facility submitted data for the standing surface water in the ash pond, interstitial water in the ash, and interstitial ash water that was treated by filters of various sizes. To introduce a margin of safety the highest measured concentration of a parameter was used in the RPA. RPA analysis was done for arsenic, cadmium, chlorides, aluminum, TDS, copper, fluoride, lead, molybdenum, nickel, selenium, zinc, barium, sulfates and thallium. None of the parameters showed reasonable potential.

### **Internal Outfall 004 - FGD**

This outfall is subject to the ELG in Table 5. These are new limitations promulgated November 3, 2015. The permittee has to meet the limitations as soon as possible beginning November 1, 2020 but no later than December 31, 2023.

Table 5. ELG Outfall 004

Pollutant	Daily Maximum	Monthly Average	ELG
pH	6 to 9 SU		40 CFR 423.12 (b) (1)
TSS	100 mg/l	30 mg/l	40 CFR 423.12 (b) (11)
Oil and grease	20 mg/l	15 mg/l	40 CFR 423.12 (b) (11)
Total Arsenic	11 µg/l	8 µg/l	40 CFR 423.13 (g) (1) (i)
Total Mercury	788 ng/l	356 ng/l	40 CFR 423.13 (g) (1) (i)
Total Selenium	23 µg/l	12 µg/l	40 CFR 423.13 (g) (1) (i)
Nitrate/nitrite	17 mg/l	4.4 mg/l	40 CFR 423.13 (g) (1) (i)

### **Schedule of Compliance for ELG:**

The new rule establishes compliance dates for the new limitations. Permittee must meet limits as soon as possible beginning on November 1, 2020 but no later than December 31, 2023. Duke requested a compliance schedule to evaluate, install and test a new treatment system with a proposed compliance date of December 31, 2023. The permit will require compliance by this date.

Table 6. Monitoring Requirements/Proposed Changes Outfall 004

Parameter	Monitoring requirements	Changes	Basis
Flow	Monitor	No changes	15A NCAC 2B.0505
TSS	Monitor	Limits of 30 mg/l (MA) and 100 mg/l (DM)	40 CFR 423.13 (b) (11)
Oil and grease	No Monitor	Limits of 15 mg/l (MA) and 20 mg/l (DM)	40 CFR 423.13 (b) (11)
Total Arsenic	Monitor	Add limits of 11 µg/l daily max and 8 µg/l monthly average	40 CFR 423.13 (g) (1) (i)
Total Cadmium	Monitor	Remove monitoring	Internal outfall, not a parameter of concern.
Total Chromium	Monitor	Remove monitoring	Internal outfall, not a parameter of concern.
Chloride	Monitor	Remove monitoring	Internal outfall, not a parameter of concern.
Total Mercury	Monitor	Add limits of 788 ng/l daily max and 356 ng/l monthly average.	40 CFR 423.13 (g) (1) (i)
Total Nickel	Monitor	Remove monitoring	Internal outfall, not a parameter of concern.
Total Selenium	Monitor	Add limits of 23 µg/l daily max and 12 µg/l monthly average	40 CFR 423.13 (g) (1) (i)
Total Silver	Monitor	Remove monitoring	Internal outfall, not a parameter of concern.
Total Zinc	Monitor	Remove monitoring	Internal outfall, not a parameter of concern.
Nitrate/Nitrite	No monitoring	Add limits of 17 mg/l daily max and 4.4 mg/l monthly average	40 CFR 423.13 (g) (1) (i)

Proposed Outfalls:

**Outfall 005 - New Wastewater Treatment System (WWTS)**

This new outfall will discharge treated process wastewaters from the plant including low volume wastes and cooling tower blowdown. This treatment system is expected to be in place by the end of 2018. Proposed limits and monitoring requirements are described in Table 7.

Table 7. Monitoring Requirements/Limits Proposed Outfall 005

Parameter	Limits/Monitoring requirements	Basis
Flow	Monitor	15A NCAC 2B.0505
TSS	30 mg/L MA 50 mg/L DM	MA - 40 CFR 423.12(b)(4) DM - 40 CFR 423 (b) (9) coal pile runoff is discharged through this outfall
Oil & Grease	15 mg/L MA 20 mg/L DM	40 CFR 423.12(b)(4)
Total Iron	1 mg/L MA 1 mg/L DM	40 CFR 423.13 (b) (5) Parameter only monitored during discharge of metal cleaning wastes
Total Cooper	251 µg/L MA 272 µg/L DM	State WQ standards, 15A NCAC 2B .0200. Parameters only monitored during discharge of metal cleaning wastes.
Total Chromium	0.2 mg/L MA 0.2 mg/L DM	40 CFR 423.13 (d)(1)
Total Zinc	1.0 mg/L MA 1.0 mg/L DM	40 CFR 423.13 (d)(1)
Total Hardness	Quarterly Monitoring	Collect data for RPA
Total Nitrogen Total Phosphorus	Quarterly Monitoring	15A NCAC 2B .0500
pH	6 to 9 SU	State WQ standards, 15A NCAC 2B .0200
BOD5	30 mg/L MA 45 mg/L DM	Outfall discharges treated domestic wastes
Fecal Coliform	200/100 mL MA 400/100 mL DM	Outfall discharges treated domestic wastes
TRC	28 µg/L DM	State WQ standards, 15A NCAC 2B .0200
Whole Effluent Toxicity	Chronic toxicity test at 3.14%	State WQ standards, 15A NCAC 2B .0200
Total Cadmium, Total Mercury, Total Selenium, Total Arsenic, Total Thallium	Monitor Monthly	Only applicable if the decanting and dewatering is discharged through the WWTS

**Outfall 002B:**

This outfall will discharge from the Basement Basin only during excessive rain events (100-yr 24 hr rain). The holding cell will collect stormwater runoff from Unit 6, RO reject wastewater, treated sanitary wastewater and process and stormwater from Unit 5.

Table 8. Monitoring Requirements/Limits Proposed Outfall 002B

Parameter	Limits/Monitoring requirements	Basis
Flow	Monitor	15A NCAC 2B.0505
TSS	30 mg/L MA 100 mg/L DM	40 CFR 423.12(b)(3)
Oil & Grease	15 mg/L MA 20 mg/L DM	40 CFR 423.12(b)(4)
Total iron	1 mg/L MA 1 mg/L DM	40 CFR 423.13 (b) (5) Parameter only monitored during discharge of metal cleaning wastes
Total cooper	251 µg/L MA 272 µg/L DM	State WQ standards, 15A NCAC 2B .0200. Parameters only monitored during discharge of metal cleaning wastes.
pH	6 to 9 SU	State WQ standards, 15A NCAC 2B .0200
BOD5	30 mg/L MA 45 mg/L DM	Outfall discharges treated domestic wastes
Fecal Coliform	200/100 mL MA 400/100 mL DM	Outfall discharges treated domestic wastes
Whole Effluent Toxicity	Acute episodic test	State WQ standards, 15A NCAC 2B .0200

**Outfall 002C:**

This outfall will discharge from the proposed Holding Basin only during excessive rain events (100-yr 24 hr rain). The holding cell will collect stormwater, coal pile runoff, gypsum pile runoff and limestone storage area runoff and flows from the Basement Basin auxiliary basin (stormwater runoff from Unit 6, RO reject wastewater, treated sanitary wastewater and process and stormwater from Unit 5).

Table 9. Monitoring Requirements/Limits Proposed Outfall 002C

Parameter	Limits/Monitoring requirements	Basis
Flow	Monitor	15A NCAC 2B.0505
TSS	30 mg/L MA 50 mg/L DM	MA - 40 CFR 423.12(b)(4) DM - 40 CFR 423 (b) (9) coal pile runoff is discharged through this outfall
Oil & Grease	15 mg/L MA 20 mg/L DM	40 CFR 423.12(b)(4)
Total Iron	1 mg/L MA 1 mg/L DM	40 CFR 423.13 (b) (5) Parameter only monitored during discharge of metal cleaning wastes
Total Cooper	102 µg/L MA 111 µg/L DM	State WQ standards, 15A NCAC 2B .0200. Parameters only monitored during discharge of metal cleaning wastes.
pH	6 to 9 SU	State WQ standards, 15A NCAC 2B .0200
BOD5	30 mg/L MA 45 mg/L DM	Outfall discharges treated domestic wastes
Fecal Coliform	200/100 mL MA 400/100 mL DM	Outfall discharges treated domestic wastes



Whole Effluent Toxicity	Acute episodic test	State WQ standards, 15A NCAC 2B .0200
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**Outfalls 104 and 106 – constructed seeps outfalls:**

Two constructed seeps, Outfalls 104 and 106, discharge from the ash basin into the Broad River. A Special Order by Consent (“Special Order”), EMC SOC 17-009, also addresses Outfalls 104 and 106. In this Special Order, these outfalls are called “engineered seeps.” Duke Energy shall follow the requirements of the Special Order with regard to these engineered seeps, including but not limited to the requirement that if any of the engineered seeps are not dispositioned (as described in EMC SOC 17-009 § 2(c)(3)) following decanting of the ash basins (as described in EMC SOC 17-009 § 1(a)) at Rogers Energy Complex, Duke Energy shall submit an amendment to its groundwater Corrective Action Plan and/or Closure Plan for the Rogers Energy Complex Station describing how any of the non-dispositioned engineered seeps will be remediated in a manner sufficient to protect public health, safety, and welfare, the environment, and natural resources (as described in EMC SOC 17-009 § 2(d))

Table 10. Toe drains Coordinates and Assigned Outfall Numbers

ID	Latitude	Longitude	Outfall number
S-4	35° 13' 3.5"	81° 45' 9.3"	104
S-6	35° 13' 6.3	81° 44' 53.7"	106

RPA Seeps

A RPA was conducted for the seeps. RPA was conducted for total arsenic, cadmium, chlorides, total chromium, total copper, total lead, total boron, total mercury, total molybdenum, total nickel, selenium, total zinc, antimony, sulfate and total thallium. Maximum flow recorded for toe drain 104 was 0.032 mgd. The maximum flow recorded for toe drain 106 was 0.164 mgd. The flows were multiplied by a factor of safety of 10 for the RPA.

These outfalls will have monitoring requirements for fluoride, total mercury, total barium, total iron, total manganese, total zinc, total arsenic, total cadmium, total chromium, total copper, total lead, total nickel, and total selenium, chlorides, nitrate/nitrite, total dissolved solids, hardness, turbidity, conductivity and limits as described in Table 11.

Table 11. Monitoring Requirements Proposed Toe Drain Outfalls Monitoring:

Parameter	Limits/Monitoring requirements	Basis
Flow	Monitor	15A NCAC 2B.0505
pH	6.0 to 9.0 S.U.	State WQ standards, 15A NCAC 2B .0200
TSS	30 mg/l MA 100 mg/l DM	40 CFR 423.12(b)(4)
Oil & Grease	15 mg/l MA 20 mg/l DM	40 CFR 423.12(b)(4)

316(b) REQUIREMENTS

The permittee shall comply with the Cooling Water Intake Structure Rule per 40 CFR 125.95. The Division approved the facility request for an alternative schedule in accordance with 40 CFR

125.95(a)(2). The permittee shall submit all the materials required by the Rule with the next renewal application.

### 316 (a) CWA

The thermal variance and temperature mixing zone once included in the permit for outfall 002 is no longer applicable. The special conditions referring to the variance and mixing zone were eliminated.

### FISH TISSUE STUDIES

The facility performed fish tissue analysis for arsenic, selenium and mercury as required by the permit. The Division reviewed the information and concluded that all the fish tissue levels reported are below the Department of Health screening values.

### INSTREAM MONITORING

The current permit did not require instream monitoring. The proposed permit will require upstream and downstream semi-annual monitoring for total arsenic, total selenium, total mercury, total chromium, dissolved lead, dissolved cadmium, dissolved copper, dissolved zinc, total bromide, total hardness (as CaCO<sub>3</sub>), temperature, turbidity, and total dissolved solids (TDS).

### SUMMARY OF CHANGES:

1. Eliminated outfall 002A since it has been shut down.
2. Added effluent pages for outfalls 002B, 002C and 005.
3. A separate effluent page for the dewatering of the ash ponds (Outfall 002) was added to the permit. Please see Special Condition A. (2)
4. Special Condition A. (24) Section 316(b) of CWA was updated to reflect the new regulations.
5. Special Condition A. (8) Section 316(a) Thermal Variance in the old permit was eliminated since the facility no longer requires a thermal variance.
6. Special Condition A. (26) Ash Pond Closure was added to the permit to facilitate the decommissioning of the ash ponds.
7. Special Condition A. (13) Instream Monitoring was added to the permit to monitor the impact of the discharges on the receiving stream.
8. Special Condition A. (25) Applicable State Law was added to the permit to meet the requirements of Senate Bill 729 (Coal Ash Management Act).
9. Special Condition A. (23) Domestic Wastewater Treatment Plant was added to the permit to assure compliance with the 40 CFR 133.102.
10. Special Condition A. (28) Electronic Reporting was added to the permit describing requirements for electronic reporting of DMRs. Starting December 21, 2016, federal regulations require electronic submittal of all discharge monitoring reports (DMRs) and specify that, if a state does not establish a system to receive such submittals, then permittees must submit DMRs electronically to the Environmental Protection Agency (EPA).
11. Special Condition A. (29) Notification of Start-up – Outfall 005 was added to the permit.

Changes to the September 21, 2016 draft permit:

1. Steam Electric ELG - In September 2017, the EPA delayed the implementation date for effluent guidelines for the Steam Electric Power Generating Point Source Category to allow time to revise some of the BAT limitations for FGD wastewaters and bottom ash transport water. The earliest compliance date for the FGD wastewater in §123.13(g)(1)(i) and for the bottom ash transport water in §123.13(k)(1)(i) were delayed from November 1, 2018 to November 1, 2020. A reopener was added to outfall 004 specifying that the Division may reopen the permit to implement limits as revised in the ELGs.

2. Seeps Discharges - Effluent Limitations and Monitoring Requirements for Outfalls 102, 103, 110, 111, 113,114, 115, 116, 117, 121, 127, 128, 129, 130, 131, and 132 were eliminated from the draft permit transmitted on September 21, 2016. The seeps will be covered under a Special Order by Consent. Constructed seeps 104 and 106 will remain in the permit.
3. Added monitoring for lead and TDS for dewatering and decanting in response to EPA comments.
4. The footnote under outfall 002 requiring physical/chemical treatment was modified to allow the installation of treatment if it is necessary.
5. A statement was added to condition A. (6) Effluent Limitations and Monitoring Requirements for outfall 005 to require submittal of Form 2C Parts V and VI within 180 days of commencement of operations.
6. Special conditions for instream sampling and fish tissue monitoring were modified to clarify requirements (See A. (13) and A. (14)).
7. The mixing zone for outfall 002 was removed from the permit. Recent data shows that the temperature standard is not exceeded at outfall 002. The Division does not consider that the mixing zone in the current permit is justified since the conditions are different from when the mixing zone was established.
8. Added limits for 126 pollutants for outfall 005 since this outfall will discharge the cooling tower blowdown.
9. The groundwater monitoring well construction and sampling condition was eliminated from the permit.
10. Special condition A. (30) Compliance Boundary was added to the permit.
11. The groundwater compliance boundary map was added to the permit.

Outfall 005 Temperature Mixing Zone:

Duke requested a mixing zone for temperature for Outfall 005. Outfall 005 is a proposed outfall that will discharge among other flows, the cooling tower blowdown. A Cormix analysis was developed to evaluate a mixing zone. Both summer and winter conditions were considered in the analysis. The model was run under conservative assumption such as the use of maximum design flow rate of 6 MGD for both summer and winter and a sensitivity analysis resulted in the use of the most conservative river depth.

Summer Analysis - The summer maximum effluent discharge temperature was estimated as 100°F. Maximum ambient temperature was recorded as 86.3°F.

Winter Analysis - The winter maximum effluent discharge temperature was estimated as 93.7°F. The minimum ambient temperature was 35.5°F.

The temperature water quality standard has two components: not to exceed 2.8 °C (5.04 °F) above natural background and not to exceed 32 °C (89.6 °F). The critical condition modeled for the summer was the maximum temperature. The critical condition modeled for the winter was the temperature exceedance over background conditions.

The model includes the following assumptions/inputs:

<b>Outfall 005</b>	
Flow	6 MGD
Max summer temperature	100 °F
Max winter temperature	93.7 °F
Outfall structure	36" pipe followed by 10 feet wide rip rap channel

<b>Ambient Conditions - Broad River</b>	
Summer 7Q10	287 cfs
Winter 7Q10	440 cfs
Summer max temperature	86.3 °F
Winter min temperature	35.5 °F
Summer ΔT	3.3 °F
Winter ΔT	58.2 °F
River width	200 ft (60.9 m)
River depth	2.5 ft

Model results:

	<b>Mixing Zone</b>		<b>Dilution</b>
	<b>Distance downstream (x)</b>	<b>Plume width (y)</b>	
Summer	130 m (426.8 ft)	37 m (121.4 ft)	4.1
Winter	145 m (476 ft)	24.5 m (80.4 ft)	10.8

A mixing zone will be implemented comprising a distance of 145 meters downstream of the outfall and 37 meters wide. The mixing zone length is maximized for the winter condition and the width is maximized for the summer condition. For both summer and winter conditions the effluent is buoyant providing for passage of fish through the mixing zone. The mixing zone shall not result in acute toxicity, prevent free passage of aquatic organisms, result in offensive conditions, produce undesirable aquatic life or result in a dominance of nuisance species outside of the assigned mixing zone; or endanger the public health or welfare.

Temperature monitoring will be implemented upstream and downstream at the edge of the mixing zone to evaluate compliance with the temperature criteria outside of the mixing zone and to verify the model predictions. If model predictions are not validated the permit will be reopened to implement more stringent requirements.

The permit includes requirements to submit a mixing zone verification study and an assessment to verify that the mixing zone does not prevent the passage of fish around the mixing zone. The assessment would include a biological component but is not intended to be a full BIP demonstration due to the greatly reduced area of the historic thermal mixing zone. The study is intended to confirm the projected impacts of the discharge that were presented in the CORMIX model.

#### PROPOSED SCHEDULE FOR PERMIT ISSUANCE

Draft Permit to Public Notice: May 2, 2018  
 Permit Scheduled to Issue: June 16, 2018

#### NPDES DIVISION CONTACT

If you have questions regarding any of the above information or on the attached permit, please contact Teresa Rodriguez at (919) 807-6387.

NAME: \_\_\_\_\_ TERESA RODRIGUEZ \_\_\_\_\_ DATE: \_\_\_5/2/2018\_\_\_\_\_