

DEPARTMENT OF ENVIRONMENTAL QUALITY / DIVISION OF WATER RESOURCES
FACT SHEET FOR NPDES PERMIT DEVELOPMENT

Duke Energy Progress, Inc. – W. H. Weatherspoon Plant
 NC0005363

Facility Information			
Applicant/Facility Name:	Duke Energy Progress, Inc. / W.H. Weatherspoon Plant		
Applicant Address:	801 Sutton Steam Plant Road, Wilmington, NC 28401		
Facility Address:	491 Power Plant Road, Lumberton, NC 28358		
Permitted Flow:	Not Limited		
Type of Waste:	99.9% Industrial and 0.1% Domestic		
Classification:	Class I Physical/Chemical/Biological		
Permit Status:	Major Modification / Renewal		
County:	Robeson		
Miscellaneous			
Receiving Stream/Index:	Lumber River/14-(13) Jacob Swamp/14-16	Drainage Basin:	Lumber
Stream Classification:	C-Sw	Sub-basin:	03-07-51
303(d) Listed?	No	HUC:	03040203
Drainage Area (mi ²):	716 mi ²	State Grid / USGS Quad:	I23SW/SE Lumberton, NC
Summer 7Q10 (cfs):	122 – Lumber River 0 – Jacob Swamp	Latitude:	34° 34' 58" N
Winter 7Q10 (cfs):	192 – Lumber River 0 – Jacob Swamp	Longitude:	78° 58' 25" W
30Q2 (cfs):	304 - Lumber River 0 – Jacob Swamp	Regional Office:	Fayetteville
Average Flow (cfs):	869 – Lumber River 0 – Jacob Swamp	Permit Writer:	Trupti Desai
IWC (%):	2.48%	Date:	9/19/2016

I SUMMARY

Duke Energy Progress, Inc. owns and operates the W.H. Weatherspoon Power Plant site in Lumberton, NC. The plant encompasses approximately 835 acres, including 65 acre ash basin and 225 acre cooling pond. The Weatherspoon Plant has four operating internal combustion turbines with total electric generation capacity of 160MW. Three coal-fired units were in operation prior to 2011. These retired units were demolished in 2013. The plant no longer meets the definition of a steam electric generating facility under 40 CFR 423.10 after retirement of the coal-fired units and is not considered as a categorical industry.

The site occasionally discharges water from the off-stream cooling pond located on the north side of the Lumber River in Robeson county. The pond receives waste streams from combustion turbine site, ash pond, retired coal site drains, fuel oil remedial recovery system and sanitary waste treatment system. The estimated flow from these sources to the cooling pond is 0.153 MGD. The discharge from the cooling ponds is expected to occur only during a major storm event or for maintenance purposes. The pond last discharged to the Lumber River in September, 1999.

Duke Energy Carolinas, LLC applied for NPDES permit renewal for its W. H. Weatherspoon Plant on January 28, 2014. This permit (NC0005363) expired on July 31, 2014. There had been two permit modifications to the previous permit since it was originally issued in November, 2009. The Division removed Section B (Stormwater Requirements) in 2011 on the basis that coal ash hauling activity had

ceased. Second modification was issued in 2012 to remove effluent limitations and monitoring requirements for outfall 002 due to the fact that the coal-fired units were retired and discharge structure was capped. The permittee has amended the application several times from 2014 to 2016 to provide information on seepage flows and chemical characterization of seeps and ash pond water.

II DATA REVIEW AND EXISTING CONDITIONS

A. Data Availability and Review

The facility is not regularly discharging wastewater to the Lumber River. Therefore, it is not required to submit DMRs or conduct instream monitoring. The aquatic toxicity tests were also not conducted during the last permit period as there was no discharge from the facility. The permittee had submitted effluent characterization data for cooling pond water with the renewal application. Supplemental data on chemical characterization of ash pond water and unpermitted seeps were added to the application. This data was used to conduct RPA and add limitation and monitoring requirements in the permit.

B. Compliance Summary

The compliance history from January 2010 till June, 2016 was reviewed. The facility has not violated the requirements of NPDES permit during this period.

C. Existing conditions (Ash Pond)

Currently, there is only interstitial water in the ash pond. Hence the facility does not require to decant the ash pond water. The interstitial water will be discharged to the cooling pond through dewatering process prior to the ash pond closure. The facility will design the physical and chemical treatment plant, prepare the ash pond closure plan and notify the Department of Environmental Quality. It will notify the Regional Office and the NPDES Complex Permitting of the Division of Water Resources seven days prior to commencement of dewatering.

D. Receiving Waters

Outfall 001 discharges to the Lumber River. This segment of the River, which classified as C-Sw waters, is not listed for any impairment in 303d list published in 2016.

The proposed seep outfall 105 discharges to Jacob Swamp which is considered a zero flow stream and classified as C-Sw waters.

III PROPOSED PERMITTING ACTION

This permit is being modified and renewed to include the unpermitted seeps. The permit modification / renewal also establishes requirements for dewatering of the ash pond, which is necessary to remove the coal ash from the pond.

The facility has one outfall (001) which is permitted to occasionally discharge water from cooling pond to the Lumber River. The Division is proposing one internal outfall 001A to discharge ash pond water to the cooling pond and one seep outfall (105) to discharge contaminated groundwater seepage from seeps 2, 3 and 5 to Jacob Swamp.

Mercury evaluation according the permitting guidance developed for the implementation of the statewide Mercury TMDL was conducted for the outfalls where mercury analysis was conducted using 1631 E method. The Division conducted EPA-recommended analyses to determine the reasonable potential for toxicants to be discharged at levels exceeding water quality standards/EPA criteria by this facility. For the purposes of the RPA, the background concentrations for all parameters were assumed to be below detections level. The RPA uses 95% probability level and 95% confidence basis in accordance with the EPA Guidance entitled "Technical Support Document for Water Quality-based Toxics Control." The RPA included evaluation of dissolved metals' standards, utilizing either a default hardness value of 25 mg/L CaCO₃ for hardness-dependent metals or actual hardness of the effluent. The instream hardness was set to a default value of 25 mg/l as CaCO₃. The mercury evaluation and RPA spreadsheets are attached to this Fact Sheet

A. Outfall 001 (Cooling Pond Water Only)

Outfall 001 is permitted to discharge the cooling pond water to the Lumber River under special conditions. The reasonable potential analysis and mercury evaluation were conducted for this outfall using the data available from the permit application.

Mercury Evaluation

The permittee did not use EPA method 1631 E for mercury analysis. Hence, it was not possible to conduct mercury evaluation according to permitting guidance developed for the implementation of the statewide Mercury TMDL. The annual average mercury limit was set to technology based effluent limit (TBEL) i.e. 47 ng/l due to lack of data.

Reasonable Potential Analysis (RPA) (Cooling Pond Water Only)

RPA was conducted for arsenic, cadmium, chromium, copper, lead, nickel, selenium, thallium and zinc. None of these parameters showed reasonable potential to exceed water quality criteria of the Lumber River. No limits were added to the permit for these metals. The monitoring requirements for iron and copper were removed based on the results of the RPA. The monitoring requirements for arsenic and selenium remain unchanged from the previous permit.

Aquatic Toxicity Testing

The permittee will continue to conduct acute episodic toxicity test using *Fathead Minnow (Pimephales promelas)* during this permit period.

Instream Monitoring

Hardness monitoring was added to the permit to collect data to conduct RPA for hardness dependent metals in the next permitting cycle. In addition, the facility shall conduct semiannual instream monitoring (approximately ¼ mile upstream and ¼ mile downstream of the Outfall 001) for total arsenic, total selenium, total mercury (method 1631E), total chromium, total lead, total cadmium, total copper, total hardness, and total zinc. The monitoring results shall be submitted with the NPDES permit renewal application.

Combined Cooling and Ash Pond Water

Once the dewatering operations are completed, outfall 001 will be permitted to discharge the cooling pond water combined with the interstitial water from the ash pond to the Lumber River under special conditions i.e. under extreme weather conditions or during plant maintenance. Data from both the interstitial water and cooling pond were combined to evaluate a potential of combined discharge to the river.

Reasonable Potential Analysis (RPA) (Combined Cooling Pond and Ash Pond Water)

The facility submitted data for the standing surface water in the ash ponds, interstitial water in the ash, and interstitial ash water that was treated by filters of various sizes. The highest measured concentration for a particular parameter was used in conducting RPA to introduce a margin of safety. The Division took the highest discharge rate i.e. 2 MGD for the dewatering process. The RPA was conducted for arsenic, barium, cadmium, chloride, chromium, copper, fluoride, lead, molybdenum, nickel, selenium, thallium and zinc

Except arsenic, none of these parameters showed reasonable potential. Discharge limit was added for arsenic upon commencement of dewatering. Cadmium, chromium, copper lead, thallium and zinc were the parameters of concern for the discharges from coal ash facilities and will be monitored after ash pond water combines with cooling pond water.

Limits and Monitoring Requirements

Current conditions, proposed changes as well as the basis for the changes are summarized in Table 1.

Table 1. Current Conditions and Proposed Changes (Outfall 001)

Parameter	Current Limit/Condition		Change from Previous Permit	Basis for Condition/Change
	Monthly Average	Daily Maximum		
Flow			No Change	15A 2B .0505
Oil & Grease	15 mg/L	20 mg/L	Added limit	40 CFR 423 Ash pond transport legacy waste water
Total Suspended Solids	30 mg/L	100 mg/L	Added limit	40 CFR 423 Ash pond transport legacy wastewater
Turbidity	No monitoring		Added monitoring for combined cooling pond and ash pond water	Parameter of concern for dewatering of ash pond
Temperature			No Change	State WQ standards, 15A 2B .0200
pH	Between 6.0 and 9.0 S.U		No Change	State WQ standards, 15A 2B .0200
BOD ₅	No limit and Monitoring		Added limit and monitoring	Cooling pond water receives domestic wastewater from the septic tank
Fecal coliform	200/100 ml	400/100 ml	Added limit and monitoring	Cooling pond water receives domestic wastewater from the septic tank
Hardness –Total as [CaCO ₃ or (Ca + Mg)]	No monitoring		Added effluent and instream monitoring	Revised water quality standards and EPA’s guidelines on hardness dependent metals
TN, TP, TKN, Nitrate/Nitrite Nitrogen	No monitoring		Added monitoring	15A 2B .0508
Chlorides and Sulfates	No monitoring		Added monitoring for combined cooling pond and ash pond water	Parameters of concern for discharges from coal ash facilities
Total Arsenic	Monitoring only		No Change prior to dewatering. Added limit for combined cooling pond and ash pond water	Parameters of concern for discharges from coal ash facilities RPA results
Total Selenium	Monitoring only		No change	Parameters of concern for discharges from coal ash facilities
Total Iron	Monitoring only		Removed monitoring	Iron is not a parameter of concern from ash pond facilities
Total Copper	Monitoring only		Removed monitoring prior to dewatering Added monitoring for combined cooling pond and ash pond water	Based on RPA results Parameter of concern for discharges from coal ash facilities
Total Cadmium, Total Chromium, Total Lead, Total Zinc, Total Thallium	No monitoring		Added monitoring for combined cooling pond and ash pond water	Parameters of concern for discharges from coal ash facilities
Total Mercury	No limit and monitoring		Added limit and monitoring	Parameter of concern for discharges from coal ash facilities Added TBEL due to lack of mercury data for cooling pond
Naphthalene and Total Phenols	No monitoring		Added monitoring	Parameters of concern for discharges from fuel oil remediation system

B. Internal Outfall 001A (Ash Pond Water)

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 Division proposes an internal outfall (001A) to discharge ash pond water to the cooling pond during dewatering operation. A. (2) in the permit shows effluent limitations and monitoring requirements at this outfall during dewatering of the ash pond. Usually, pH, oil & grease and TSS are monitored at the internal outfalls but the Division took the conservative approach to make sure that all the parameters of concerns are monitored at this outfall. The Division took the conservative approach to monitor the dewatering activities and conducted

mercury evaluation and RPA using the low flow data of Lumber river. The monitoring frequency for all the parameters listed in Section A. (2) is weekly as per the recommendation by EPA.

Mercury Evaluation

Mercury evaluation was conducted using the mercury data for interstitial water submitted by the permittee and permitting guidance developed for the implementation of the statewide Mercury TMDL. The evaluation was conducted using the chemical characterization data for interstitial water from the ash pond. The highest concentration of mercury in the interstitial water was considered for the evaluation. The facility does not need mercury limit according to the results of mercury evaluation. Mercury monitoring has been added to the permit.

Reasonable Potential Analysis (RPA) (Outfall 001A)

RPA was conducted for arsenic, barium, cadmium, chloride, chromium, copper, fluoride, lead, molybdenum, nickel, selenium, thallium and zinc. Except arsenic, none of these parameters showed reasonable potential. Because this is an internal outfall, only monitoring was added for arsenic. Other parameters did not required monitoring. However, cadmium, chromium, copper lead, selenium, thallium and zinc are the parameters of concern for discharges from coal ash facilities. Therefore, monitoring requirements were added in the permit.

Limits and Monitoring Requirements

This is a proposed outfall. All the monitoring requirements are new and will come into effect during the dewatering of the ash pond. The proposed requirements are given in Table – 2.

Table 2. Proposed Changes (Internal Outfall 001A)

Parameter	Proposed Changes		Basis for Condition/Change
	Monthly Average	Daily Maximum	
Flow		2.0 MGD	Based on the capacity of the treatment plant
Oil & Grease	Added limit and monitoring		40 CFR 423 Ash transport legacy wastewater
Total Suspended Solids	Added limit and monitoring		40 CFR 423 Ash transport legacy wastewater
Turbidity	Added monitoring		Parameter of concern for dewatering of ash pond
pH	Between 6.0 and 9.0 S.U		State WQ standards, 15A 2B .0200
Hardness –Total as [CaCO3 or (Ca + Mg)]	Added Monitoring		Revised water quality standards and EPA’s guidelines on hardness dependent metals
Chlorides and Sulfates	Added monitoring		Parameters of concern for discharges from coal ash facilities
Total Arsenic	Added monitoring		Based on the RPA results
Total Cadmium, Total Chromium, Total Copper, Total Lead, Total Selenium, Total Zinc, Total Thallium	Added Monitoring		Parameters of concern for discharges from coal ash facilities
Total Mercury	Added monitoring		Parameter of concern for discharges from coal ash facilities

C. Seeps Outfall 105 (Contaminated groundwater from Seeps 102, 103 & 105)

Existing Discharges from Seepage

The facility identified 16 unpermitted seeps (all non-engineered) from the ash settling basin and 4 toe drains. The data submitted by the permittee was reviewed to determine the need for limits. 8 seeps and 4 toe drains discharge to the cooling pond. Two seeps were identified as future stormwater outfalls and covered in NPDES stormwater permit. The water from other three seeps was not contaminated with the pollutants associated with coal ash. Therefore, these 13 seeps and 4 toe drains are not considered point-source wastewater discharges under the Clean Water Act. They do not need coverage under the permit based on the low concentration of the pollutants associated with the coal ash and or/absence of a discharge to “Waters of the State”.

Remaining 3 non-engineered seeps from the ash settling basin discharge to Jacob Swamp. The location of the seeps is identified below and is depicted on the map attached to the permit.

Table 3. Seep Coordinates and Assigned Outfall Numbers

Discharge ID	Latitude	Longitude	Outfall number
S-2	34° 35' 36"N	78° 58' 11" W	105
S-3	34° 35' 30"N	78° 57' 04" W	105
S-5	34° 35' 23"N	78° 57' 57" W	105

The outfall for this discharge is through an effluent channel meeting the requirements in 15A NCAC 2B .0228. Within 180 days of the effective date of this permit, the permittee shall demonstrate, through instream sampling meeting the requirements of condition A.(10), that the water quality standards in the receiving stream are not contravened.

Discharges from Seepage Identified After Permit Issuance

The facility shall comply with the “Plan for Identification of New Discharges” as contained in Attachment 2. For any discharge identified pursuant to this Plan, the facility shall, within 90 days of the seep discovery, determine if the discharge seep meets the state water quality standards established in 15A NCAC 2B .0200 and submit the results of this determination to the Division. If the standards are not contravened, the facility shall conduct monitoring for the parameters specified in A. (3).

If any of the water quality standards are exceeded, the facility shall be considered in violation until one of the options below is fully implemented:

- 1) Submit a complete application for 404 Permit (within 30 days after determining that a water quality standard is exceeded) to pump the seep discharge to one of the existing outfalls, install a pipe to discharge the seep to the Lumber River, or install an in-situ treatment system. After the 404 Permit is obtained, the facility shall complete the installation of the pump, pipe, or treatment system within 180 days from the date of the 404 permit receipt and begin pumping/discharging or treatment.
- 2) Demonstrate through modeling that the decanting and dewatering of the ash basin will result in the elimination of the seep. The modeling results shall be submitted to the Division within 120 days from the date of the seep discovery. Within 180 days from the completion of the dewatering the facility shall confirm that the seep flow ceased. If the seep flow continues, the facility shall choose one of the other options in this Special Condition.
- 3) Demonstrate that the seep is discharging through the designated “Effluent Channel” and the water quality standards in the receiving stream are not contravened. This demonstration should be submitted to the Division no later than 180 days from the date of the seep discovery. The “Effluent Channel” designation should be established by the DEQ Regional Office personnel prior to the issuance of the permit. This permit shall be reopened for cause to include the “Effluent Channel” in a revised permit.

The facility intends to divert seepage from S-2 and S-3 to S-5 from Jacob Swamp to the cooling pond by diverting existing drainage ditch that carries water from these three seeps. This project is in the planning phase. The proposed design involves constructing an approximately 320 feet grass lined ditch to direct water flow into an existing drainage which conveys tow drain seepage and ash pond water to the cooling pond. The design and procurement would take approximately 4 months and construction will be completed in 1 month after procuring all the necessary permits for this project.

All effluent limits, including water quality-based effluent limits, remain applicable notwithstanding any action by the Permittee to address the violation through one of the identified options, so that any discharge in exceedance of an applicable effluent limit is a violation of the Permit as long as the seep remains flowing.

New Identified Seeps

If new seeps are identified, the facility shall follow the procedures outlined above. The deadlines for new seeps shall be calculated from the date of the seep discovery. The new identified seeps are not permitted until the permit is modified and the new seep included in the permit and the new outfall established for the seep.

The permittee shall notify the Fayetteville Regional Office and the NPDES Permitting Unit 7 days prior to the connection of Outfall 105 to the cooling pond

Ash Pond Dams

Seepage through earthen dams is common and is an expected consequence of impounding water with an earthen embankment. Even the tightest, best-compacted clays cannot prevent some water from seeping through them. Seepage is not necessarily an indication that a dam has structural problems, but should be kept in check through various engineering controls and regularly monitored for changes in quantity or quality which, over time, may result in dam failure.

Mercury Evaluation

RPA was conducted for the discharge from seeps S-2, S-3 & S-5 to determine the need for mercury limit. The analysis showed that the mercury levels in the seepage did not show reasonable potential to violate state's water quality standards. Mercury limit was not required at this outlet. Monthly and quarterly monitoring requirements were added at this outfall (Refer A. (3)).

Reasonable Potential Analysis (RPA) (Outfall 105)

The RPA was conducted for arsenic, barium, cadmium, chloride, chromium, copper, fluoride, lead, molybdenum, nickel, selenium, thallium and zinc. Arsenic, Lead, Selenium and Thallium showed reasonable potential to violate the water quality criteria/ standards for Jacob Swamp. Discharge limitation requirements were added to the permit. No limits were added for other parameters as they were not detected or did not show reasonable potential. Monthly and quarterly monitoring requirements were added for all the parameters. A. (3) presents effluent limitations and monitoring requirements for outfall 105.

Limits and Monitoring Requirements

Effluent limitation and monitoring requirements for seeps outfall 105 are given in table – 4.

Table 4. Proposed Changes (Seeps Outfall 105)

Parameter	Proposed Changes		Basis for Condition/Change
	Monthly Average	Daily Maximum	
Flow			15A 2B .0505
Oil & Grease	Added limit and monitoring		40 CFR 423 Ash transport legacy wastewater
Total Suspended Solids	Added limit and monitoring		40 CFR 423 Ash transport legacy wastewater
TDS, Chlorides, Fluorides and Sulfates	Added monitoring		Parameters of concern for discharge from coal ash facilities
Nitrate/Nitrite	Added monitoring		Parameter of concern for discharges from coal ash facilities
pH	Between 6.0 and 9.0 S.U		State WQ standards, 15A 2B .0200
Temperature	Added monitoring		Parameter of concern for discharges from coal ash facilities
Conductivity	Added monitoring		Parameter of concern for discharges from coal ash facilities
Hardness –Total as [CaCO ₃ or (Ca + Mg)]	Added monitoring		Revised water quality standards and EPA's guidelines on hardness dependent metals
Total Arsenic, Total Lead, Total Selenium, Total Thallium	Added limit and monitoring		Based on the RPA results
Total Cadmium, Total Barium, Total Chromium, Total Copper, , Total Iron, Total Manganese, Total Molybdenum, Total Nickel, Total Zinc	Added monitoring		Parameters of concern for discharges from coal ash facilities
Total Mercury	Added monitoring		Parameter of concern for discharges from coal ash facilities

IV CWA SECTION 316(a) and 316(b)

W.H. Weatherspoon Plant has ceased operations of its coal fired power generation units since 2011. CWA section 316 (a) and 316 (b) are not applicable for this facility.

V. OTHER PROPOSED CHANGES

1. To meet new federal regulations for electronic reporting, Special Condition A. (13) has been added describing requirements for submittal of electronic DMRs.
2. A. (6) Biocide condition was changed for biocide used in cooling pond which was required for cooling water systems in the previous permit
3. Following new conditions were added to the draft permit to be consistent with other Duke permits.
 - ✦ A. (4) Additional Conditions and Definitions
 - ✦ A. (7) Groundwater Monitoring Well Construction and Sampling
 - ✦ A. (8) Structural Integrity Inspections of Ash Pond Dam
 - ✦ A. (9) Ash Pond Closure
 - ✦ A. (10) Instream Monitoring
 - ✦ A. (11) Applicable State Law (State Enforceable Only)
 - ✦ A. (12) Domestic Wastewater Treatment Plant
 - ✦ A. (14) Discharge from Seepage
 - ✦ A. (15) Fish Tissue Monitoring Near Ash Pond Discharge
4. Stormwater permit requirements were removed from the permit.
5. Attachment I Groundwater Monitoring Plan was added to the permit.
6. Attachment II Plan for Identification of New Discharges (State Enforceable Only) was added to the permit.

VI. PROPOSED SCHEDULE FOR PERMIT ISSUANCE

Draft Permit to Public Notice: 9/19/2016

Public Hearing: 10/25/2016

Permit Scheduled to Issue (tentative): 12/8/2016

VII. STATE CONTACT INFORMATION

If you have any questions on any of the above information or on the attached permit, please contact Trupti Desai at (919) 807-6351 or trupti.desai@ncdenr.gov.

Copies of the following are attached to provide further information on the permit development:

- Draft permit
- Mercury analysis
- Reasonable Potential Analysis

NPDES Recommendation by:

Signature: *Trupti A. Desai*

Date: 9/19/2016