

North Carolina Department of Environment and Natural Resources

Division of Water Quality
Coleen H. Sullins

Beverly Eaves Perdue Coleen H. So Governor Director Dee Freeman Secretary

January 18, 2011

Mr. Allen Stowe Water Management, Duke Energy Corporation, P.O. Box 1006 Charlotte, North Carolina 28201

Subject:

NPDES Permit Issuance Permit No. NC0004961 Riverbend Steam Station Gaston County

Dear Mr. Stowe:

The Division of Water Quality is forwarding herewith the Final NPDES permit for Riverbend Steam Station. This permit renewal is issued pursuant to the requirements of North Carolina General Statute 143-215.1 and the Memorandum of Agreement between North Carolina and the U.S. Environmental Protection Agency dated October 15, 2007 (or as subsequently amended).

A public hearing was held on October 19, 2010 in Mooresville seeking comments on the Draft permit and proposed continuation of the Clean Water Act Section 316(a) temperature variance. This Final permit incorporates recommendations of the DWQ Hearing Officer as well as other changes. Listed below are all changes from the previous permit:

- <u>Structural integrity inspection of ash pond dam.</u> Dam safety and design requirements per 15A NCAC 2K are required.
- <u>CWA Section 316(a) Thermal Variance</u>. This condition requires the facility to submit a Balanced and Indigenous Population (BIP) study plan that conforms to EPA study guidelines, and receives DWQ and EPA concurrence prior to study implementation. A BIP report must be submitted no later than 180 days prior to permit expiration, should the permittee request continuation of the CWA Section 316(a) thermal variance.
- <u>Fish Tissue Monitoring Near Ash Pond Discharge</u>. The facility shall conduct fish tissue monitoring near the ash pond discharge, once during the permit term, and analyze for arsenic, selenium, and mercury. The fish tissue monitoring shall be in accordance with the Sampling Plan approved by the Division.
- <u>Instream Monitoring</u>. The facility shall conduct semiannual instream monitoring at two BIP monitoring stations (located upstream and downstream of the ash pond discharge). Samples shall be analyzed for arsenic, selenium, mercury, chromium, lead, cadmium, copper, zinc, and total dissolved solids (TDS).
- Quarterly effluent monitoring for mercury was added to Outfall 002.



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- Ash Pond Closure. The facility shall prepare an Ash Pond Closure Plan in anticipation of the facility closure. This Plan shall be submitted to the Division one year prior to the closure of the facility.
- Monitoring frequency for Oil and Grease has been reduced to annually based on DMR data and as a response to your request.
- Monitoring frequency for TSS has been reduced to monthly based on DMR data and as a response to your request.
- Groundwater monitoring was added to the permit. Please see Special Condition A.(11.)

If any parts, measurement frequencies, or sampling requirements contained in this permit are unacceptable to you, you have the right to an adjudicatory hearing upon written request within thirty (30) days following receipt of this letter. This request must be in the form of a written petition, conforming to Chapter 150B of the North Carolina General Statutes, and filed with the office of Administrative Hearings, 6714 Mail Service Center, Raleigh, North Carolina 27699-6714. Unless such a demand is made, this permit shall be final and binding.

Please take notice that this permit is not transferable except after notice to the Division of Water Quality. The Division may require modification or revocation and reissuance of the permit. This permit does not affect the legal requirements to obtain other permits which may be required by the Division of Water Quality, the Division of Land Resources, the Coastal Area Management Act, or any other federal or local governmental permit.

If you have any questions on this permit, please contact Sergei Chernikov at 919-807-6393.

Sincerely,

Coleen H. Spillins

Hardcopy:

Central Files, NPDES Files

Mooresville Regional Office, SWPS

NPDES files

Email:

US EPA, Region IV

Aquatic Toxicology Unit

Kay Bond, Southern Environmental Law Center [kbond@selcnc.org]
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Hope Taylor, CWFNC [hope@cwfnc.org]



STATE OF NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES DIVISION OF WATER QUALITY

PERMIT

TO DISCHARGE WASTEWATER UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provision of North Carolina General Statute 143-215.1, other lawful standards and regulations promulgated and adopted by the North Carolina Environmental Management Commission, and the Federal Water Pollution Control Act, as amended,

Duke Energy Carolinas, LLC

is hereby authorized to discharge wastewater from a facility located at the

Riverbend Steam Station Mount Holly Gaston County

to receiving waters designated as the Catawba River in the Catawba River Basin

in accordance with effluent limitations, monitoring requirements, and other conditions set forth in Parts I, II, III and IV hereof.

This permit shall become effective March 1, 2011.

This permit and authorization to discharge shall expire at midnight on February 28, 2015. Signed this day January 18, 2011.

Division of Water Quality

By Authority of the Environmental Management Commission

SUPPLEMENT TO PERMIT COVER SHEET

All previous NPDES Permits issued to this facility, whether for operation or discharge are hereby revoked. As of this permit issuance, any previously issued permit bearing this number is no longer effective. Therefore, the exclusive authority to operate and discharge from this facility arises under the permit conditions, requirements, terms, and provisions included herein.

Duke Energy Carolinas, LLC is hereby authorized to:

1. Continue to discharge:

- Once through cooling water (outfall 001) consisting of intake screen backwash and water from the plant chiller system, turbine lube oil coolers, condensate coolers, main turbine steam condensers and the intake tunnel dewatering sump
- Ash basin discharge (outfall 002) consisting of induced draft fan and preheater bearing cooling water, stormwater from roof drains and paving, treated groundwater, track hopper sump (groundwater), coal pile runoff, laboratory drain and chemical makeup tanks and drums rinsate wastes, ash transport water, general plant/trailer sanitary wastewater, metal cleaning waste, chemical metal cleaning waste, combustion turbine cooling water discharges, turbine and boiler rooms sumps, vehicle rinse water, and stormwater from pond areas and upgradient watershed
- Yard sump overflow (002A)
 From a facility located at Riverbend Steam Station, Mount Holly in Gaston County, and
- 2. Discharge wastewater from said treatment works at the location specified on the attached map into the Catawba River, which is classified WS-IV and B-CA waters in the Catawba River Basin.

A. (1.) EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning on the effective date of this permit and lasting until expiration, the Permittee is authorized to discharge once-through cooling water and intake screen backwash from outfall 001. Such discharges shall be limited and monitored by the Permittee as specified below:

EFFLUENT CHARACTERISTICS	LIN	LIMITS		MONITORING REQUIREMENTS			
	Monthly Average	Daily Maximum	Measurement Frequency	Sample Type	Sample Location ¹		
Flow			Daily	Pump Logs	Influent or Effluent		
Temperature (°F)	95.0 (35°C)		Daily	Grab	Effluent		
Temperature (°F) ²		89.6 (32°C)	Daily	Grab	Downstream		
Temperature (°F)3			Daily	Grab	Effluent		

Notes:

- 1. Downstream sampling point: downstream at Mountain Island Lake. If samples are collected below the water surface, the Permittee will record the sample depth on the DMR form.
- 2. The ambient temperature shall not exceed 89.6°F (32.0°C) and is defined as the daily average downstream water temperature. When the Riverbend Station effluent temperature is recorded below 89.6°F (32.0°C), as a daily average, then monitoring and reporting of the downstream water temperature is not required. In cases where the Permittee experiences equipment problems and is unable to obtain daily temperatures from the existing temperature monitoring system, the temperature monitoring must be reestablished within five working days.
- 3. This temperature requirement is in effect when only units with a shared control system are operating.
 - 1. If the daily average intake temperature is below 36.5°F (2.5°C), the daily average effluent temperature shall not exceed 50.0°F (10°C), and
 - 2. If the daily average intake temperature ranges from 36.5°F (2.5°C) to 55.0°F (12.8°C), the daily average effluent temperature shall not exceed two times the intake temperature (°F) minus 23.

Chlorination of the once through condenser cooling water, discharged through outfall 001, is not allowed under this permit. Should Duke Energy wish to chlorinate its condenser cooling water, a permit modification must be requested and received prior to commencing chlorination.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

A. (2.) EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning on the effective date of this permit and lasting until expiration, the Permittee is authorized to discharge from outfall 002. Such discharges shall be limited and monitored by the Permittee as specified below:

EFFLUENT CHARACTERISTICS	LIMITS		MONITORING REQUIREMENTS			
	Monthly Average	Daily Maximum	Measurement Frequency	Sample Type	Sample Location	
Flow		A STATE OF STATE	Weekly	Pump logs or estimate	Influent or Effluent	
Total Suspended Solids ¹	23.0 mg/L	75.0 mg/L	Monthly	Grab	Effluent	
Oil and Grease	11.0 mg/L	15.0 mg/L	Annually	Grab	Effluent	
Total Copper ²	1.0 mg/L	1.0 mg/L	Quarterly	Grab	Effluent	
Total Iron ²	1.0 mg/L	1.0 mg/L	Quarterly	Grab	Effluent	
Total Arsenic ²			Quarterly	Grab	Effluent	
Total Selenium ²			Quarterly	Grab	Effluent	
Total Mercury			Quarterly	Grab	Effluent	
Total Phosphorus			Semi-annually	Grab	Effluent	
Total Nitrogen (NO ₂ + NO ₃ + TKN)			Semi-annually	Grab	Effluent	
pH ³			Monthly	Grab	Effluent	
Chronic Toxicity ⁴			Quarterly	Grab	Effluent	

Notes:

- 1. Monthly average of 43 mg/L is permitted provided that the Permittee can satisfactorily demonstrate that the difference between 23 mg/L and 43 mg/L is a result of the concentration of total suspended solids in the intake water.
- 2. Total metals are defined by 40 CFR 136. Any method specified by 40 CFR 136 is considered acceptable for analysis.
- 3. The pH shall not be less than 6.0 standard units nor greater than 9.0 standard units.
- 4. Whole Effluent Toxicity shall be monitored by chronic toxicity (Ceriodaphnia) P/F at 10%. Tests shall be conducted in January, April, July and October (see Part A.(4.) for details)

The metal cleaning waste, coal pile runoff, ash transport water, domestic wastewater, and low volume waste shall be discharged into the ash settling pond.

No chemicals, cleaners, or other additives may be present in the vehicle wash water to be discharged from this outfall.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

A. (3.) EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning on the effective date of this permit and lasting until expiration, the Permittee is authorized to discharge from outfall 002A – Yard Sump Overflows. Such discharges shall be limited and monitored by the Permittee as specified below:

EFFLUENT CHARACTERISTICS	LIM	LIMITS		MONITORING REQUIREMENTS			
	Monthly Average	Daily Maximum	Measurement Frequency	Sample Type	Sample Location		
Flow			Episodic	Estimate	Effluent ¹		
pH			Episodic	Grab	Effluent		
Total Suspended Solids ²	23.0 mg/L	75.0 mg/L	Episodic	Grab	Effluent		
Oil and Grease ²	11.0 mg/L	15.0 mg/L	Episodic	Grab	Effluent		
Fecal Coliform			Episodic	Grab	Effluent		
Total Copper ³	1.0 mg/L	1.0 mg/L	Episodic	Grab	Effluent		
Total Iron ³	1.0 mg/L	1.0 mg/L	Episodic	Grab	Effluent		

Notes:

- 1. Effluent sampling shall be conducted at a point upstream of discharge to the receiving stream.
- 2. The monthly average limits for total suspended solids and oil and grease are applicable only if the overflow occurs for more than 24 hours.
- 3. The limits for total copper and total iron only apply during a chemical metals cleaning.

THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS

ALL FLOWS SHALL BE REPORTED ON MONTHLY DMRS. SHOULD NO FLOW OCCUR DURING A GIVEN MONTH, THE WORDS "NO FLOW" SHOULD BE CLEARLY WRITEN ON THE FRONT OF THE DMR. EPISODIC SAMPLING IS REQUIRED PER OCCURRANCE WHEN SUMP OVERFLOWS OCCUR FOR LONGER THAN ONE HOUR. ALL SAMPLES SHALL BE OF A REPRESENTATIVE DISCHARGE.

A. (4.) CHRONIC TOXICITY PASS/FAIL PERMIT LIMIT (QUARTERLY)

The effluent discharge shall at no time exhibit observable inhibition of reproduction or significant mortality to *Ceriodaphnia dubia* at an effluent concentration of **10%**.

The permit holder shall perform at a minimum, <u>quarterly</u> monitoring using test procedures outlined in the "North Carolina Ceriodaphnia Chronic Effluent Bioassay Procedure," Revised February 1998, or subsequent versions or "North Carolina Phase II Chronic Whole Effluent Toxicity Test Procedure" (Revised-February 1998) or subsequent versions. **The tests will be performed** during the months of January, April, July and October. Effluent sampling for this testing shall be performed at the NPDES permitted final effluent discharge below all treatment processes.

If the test procedure performed as the first test of any single quarter results in a failure or ChV below the permit limit, then multiple-concentration testing shall be performed at a minimum, in each of the two following months as described in "North Carolina Phase II Chronic Whole Effluent Toxicity Test Procedure" (Revised-February 1998) or subsequent versions.

The chronic value for multiple concentration tests will be determined using the geometric mean of the highest concentration having no detectable impairment of reproduction or survival and the lowest concentration that does have a detectable impairment of reproduction or survival. The definition of "detectable impairment," collection methods, exposure regimes, and further statistical methods are specified in the "North Carolina Phase II Chronic Whole Effluent Toxicity Test Procedure" (Revised-February 1998) or subsequent versions.

All toxicity testing results required as part of this permit condition will be entered on the Effluent Discharge Monitoring Form (MR-1) for the months in which tests were performed, using the parameter code TGP3B for the pass/fail results and THP3B for the Chronic Value. Additionally, DWQ Form AT-3 (original) is to be sent to the following address:

Attention: North Carolina Division of Water Quality
Environmental Sciences Section
1621 Mail Service Center
Raleigh, North Carolina 27699-1621

Completed Aquatic Toxicity Test Forms shall be filed with the Environmental Sciences Section no later than 30 days after the end of the reporting period for which the report is made.

Test data shall be complete, accurate, include all supporting chemical/physical measurements and all concentration/response data, and be certified by laboratory supervisor and ORC or approved designate signature. Total residual chlorine of the effluent toxicity sample must be measured and reported if chlorine is employed for disinfection of the waste stream.

Should there be no discharge of flow from the facility during a month in which toxicity monitoring is required, the permittee will complete the information located at the top of the aquatic toxicity (AT) test form indicating the facility name, permit number, pipe number, county, and the month/year of the report with the notation of "No Flow" in the comment area of the form. The report shall be submitted to the Environmental Sciences Section at the address cited above. Should the permittee fail to monitor during a month in which toxicity monitoring is required, monitoring will be required during the following month. Should any test data from this monitoring requirement or tests performed by the North Carolina Division of Water Quality indicate potential impacts to the receiving stream, this permit may be re-opened and modified to include alternate monitoring requirements or limits. If the Permittee monitors any pollutant more frequently then required by this permit, the results of such monitoring shall be included in the calculation & reporting of the data submitted on the DMR & all AT Forms submitted.

NOTE: Failure to achieve test conditions as specified in the cited document, such as minimum control organism survival, minimum control organism reproduction, and appropriate environmental controls, shall constitute an invalid test and will require immediate follow-up testing to be completed no later than the last day of the month following the month of the initial monitoring.

A. (5.) BIOCIDE CONDITION

The permittee shall not use any biocides except those approved in conjunction with the permit application. The permittee shall notify the Director in writing not later than ninety (90) days prior to instituting use of nay additional biocide used in cooling systems which may be toxic to aquatic life other than those previously reported to the Division of Water Quality. Such notification shall include completion of Biocide Worksheet From 101 and a map locating the discharge point and receiving stream. Completion of a Biocide Worksheet 101 is not necessary for the introduction of a new biocide into an outfall currently being tested for toxicity.

A. (6.) SPECIAL CONDITIONS

The following special conditions are applicable to all outfalls regulated by NC0004961:

- There shall be no discharge of polychlorinated biphenyl compounds.
- The Permittee shall check the diked areas for leaks by a visual inspection and shall report any leakage detected
- Nothing contained in this permit shall be construed as a waiver by the Permittee or any right to a hearing it may have pursuant to State or Federal laws or regulations.
- Discharge of any product registered under the Federal Insecticide, Fungicide, and Rodenticide Act
 to any waste stream which may ultimately be released to lakes, rivers, streams or other wasters
 of the United States is prohibited unless specifically authorized elsewhere in this permit.
 Discharge of chlorine from the use of chlorine gas, sodium hypochlorite, or other similar
 chlorination compounds for disinfection in the plant potable and service water systems and in
 sewage treatment is authorized. Use of restricted use pesticides for lake management purposes
 by applicators licensed by the N.C. Pesticide Board is allowed.
- The Permittee shall report all visible discharges of floating materials, such as an oil sheen, to the Director when submitting DMRs

A. (7.) PERMIT TERMS

The following are applicable to all outfalls regulated by NC0004961:

- The term "low volume waste sources" means, taken collectively as if from one source, wastewater from all sources except those for which specific limitations are otherwise established in this part. Low volume wastewater sources include, but are not limited to: wastewater from wet scrubber air pollution control systems, ion exchange water treatment system, water treatment evaporator blowdown, laboratory and sampling streams, boiler blowdown, floor drains, cooling tower basin cleaning wastes, and recirculating service water systems. Sanitary and air conditioning wastes are not included.
- The term "metal cleaning waste" means any wastewater resulting from cleaning (with or without chemical cleaning compounds) any metal process equipment including, but not limited to, boiler tube cleaning, boiler fireside cleaning, and air preheater cleaning. Chemical metal cleaning will be conducted according to Duke Energy approved equivalency demonstration.
- It has been determined from information submitted that the plans and procedures in place at Riverbend Steam Station are equivalent to that of a BMP.

A. (8.) ASH SETTLING BASIN

Beginning on the effective date of this permit and lasting until expiration, there shall be no discharge of plant wastewater to the ash pond unless the Permittee provides and maintains at all times a minimum free water volume (between the top of the sediment level and the minimum discharge elevation) equivalent to the sum of the maximum 24-hour plant discharges plus all direct rainfall and all runoff flows to the pond resulting from a 10-year, 24-hour rainfall event, when using a runoff coefficient of 1.0. During the term of the permit, the Permittee shall remove settled material from the ponds or otherwise enlarge the available storage capacities in order to maintain the required minimum volumes at all times. The Permittee shall determine and report to the permit issuing authority the following on an annual basis:

- 1) the actual free water volume of the ash pond,
- 2) physical measurements of the dimensions of the free water volume in sufficient detail to allow validation of the calculated volume, and
- 3) a certification that the required volume is available with adequate safety factor to include all solids expected to be deposited in the pond for the following year.

Present information indicates a needed volume of 86.2 acre-feet in addition to solids that will be deposited to the ash pond; any change to plant operations affecting such certification shall be reported to the Director within five days.

NOTE: In the event that adequate volume has been certified to exist for the term of the permit, periodic certification is not needed.

A.(9.) BOILER CLEANING WASTES

It has been demonstrated that under certain conditions it is possible to reduce the concentration of metals in boiler cleaning wastes in the range of 92-99+ percent by treatment in ash ponds. Because of dilution problems and the existence of boundary interface layers at the extremities of the plume, it is difficult to prove beyond doubt that the quantity of iron and copper discharge will always be less than one milligram per liter times the flow of metal cleaning when treated in this manner.

The application of physical/chemical methods of treating wastewater has also been demonstrated to be effective in the treatment of metal cleaning wastes. However, the effectiveness of ash pond treatment should be considered in relation to the small differences in effluent quality realized between the two methods.

It has been demonstrated that the presence of ions of copper, iron, nickel and zinc in the ash pond waters was not measurably increased during the ash pond equivalency demonstration oat the Duke Energy's Riverbend Steam Station. Therefore, when the following conditions are implemented during metal cleaning procedures, effective treatment for metals can be obtained at this facility:

- 1. Large ash basin providing potential reaction volumes in the ratio of 100 to 1.
- 2. Well-defined shallow ash delta near the ash basin influent.
- 3. Ash pond pHs of no less than 6.5 prior to metal cleaning waste addition.
- 4. Four days retention time in ahs pond with effluent stopped.
- 5. Boiler volume less than 86,000 gallons.
- 6. Chemicals for cleaning to include only one or more of the following:
 - a. Copper removal step- sodium bromate (NaBrO₂), ammonium carbonate ((NH₄)₂CO₃-H₂O, and ammonium hydroxide (NH₄OH).
 - b. Iron removal step hydrochloric acid (HCl), ammonium bifluoride ((NH₄)HF₂ and proprietary inhibitors.
- 7. Maximum dilution of wastewater before entering ash pond: 6 to 1.
- 8. If monitoring of basin effluents (as required by the permit) after treatment of metal cleaning wastes reveals discharges outside the limits of the permit, Permittee will:
 - 1) re-close the basin discharge,
 - 2) conduct such in-basin sampling as necessary to determine the cause of nonconformance,
 - 3) take appropriate corrective actions, and
 - 4) file a report with EPA including all pertinent data.

A.(10.) SECTION 316 (B) OF CWA

The permittee shall comply with the Cooling Water Intake Structure Rule per 40 CFR 125.95.

A.(11.) GROUNDWATER MONITORING WELL CONSTRUCTION AND SAMPLING

The permittee shall conduct groundwater monitoring to determine the compliance of this NPDES permitted facility with the current groundwater Standards found under 15A NCAC 2L .0200. The monitoring shall be conducted in accordance with the Sampling Plan approved by the Division.

A.(12.) STRUCTURAL INTEGRITY INSPECTIONS OF ASH POND DAM

The facility shall meet the dam design and dam safety requirements per 15A NCAC 2K.

A.(13.) CWA SECTION 316(A) THERMAL VARIANCE

The thermal variance granted under Section 316(a) terminates on expiration of the NPDES permit. Should the permittee wish a continuation of its 316(a) thermal variance beyond the term of this permit, reapplication for such continuation shall be submitted in accordance with 40 CFR Part 125, Subpart H and Section 122.21(1)(6) not later than 180 days prior to permit expiration. Reapplication shall include a basis for continuation such as a) plant operating conditions and load factors are unchanged and are expected to remain so for the term of the reissued permit; b) there are no changes to plant discharges or other discharges in the plant site area which

could interact with the thermal discharges; and c) there are no changes to the biotic community of the receiving water body which would impact the previous variance determination.

The next 316 (a) studies shall be performed in accordance with the Division of Water Quality approved plan. The temperature analysis and the balanced and indigenous study plan shall conform to the specifications outlined in 40 CFR 125 Subpart H and the EPA's Draft 316a Guidance Manual, dated 1977. The EPA shall be provided an opportunity to review the plan prior to the commencement of the study.

A.(14.) FISH TISSUE MONITORING NEAR ASH POND DISCHARGE

The facility shall conduct fish tissue monitoring once during the permit term and submit the results with the NPDES permit renewal application. The objective of the monitoring is to evaluate potential uptake of pollutants by fish tissue near the Ash Pond discharge. The parameters analyzed in fish tissue shall be arsenic, selenium, and mercury. The monitoring shall be conducted in accordance with the Sampling Plan approved by the Division.

A.(15.) INSTREAM MONITORING

The facility shall conduct semiannual in stream monitoring (one upstream and one downstream of the ash pond discharge) for arsenic, selenium, mercury, chromium, lead, cadmium, copper, zinc, and total dissolved solids (TDS). Instream monitoring should be conducted at the stations that have already been established through the BIP monitoring program. The monitoring results shall be submitted with the NPDES permit renewal application.

A.(16.) ASH POND CLOSURE

The facility shall prepare an Ash Pond Closure Plan in anticipation of the facility closure. This Plan shall be submitted to the Division one year prior to the closure of the facility.

A.(17.) PRIORITY POLLUTANT ANALYSIS

The Permittee shall conduct a priority pollutant analysis (in accordance with 40 CFR Part 136) once per permit cycle at outfall 002 and submit the results with the application for permit renewal.