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 provisions 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

Cliffside Steam Station
NCSR 1002
South of Cliffside
Rutherford County

to receiving waters designated as the Broad River in the Broad 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 July 31, 2015.

Signed this day February 20, 2012.

Original signed by Tom Belnick

Charles Wakild, P.E., Director
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:

   - Treated wastewater from the ash basin through outfall 002, containing low volume wastes, coal pile runoff, metal cleaning wastes, treated domestic wastewater, chemical metal cleaning wastes, water treatment system wastewaters, ash transport water, landfill leachate (landfill contains fly and bottom ash, and gypsum from FGD system), cooling towers blow down, runoff from limestone stacking area and gypsum stacking area.

   - Emergency yard drainage basin overflow through outfall 002A.

   From a facility located at Cliffside Steam Station, off of NCSR 1002, South of Cliffside in Rutherford County;

2. Discharge from said treatment works at the location specified on the attached map into the Broad River which is classified C waters in the Broad River Basin.

A. (1.) EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

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

Effluent Characteristics	Discharge Limitations		Monitoring Requirements		
	Monthly Average	Daily Maximum	Measurement Frequency	Sample Type	Sample Location[1]
Flow (MGD)			Weekly	Calculation or similar readings	T
Oil and Grease	15.0 mg/L	20.0 mg/L	Monthly	Grab	E
Total Suspended Solids[2]	30.0 mg/L	100.0 mg/L	Monthly	Grab	E
Total Copper	1.0 mg/L	1.0 mg/L	See Note 3	Grab	E
Total Iron	1.0 mg/L	1.0 mg/L	See Note 3	Grab	E
Total Arsenic			Monthly	Grab	E
Total Selenium			Monthly	Grab	E
Chronic Toxicity[4]			Quarterly	Grab	E
Total Nitrogen (NO_2+NO_3+TKN)			Quarterly	Grab	E
Total Phosphorus			Quarterly	Grab	E
pH[5]			2/Month	Grab	E
Total Cadmium[6]			Weekly	Grab	E
Total Chromium[6]			Weekly	Grab	E
Total Mercury			Monthly	Grab	E
Total Nickel[6]			Weekly	Grab	E
Total Silver[6]			Weekly	Grab	E
Total Zinc[6]			Weekly	Grab	E
Temperature	35°C (95°F)		Weekly	Grab	E
Temperature[7]	32°C (89.6°F)		Weekly [8]	Grab	D

Notes:

1. Sample Locations: T – Ash Basin Discharge Tower, E – Effluent; Effluent sampling shall be conducted at the discharge from the ash settling pond prior to mixing with any other waste streams, D - Downstream at the Gaffney Water Works.
2. A total suspended solids monthly average of 50 mg/L is permitted provided that the permittee can satisfactorily demonstrate that the difference between the monthly average of 30 mg/L and 50 mg/L is the result of the concentration of total suspended solids in the intake water.
3. Monitoring shall be per occurrence of chemical metal cleaning and sample shall be from a representative discharge.
4. Chronic Toxicity (Ceriodaphnia) P/F at 7.14 %; March, June, September, and December; See condition A. (7.) of this permit.
5. The pH shall not be less than 6.0 standard units nor greater than 9.0 standard units.
6. Monitoring will become effective only after the discharge from the FGD system commences (Outfall 004).
7. In no case should the ambient temperature exceed 32°C (89.6°F). When the effluent temperature is recorded below 32°C, reporting and monitoring of the downstream water temperature is not required. The ambient temperature shall be defined as the weekly average downstream water temperature.

8. In cases when the permittee experiences equipment problems and is unable to obtain weekly temperature from the temperature monitoring system, monitoring shall be reestablished within five working days.

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

The metal cleaning waste, coal pile runoff, ash transport water, domestic wastewater, landfill leachate, cooling tower blowdown, limestone and gypsum stacking area runoff, and low volume wastes shall be discharged into the ash settling pond.

The mixing zone is defined as the area extending from the intake of the power plant to approximately twelve (12) miles downstream at a location between the Cherokee County, South Carolina/Cleveland County, North Carolina and the substation for Gaston Shoals Power Plant, at the Gaffney Water Works.

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 any 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 Form 101 and a map locating the discharge point and receiving stream.

A. (2.) EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

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

Effluent Characteristics	Discharge Limitations		Monitoring Requirements		
	Monthly Average	Daily Maximum	Measurement Frequency	Sample Type	Sample Location[1]
Flow (MGD)			Episodic	Estimate	E
Oil and Grease	15 mg/L	20 mg/L	Episodic	Grab	E
Total Suspended Solids	30 mg/L	100 mg/L	Episodic	Grab	E
pH [2]			Episodic	Grab	E
Total Copper	1.0 mg/L	1.0 mg/L	See Note 3	Grab	E
Total Iron	1.0 mg/L	1.0 mg/L	See Note 3	Grab	E

Notes:

1. Sample Locations: E – Effluent Tower.
2. The pH shall not be less than 6.0 standard units nor greater than 9.0 standard units.
3. Monitor only if the emergency overflow is used when chemical metal cleaning waste is being discharged.

EPISODIC SAMPLING IS REQUIRED PER OCCURRANCE WHEN POND OVERFLOWS OCCUR FOR LONGER THAN ONE HOUR. ALL SAMPLES SHALL BE OF A REPRESENTATIVE DISCHARGE. THE DIVISION SHALL BE NOTIFIED IF THE EMERGENCY BASIN DISCHARGES.

A. (3.) EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning on the effective date of the permit and lasting until expiration, the Permittee is authorized to discharge from internal outfall serial number 004 – FGD Wastewater Treatment System to Ash Settling Basin. Such discharges shall be limited and monitored by the Permittee as specified below:

Effluent Characteristics	Discharge Limitations		Monitoring Requirements		
	Monthly Average	Daily Maximum	Measurement Frequency	Sample Type	Sample Location[1]
Flow	Monitor & Report		Monthly	Pump Logs or similar readings	E
Total Suspended Solids	Monitor & Report		Weekly	Grab	E
Total Arsenic	Monitor & Report		Weekly	Grab	E
Total Cadmium	Monitor & Report		Weekly	Grab	E
Total Chromium	Monitor & Report		Weekly	Grab	E
Chloride	Monitor & Report		Weekly	Grab	E
Total Mercury	Monitor & Report		Weekly	Grab	E
Total Nickel	Monitor & Report		Weekly	Grab	E
Total Selenium	Monitor & Report		Weekly	Grab	E
Total Silver	Monitor & Report		Weekly	Grab	E
Total Zinc	Monitor & Report		Weekly	Grab	E

Notes:

1. Sample location: E- Effluent from the FGD Wastewater Treatment System prior to discharge to Ash Settling Basin.

DMRs for this outfall shall be submitted only after discharge commences from the FGD system. All flows shall be reported on monthly DMRs. Should no flow occur during a given month, the words “no flow” shall be clearly written in the front of the DMR. All samples shall be of a representative discharge.

SUPPLEMENT TO EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

SPECIAL CONDITIONS

A. (4.) ASH POND

Beginning on the effective date of this permit and lasting until expiration, there shall be no discharge of plant wastes 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 annually determine and report to the permit issuing authority: (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 ponds for the following year. Any changes 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. (5.) BEST MANAGEMENT PRACTICES

It has been determined from information submitted that the plans and procedures in place at Cliffside Steam Station are equivalent to that of a Best Management Practice (BMP).

A. (6.) CHEMICAL DISCHARGES

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 waters 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 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.

A. (7.) CHRONIC TOXICITY PERMIT LIMIT (QRTRLY)

The effluent discharge shall at no time exhibit observable inhibition of reproduction or significant mortality to *Ceriodaphnia dubia* at an effluent concentration of 7.14 %.
The permit holder shall perform at a minimum, *quarterly* 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* March, June, September and December. 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: Environmental Sciences Section
North Carolina Division of Water Quality
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.
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. (8.) 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 waterbody 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. (9.) DEFINITIONS

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 wastes 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 house service water systems. Sanitary and air conditioning wastes are not considered low volume wastes.

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. Metals cleaning will be conducted according to approved Duke Energy equivalency demonstration.

The term, "chemical metals cleaning waste" means any wastewater resulting from the cleaning of any metal process equipment with chemical compounds, including, but not limited to, boiler tube cleaning.

A. (10.) DIKE INSPECTIONS

The permittee shall maintain and monitor diked areas in accordance with the 15A NCAC 2K.

A. (11.) DOWNSTREAM VIOLATIONS

Upon acceptance of this permit, it is agreed that a violation of effluent limitations at the specified downstream monitoring station, which is located in the state of South Carolina, shall be considered a legally enforceable violation in the state of North Carolina. For purposes of downstream violations, the point of compliance shall be considered the North Carolina/South Carolina state line.

A. (12.) FLOATING MATERIALS

The Permittee shall report all visible discharges of floating materials, such as an oil sheen, to the Director when submitting DMRs.

A. (13.) INTAKE SCREEN BACKWASH

Continued intake screen backwash discharge and overflow from the settling basin are permitted without limitations or monitoring requirements.

A. (14.) MONITORING FREQUENCY

If the Permittee, after monitoring for at least six months, determines that he is consistently meeting the effluent limits contained herein, the permittee may request of the Director that the monitoring requirements be reduced to a lesser frequency.

A. (15.) POLYCHLORINATED BIPHENYL COMPOUNDS

There shall be no discharge of polychlorinated biphenyl compounds such as those commonly used for transformer fluid.

A. (16.) CHEMICAL METAL 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 to 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 discharged 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 wastes 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 at 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 pH of no less than 6.5 prior to metal cleaning waste addition.
(4) Four days retention time in ash pond with effluent virtually 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, NaBrO; ammonium carbonate, (NH)CO; and ammonium hydroxide, NHOH.
    (b) Iron removal step-hydrochloric acid, HCl; and ammonium bifluoride, (NH)BF and proprietary inhibitors.
(7) Maximum dilution of wastes before entering ash pond should not be greater than 6 to 1.
(8) After treatment of metal cleaning wastes, if monitoring of basin effluents as required by the permit reveals discharges outside the limits of the permit. permittee will re-close the basin discharge, conduct such in-basin sampling as necessary to determine the cause of nonconformance, will take appropriate corrective actions, and will file a report with EPA including all pertinent data.

A. (17.) TOXICITY REOPENER CONDITION

This permit shall be modified, or revoked and reissued to incorporate toxicity limitations and monitoring requirements in the event toxicity testing or other studies conducted on the effluent or receiving stream indicate that detrimental effects may be expected in the receiving stream as a result of this discharge.

A. (18.) WAIVERS

Nothing contained in this permit shall be construed as a waiver by permittee or any right to a hearing it may have pursuant to State or Federal laws or regulations.

A. (19.) DOMESTIC WASTEWATER TREATMENT PLANT

The permittee shall at all times properly operate and maintain the domestic wastewater treatment plant to meet secondary standards.

A. (20.) 316(b) REQUIREMENTS

Impingement sampling that was conducted in 1974 and annual electrofishing surveys that have been conducted since 1989 indicate that the facilility's operation and maintenance of cooling water intake structure (CWIS) is consistent with the intent of 40 CFR 401.14. The facility shall continue to properly operate and maintain the CWIS.

A. (21.) RENEWAL APPLICATION

The permittee shall submit form 2C or 2E for every external outfall identified in the permit during the next renewal.

A. (22.) 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. (23.) 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.