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

Dan River Combined Cycle Station
864 South Edgewood Road
South of Eden, NC
Rockingham County

to receiving waters designated as the Dan River in the Roanoke River Basin

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

This permit shall become effective March 1, 2013.

This permit and authorization to discharge shall expire at midnight on April 30, 2017.

Signed this day: January 31, 2013.

[Original Signed by Sergei Chernikov]
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 the following:
   - Once-through cooling water and cooling tower blowdown from the combined cycle unit, intake screen backwash, plant collection sumps (low volume wastes), and treated domestic wastewater from outfall 001;
   - Wastes from the filtered water plant including miscellaneous wash down water and laboratory wastes (low volume waste sources) from internal outfall 001A;
   - an ash basin discharge consisting of low volume wastes, boiler cleaning wastewater, ash disposal, stormwater, boiler blowdown, and metal washing wastewater from outfall 002;
   - a yard sump overflow consisting of stormwater runoff, misc. sumps, and coal yard runoff (outfall 002A); and

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

A (1) EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (Outfall 001)

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, intake screen backwash, cooling tower blowdown, and treated domestic wastewater from outfall 001. 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 [1]
Flow, MGD			Daily	Pump Logs	Upstream or Effluent
Temperature, °C	35		Daily	Grab	Effluent
Temperature, °C [2]		32	Daily	Grab	Downstream
Temperature, °C [3]			Daily	Grab	Upstream, Effluent
Total Iron, mg/L			Quarterly	Grab	Effluent
Total Suspended Solids	30 mg/L	100 mg/L	2/Month	Grab	Effluent
pH	Not less than 6.0 s.u. nor greater than 9.0 s.u.		2/Month	Grab	Effluent
Total Residual Chlorine [4]		28 µg/L	2/Month	Grab	Effluent

Notes:

1. Sample locations: Upstream – at intake; Downstream – downstream approximately two (2) miles near the NCSR 700 bridge crossing; Effluent - at point downstream of combined wastewaters from the combined cycle turbine unit.
2. In no case should the ambient temperature exceed 32°C as a result of Dan River Steam Station operations. The ambient temperature shall be defined as the daily average downstream water temperature. When the effluent temperature is recorded below 32°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, temperature monitoring must be reestablished within five working days.
3. The daily average temperature of the effluent shall be such as not to exceed 10°C if the daily average intake temperature is below 2.5°C, and shall not exceed two times the intake temperature (°C) plus 5 if the daily average intake temperature ranges from 2.5°C to 12.8°C. This limitation is in effect only when a single control unit is operating.
4. Total Residual Chlorine compliance is required only if chlorine or chlorine derivative is added to the cooling water. The Division shall consider all effluent TRC values reported below 50 µg/L to be in compliance with the permit. However, the permittee shall continue to record and submit all values reported by a North Carolina certified laboratory (including field certified), even if these values fall below 50 µg/L.

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

The mixing zone is defined as the area extending from the power plant intake to the NCSR 700 bridge crossing (downstream approximately two miles).

Based upon studies conducted by the permittee and submitted to the Division, it has been determined pursuant to Section 316(a) of the Clean Water Act that the thermal component of the discharge assures the protection and propagation of a balanced, indigenous population of shellfish, fish and wildlife in the receiving water.

All domestic wastewater produced at the power plant is to be fully treated through the onsite wastewater treatment system prior to being discharged.

The permittee shall obtain authorization from the Division of Water Quality prior to using any biocide in the cooling water; see condition A (7).

Should no flow occur during a given month, the words "no flow" should be clearly written on the front of the discharge monitoring report (DMR). All samples shall be a representative discharge.

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

A (2) EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (Outfall 001A)

During the period beginning on the effective date of this permit and lasting until expiration, the permittee is authorized to discharge wastewater from the filtered water plant including wash down water and laboratory wastes (low volume waste sources) through internal outfall 001A. Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTICS	LIMITS		MONITORING REQUIREMENTS		
	Monthly Average	Daily Average	Measurement Frequency	Sample Type	Sample Location [1]
Total Suspended Solids	30.0 mg/l	100.0 mg/l	2/Month	Grab	Effluent
Oil & Grease	15.0 mg/l	20.0 mg/l	2/Month	Grab	Effluent

Notes:
1. Effluent sample location shall be at point downstream of the oil separator and prior to mixing with outfall 001.

Should no flow occur during a given month, the words "no flow" should be clearly written on the front of the DMR. All samples shall be a representative discharge.

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

A (3) EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (Outfall 002)

During the period beginning on the effective date of this permit and lasting until expiration, the permittee is authorized to discharge effluent from outfall 002 consisting of low volume wastes, boiler cleaning wastewater, ash disposal, stormwater, boiler blowdown, and metal washing wastewater. 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 [1]
Flow, MGD			Weekly	Pump Logs or estimate	Effluent
pH	Not less than 6.0 s.u. nor greater than 9.0 s.u.		Monthly	Grab	Effluent
Total Iron [2]	1.0 mg/L	1.0 mg/L	Monthly	Grab	Effluent
Total Suspended Solids [3]	29.0 mg/L	96.0 mg/L	Quarterly	Grab	Effluent
Sulfate, mg/L			Quarterly	Grab	Effluent
Acute Toxicity [4]			Quarterly	Grab	Effluent
Oil and Grease	14.0 mg/L	19.0 mg/L	Annually	Grab	Effluent
Nitrite/Nitrate Nitrogen (NO_2 + NO_3), mg/L			Annually	Grab	Effluent
Total Kjeldahl Nitrogen (TKN), mg/L			Annually	Grab	Effluent
Total Nitrogen (TN), mg/L TN = (NO_2 + NO_3) + TKN			Annually	Calculated	Effluent
Total Phosphorus, mg/L			Annually	Grab	Effluent

Notes:

1. Effluent sampling shall be conducted at the discharge from the ash settling pond prior to mixing with any other waste stream.
2. Monitoring for total iron and its discharge limits apply only if wastewater from a boiler chemical cleaning is generated and discharged to the ash basin.
3. A monthly average of 49 mg/L is permitted provided that the permittee can satisfactorily demonstrate that concentrations above 29 mg/L are due to the concentration of total suspended solids in the intake water.
4. Acute Toxicity (Fathead Minnow 24 hr) no significant mortality at 90%; March, June, September, and December; see condition A (7) of this permit.

Metal cleaning waste, coal pile runoff, ash transport water, low volume waste, and boiler blowdown shall be discharged into the ash settling pond.

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

A (4) EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (Outfall 002A)

During the period beginning on the effective date of this permit and lasting until expiration, the permittee is authorized to discharge rainfall runoff including runoff from the coal yard through outfall 002A –yard sump overflows. 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 [1]
Flow, MGD			Episodic	Estimate	Effluent
pH	Not less than 6.0 s.u. nor greater than 9.0 s.u.		Episodic	Grab	Effluent
Oil and Grease [2]	15.0 mg/L	20.0 mg/L	Episodic	Grab	Effluent
Total Suspended Solids [2]	30.0 mg/L	100.0 mg/L	Episodic	Grab	Effluent
Total Iron, mg/L [3]			Episodic	Grab	Effluent

Notes:
1. Effluent sampling shall be conducted at a point upstream of discharge to the receiving stream.
2. Monthly average limits for total suspended solids and oil and grease only apply if the overflow occurs for more than 24 hours.
3. Sampling for total iron is required only when TSS is reported as greater than 100 mg/L.

All flows shall be reported on monthly DMRs. Should no flow occur during a given month, the words "no flow" should be clearly written on the front of the DMR. Episodic sampling is required per occurrence when sump overflows occur for longer than one hour. All samples shall be taken from a representative discharge.

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

A (5) TOXICITY REOPENER CONDITION

This permit shall be modified, or revoked and reissued, to incorporate additional toxicity limitations and monitoring requirements in the event that 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 (6) SPECIAL CONDITIONS

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

a) If the permittee, after monitoring for at least six months, determines the effluent limits contained herein are consistently being met, the permittee may request to the Director that the monitoring requirement be reduced to a lesser frequency.
b) There shall be no discharge of polychlorinated biphenyl compounds such as those once commonly used for transformer fluid.
c) Continued intake screen backwash discharges and overflow from the settling basin are permitted without limitations or monitoring requirements.
d) Nothing contained in this permit shall be construed as a waiver by the permittee of any right to a hearing it may have pursuant to State or Federal laws or regulations.
e) Low volume waste is defined as follows (as per 40 CFR 423.11(b): "Low volume wastes sources include, but are not limited to, wastewaters 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 included."

f) The term "metal cleaning waste" means any wastewater resulting from cleaning (with or without cleaning compounds) any metal process equipment including, but not limited to, boiler tube cleaning, boiler fireside cleaning, and air preheater cleaning.

g) 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. Chemical metals cleaning will be conducted according to Duke Energy's approved equivalency demonstration.

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

i) Discharge of any waste resulting from the combustion of toxic or hazardous waste to any waste stream which ultimately discharges to waters of the United States is prohibited, unless specifically authorized in this permit.

j) The permittee shall report all visible discharges of floating materials (such as an oil slick) to the Director when submitting DMRs.

k) The permittee shall check the diked areas for leaks by a visible inspection and shall report to the Division's Winston-Salem Regional Office any seepage detected.

l) "Upset," means an exceptional incident in which there is an unintentional and temporary non-compliance with technology-based effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent cause by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or improper operations.

m) Discharge of chlorine from the use of chlorine gas, sodium hypochlorite, or other similar chlorination compounds for disinfection in plant potable, service water systems, and in sewage treatment is authorized. The application of restricted pesticides for aquatic management purposes by applicators licensed by the North Carolina Pesticide Board is authorized.

n) The domestic wastewater treatment facility shall be properly operated and maintained at all times. Its effluent must meet secondary limits for domestic wastewater, and not cause contravention of any water quality standards.

A (7) QUARTERLY ACUTE TOXICITY LIMIT (Outfall 002)

The permittee shall conduct acute toxicity tests on a quarterly basis using protocols defined in the North Carolina Procedure Document entitled "Pass/Fail Methodology for Determining Acute Toxicity in a Single Effluent Concentration" (Revised-July, 1992 or subsequent versions). The monitoring shall be performed as a Fathead Minnow (*Pimephales promelas*) 24 hour static test. The effluent concentration at which there may be at no time significant acute mortality is 90% (defined as treatment two in the procedure document). Effluent samples for self-monitoring purposes must be obtained during representative effluent discharge below all waste treatment. The tests will be performed during the months of March, June, September, and December.

All toxicity testing results required as part of this permit condition will be entered on the Effluent Discharge Monitoring Form (MR-1) for the month in which it was performed, using the parameter code TGE6C. Additionally, DWQ Form AT-2 (original) is to be sent to the following address:

Attention: NC DENR / DWQ / 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 and accurate and include all supporting chemical/physical measurements performed in association with the toxicity tests, as well as all dose/response data. 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 any single quarterly monitoring indicate a failure to meet specified limits, then monthly monitoring will begin immediately until such time that a single test is passed. Upon passing, this monthly test requirement will revert to quarterly in the months specified above.

Should the permittee fail to monitor during a month in which toxicity monitoring is required, then monthly monitoring will begin immediately until such time that a single test is passed. Upon passing, this monthly test requirement will revert to quarterly in the months specified above.

Should any test data from either these monitoring requirements 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 than 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.

A (8) 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 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. Completion of Biocide Worksheet Form 101 is not necessary for those outfalls with toxicity testing. Division approval is not necessary for the introduction of a new biocide into an outfall with toxicity testing.

A (9) ASH POND WORKING CAPACITY

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.

On an annual basis, the permittee shall determine and report to the Division: (1) the actual free water volume of the ash pond, (2) the 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 an adequate safety factor to include all solids expected to be deposited in the ponds for the following year.

Present information indicates a needed volume of 87.79 acre-ft in addition to solids, which will be deposited in the ash pond. 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 required.

A (10) 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 Power Company's Riverbend Steam Station. Therefore, when the following conditions are implemented during chemical 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 stopped.
5. Boiler volumes less than 86,000 gallons.
6. Chemicals for cleaning to include only one or more of the following:
   a. Copper removal step- ammonium carbonate, ammonium hydroxide and sodium bromate.
   b. Iron removal step – ammonium bifluoride, hydrochloric acid, proprietary inhibitor and thiourea.
   c. Rinse step – citric acid.
   d. Neutralization step – sodium carbonate (soda ash).
7. Maximum dilution of wastes before entering the ash pond is 6 to 1.
8. After treatment of chemical metal cleaning wastes, if monitoring of basin effluents as required by the permit reveals discharges exceeding permit limits, the permittee will re-close the basin discharge, conduct such in-basin sampling as necessary to determine the cause of nonconformance, take appropriate corrective actions, and file a report with EPA including all pertinent data.

A (11) SECTION 316 (a) THERMAL VARIANCE

The thermal variance granted under Section 316(a) terminates on expiration of this 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 316(a) Guidance Manual, dated 1977. EPA shall be provided an opportunity to review the plan prior to the commencement of the study.

A (12) SECTION 316 (b) COMPLIANCE

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

A (13) 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 most recent sampling plan approved by the Division.

A (14) STRUCTURAL INTEGRITY INSPECTIONS OF ASH POND DAM

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