

#30

PERMIT NO. NC0024406

**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 Corporation

is hereby authorized to discharge wastewater from a facility located at

**Belews Creek Steam Station
3195 Pine Hall Road (NCSR 1908)
Belews Creek
Stokes County**

to receiving waters designated as West Belews Creek/Belews Lake (outfall 001) and the Dan River (outfall 003) in the Roanoke 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 June 1, 2005.

This permit and authorization to discharge shall expire at midnight on February 28, 2007.

Signed this day May 16, 2005.

**ORIGINAL SIGNED BY
Mark McIntire**

Alan W. Klimek, 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, and as of this 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 Corporation

is hereby authorized to:

1. Continue to discharge once-through cooling water, intake screen backwash, recirculated cooling water, and station equipment cooling water through outfall 001; treated wastewater consisting of waste streams from the power house and yard holding sumps, ash sluice lines, chemical holding pond, coal yard sumps, stormwater, remediated groundwater, domestic wastewater, and FGD system blowdown through outfall 003. All discharges result from activities at Duke Energy's Belews Creek Steam Station, 3195 Pine Hall Road (NCSR 1908), Belews Creek, Stokes County; and
2. After receiving an Authorization to Construct from the Division of Water Quality, construct and operate a FGD wet scrubber wastewater treatment system discharging to the ash settling basin through internal outfall 002; and
3. Discharge from said treatment works at the locations specified on the attached map into West Belews Creek/Belews Lake (outfall 001) and the Dan River (outfall 003), which are classified C and WS-IV waters, respectively, in the Roanoke River Basin.

PART I

SECTION A: FINAL LIMITATIONS AND CONTROLS

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 waste streams described in the Supplement to Permit Cover Sheet from **Outfall 001**. 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)	Monitor & Report		Continuous	Pump logs or similar readings	Effluent
Temperature °C			Daily	Recorder/Grab	Upstream
Temperature °C(°F) ²	32°C (89.6°F)		Daily	Recorder/Grab	Downstream
Temperature °C(°F)			Daily	Recorder/Grab	Effluent

NOTES:

- 1 Sampling Locations: Upstream - Upstream at Southern Railroad crossing of Belews Creek OR East Belews Creek (site 405 or site 419). Downstream - Downstream at the discharge from the dam. Upstream temperature measurements are to be taken one foot below the water surface.
- 2 **In no case shall the ambient temperature exceed 32°C (89.6°F) as a result of Belews Creek Steam Station operations.** The ambient temperature shall be defined as the daily average downstream discharge water temperature. In cases where the Permittee experiences equipment problems and is unable to obtain daily temperature from the existing temperature monitoring system, monitoring must be reestablished within five working days.

Chlorination of the once through condenser cooling water and/or auxiliary cooling water, discharged through outfall 001, is not allowed. 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.

PART I

2. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (INTERNAL OUTFALL 002)

During the period beginning on the effective date of this permit and lasting until expiration, the Permittee is authorized to discharge from **Internal Outfall 002 (treated FGD wet scrubber wastewater 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 (MGD)	Monitor & Report		Monthly	Pump logs or similar readings	Effluent
Total Suspended Solids	Monitor & Report		Weekly	Grab	Effluent
Total Arsenic	Monitor & Report		Weekly	Grab	Effluent
Total Cadmium	Monitor & Report		Weekly	Grab	Effluent
Total Chromium	Monitor & Report		Weekly	Grab	Effluent
Chloride	Monitor & Report		Weekly	Grab	Effluent
Total Mercury	Monitor & Report		Weekly	Grab	Effluent
Total Nickel	Monitor & Report		Weekly	Grab	Effluent
Total Selenium	Monitor & Report		Weekly	Grab	Effluent
Total Silver	Monitor & Report		Weekly	Grab	Effluent
Total Zinc	Monitor & Report		Weekly	Grab	Effluent

NOTES:

- 1 Effluent shall be defined as the discharge from the FGD wastewater treatment system prior to discharge to the ash settling basin.

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

Sampling is only required when this outfall is discharging.

PART I

3. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (OUTFALL 003)

During the period beginning on the effective date of this permit and lasting until expiration, the Permittee is authorized to discharge from **Outfall 003 (ash settling basin 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)			Monthly	Pump logs or similar readings	Effluent
Oil and Grease ¹	15.0 mg/L	20.0 mg/L	Quarterly	Grab	Effluent
Total Suspended Solid ¹	30.0 mg/L	100.0 mg/L	Quarterly	Grab	Effluent
Total Arsenic ²			Weekly	Grab	Effluent
Total Cadmium ³			Weekly	Grab	Effluent
Total Chromium ³			Weekly	Grab	Effluent
Chloride ³			Weekly	Grab	Effluent
Total Copper		1.0 mg/L	Quarterly	Grab	Effluent
Total Iron		1.0 mg/L	Quarterly	Grab	Effluent
Total Mercury ³			Weekly	Grab	Effluent
Total Nickel ³			Weekly	Grab	Effluent
Total Selenium ²		26 µg/L	Weekly	Grab	Effluent
Total Silver ³			Weekly	Grab	Effluent
Total Zinc ³			Weekly	Grab	Effluent
Sulfates			Monthly	Grab	Effluent
Fluoride			Quarterly	Grab	Effluent
Total Nitrogen (NO ₂ +NO ₃ +TKN)			Quarterly	Grab	Effluent
Total Phosphorus			Quarterly	Grab	Effluent
Chronic Toxicity	See Part I, Section A, #6		Quarterly	Grab	Effluent
pH ⁴	Between 6.0 and 9.0 Standard Units		2/Month	Grab	Effluent

NOTES:

- 1 Quarterly monitoring for TSS and Oil and Grease shall be performed concurrently with monitoring for whole effluent toxicity.
- 2 Monitoring for arsenic & selenium shall be conducted weekly when outfall 002 is discharging. When 002 is not discharging, monitoring shall revert to quarterly coinciding with sampling for whole effluent toxicity.
- 3 Monitoring is required only when outfall 002 is discharging.
- 4 The pH shall not be less than 6.0 standard units nor greater than 9.0 standard units and shall be monitored 2/month at the confluence of the discharge and the receiving waters by grab sample.

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

The coal pile runoff and low volume wastes shall be discharged into the ash settling pond.

PART I**4. SPECIAL CONDITIONS**

The following special conditions are applicable to Belews Creek Steam Station under NC0024406:

- There shall be no discharge of polychlorinated biphenyl compounds such as those commonly used for transformer fluid.
- Outfall 006 - The monitoring requirements for this internal discharge have been relocated to the actual discharge location (outfall 003) as of the February 1, 1998 NPDES permit. This discharge must remain internal and discharge to the ash pond. If discharge to the ash pond is relocated to surface waters of the state, then the monitoring requirements for this discharge will be reinstated.
- Continued intake screen backwash and non-contact cooling water are permitted without limitations or monitoring requirements.
- 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.
- 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 "chemical metal cleaning waste" means any wastewater resulting from cleaning any metal process equipment with chemical compounds, including, but not limited to, boiler tube cleaning. Chemical metal cleaning will be conducted according to Duke Power approved equivalency demonstration.
- It has been determined from information submitted that the plans and procedures in place at Belews Creek Steam Station are equivalent to that of a BMP.
- 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 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
- If the Permittee, after monitoring for at least six months, determines that the facility 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.
- The Dan River Monitoring Plan, Phase III, as referred in the Engineering Report dated June 10, 1983 and submitted to DWQ, shall continue to be conducted.

PART I

5. SPECIAL CONDITION FOR DISCHARGE OF WASTEWATER

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 376.03 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.

PART I**6. 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 **19.0%**.

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 February, May, August and November.** 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 Branch
1621 Mail Service Center
Raleigh, North Carolina 27699-1621**

Completed Aquatic Toxicity Test Forms shall be filed with the Environmental Sciences Branch 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 Branch 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.

PART I

7. BIOCIDES 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 containing toxicity testing. Division approval is not necessary for the introduction of a new biocide into an outfall currently being tested for toxicity.

Q i310

See FGD wastewater is
"Hot Topic" for Jan 10, 2008
at 9:00 am CST

Add to biological section on Q shore.

Zenon Env. AB Met (R)
Can also remove: As, Cu, Ni
Hg & Zn
- Jill Stalgaard

Although biological ^{if also} treatment has shown reductions
in ~~other~~ ^{various other pollutants} metals such as cadmium, arsenic,
mercury, ^{+BOD} Biological treatment has been
demonstrated to effectively remove ^{only}
~~arsenic~~ ^{certain} nitrogen
compounds and
selenium.

EPA RI considers
for this reason, biological treatment
~~is not~~ ^{is} ~~only~~ ^{considered} as a component of
BAT for only selenium & nitrogen
compounds.

arsenic, ~~etc~~ The ^{draft} permit limit of 20 µg/L is within the
range of ~~total~~ ^{data} collected for
total arsenic.

Although ~~EPA RI~~ notes that cadmium may be reduced further
with the use of biological treatment, ~~there is~~
insufficient information ^{at this time} ~~at this time~~ for base
~~this BAT determination~~ cadmium limits.
Therefore, biological treatment is not
considered a component of BAT for cadmium

~~at this time~~ EPA has collected self monitoring
data from one plant that uses
for this draft permit.

biological treatment ~~data~~ acceptable levels measured
Sampling & analysis of Belevis ~~sample~~ from EPA's
Creek monitoring system