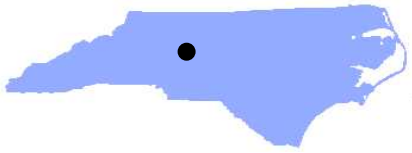
DRAFT

DEQ/DWR
FACT SHEET FOR NPDES PERMIT DEVELOPMENT

NPDES No. NC0004774

FACILITY INFORMATION			
Permittee:	Duke Energy Carolinas, LLC		
Permittee Address:	526 S. Church Street, Mail Code EC3XP, Charlotte, NC 28202		
Facility Name:	Buck Combined Cycle Station (formerly Buck Steam Station)		
Facility Address:	Dukeville Road, Salisbury, NC 28146	Facility County:	Rowan
Facility Type:	Industrial – Steam Electric Power Generation	SIC Code(s):	4911
Permitted Flow:	Not Limited	Facility Status:	Existing
Waste Type:	Industrial	WWTP Grade:	PC-1

WATERBODY INFORMATION		ADDITIONAL INFORMATION	
Waterbody Name:	Yadkin River	Regional Office:	Mooresville
Classification:	WS-V	USGS Topo Quad:	E17NW
Subbasin:	03-07-06	Permit Action:	Renewal
HUC8:	03040102	Permit Writer:	Mike Templeton
Drainage Area (mi^2):	3,452	Date:	April 30, 2018 – Draft Permit
Summer 7Q10 (cfs):	1,030		
Winter 7Q10 (cfs):	1,480		
Average Flow (cfs):	4,960		
Listed:	Not for POCs		
IWC (%):	0.1%, 0.3%, 0.7%, & 100%		

I. PROPOSED PERMIT ACTION

Duke Energy Carolina, LLC, (hereafter, "Duke Energy" or "Duke Energy") has applied for renewal of permit NC0004774 for its Buck Combined Cycle Station (formerly, the Buck Steam Station). The Division of Water Resources has reviewed the application and additional information submitted by Duke Energy and has made a tentative determination to reissue the permit with modifications.

This Fact Sheet describes the Buck facility; its wastestreams and receiving streams; recent and planned changes in the facility; its compliance history; the proposed terms and conditions of the permit and the rationale for those; and the schedule and process for public participation in the Division's final decision on the permit.

II. SUMMARY

Duke Energy owns and operates the Buck Combined Cycle Station (BCCS), a steam electric power generating facility in Rowan County near Spencer, North Carolina. For permitting purposes, the facility includes the Buck Steam Station (BSS), now retired; the 620 MW Combustion Turbine Combined Cycle (CTCC) plant; and the associated system of ash and waste settling ponds. The combined site is approximately 640 acres (1 sq. mi.) in size. The facility is currently authorized to discharge process wastes, comingled stormwater, and other wastewaters to the Yadkin River and its tributaries at multiple points, subject to the terms and conditions of NPDES permit NC0004774.

Duke Energy has also applied to the Division of Energy, Mining, and Land Resources (DEMLR) for two NPDES stormwater permits. The permits will govern the discharge of stormwaters that are not intermixed with wastewaters. Each will apply to a different part of the site: NCS000578 for the former Buck Steam Station (site restoration) and NCS000554 for the Buck CTCC (active operations). DEMLR plans to issue the permits in coordination with reissuance of this wastewater permit.

The Buck Tie Station, a large substation facility, is a separate operation located between the BSS and CTCC. The Tie Station does not discharge wastes to surface waters and is not subject to NPDES permit requirements.

Permit NC0004774 was last issued in December 2011 and expired August 31, 2016. On February 26, 2016, prior to expiration, Duke Energy applied for permit renewal. In accordance with NPDES regulations, the permit was administratively extended and remains in effect until the Division takes final action on the application, that is, until it issues a new permit or denies the application.

The current permit authorizes the discharge of once-through noncontact cooling waters to the mainstem of the Yadkin River/ High Rock Lake and the discharge of process and other wastes from the ash pond system to a side cove of the lake and, on an emergency basis, to the mainstem of the river.

Duke Energy's facilities, operations, and waste management needs at the Buck site have changed substantially since the permit was last issued. The last coal-fired units have been retired, and all power is now generated at the CTCC plant. Duke Energy is required to decant and dewater the ash ponds and dispose of the accumulated ash, and it will discharge treated wastes from those operations. Wastewater outfall configurations will evolve as these changes take place. Duke Energy must also address the discharge from two "constructed seeps" at the ash ponds. The draft permit includes extensive modifications to address these changes, as described in this fact sheet.

III. RECEIVING WATERS

The Buck Combined Cycle Station is located adjacent to the Yadkin River in the upper reaches of High Rock Lake. The side channels of the lake to the east and west of the site behave as impounded waters, except at low water levels. The mainstem of the river (segment 12-(108)b), though part of the lake, is still generally riverine in nature. All receiving waters are classified WS-V, and their designated uses include aquatic life propagation, maintenance of biological integrity (including fishing and fish), wildlife, secondary recreation, and industrial water supplies. This portion of the Yadkin River is considered lower piedmont waters (15A NCAC 02B .0202, Definitions).

Stream Flows. High Rock Dam was constructed and High Rock Lake impounded in 1927. The dam and reservoir are the uppermost of six hydroelectric projects on the river. These have been owned and operated by Alcoa Power Generating Inc. (APGI) under FERC licenses 2197 (Yadkin Project) and 2206 (Yadkin-Pee Dee River Project). In 2017, Cube Hydro Partners, LLC, acquired four of the projects, including High Rock.

Flow through the system is managed collectively to ensure sufficient flows throughout; however, no minimum flow is specified for the High Rock project. Under normal conditions, water levels at the dam fluctuate as much as 10 feet on a seasonal basis.

The statistical stream flows for this reach of the river are listed on page 1 of this fact sheet. The flows were determined by the USGS in the 1980s based on historical data. The USGS has not updated the stream flows since that time due to the complexity and uncertainty of the effects of hydropower operations in the Yadkin-Pee Dee River system.

Water Quality Assessment. The Division's 2014 Integrated Report indicated that High Rock Lake in the vicinity of the Buck site met state criteria for water temperature, dissolved oxygen, and pH. The lake did not meet criteria for chlorophyll a, turbidity, mercury (fish consumption advisory), and PCBs (fish consumption advisory).

> Chlorophyll a. The majority of the lake exhibits symptoms of nutrient over-enrichment. The Division and affected stakeholders have worked to develop a TMDL to address these impacts. More recently, a Scientific Advisory Committee was established by the Division and is developing protective nutrient criteria for the lake.
>
> Turbidity violations are common throughout the High Rock Lake watershed. Turbidity is a measure of clarity in water and often increases due to excessive sediment loading in the stream.

Soil erosion is the most common source of sediment loads and turbidity. Some erosion occurs naturally, though human activities can accelerate the process considerably. The Buck facility is not a significant source of sediments or turbidity in the lake.

Mercury is found naturally at low levels in rock, soil and water throughout North Carolina and is also released into the air when fossil fuels (or other materials) are burned. Measurable levels of mercury have been found in certain fish species in waters across the state. On April 2, 2008, the NC DHHS issued a statewide fish consumption advisory for mercury. In response, the Division listed all surface waters as impaired for mercury in fish tissue. In 2012, the Division prepared a TMDL and implementation strategy to address the issue, and the U.S. EPA approved both.

PCBs have long been used as coolants and lubricants in transformers, capacitors, and other electrical equipment. The manufacture of PCBs was stopped in the U.S. in 1977 because of evidence of environmental and human health impacts. On March 13, 2013, the NC DHHS issued a fish consumption advisory for catfish larger than 18 inches caught in reservoirs in the Yadkin-Pee Dee River system, including High Rock Lake. The advisory noted that the limit on catfish consumption in the mercury advisory would also be protective of potential health effects from PCBs in those fish. The Buck facility is not a significant source of PCBs.

The Buck facility is not considered to be a significant contributor to these impairments in the lake.

Fish Tissue Sampling. Under the current permit, Duke Energy is required to analyze fish tissue samples from the mainstem of the Yadkin River once per permit cycle to monitor for accumulation of arsenic, selenium, and mercury. Accumulation has not been observed in the samples collected.

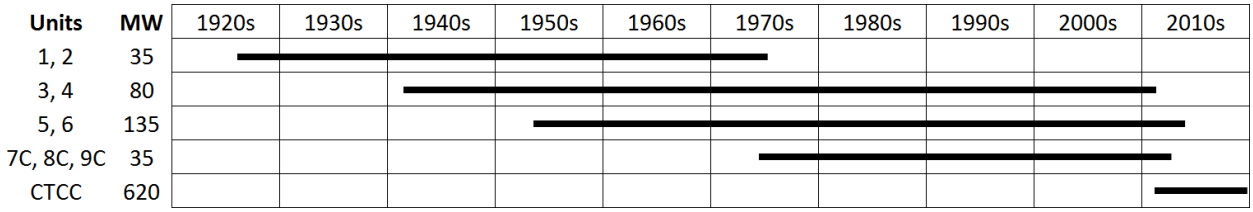
Biological Monitoring. By agreement with the Division, Duke Energy conducts annual biological and chemical monitoring to evaluate the possible impacts of its thermal discharges upon the macroinvertebrate and fish community in in the Yadkin River near Buck Steam Station. The latest BIP (balanced and indigenous population) report was submitted to DWR in November of 2011. The report concluded that the indigenous macroinvertebrate community in the river varied with the extreme high- and low-flow years in the study period (2003-2008) but remained within the historic range of densities; and that the river continues to have a balanced and indigenous fish community.

IV. PERMITTED FACILITY

A. History of Buck Power Generating Facilities

The Buck Steam Station (BSS) began operations with two coal-fired steam-electric generation units in 1926. The units were rated at 35 MW each. Units 3 and 4 (80 and 40 MW) were added in the early 1940s, and Units 5 and 6 (135 MW each) were added it 1953. To meet peak demands, three 31 MW natural gas/ fuel oil-fired combustion turbine units, Units 7C, 8C, and 9C, were added in 1970. See Figure 1.

Figure 1 – Operating Lives of Generating Units – Buck Station



Duke Energy retired Units 1 and 2 in the 1970s and Units 3 and 4 in May 2011. Duke Energy constructed the Buck Combustion Turbine Combined Cycle (CTCC) plant, a 620 MW, natural gas-fired, steam electric power generating facility, and the new plant began operating commercially in late 2011. BSS Units 7C, 8C, and 9C were then retired in October 2012. Units 5 and 6, the last of the coal-fired units, were retired in April 2013.

The CTCC plant is now the sole power-generating unit at the Buck site. The plant utilizes two combustion turbine generators, two heat recovery steam generators (boilers), and one steam turbine generator (known as a 2 X 1 configuration) to produce electricity.

The plant employs wet cooling towers for steam generator condenser cooling. Evaporative losses from these cooling towers are estimated at 3,273 gpm (4.7 MGD). Water in the cooling tower system is typically recycled 5 times before blowdown is sent to the CTCC wastewater sump. Make-up water is withdrawn from the river and treated prior to use; and other CTCC wastestreams, including chiller system blowdown, are reused as make-up waters. The design average blowdown rate from the system is 400 gpm. Wastes from treatment of cooling tower make-up water (23 gpm), service waters and floor drains (5 gpm), and potable water treatment wastes (2 gpm) are also discharged to the wastewater sump. The CTCC plant generates an estimated total 430 gpm (0.62 MGD) of wastewater. These flows are pumped from the wastewater sump to Cell 1 of the ash basin system.

B. Coal Ash Basins/ Settling Ponds

Duke Energy maintains an ash basin system consisting of three cells and associated earthen dikes, discharge structures, and canals. The cells are designated as Cell 1 – Additional Primary Pond, Cell 2 – Primary Pond, and Cell 3 – Secondary Pond. The original ash pond began operation in 1957. The pond was later divided to form Ponds 2 and 3 (approximately 81 acres). Ash from the coal combustion process was sluiced to Cell 2. Cell 1 was the last cell constructed, in 1982, to provide additional storage (approximately 90 acres). Coal ash was then routed to Cell 1 until the end of coal-fired operations. Wastes flow from Cell 1 to Cell 2 to Cell 3 and discharge from Cell 3 to a cove of High Rock Lake at Outfall 002. These wastes are described below.

C. Wastestreams and Outfalls – Current Permit

The current permit authorizes the following discharges and discharge locations:

Table 1. Existing Process Outfalls

OUTFALL	EFFLUENT	LATITUDE	LONGITUDE	RECEIVING WATER	CLASS
001	Once-through non-contact cooling water	35.71389º	-80.37528º	Yadkin River/ High Rock Lake	WS-V
004	Screenings from raw water intake	35.71389º	-80.37556º	Yadkin River/ High Rock Lake	WS-V
002	Process wastewaters, treated domestic wastes, contaminated groundwater, and comingled stormwater	35.71222º	-80.36417º	UT Yadkin River/ cove of High Rock Lake	WS-V
002A	Emergency overflow from Yard Sump	35.71389º	-80.37306º	Yadkin River	WS-V

Outfall 001. When the permit was last issued, in early 2011, coal-fired units 3, 4, 5, and 6 and gas-fired units 7C, 8C, and 9C were operational. The gas-fired CTCC came online before the end of 2011. At the time, most of the water pumped from the river was used for once-through non-contact cooling in the Condenser Cooling Water (CCW) system and returned to the river at Outfall 001. The CCW system's design flow was 395 MGD; the average reported flow from 2011 through March 2013 was 177 MGD. The system ceased operation in 2013 with the retirement of the last coal-fired units.

The current permit establishes temperature limits for the discharge. Consistent with Sections 301 and 316(a) of the Clean Water Act, the permit sets a mixing zone that extends to High Rock Lake Dam within which the state's surface water quality standard for temperature is modified so long as Duke Energy can demonstrate that the river still maintains balanced and indigenous populations of fish and macroinvertebrate species.

Outfall 004. The facility withdraws water from the Yadkin River at the BSS powerhouse. In addition to providing cooling capacity in the CCW system, the water was and is used to meet other cooling

needs and to provide process make-up waters and sanitary (potable) waters. The raw water is screened to prevent vegetative and other debris and any fish in the vicinity from being drawn into the plant. Historically, the intake screens have required periodic backwashes (design flow of 0.225 MGD) to clear them of debris, and the screenings are returned to the river. A new system was installed in 2017 that uses bursts of air to clear the screens. It still returns screenings to the river but without the associated flow.

This release of screenings is deemed permitted under 15A NCAC 02H .0106(f)(2) so long as no water quality standards are contravened. Thus, the current permit does not set specific limitations or monitoring requirements for the discharge.

Silt accumulation around the intake has been periodically dredged. The spoils were conveyed to the ash ponds for settling and were discharged subject to the requirements for Outfall 002. The new system reaches the river from above, and dredging is not expected to be needed.

Outfall 002. When the permit was issued in 2011, the BSS process wastestreams consisted primarily of coal pile runoff, fly and bottom ash, ash transport water, low-volume wastes (including water treatment wastes, wet scrubber air pollution control waters, laboratory and sampling streams, and boiler/ condenser/ cooling tower blowdowns), and metal cleaning wastes. Other flows included domestic wastewater (0.002 MGD), petroleum-contaminated groundwater, and stormwater runoff from the plant site (0.364 MGD). Coal pile runoff and coal ash were conveyed directly to Cell 1 of the ash basin system, and most other wastes were pumped to Cell 2 from the BSS Yard Sump adjacent to the powerhouse.

Settled wastes from the ash basins was and is discharged at Outfall 002. The estimated average design flow was 4.4 MGD; the average actual flow reported from 2011 through March 2013 was 1.6 MGD. The discharge is subject to limitations for oil & grease, total suspended solids, pH, iron, copper, and chronic toxicity.

With the startup of the CTCC in 2011, new wastes flows were generated that were similar in nature to those generated at the BSS gas-fired units. Key among them are blowdown from the condenser cooling towers and from the chiller and closed-cycle cooling towers; blowdowns from the heat recovery steam generators (HRSG) and from auxiliary boilers; residuals from the settling, filtration, reverse osmosis, demineralization, and ultrafiltration processes used to produce potable and process makeup water for the plant; and sanitary sewage (treated in a small package plant). The design flow for these waste flows is 430 gpm, or 0.62 MGD. All CTCC flows drain to the Plant Sump and are pumped to Cell 1 of the ash basin system.

Metal cleaning wastes generated in the course of regular maintenance at the CTCC are directed to a blind sump. These wastes are collected for offsite disposal and are not discharged to surface waters.

With the retirement of the last BSS units in 2013, the historic process wastes (including coal pile runoff and coal ash wastes) and the withdrawals of river water for cooling and process makeup waters were eliminated or greatly reduced:

- Outfall 001. Withdrawals for the Condenser Cooling Water system (once-through, non-contact) were eliminated entirely.
- Outfall 002. The coal yard and other BSS facilities have been or are being removed, and most wastes have been eliminated. The BSS powerhouse is scheduled to be demolished in 2018, and the last waste flows (raw water treatment wastes and groundwater flows) will be eliminated in that process.

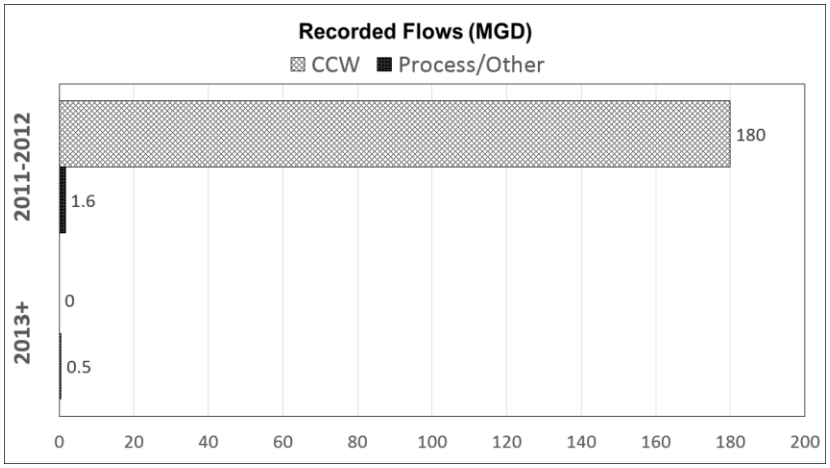
These changes in the production facilities have vastly reduced process and cooling water flows and the potential for impacts on surface waters. In 2011-2012, while the last coal-fired units were still operating, the cooling water flows at Outfall 001 averaged 177 MGD, and process and other flows at

Outfall 002 totaled less than 2 MGD (design 4.4 MGD). Since the retirement of those units in April 2013, flows have averaged less than 0.5 MGD. See Figure 2.

In the course of these changes, the terms and conditions of the wastewater permit have continued to satisfy both technology-based and water quality-based standards.

Outfall 002A. The BSS Yard Sump discharges to the Yadkin River in rare instances when flows to the sump exceed its pumping capacity. Monitoring is required and a pH limit applies if the discharge lasts more than one hour.
Two overflows occurred in this permit term, one each in 2011 and 2013. Each lasted less than one hour and released less than 45,000 gallons to the river.

Figure 2 – Flow Reductions – Buck Station



D. Compliance History

Duke Energy's discharge monitoring reports indicate the facility has met all permit limits during the previous permit cycle, as summarized in Table 2, below.

Table 2. DMR Summary, 2011-2016

OUTFALL	PARAMETER	LIMIT Mo Avg/ Daily Max	COMPLIANCE PERIOD	PERIOD AVG	PEAK MO AVG/ DAILY MAX
001	Temperature	95°F/ -	Jan 2011 – Mar 2013	72.6°F	95°F/ 101°F
002	O&G	11.0 / 15.0 mg/L	Jan 2011 – Jun 2016	<5 mg/L	<5 / <5 mg/L
	TSS	23.0 / 74.0 mg/L		6.6 mg/L	22.5 / 30 mg/L
	Cu	1.0 / 1.0 mg/L		<0.005 mg/L	0.006 / 0.006 mg/L
	Fe	1.0 / 1.0 mg/L		0.26 mg/L	0.6 / 0.6 mg/L
	pH	6-9 s.u.		N/A	6.5 min., 8.9 max.
	WET (7-day Static)	P/F	Mar 2011 – Jun 2016	Passed all	
	WET (Chronic)	P/F	Mar 2011 – Sep 2011	Passed all	
002A	Flow		Jan 2011 – Jun 2016	0.044 MG (4/11), 0.03 MG (3/13)	
	pH	6-9 s.u.		Monitoring is only required if discharge exceeds 1 hour duration. No monitoring reported.	
	TSS				
	Fecal coliform				
	Iron				

V. REGULATORY DRIVERS

Effluent limitations and other special conditions in the existing and proposed permits must adhere to and satisfy applicable rules and regulations. The following are essential in developing this permit:

A. Federal Effluent Guidelines

The Buck Combined Cycle Station (like the Buck Steam Station before it) is subject to federal Effluent Limitations Guidelines (ELGs) for the Steam Electric Power Generation Point Source Category, 40 CFR Part 423. The U.S. EPA published revisions to the ELGs on November 3, 2015 to improve control of pollutants found in the following wastestreams: flue-gas desulfurization (FGD) wastewater, fly ash transport water, bottom ash transport water, combustion residual leachate from landfills and surface impoundments, nonchemical metal cleaning wastes, and wastewater from flue gas mercury control (FGMC) systems and gasification systems. The BCCS does not employ FGD.

The discharge of sanitary wastes (domestic sewage) is subject to the Secondary Treatment Regulation, 40 CFR Part 133.

These regulations form the basis for developing technology-based effluent limitations (TBELs) for the facility (see TBELs in Section VI.B, below).

B. State Water Quality Standards

Many of the parameters detected in the facility discharges are subject to NC surface water quality standards. These standards are the basis for developing water quality-based effluent limitations (WQBELs) for the facility (see WQBELs in Section VI.C, below).

C. Coal Ash Management Act; Related Agreement

Duke Energy is subject to requirements of the 2014 Coal Ash Management Act (S.L. 2014-122) and subsequent revisions. The Act requires comprehensive changes in how Duke Energy manages its coal-fired stations and coal ash storage facilities. Among other things, it requires Duke Energy to (1) evaluate and remediate the coal ash basins at its North Carolina facilities and close the ash basins at the Buck facility by August 1, 2019, and (2) identify and properly manage wastewater seeps from the ash basins at those facilities.

D. Clean Water Act 316(a) Variance

Section 316(a) of the Clean Water Act provides that a thermal discharge may be granted a variance from stream standards for temperature if the permittee can demonstrate that the discharge will still ensure "the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on that body of water." The criteria for establishing such a variance are set forth in 40 CFR Part 125, Subpart H.

The Division has granted a temperature variance for operation of the Buck Steam Station since the mid-1970s. The thermal mixing zone originally extended to the High Rock Lake Dam.

E. Clean Water Act 316(b) Raw Water Intake Regulations

Section 316(b) of the Clean Water Act requires that cooling water intake structures minimize the adverse environmental impact of their operation. The requirements for intake structures at existing facilities are set forth in 40 CFR Part 125, Subpart J, last revised on August 14, 2014. Existing facilities with a design intake flow of 2 MGD or greater must meet 'best technology available' standards for impingement mortality and entrainment. 40 CFR 125.95(a)(2) requires permittees, at permit renewal or other approved date, to submit information to verify that its intake structure satisfies the BTA standards.

VI. RATIONALE FOR EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

Duke Energy's facilities, operations, and waste management needs at the Buck site have changed substantially since the permit was last issued. New regulatory requirements, legal agreements and other developments have placed additional demands on Duke Energy and the Buck facilities.

In response to these demands, Duke Energy proposes to:

- Continue operation of the CTCC plant;
- Complete the decommissioning of the Buck Steam Station and restoration of the BSS site;
- Undertake remediation of the ash basin system: decanting, dewatering, and reburning of the ash ("beneficiation") for use in concrete manufacturing;
- Manage discharges from two ash basin constructed seeps;
- Modify its waste treatment operations as necessary; and
- Modify its outfall configuration and install additional outfalls to accommodate these activities.

The draft permit includes significant modifications to accommodate these changes, as described in this section.

A. Proposed Wastestreams and Outfalls

The sources and types of waste discharges will increase and, for permitting purposes, can be categorized as those coming from steam electric power operations, coal ash pond remediation, and two ash pond constructed seeps. Table 3 lists the existing and planned outfalls for discharges from power generation and ash pond remediation. Table 4 notes the location of the constructed seep outfalls.

Table 3. Proposed Process Outfalls

OUTFALL	EFFLUENT	LATITUDE	LONGITUDE	RECEIVING WATER	CLASS
Steam Electric Operations					
002	Initial BSS/ CTCC Operations Process, sanitary, & domestic wastewaters, contaminated groundwater, and comingled stormwater	35.71222º	-80.36417º	UT Yadkin River/ cove of High Rock Lake	WS-V
002	Interim CTCC Operations Process, sanitary, & domestic wastewaters	35.71222º	-80.36417º	UT Yadkin River/ cove of High Rock Lake	WS-V
001A/ 006 (proposed)	CTCC Operations Process, sanitary, & domestic wastewaters	35.71384º 35.71416º	-80.37539º -80.37413º	Yadkin River/ HRL (mainstem)	WS-V
002A	Emergency overflow from Yard Sump	35.71389º	-80.37306º	Yadkin River/ HRL (mainstem)	WS-V
004	Raw water intake screenings	35.71384º	-80.37556º	Yadkin River/ High Rock Lake	WS-V
Ash Basin Remediation					
002	Ash Pond Decanting/ Dewatering Treated waters from ash basin remediation	35.71222º	-80.36417º	UT Yadkin River/ cove of High Rock Lake	WS-V
007 (proposed)	Ash Pond Decanting/ Dewatering Treated waters from ash basin remediation	35.71545°	-80.36522°	Yadkin River/ HRL (mainstem)	WS-V

1. Steam Electric Operations

   - Outfall 002. Sanitary (water treatment) and other wastes will continue to be generated in small amounts at the BSS through part of 2017. CTCC operations will continue to generate process, sanitary, and domestic wastes typical of steam electric power generating facilities. These wastes will continue to be collected at the BSS Yard Sump and the CTCC Plant Wastewater Sump, respectively, and pumped to the ash basins for settling and discharge at Outfall 002.

     Domestic wastewater is now directed to an on-site waste system permitted by Rowan County and will no longer be subject to this NPDES permit.

     When the NPDES stormwater permits for the facility are issued, Duke Energy will proceed with demolition of the remaining BSS structures and remediation of that portion of the Buck site. In general, work will begin on the western end of the site and proceed toward the eastern end. All sources of wastes to the BSS Yard Sump – and the Yard Sump itself – will be eliminated in this effort. Restoration of the BSS site will eliminate the discharge of contaminated stormwater to the ponds.

   - Outfalls 001A/ 006. Once the BSS wastes are eliminated and this wastewater permit is issued, Duke Energy will redirect all flows from the CTCC Wastewater Sump to the Yadkin River in accordance with the new permit. The CTCC wastes may initially discharge at the existing Outfall 001 (renumbered 001A). Outfall 001A will be removed in the course of the BSS demolition, and Duke Energy will then divert flows to a new Outfall 006 for those waste flows, to be located in the same vicinity, adjacent to the Buck boat ramp and dock.

2. Ash Basin Remediation

   - Outfall 002/ 007 – Decant Phase. When the CTCC waste flows have been redirected to Outfall 001A/ 006, Duke Energy will begin remediation of the ash ponds. First, free waters in the ponds will be decanted, treated (as necessary), and discharged, either at the existing Outfall 002 or at a new Outfall 007 to be constructed to the Yadkin River mainstem north of Outfall 002.
   - Outfall 002/ 007 – Dewatering Phase. When free waters are removed to a depth of 3 feet, remediation will enter the dewatering phase. The remaining free water and the interstitial waters within the ash deposits will be removed, treated (as necessary), and discharged at Outfall 002 or 007.

   (Duke Energy has not yet indicated whether it will remove the ash pond impoundments once the ash is removed, nor the nature of any flows that would continue to discharge from the site at that time. Thus, the permit does not address discharges from the ponds beyond the dewatering phase, and the permit requirements for that phase would apply to any such discharge.)

3. Ash Basin Constructed Seep Discharges

   Process for Seep Identification and Permitting. In 2014, Duke Energy developed and implemented a *Plan for Identification of New Discharges* for the Buck property, as required under the CAMA. The Plan specifies that Duke Energy will inspect the site on a regular basis and, when a seep is identified, ensure that any discharge is properly addressed.

   Duke Energy identified and sampled 17 potential seeps from the ash basin system, and seven more potential seeps and Areas of Wetness were identified later, for a total of 24 sampling points. Duke Energy and DEQ now propose to regulate constructed seeps in the NPDES permit and to enter into a Special Order of Compliance (SOC) that will govern discharges from other seeps.

   Of the seeps identified thus far, S-11 and S-17 are the only engineered seeps, and they will be regulated as Outfalls 111 and 117 under this permit; see Table 4. The remaining points are proposed to be regulated under the SOC, once it is established.

Table 4. Constructed Seeps

SAMPLING POINT ID	LATITUDE	LONGITUDE	POTENTIAL EFFLUENT CHANNEL	OUTFALL NUMBER	RECEIVING STREAM
S-11	35.707126	-80.374034	-	111	UT Yadkin R.
S-17	35.7058	-80.3753	-	117	UT Yadkin R.

B. Basis of Effluent Limitations

Limits are generally classified as one of two types:

- Technology-based effluent limitations (TBELs) are applicable waste treatment performance standards (if any) and apply regardless of the discharge's impacts to the receiving waters.
- Water quality-based effluent limits (WQBELs) ensure that a discharge does not cause or contribute to an exceedance of applicable surface water quality standards and criteria. WQBELs represent the maximum allowable effluent concentration that will not cause an exceedance under specific low-flow conditions.

A discharge may be subject to one or both types of limit for any given parameter of concern.

1. TBELs

   a. Process Wastewaters

   Process waste discharges from the Buck facility are subject to technology-based effluent limitations established in the Effluent Limitations Guidelines (ELGs) for Steam Electric Power Generating Point Source Category, 40 CFR Part 423.

   40 CFR 423.12 and 423.13 set BPT and BAT performance standards, respectively, applicable to discharges from the Buck facilities. The requirements are summarized below:

   The following Buck process waste flows are subject to the Steam Electric ELGs. Although the coal-fired operations have ceased, the technology-based limits that applied to most waste sources will continue to apply to the pond discharges until the residuals from past operations ('legacy' sources) are removed. Metal cleaning wastes are no longer discharged to the ash basin system and are not treated as legacy sources.

   Initial BSS/ CTCC Operations – Outfall 002:

   - Cooling tower blowdown (CTCC);
   - Low volume waste sources (CTCC, legacy BSS @ powerhouse, ash ponds); and
   - Coal pile runoff, ash transport waters, ash leachate (legacy BSS @ ponds).

   Interim CTCC Operations – Outfalls 001A/006:

   - Cooling tower blowdown (CTCC);
   - Low volume waste sources (CTCC, legacy BSS @ ponds); and
   - Coal pile runoff, ash transport waters, ash leachate (legacy BSS @ ponds).

   CTCC Operations – Outfalls 001A/006:

   - Cooling tower blowdown (CTCC); and
   - Low-volume wastes (CTCC).

40 CFR 423.12
BPT STANDARDS FOR EXISTING FACILITIES

(a) (Explanatory)

(b) (1) pH: 6-9 at all times

(2) No discharge of PCBs

(3) Low volume waste sources:

(4) Fly & bottom ash transport waters:

(11) Combustion residual (ash) leachate:

	BPT Effluent Limits	
	Daily Max (mg/L)	**Mo. Average (mg/L)**
TSS	100.0	30.0
O&G	20.0	15.0

(5) Metal cleaning wastes:

	BPT Effluent Limits	
	Daily Max (mg/L)	**Mo. Average (mg/L)**
TSS	100.0	30.0
O&G	20.0	15.0
Total Copper	1.0	1.0
Total Iron	1.0	1.0

(6) Once-through cooling water:

(7) Cooling tower blowdown:

	BPT Effluent Limits	
	Daily Max (mg/L)	**Mo. Average (mg/L)**
Free available chlorine	0.5	0.2

(8) Free available chlorine and total chlorine: restrictions on duration of discharges (1 unit max, 2 hr/day max)

(9) Coal pile runoff

	BPT Effluent Limits	
	Daily Max (mg/L)	**Mo. Average (mg/L)**
TSS	50.0	-

(10) Coal pile runoff – storm overflow waiver

(12) Concentration limits allowed

(13) Combined wastestreams

40 CFR 423.13
BAT STANDARDS FOR EXISTING FACILITIES

(a) No discharge of PCBs

(b) (1) Once-through cooling water (≥25 MW capacity)

	BAT Effluent Limits	
	Daily Max (mg/L)	**Mo. Average (mg/L)**
Total residual chlorine	0.2	-

(2) Restrictions on chlorine discharges (2 hr/day max)

(c) (<25 MW capacity – Not Applicable)

(d) (1) Cooling tower blowdown:

	BAT Effluent Limits	
	Daily Max (mg/L)	**Mo. Average (mg/L)**
Free available chlorine	0.5	0.2
126 priority pollutants*	No detectable amount	
except: **Total Cr**	0.2	0.2
Total Zn	1.00	1.00

(2) Restrictions on chlorine discharges (1 unit max, 2 hr/day max)

(3) Alternative to monitoring priority pollutants

(e) Chemical metal cleaning wastes:

	BAT Effluent Limits	
	Daily Max (mg/L)	**Mo. Average (mg/L)**
Total Copper	1.0	1.0
Total Iron	1.0	1.0

(f)-(k) (Not Applicable)

(l) Combustion residual (ash) leachate:

	BAT Effluent Limits	
	Daily Max (mg/L)	**Mo. Average (mg/L)**
TSS	100.0	30.0

(m) Concentration limits allowed

(n) Combined wastestreams

* Contained in chemicals for cooling tower maintenance.

b. Ash Basin Remediation

Discharges from the ash pond during remediation will be subject to the Steam Electric ELGs at least until completion of remediation:

Ash Pond Decanting/ Dewatering – Outfalls 002/007:

- Low volume waste sources (legacy BSS & CTCC); and
- Coal pile runoff, ash transport waters, ash leachate (legacy BSS).

c. Ash Basin Constructed Seeps

Discharges from the constructed seeps will also be subject to the Steam Electric ELGs:

Ash Basin Constructed Seeps – Outfalls 111 & 117:

- Cooling tower blowdown (CTCC);
- Low volume waste sources (CTCC, legacy BSS @ powerhouse, ash ponds); and
- Coal pile runoff, ash transport waters, ash leachate (legacy BSS @ ponds).

d. Domestic Wastewater

Domestic wastewater is now directed to an on-site waste system permitted by Rowan County and will no longer be subject to this NPDES permit.

2. WQBELs – Reasonable Potential Analysis (RPA)

Purpose and Methodology. The need for water quality-based effluent limits (WQBELs) was evaluated for each discharge of process wastes, ash remediation waters, and ash basin seepage using the Division's Reasonable Potential Analysis (RPA) methodology. The RPA used here is a statistical means of evaluating whether toxicants discharged by a facility have a reasonable potential to cause an exceedance of water quality standards or EPA-recommended criteria in the receiving stream. The Division's methodology is approved by the U.S. EPA and is consistent with the EPA's *Technical Support Document for Water Quality-based Toxics Control*, or "TSD".

The RPA evaluates actual effluent data for each waste discharge and estimates the maximum concentration for each pollutant of concern that will not be exceeded in 95% of future samples, with 95% confidence. It also calculates for each parameter the maximum allowable effluent concentration, which is the highest discharge concentration that, at design discharge flow and statistical low flows in the receiving stream, will not exceed the surface water quality standard or criterion in the stream. If the maximum *predicted* effluent concentration of a pollutant is greater than the maximum *allowable* concentration, the discharge is said to show a reasonable potential to cause an exceedance of that standard or criterion. When that is the case, an effluent limit is warranted and is included in the permit.

The Division compiled effluent data for discharges at the Buck site and conducted RPAs for each toxicant of concern at each outfall. A minimum of 12 samples is preferred for RPAs. In most cases, fewer than ten samples were available for the Buck discharges; often a single result. In these cases, the RPA calculations conservatively account for the resulting uncertainties. Still, additional monitoring is needed to support a more rigorous evaluation of the discharges' likely impacts on water quality.

For the purposes of these RPAs, instream background concentrations for all toxicant parameters were assumed to be below detection levels. Standards for hardness-dependent metals were calculated assuming a default hardness value of 25 mg/L as $CaCO_3$.

Flow Values. The following assumptions were used to set stream flow values for the RPAs.

Discharges to Yadkin River Mainstem. The mainstem of the Yadkin River adjacent to the Buck site is generally riverine in nature and provides mixing and dilution to discharges. For

permitting purposes, the Division used the stream flow values last developed by the USGS to evaluate limits for these discharges.

Discharges to Yadkin River Side Channels. Outfall 002 discharges to a side cove of High Rock Lake. Outfall 002 is located approximately 0.7 mile from the mainstem of the river. While the mainstem is riverine, the cove does not reliably provide mixing or dilution for discharges.

Discharges to Unnamed Tributaries. The constructed seeps designated as Outfalls 111 and 117 discharge to the same unnamed tributary, which then flows to the side channel along the west side of the Buck site. It is assumed that these are zero-flow streams and provide no dilution to the discharge.

Additional assumptions and results of the RPAs for each outfall and discharge are described below. Detailed results of each RPA are attached to this Fact Sheet.

NOTE: A discharge may be subject to one or both types of limit for any given parameter of concern. If the discharge is subject to both TBELs and WQBELs for a parameter, the more stringent limit is applied in the permit. If water quality standards or criteria have been established for the parameter, the TBEL is compared to the maximum allowable effluent concentration, and the more stringent value is applied as a limit.

C. Results of RPAs

1. Outfall 002 – Initial BSS/CTCC Operations.

   RPAs were conducted for the current discharge from the ash ponds, prior to closure of the BSS Yard Sump and diversion of CTCC flows to the Yadkin River, and prior to the start of ash pond decanting. The calculations were conducted with Jan 2012 to Jun 2016 DMR data for metals monitored under the current permit (arsenic, copper, mercury, and selenium); and with results from the one-time sampling required for permit renewal (Form 2C results): aluminum, antimony, beryllium, boron, cadmium, total chromium, iron, lead, magnesium, manganese, molybdenum, nickel, thallium, and zinc. The waste flow was 0.62 MGD, derived from the application. Available dilution in the impounded cove was assumed to be zero, a significant decrease from previous permits.

   The results indicate that the discharge shows reasonable potential to cause an exceedance of one or more standards for arsenic, antimony, trivalent chromium, hexavalent chromium, copper, nickel and zinc and warrants monitoring for mercury and selenium (maximum predicted concentration > ½ maximum allowable concentration). Where acute standards have not been adopted (antimony), the Daily Maximum limit is set equal to the Monthly Average.

2. Outfall 002 – Interim Outfall – CTCC.

   RPAs were conducted using monitoring data for a single sampling event at the CTCC Plant Sump, provided in Form 2C of the permit application. The parameters included aluminum, antimony, boron, cadmium, total chromium, copper, fluoride, iron, lead, magnesium, manganese, mercury, molybdenum, nickel, selenium, thallium, and zinc. While the RPA is designed to account for the uncertainties of limited data, it will be necessary for Duke Energy to more thoroughly characterize the discharge in the coming term of the permit. The discharge flow rate was determined from component wastestream flows found in the application package and supplemental materials.

   The analysis indicates that the discharge shows reasonable potential to cause an exceedance of one or more standards for aluminum, antimony, chloroform, trivalent chromium, hexavalent chromium, copper, fluoride, nickel, and zinc. Where acute standards have not been adopted (antimony, fluoride, chloroform), the Daily Maximum limit is set the same as the Monthly Average.

Duke Energy has indicated it does not use chloroform at the facility, and its detection could be the result of lab contamination. Further analysis is required to verify its presence before a limit is set.

3. Outfall 001A/ 006 – CTCC Operations.

   RPAs were conducted for the discharge of process and sanitary wastes once those flows are diverted to Outfalls 001A and then 006. The RPAs were based on results from the same sampling event, reported in Duke Energy's permit application; a waste flow of 0.62 MGD, and a summer 7Q10 flow of 1,030 cfs. Parameters evaluated included aluminum, antimony, arsenic, beryllium, cadmium, chloroform, total chromium, copper, fluoride, lead, magnesium, manganese, mercury, nickel, selenium, and zinc.

   The analysis indicates that the discharge does not show reasonable potential to violate acute or chronic aquatic life standards in the river for the pollutants of concern.

   Temperature limits and variance conditions from the previous permit are carried forward to apply to CTCC discharges, once those flows are diverted from the ash ponds to the Yadkin River.

4. Outfalls 002/007 – Ash Pond Decanting.

   RPAs were conducted for the potential discharge from the ash ponds during the decanting phase. These RPAs were conducted for aluminum, antimony, boron, cadmium, total chromium, copper, fluoride, iron, lead, magnesium, manganese, molybdenum, nickel, selenium, thallium, vanadium, and zinc. They used the results from samples of standing water ("free water") collected from the ash basins on January 9, 2015; to introduce a margin of safety, the maximum reported values from Cell 3 were used.

   Discharge flow was based on estimated discharge from treatment units installed for this purpose – 1,200 gpm (1.728 MGD). The 7Q10 flow used for Outfall 002 (impounded waters) was zero; and for Outfall 007, 1,030 cfs.

   The analysis indicates reasonable potential for several parameters to exceed surface water quality standards or EPA criteria at Outfall 002: total dissolved solids (TDS), arsenic, chlorides, copper, antimony, lead, nickel, and selenium. Chromium warrants further monitoring.

   The analysis indicates no reasonable potential to exceed surface water quality standards or EPA criteria if the flow is diverted to Outfall 007. Per Division guidance, WQBELs for arsenic and selenium are included nonetheless.

5. Outfalls 002/007 – Ash Pond Dewatering.

   RPAs were conducted for the potential discharge from the ash ponds during the dewatering phase. These RPAs were conducted for aluminum, antimony, boron, cadmium, total chromium, copper, fluoride, iron, lead, magnesium, manganese, molybdenum, nickel, selenium, thallium, vanadium, and zinc. They used the results from samples of interstitial waters (those waters within the ash deposits) collected from the ash basins on January 9, 2015; to introduce a margin of safety, the maximum reported values from unfiltered samples were used.

   Discharge flow was based on estimated discharge from treatment units installed for this purpose – 500 gpm (0.72 MGD). The 7Q10 flow used for Outfall 002 (impounded waters) was zero; and for Outfall 007, 1,030 cfs.

   The analysis for Outfall 002 indicates reasonable potential for the same parameters as in the decanting phase, with the addition of thallium. Again, chromium warrants further monitoring.

   The analysis for Outfall 007 indicates no reasonable potential to exceed surface water quality standards or EPA criteria.

6. Outfalls 111 and 117 – Ash Basin Constructed Seep Management

   RPAs were conducted for flows from the constructed seeps using available data from sampling conducted since 2013. The parameters evaluated in these RPAs were total dissolved solids, chlorides, aluminum, antimony, arsenic, boron, cadmium, total chromium, copper, iron, lead, manganese, mercury, molybdenum, nickel, selenium, thallium, and zinc.

   The maximum reported flows for seep S-11 were multiplied by a factor of 10 to account for uncertainties in the flow rates. No flows had been recorded for seep S-17, so the S-11 flow was used for those RPAs as well. For permitting purposes, the constructed seeps were assumed to discharge to zero-flow waters.

   The analyses indicate that Outfalls 111 and 117 both show reasonable potential for TDS, and Outfall 117 also shows reasonable potential for aluminum.

D. WQBELs – Mercury Evaluations

Mercury levels in the process discharges and seepage flows were also evaluated in accordance with the Division's *Permitting Guidelines for Statewide Mercury TMDL*. According to the *Guidelines*, annual average mercury concentrations are compared to the 12.0 ng/L water quality standard, and maximum values are compared to a treatment performance standard of 47.0 ng/L. If either standard is exceeded, it is applied as the corresponding effluent limitation in the permit: annual average or daily maximum. The results for the Buck facility are as follows.

1. Process Outfall Evaluations

   Outfall 002 – Initial BSS/CTCC Operations. Duke Energy monitors mercury at Outfall 002 on a quarterly basis. Results from March 2012 through June 2016 are summarized in Table 3.

Table 3. Mercury Results – Outfall 002

YEAR	2012	2013	2014	2015	2016
Annual Average Concentration (ng/L)	0.58	0.59	0.81	0.71	2.3
Maximum Sampling Result (ng/L)	0.83	0.74	1.3	0.88	1.77
Number of Samples	4	4	5	4	3

   With an IWC of 100%, the allowable mercury concentration for this outfall is equal to the surface water quality standard of 12 ng/L. All annual average mercury concentrations are below the allowable level, and all maximum sampling results are below the TBEL of 47.0 ng/L. Thus, per the *Guidelines*, mercury limits are not warranted at this outfall.

   Outfall 002 – Interim Outfall – CTCC. Duke Energy has only reported one sampling event at the CTCC Plant Sump. Given an IWC of 100%, the allowable mercury concentration is again 12 ng/L. The one sample result, reported on the Form 2C in Duke Energy's permit application, was 13 ng/L, greater than the allowable level. Thus, a mercury limit is warranted at this outfall.

   Outfall 001A/ 006 – CTCC. Duke Energy plans to divert the CTCC discharge to the Yadkin River once the steam station is decommissioned. This will result in an IWC of 0.1% and an allowable mercury concentration 1,000 times greater than the standard. As a result, the mercury limit for this discharge will no longer be warranted.

2. Ash Pond Decanting and Dewatering Outfall Evaluations

   On January 9, 2015, Duke Energy sampled the free-standing and interstitial waters in its ash basin system. The mercury results for each set of waters were evaluated as above; the maximum values in each case were used in order to conservatively test the impacts that could result from discharging these without treatment to the receiving water.

   Outfall 002/ 007 (Decanting Phase). The maximum value reported for the free-standing waters was 6.96 ng/L. This is less than the allowable concentration of 12 ng/L. Thus, no mercury limit is required.

Outfall 002/ 007 (Dewatering Phase). The maximum value reported for the interstitial waters was 6.7 ng/L. Again, this is less than the allowable concentration of 12 ng/L, and no mercury limit is required.

3. Ash Basin Constructed Seeps Evaluation

   From September 2014 to October 2017, Duke Energy sampled the constructed seeps approximately four times each for an array of parameters, including mercury. The mercury results were evaluated as above; and the maximum value was used as a conservative test.

   The constructed seeps discharge to an unnamed tributary to the side channel of the lake on the west side of the Buck site. The maximum reported value was 3.3 ng/L, and no mercury limit is warranted for either discharge.

E. Toxicity Testing

Whole effluent toxicity monitoring and limits are established according to the Division's long-standing toxicity policy. The following is a summary of current and proposed toxicity requirements for each outfall.

1. Outfall 002 (Initial BSS/CTCC Operations, Interim CTCC Operations)

   Current: Chronic P/F @ 0.7% using *Ceriodaphnia dubia*; quarterly, during the months of March, June, September, and December.

   Recommended: Chronic P/F @ 90% using *Ceriodaphnia dubia*; quarterly, during the months of March, June, September, and December; effective six months after the effective date of the permit.

   During the current permit cycle, the facility passed all (19 out of 19) toxicity tests at the 0.7% waste concentration. In order to reflect the limited dilution available at this outfall and to conform to the Division's policy for discharges to impounded waters, the draft permit requires the same quarterly Chronic P/F test using *Ceriodaphnia dubia* but at a waste concentration of 90%.

2. Outfall 001A/006 (CTCC Operations)

   Current: None – new discharge.

   Recommended: Chronic P/F @ 0.1% using *Ceriodaphnia dubia*; quarterly, during the months of March, June, September, and December.

   When the process and sanitary flows are diverted to the new outfall structures, the toxicity test will change to reflect the dilution available at the new location(s). In other respects, the requirement remains the same as at Outfall 002.

3. Outfall 002 (Decanting and Dewatering of Ash Ponds)

   Current: None – new discharge.

   Recommended: Chronic P/F @ 90% using *Ceriodaphnia dubia*; monthly test for both phases.

   The same chronic test will be required during decanting and dewatering of the ash ponds. Testing is required on a monthly basis due to the potential variability of the discharge characteristics during the course of the remediation project.

4. Outfall 007 (Decanting and Dewatering of Ash Ponds)

   Current: None – new discharge.

   Recommended: Chronic P/F @ 0.3% (decant phase) and 0.1% (dewatering phase) using *Ceriodaphnia dubia*; monthly test for both phases.

   Testing will continue at a monthly frequency when and if the discharge is relocated to a new Outfall 007at the river. The other requirements for the test are the same as those at Outfall 002.

5. Outfalls 111 and 117 (Constructed Seeps)

   Current: None – newly permitted discharge.

   Recommended: The Division is not proposing toxicity limits or monitoring for the constructed seeps at this time. The characteristics are generally similar to ash pond discharges, which already have toxicity limits. The discharge is also less contaminated – and likely less toxic – than the decanting/ dewatering discharges, which will receive toxicity limits. Thus, WET tests here would be of little value.

F. Summary of Proposed Effluent Limitations and Monitoring Requirements

Part I of the permit is organized into four sections:

A. Steam Electric Operations

B. Ash Basin Remediation

C. Ash Basin Constructed Seeps Management

These sections are primarily effluent limits pages for the various outfalls and operating phases at the facility.

The following tables summarize the proposed effluent limits and other requirements, as described above, for each discharge and each phase of operations (Sections A.-B.). Then follows a brief description of the special conditions in Section C.

F1. Steam Electric Operations (Section A of Permit).

1. Outfall 001 – Once-Through Non-Contact Cooling Water.

This operation is no longer active, and the outfall is deleted from the permit. Thermal limits, the 316(a) temperature variance, and other relevant conditions are applied to process discharges at other outfalls.

(go to next page)

2. Outfall 002 – Initial BSS/CTCC Operations.

Effluent limitations and monitoring requirements are summarized as follows:

PARAMETER	LIMITATIONS AND MONITORING			CHANGE	BASIS
	Monthly Average	Daily Maximum	Frequency/ Type		
Flow (MGD)			Weekly / Logs	None	15A NCAC 02B .0505
pH	≥ 6.0 and ≤ 9.0 standard units		Weekly / Grab	None	40 CFR 423.12(b)(1)
Total Nitrogen, mg/L			Monthly / Grab	None	15A NCAC 02B .0508
Total Phosphorus, mg/L			Monthly / Grab	None	15A NCAC 02B .0508
Total Suspended Solids	23.0 mg/L	74.0 mg/L	Quarterly / Grab	None	40 CFR 423.12(b)(3)
Oil and Grease	11.0 mg/L	15.0 mg/L	Quarterly / Grab	None	40 CFR 423.12(b)(3)
Total Hardness, mg/L as $CaCO_3$			Quarterly / Grab	New monitoring	Parameter of concern
Total Arsenic *(eff. [>6 mos.])*	10.0 µg/L	340 µg/L	Quarterly / Grab	New limit	RPA, 15A NCAC 02B .0200
Total Selenium, µg/L			Quarterly / Grab	None	Parameter of concern
Total Mercury, ng/L			Quarterly / Grab	None	Parameter of concern
Total Antimony *(effective [>6 mos.])*	5.6 µg/L	5.6 µg/L	Quarterly / Grab	New limit	RPA, 15A NCAC 02B .0200
Total Chromium, ug/L	200 µg/L	200 µg/L	Quarterly / Grab	New limit	40 CFR 423.13(d)
Trivalent Chromium *(effective [>6 mos.])*	118 µg/L	905 µg/L	Quarterly / Calc'd	New limit	15A NCAC 02B .0200
Hexavalent Chromium *(effective [>6 mos.])*	11.0 µg/L	16.0 µg/L	Quarterly / Grab	New limit	15A NCAC 02B .0200
Total Copper *(eff. [>6 mos.])*	7.9 µg/L	10.5 µg/L	Quarterly / Grab	New limit	15A NCAC 02B .0200
Total Nickel *(eff. [>6 mos.])*	25.0 µg/L	335 µg/L	Quarterly / Grab	New limit	RPA, 15A NCAC 02B .0200
Total Zinc *(eff. [>6 mos.])*	126 µg/L	126 µg/L	Quarterly / Grab	New limit	15A NCAC 02B .0200
Chronic Toxicity *(1st 6 mos.)* *(effective [>6 mos.])*	P/F @ 0.7% P/F @ 90%		Quarterly / Grab	None New limit	15A NCAC 02B .0208
The 126 priority pollutants except Total Chromium and Total Zinc	No detectable amount		Annually / Grab	New limits	40 CFR 423.13(d)

* IWC means Instream Waste Concentration

Flow. Daily flows are determined weekly based on operating logs for the ash ponds.

pH. The instantaneous limit for pH is based on the Effluent Limitations Guidelines (ELGs) for Steam Electric Power Generation facilities.

Nutrients. Nutrient monitoring is as required in 15A NCAC 02B .0508.

Oil & Grease, TSS. The ELGs include limits for Oil & Grease and TSS. The limits in this permit were previously tightened to account for mixing of regulated and unregulated wastestreams. The flow balance has changed since that time. Updating the adjustment could result in relaxed limits. The facility has consistently met the limits, so the existing limits are continued.

The EPA has objected to the footnote in the existing permit allowing a net/gross adjustment to the TSS limit, and the footnote has been deleted.

Hardness monitoring is necessary to determining applicable standards for hardness-dependent metals.

Copper, Zinc. The ELGs set technology-based limits (TBELs) for total copper and total zinc at 1.0 mg/L Monthly Average and Daily Maximum. The discharge does not show reasonable potential to exceed the dissolved metal water quality standards for either metal; however, discharging at the 1.0 mg/L total metal limits could cause an exceedance in either case. Thus, the permit sets water quality-based limits (WQBELs) for total copper and total zinc. (See Compliance Schedule, below.)

Iron. No requirements. The state no longer has an iron standard, and the ELG limits (1.0 mg/L) apply only when metal cleaning wastes (none here) are discharged.

Chromium. The ELGs set limits for total chromium at 0.2 mg/L. The discharge does not show reasonable potential to exceed either the previous surface water standard for total chromium or the current standards for dissolved trivalent and hexavalent chromium (one data point, less than PQL). However, as with copper and zinc, discharging at the TBEL concentrations (total metals) could cause an exceedance of applicable dissolved metals standards in the receiving stream. Thus, the permit includes TBELs for total chromium and WQBELs for hexavalent and trivalent chromium.

Selenium and Mercury do not show reasonable potential but are pollutants of concern and will continue to be monitored to provide additional data for the next RPAs.

Arsenic, Antimony, and Nickel exhibit reasonable potential to cause exceedances of surface water standards, and the maximum allowable effluent concentrations for each are applied as limits. If there is no acute standard, the Daily Maximum limit is set equal to the Monthly Average limit. These WQBELs become effective six months after the effective date of the permit

The 126 Priority Pollutants. The ELGs prohibit discharge of these pollutants except for chromium and zinc, for which they set TBELs (see above). The regulations also provide that the monitoring requirement can be waived at the Director's discretion if calculations demonstrate that the pollutants will be at low enough concentrations so as to not be detected in the discharge. This condition includes language to that effect.

Chronic Toxicity is limited and testing is required on a quarterly basis per the Division's whole effluent toxicity protocol. The initial IWC will be 0.7%, as in the current permit; this will increase to 90% six months after the effective date of the permit to reflect the limited dilution in the cove.

Chlorine. Detention times in the ash ponds are relatively long and allow for dissipation of chlorine prior to discharge. Therefore, neither ELG limits nor monitoring requirements for chlorine are included in the permit.

Monitoring frequencies are similar to those in the current permit, which take into account the detention times in the ash ponds; except that flow and pH monitoring is increased to weekly to be more consistent with minimum frequencies at other NPDES facilities.

Compliance Schedule -Metals and Chronic Toxicity.

The permit allows Duke Energy six months to comply with the new limits for metals and chronic toxicity (or to divert flows to the river via Outfall 001A or 006). For those metals with applicable TBELs, the TBELs will apply for the first six months of the permit term and replaced by the WQBELs beginning with the seventh month.

Additional Provisions.

- Authorized waste flows are specified.
- The discharge of metal cleaning wastes is prohibited as is the discharge of floating solids or visible foam in other than trace amounts.
- The Permittee must notify the Division prior to eliminating the BSS waste flows, a change that triggers new effluent limitations and monitoring requirements for the discharge.

3. Outfall 002 – Interim Outfall – CTCC Operations.

With the cessation of the BSS discharges, effluent limitations and monitoring requirements are as follows:

PARAMETER	LIMITATIONS AND MONITORING			CHANGE	BASIS
	Monthly Average	Daily Maximum	Frequency/ Type		
Flow (MGD)			Weekly / Logs	None	15A NCAC 02B .0505
pH	≥ 6.0 and ≤ 9.0 standard units		Weekly / Grab	None	40 CFR 423.12(b)(1)
Total Nitrogen, mg/L			Monthly / Grab	None	15A NCAC 02B .0508
Total Phosphorus, mg/L			Monthly / Grab	None	15A NCAC 02B .0508
Total Suspended Solids	23.0 mg/L	74.0 mg/L	Monthly / Grab	None	40 CFR 423.12(b)(3)
Oil and Grease	11.0 mg/L	15.0 mg/L	Monthly / Grab	None	40 CFR 423.12(b)(3)
Total Hardness, mg/L as $CaCO_3$			Monthly / Grab	New monitoring	Parameter of concern
Total Arsenic, µg/L			Monthly / Grab	None	RPA, 15A NCAC 02B .0200
Total Selenium, µg/L			Monthly / Grab	None	RPA, 15A NCAC 02B .0200
Total Mercury *(eff. [>6 mos.])*	12.0 ng/L (annual average) [4]		Monthly / Grab	None	Hg Evaluation
Total Aluminum *(>6 mos.)*	6.5 mg/L	6.5 mg/L	Monthly / Grab	New limit	RPA, 15A NCAC 02B .0200
Total Antimony *(>6 mos.)*	5.6 µg/L	5.6 µg/L	Monthly / Grab	New limit	RPA, 15A NCAC 02B .0200
Total Chromium	200 µg/L	200 µg/L	Monthly / Grab	New limit	40 CFR 423.13(d)
Trivalent Chromium *(effective [>6 mos.])*	118 µg/L	905 µg/L	Monthly / Calc'd	New limit	15A NCAC 02B .0200
Hexavalent Chromium *(effective [>6 mos.])*	11.0 µg/L	16.0 µg/L	Monthly / Grab	New limit	15A NCAC 02B .0200
Total Copper *(eff. [>6 mos.])*	7.9 µg/L	10.5 µg/L	Quarterly / Grab	New limit	15A NCAC 02B .0200
Total Nickel *(>6 mos.)*	25.0 µg/L	335 µg/L	Monthly / Grab	New limit	RPA, 15A NCAC 02B .0200
Total Zinc *(eff. [>6 mos.])*	126 µg/L	126 µg/L	Quarterly / Grab	New limit	15A NCAC 02B .0200
Total Fluoride *(>6 mos.)*	1.8 mg/L	1.8 mg/L	Monthly / Grab	New limit	RPA, 15A NCAC 02B .0200
Chloroform, µg/L			Quarterly / Grab	New monitoring	RPA, 02B .0200**
Chronic Toxicity *(1st 6 mos.)* *(effective [>6 mos.])*	P/F @ 0.7% P/F @ 90%		Quarterly / Grab	None New limit	15A NCAC 02B .0200
The 126 priority pollutants except Total Chromium and Total Zinc	No detectable amount		Annually / Grab	New limits	40 CFR 423.13(d)

* IWC means Instream Waste Concentration

** Maximum predicted concentration > ½ Maximum allowable concentration

Limits were evaluated based on a single sample whose results were reported in a Form 2C in the permit application. Most requirements are similar to or the same as those for the initial Outfall 002 effluent page, above. Key differences are as follows:

Arsenic shows no reasonable potential. It remains a parameter of concern, and monitoring is required.

Copper, Hexavalent Chromium, Aluminum, Antimony, Nickel, Zinc, and Fluoride. The discharge shows reasonable potential for these parameters, and WQBELs are included in the permit. See Compliance Schedule, below.

Mercury. The only sample was analyzed for mercury and, because it exceeded the 12.0 ng/L standard (13.0 ng/L), an annual limit is applied.

Chloroform was detected in this sample, but the result is unexpected and the source is unknown. The permit requires additional monitoring to check for its presence; if the initial analysis is less than the PQL (non-detect), monitoring is waived for the duration of the permit term.

Compliance Schedule – Metals and Chronic Toxicity. The permit allows Duke Energy six months from the effective date of the permit to comply with the new limits for metals and chronic toxicity

(or to divert flows to the river via Outfall 001A or 006). In the meantime, the existing limits apply. This is a continuation, not an extension, of the six month compliance period in Condition A.(1.).

Monitoring. Monitoring frequencies for most parameters are increased to monthly due to the addition of new WQBELs. This increase also applies to parameters that have been monitored less frequently because of the long holding times in the ash ponds.

Additional Provisions.

- Given the limited characterization of this discharge, the Permittee must sample at least once more and submit a completed Form 2C application with the results within 180 days in order to identify or verify the parameters of concern.
- Regular monitoring of this particular combination of waste flows will provide additional data for future RPAs for key parameters. Monitoring frequencies for most of the limited parameters are increased to monthly.
- The Permittee must notify the Division prior to diverting the sump discharge to Outfall 001A or 006, in order to trigger new effluent limitations and monitoring requirements for the discharge.

4. Outfall 001A – CTCC Operations.

Effluent limitations and monitoring requirements are summarized as follows:

PARAMETER	LIMITATIONS AND MONITORING			CHANGE	BASIS
	Monthly Average	Daily Maximum	Frequency/ Type		
Flow (MGD)			Daily / Logs	New	15A NCAC 02B .0505
pH	≥ 6.0 and ≤ 9.0 standard units		Daily / Grab	New	40 CFR 423.12(b)(1)
Temperature (Effluent)	35°C (95°F)		Daily / Grab	New	15A NCAC 02B .0200
Temperature Rise (Effl – Intake)			Daily / Grab	New	15A NCAC 02B .0208
Total Nitrogen, mg/L			Monthly / Grab	New	15A NCAC 02B .0500
Total Phosphorus, mg/L			Monthly / Grab	New	15A NCAC 02B .0500
Total Suspended Solids	23.0 mg/L	74.0 mg/L	2/Month / Grab	New	40 CFR 423.12(b)(3)
Oil and Grease	11.0 mg/L	15.0 mg/L	2/Month / Grab	New	40 CFR 423.12(b)(3)
Total Residual Chlorine		28.0 µg/L	2/Month / Grab	New	40 CFR 423.12(b)(3)
Free Available Chlorine	200 µg/L	500 µg/L	2/Month / Grab	New	40 CFR 423.13(d)(1)
Total Hardness, mg/L as $CaCO_3$			2/Month / Grab	New	Parameter of concern
Total Arsenic			Quarterly / Grab	New	POC – No RP**
Total Selenium, µg/L			Quarterly / Grab	New	POC – No RP**
Total Mercury, ng/L			Quarterly / Grab	New	POC – No RP**
Total Aluminum			Quarterly / Grab	New	POC – No RP**
Total Antimony			Quarterly / Grab	New	POC – No RP**
Total Chromium	200 µg/L	200 µg/L	2/Month / Grab	None	40 CFR 423.13(d)
Total Copper			Quarterly / Grab	New	40 CFR 423.13(e)
Total Nickel			Quarterly / Grab	New	POC – No RP**
Total Zinc	1,000 µg/L	1,000 µg/L	2/Month / Grab	None	15A NCAC 02B .0200
Total Fluoride			Quarterly / Grab	New	POC – No RP**
Chloroform, µg/L			Quarterly / Grab	New	POC – No RP**
Chronic Toxicity	P/F at 0.1% IWC*		Quarterly / Grab	New	15A NCAC 02B .0200
The 126 priority pollutants except Cr_T and Zn_T	No detectable amount		Annually / Grab	New	40 CFR 423.13(d)

* IWC means Instream Waste Concentration

** Parameter of concern, did not show reasonable potential bases on limited data set.

Most requirements are similar to or the same as those for the initial and interim Outfall 002 effluent pages, above. Differences are described below:

Temperature. This condition includes the same 35°C effluent limit and temperature rise limits as before and, in paragraphs below the limits table, other provisions of the thermal variance.

With retirement of the BSS coal-fired units, heated discharges are less than 1% of past flows and thermal loads. It is not clear that a variance or mixing zone is needed any longer. Duke Energy has requested continuation of its 316(a) temperature variance for this permit cycle so that it can evaluate the need. A special condition in Section C of the permit provides that, if Duke Energy plans to request continuation of the variance in the next cycle, it must perform a thermal mixing study to justify the variance and determine the extent of the thermal mixing zone.

Copper, Chromium, Zinc, Oil & Grease, TSS, and pH. Limits are based on the ELGs. None of the metals exhibited reasonable potential.

Other Metals, Fluoride. These parameters are not subject to ELGs and, due to the greater dilution in the river, none exhibited reasonable potential. Thus, no water quality-based limits are warranted.

Chlorine. TBELs for free available chlorine are included per the ELGs. A WQBEL of 28.0 µg/L for total residual chlorine is included, along with the standard footnote regarding the 50 µg/L compliance threshold.

Chloroform. In case the chloroform sample from the previous condition has not been collected when this condition takes effect, the condition and the original compliance date are carried forward.

Monitoring. Direct discharge to the river (rather than to the ash ponds) warrants more frequent monitoring for most parameters, even though the IWC is greatly reduced. The Permittee can request reduced frequencies when sufficient data indicate a consistently high level of compliance with the new limits.

Additional Provisions.

- The permit requires a new pollutant scan and Form 2C application within 180 days of discharge at the new outfall, unless a scan has already been performed to satisfy the previous conditions.
- Concurrent discharge from 001A and 006 is only allowed to the extent necessary to bring the new outfall online.
- Duke Energy must notify the Division prior to diverting the sump discharge to a new Outfall 006.

5. Outfall 006 – CTCC Operations.

Requirements for Outfall 006 are the same as for Outfall 001A.

6. Outfall 002A – Emergency Yard Sump Overflow.

Effluent limitations and monitoring requirements are summarized as follows:

PARAMETER	LIMITATIONS AND MONITORING			CHANGE	BASIS
	Monthly Average	Daily Maximum	Frequency/ Type		
Flow (MGD)			Episodic / Estimate	None	15A NCAC 02B .0505
pH	≥ 6.0 and ≤ 9.0 standard units		Episodic / Grab	None	40 CFR 423.12(b)(1)
Total Suspended Solids, mg/L			Episodic / Grab	None	Parameter of concern
Fecal Coliform, #/100 mL			Episodic / Grab	None	Parameter of concern

Monitoring is required if overflow event exceeds one hour in duration.

This discharge will be eliminated with the removal of the Yard Sump, as soon as 2018.

7. Outfall 004 – Raw Water Intake.

This new special condition designates this point as Outfall 004 for the air-purging of the intake screens; it also notes that the release of screenings is deemed permitted, so long as water quality standards are not exceeded. It requires Duke Energy to inspect the operation of the intake at least quarterly and report any exceedances on its DMRs.

8. Internal Outfall 008 – Beneficiation Plant.

The Coal Ash Beneficiation Plant is under design at this writing. Analyses of wastes from a similar site were provided but do not necessarily represent the wastes to be generated at the Buck site. Wastes are expected to be limited to truck wash waters. Flows are estimated at less than 5,000 gpd and could be zero if the system operates as a closed loop. The aim of this condition is get a measure of the actual flow and characteristics of the wastestream once the plant is operational. The parameter list includes typical parameters of concern at other coal ash-related outfalls at the facility.

Monitoring requirements are summarized as follows:

PARAMETER	LIMITATIONS AND MONITORING			CHANGE	BASIS
	Monthly Average	Daily Maximum	Frequency/ Type		
Flow, MGD			Daily/ Estimate (first year)	New monitoring	15A NCAC 02B .0505
pH			Once/ Grab	New monitoring	15A NCAC 02B .0505
Total Suspended Solids			Once/ Grab	New monitoring	15A NCAC 02B .0505
Oil and Grease			Once/ Grab	New monitoring	15A NCAC 02B .0505
Total Dissolved Solids, mg/L			Once/ Grab	New monitoring	15A NCAC 02B .0505
Chlorides, mg/L			Once/ Grab	New monitoring	15A NCAC 02B .0505
Fluoride, mg/L			Once/ Grab	New monitoring	15A NCAC 02B .0505
Nitrate/nitrite as N, mg/L			Once/ Grab	New monitoring	15A NCAC 02B .0505
Sulfates, mg/L			Once/ Grab	New monitoring	15A NCAC 02B .0505
Total Hardness, mg/L as $CaCO_3$			Once/ Grab	New monitoring	15A NCAC 02B .0505
Total Arsenic, µg/L [3]			Once/ Grab	New monitoring	15A NCAC 02B .0505
Total Selenium, µg/L [3]			Once/ Grab	New monitoring	15A NCAC 02B .0505
Total Copper [3]			Once/ Grab	New monitoring	15A NCAC 02B .0505
Total Lead, mg/L [3]			Once/ Grab	New monitoring	15A NCAC 02B .0505
Total Nickel, µg/L [3]			Once/ Grab	New monitoring	15A NCAC 02B .0505
Total Thallium, µg/L [3]			Once/ Grab	New monitoring	15A NCAC 02B .0505
Total Zinc, mg/L [3]			Once/ Grab	New monitoring	15A NCAC 02B .0505

Additional Provisions.

- The Permittee is required to notify the Division of the plant's startup.

Section B. Ash Basin Remediation, Constructed Seeps

1. Outfall 002 – Ash Pond Decanting.

Effluent limitations and monitoring requirements are summarized as follows:

PARAMETER	LIMITATIONS AND MONITORING			CHANGE	BASIS
	Monthly Average	Daily Maximum	Frequency/ Type		
Flow (MGD)			Weekly / Logs	New	15A NCAC 02B .0505
pH	≥ 6.0 and ≤ 9.0 standard units		Weekly / Grab	New	40 CFR 423.12(b)(1)
Total Nitrogen, mg/L			Monthly / Grab	New	15A NCAC 02B .0500
Total Phosphorus, mg/L			Monthly / Grab	New	15A NCAC 02B .0500
Total Suspended Solids, mg/L	23.0 mg/L	74.0 mg/L	Monthly / Grab	New	40 CFR 423.12(b)(3)
Oil and Grease	11.0 mg/L	15.0 mg/L	Monthly / Grab	New	40 CFR 423.12(b)(3)
Total Dissolved Solids	500 mg/L	500 mg/L	Monthly / Grab	New	RPA, 15A NCAC 02B .0200
Turbidity, NTU			Monthly / Grab	New	15A NCAC 02B .0200
Chlorides	250 mg/L	250 mg/L	Monthly / Grab	New	RPA
Total Hardness, mg/L as $CaCO_3$			Monthly / Grab	New	Parameter of concern
Total Arsenic	10.0 µg/L	340 µg/L	Monthly / Grab	New	RPA, 15A NCAC 02B .0200
Total Selenium	5.0 µg/L	56.0 µg/L	Monthly / Grab	New	RPA, 15A NCAC 02B .0200
Total Mercury, ng/L			Monthly / Grab	New	TMDL
Total Antimony	5.6 µg/L	5.6 µg/L	Monthly / Grab	New	RPA, 15A NCAC 02B .0200
Total Chromium, ug/L			Monthly / Grab	New	POC – No RP**
Hexavalent Chromium, ug/L			Monthly / Grab	New	POC – No RP**
Trivalent Chromium, ug/L			Monthly / Grab	New	POC – No RP**
Total Copper	7.9 µg/L	10.5 µg/L	Monthly / Grab	New	RPA, 40 CFR 423.13(e)
Total Lead	2.9 µg/L	75.0 µg/L	Monthly / Grab	New	RPA, 15A NCAC 02B .0200
Total Nickel	25.0 µg/L	335 µg/L	Monthly / Grab	New	RPA, 15A NCAC 02B .0200
Total Thallium, µg/L			Monthly / Grab	New	POC – No RP
Chronic Toxicity	P/F at 90% IWC*		Quarterly / Grab	New	15A NCAC 02B .0200

* IWC means Instream Waste Concentration

** Parameter of concern; did not show reasonable potential but max predicted concentration > ½ max allowable concentration.

Effluent limitations are a combination of TBELs and WQBELs, as described in a previous section. Parameters of concern were identified based on applicable ELGs or waste characterization of the ash pond waters.

Flow. Average daily flows are determined weekly based on operating logs for the ash ponds.

pH. The instantaneous limit for pH is based on the Effluent Limitations Guidelines (ELGs) and surface water quality standard.

Oil & Grease, TSS. The limits at Outfall 002 for process discharges are retained for the pond remediation efforts.

Copper, Arsenic, Selenium, Antimony, Lead, Nickel, Chlorides, and TDS exhibit reasonable potential, and the permit includes limits for each. If there is no acute standard, the Monthly Average limit value is applied to the Daily Maximum limit as well. Limits can be either TBELs or WQBELs, whichever is more stringent for a particular parameter.

Iron. The ELGs set limits for iron at 1.0 mg/L. The state no longer has an iron standard, so the ELG limits apply.

Total Chromium was detected in the ash pond free water. The results do not require a limit but do warrant additional monitoring to determine whether hexavalent or trivalent chromium are parameters of interest.

Mercury and Thallium are parameters of interest and will be monitored.

Monitoring frequencies for all parameters except flow and pH are set at monthly for decant discharges; flow and pH are set at weekly.

Nutrient monitoring is as required in 15A 02B .0508.

Hardness monitoring is necessary for determining applicable standards for hardness-dependent metals.

Additional Provisions.

- The permit does not include a limit for discharge flow. However, the level of water in the ash pond shall not be lowered more than 1 foot per week without prior approval of the DEQ Dam Safety Program (DEMLR).
- The condition specifies use of a floating suction pump pipe for decanting, per EPA.
- When the water level is less than three feet above the ash, these decanting requirements end, and dewatering requirements become effective. (Though not specifically stated here, the Division has said that the facility cannot return to these decanting requirements once dewatering begins.)
- Continuous pH and TSS monitoring is required when decanting is performed, with automatic shutdown if average TSS exceeds half of Daily Maximum limit or if the 15-minute composite pH is outside the range of 6.1-8.9 s.u.
- The discharge is not allowed to exceed the 50 NTU surface water standard or cause an increase in turbidity in the river.
- The discharge of floating solids or visible foam in other than trace amounts is prohibited.
- The Permittee must notify the Division prior to installation of treatment units, commencement of ash dewatering, and diversion of ash pond discharges to the proposed Outfall 007.

2. Outfall 002 – Ash Pond Dewatering.

Effluent limitations and monitoring requirements are summarized as follows:

PARAMETER	LIMITATIONS AND MONITORING			CHANGE	BASIS
	Monthly Average	Daily Maximum	Frequency/ Type		
Flow (MGD)			Daily / Grab	New	15A NCAC 02B .0505
pH	≥ 6.0 and ≤ 9.0 standard units		Daily / Grab	New	40 CFR 423.12(b)(1)
Total Nitrogen, mg/L			Weekly / Grab	New	15A NCAC 02B .0500
Total Phosphorus, mg/L			Weekly / Grab	New	15A NCAC 02B .0500
Total Suspended Solids, mg/L	23.0 mg/L	74.0 mg /L	Weekly / Grab	New	40 CFR 423.12(b)(3)
Oil and Grease	11.0 mg/L	15.0 mg /L	Weekly / Grab	New	40 CFR 423.12(b)(3)
Total Dissolved Solids	500 mg/L	500 mg /L	Weekly / Grab	New	RPA, 15A NCAC 02B .0200
Turbidity, NTU			Weekly / Grab	New	15A NCAC 02B .0200
Chlorides	250 mg/L	250 mg /L	Weekly / Grab	New	RPA, 15A NCAC 02B .0200
Total Hardness, mg/L as $CaCO_3$			Weekly / Grab	New	Parameter of concern
Total Arsenic	10.0 µg/L	340 µg /L	Weekly / Grab	New	RPA, 15A NCAC 02B .0200
Total Selenium	5.0 µg/L	56 µg /L	Weekly / Grab	New	RPA, 15A NCAC 02B .0200
Total Mercury, ng/L			Weekly / Grab	New	TMDL
Total Antimony	5.6 µg/L	5.6 µg /L	Weekly / Grab	New	RPA, 15A NCAC 02B .0200
Total Chromium, ug/L			Weekly / Grab	New	POC – No RP**
Hexavalent Chromium, ug/L			Weekly / Grab	New	POC – No RP**
Trivalent Chromium, ug/L			Weekly / Grab	New	POC – No RP**
Total Copper	7.9 µg/L	10.5 µg /L	Weekly / Grab	New	RPA, 40 CFR 423.13(e)
Total Lead	2.9 µg/L	75 µg /L	Weekly / Grab	New	RPA, 15A NCAC 02B .0200
Total Nickel	25 µg/L	335 µg /L	Weekly / Grab	New	RPA, 15A NCAC 02B .0200
Total Thallium, µg/L	0.4 µg/L	0.4 µg /L	Weekly / Grab	New	RPA, 15A NCAC 02B .0200
Chronic Toxicity	P/F at 90% IWC*		Monthly / Grab	New	15A NCAC 02B .0200

* IWC means Instream Waste Concentration

** Parameter of concern; did not show reasonable potential but max predicted concentration > ½ max allowable concentration.

Requirements for dewatering operations are the same as or similar to those for decanting, with the following exceptions:

Thallium exhibits reasonable potential, and limits are included in the permit.

Monitoring frequency for all parameters is increased from monthly to weekly.

Additional Provisions.

- Once dewatering begins, the ash basin remediation remains subject to those requirements and cannot revert to the decanting requirements.
- The Permittee must notify the Division prior to installation of treatment units and prior to diversion of ash pond discharges to the proposed Outfall 007.

3. Outfall 007 – Ash Pond Decanting.

Effluent limitations and monitoring requirements are summarized as follows:

PARAMETER	LIMITATIONS AND MONITORING			CHANGE	BASIS
	Monthly Average	Daily Maximum	Frequency/ Type		
Flow (MGD)			Weekly / Logs	New	15A NCAC 02B .0505
pH	≥ 6.0 and ≤ 9.0 standard units		Weekly / Grab	New	40 CFR 423.12(b)(1)
Total Nitrogen, mg/L			Monthly / Grab	New	15A NCAC 02B .0500
Total Phosphorus, mg/L			Monthly / Grab	New	15A NCAC 02B .0500
Total Suspended Solids, mg/L	23.0 mg/L	74.0 mg /L	Monthly / Grab	New	40 CFR 423.12(b)(3)
Oil and Grease	11.0 mg/L	15.0 mg /L	Monthly / Grab	New	40 CFR 423.12(b)(3)
Total Dissolved Solids, mg/L			Monthly / Grab	New	POC – No RP**
Turbidity, NTU			Monthly / Grab	New	Parameter of concern
Chlorides, mg/L			Monthly / Grab	New	POC – No RP**
Total Hardness, mg/L as $CaCO_3$			Monthly / Grab	New	Parameter of concern
Total Arsenic			Monthly / Grab	New	POC – No RP**
Total Selenium			Monthly / Grab	New	POC – No RP**
Total Mercury, ng/L			Monthly / Grab	New	TMDL
Total Antimony, µg/L			Monthly / Grab	New	POC – No RP**
Total Chromium, ug/L			Monthly / Grab	New	POC – No RP**
Total Copper, µg/L			Monthly / Grab	New	POC – No RP**
Total Lead, µg/L			Monthly / Grab	New	POC – No RP**
Total Nickel, µg/L			Monthly / Grab	New	POC – No RP**
Total Thallium, µg/L			Monthly / Grab	New	POC – No RP**
Chronic Toxicity	P/F at 0.3% IWC*		Quarterly / Grab	New	15A NCAC 02B .0200

* IWC means Instream Waste Concentration

** Parameter of concern, did not show reasonable potential.

Requirements for discharges of decanting wastes at Outfall 007 are the same as at Outfall 002 with the following exceptions:

Limits. Available dilution increases dramatically at the new outfall; thus, all limits applied to this discharge, with the exception of chronic toxicity, are TBELs.

Additional Provisions.

- This condition is not intended to authorize concurrent discharge from Outfalls 002 and 007 except to the extent necessary to bring the new outfall online.
- Once dewatering begins, the ash basin remediation remains subject to those requirements and cannot revert to the decanting requirements.
- The Permittee must notify the Division prior to installation of treatment units and prior to the commencement of ash dewatering.

4. Outfall 007 – Ash Pond Dewatering.

Effluent limitations and monitoring requirements are summarized as follows:

PARAMETER	LIMITATIONS AND MONITORING			CHANGE	BASIS
	Monthly Average	Daily Maximum	Frequency/ Type		
Flow (MGD)			Daily / Grab	New	15A NCAC 02B .0505
pH	≥ 6.0 and ≤ 9.0 standard units		Daily / Grab	New	40 CFR 423.12(b)(1)
Total Nitrogen, mg/L			Weekly / Grab	New	15A NCAC 02B .0500
Total Phosphorus, mg/L			Weekly / Grab	New	15A NCAC 02B .0500
Total Suspended Solids, mg/L	23.0 mg/L	74.0 mg /L	Weekly / Grab	New	40 CFR 423.12(b)(3)
Oil and Grease	11.0 mg/L	15.0 mg /L	Weekly / Grab	New	40 CFR 423.12(b)(3)
Total Dissolved Solids, mg/L			Weekly / Grab	New	POC – No RP**
Turbidity, NTU			Weekly / Grab	New	Parameter of concern
Chlorides, mg/L			Weekly / Grab	New	POC – No RP**
Total Hardness, mg/L as $CaCO_3$			Weekly / Grab	New	Parameter of concern
Total Arsenic			Weekly / Grab	New	POC – No RP**
Total Selenium			Weekly / Grab	New	POC – No RP**
Total Mercury, ng/L			Weekly / Grab	New	TMDL
Total Antimony, µg/L			Weekly / Grab	New	POC – No RP**
Total Chromium, ug/L			Weekly / Grab	New	POC – No RP**
Total Copper, µg/L			Weekly / Grab	New	POC – No RP**
Total Lead, µg/L			Weekly / Grab	New	POC – No RP**
Total Nickel, µg/L			Weekly / Grab	New	POC – No RP**
Total Thallium, µg/L			Weekly / Grab	New	POC – No RP**
Chronic Toxicity	P/F at 0.1% IWC*		Monthly / Grab	New	15A NCAC 02B .0200

* IWC means Instream Waste Concentration

** Parameter of concern, did not show reasonable potential.

As with Outfall 007-Decanting, all limits applied to this discharge, with the exception of chronic toxicity, are TBELs.

Additional provisions applicable to this discharge are similar to or the same as those for Outfall 002-Dewatering or Outfall 007-Decanting.

5. Outfalls 111 & 117 – Ash Pond Constructed Seeps.

Parameters of concern and monitoring requirements for the constructed seep discharges are as agreed upon by EPA Region 4, Duke Energy, and DEQ, based on characterization of seeps collected from Duke Energy's 14 North Carolina coal ash facilities. Effluent limitations are a combination of TBELs and WQBELs, as described in previous sections.

Effluent limitations and monitoring requirements for Outfalls 111 and 117 are as follows:

PARAMETER	LIMITATIONS AND MONITORING			CHANGE	BASIS
	Monthly Average	Daily Maximum	Frequency/ Type		
Flow (MGD)			1/Mo-1/Qtr / Estimate	New	15A NCAC 02B .0505
pH	≥ 6.0 and ≤ 9.0 standard units		1/Mo-1/Qtr / Grab	New	40 CFR 423.12(b)(1)
Temperature, ºC			1/Mo-1/Qtr / Grab	New	Parameter of concern
Total Suspended Solids, mg/L	30.0 mg/L	100.0 mg/L	1/Mo-1/Qtr / Grab	New	40 CFR 423.12(b)(3)
Oil and Grease	15.0 mg/L	20.0 mg/L	1/Mo-1/Qtr / Grab	New	40 CFR 423.12(b)(3)
Total Dissolved Solids, mg/L			1/Mo-1/Qtr / Grab	New	POC – No RP*
Conductivity, µmho/cm			1/Mo-1/Qtr / Grab	New	Parameter of concern
Chlorides, mg/L			1/Mo-1/Qtr / Grab	New	Parameter of concern
Fluoride, mg/L			1/Mo-1/Qtr / Grab	New	Parameter of concern
Nitrate/nitrite as N, mg/L			1/Mo-1/Qtr / Grab	New	Parameter of concern
Sulfates, mg/L			1/Mo-1/Qtr / Grab	New	Parameter of concern
Total Hardness, mg/L as $CaCO_3$			1/Mo-1/Qtr / Grab	New	Parameter of concern
Total Arsenic			1/Mo-1/Qtr / Grab	New	POC – No RP*
Total Selenium			1/Mo-1/Qtr / Grab	New	POC – No RP*
Total Mercury, ng/L			1/Mo-1/Qtr / Grab	New	TMDL
Total Aluminum *(117 only)*	6.5 mg/L	6.5 mg/L	1/Mo-1/Qtr / Grab	New	RPA, 15A NCAC 02B .0200
Total Barium, mg/L			1/Mo-1/Qtr / Grab	New	POC – No RP*
Total Cadmium, µg/L			1/Mo-1/Qtr / Grab	New	POC – No RP*
Total Chromium, µg/L			1/Mo-1/Qtr / Grab	New	POC – No RP*
Total Copper			1/Mo-1/Qtr / Grab	New	POC – No RP*
Total Lead, µg/L			1/Mo-1/Qtr / Grab	New	POC – No RP*
Total Manganese, mg/L			1/Mo-1/Qtr / Grab	New	POC – No RP*
Total Nickel, µg/L			1/Mo-1/Qtr / Grab	New	POC – No RP*
Total Thallium, µg/L			1/Mo-1/Qtr / Grab	New	POC – No RP*
Total Zinc, µg/L			1/Mo-1/Qtr / Grab	New	POC – No RP*

* Parameter of concern; did not show reasonable potential but max predicted concentration > ½ max allowable concentration.

Flow. Daily flows are to be estimated using appropriate methods.

pH, Oil & Grease, TSS, Copper, and Iron. The limits for these parameters are based on the ELGs.

Other Metals. The discharge does not exhibit reasonable potential for the remaining metals. Because these remain parameters of concern, the permit requires regular monitoring for those listed.

Monitoring for all parameters will be conducted on a monthly basis for the first year and quarterly thereafter.

G. RATIONALE FOR OTHER SPECIAL CONDITIONS

The following is a summary of changes (or lack thereof) made to the special conditions found in Section C. Most are the result of on-going negotiations regarding the management and disposal of coal ash at Duke Energy's facilities in North Carolina.

1. Special Conditions Retained

   These existing special conditions remain in the permit with minimal changes. Some have been combined with other conditions by topic but are listed separately here:

   Chemical Discharges (combined with similar)
   Best Management Practices Plan (combined with Chemical Discharges condition)
   Polychlorinated Biphenyl Compounds (combined with Chemical Discharges condition)
   Metal Cleaning Waste (combined with Chemical Discharges condition)
   Biocide Condition
   Intake Screen Backwash (relocated to Section A, internal Outfall 004)
   Floating Materials (relocated to Discharges of Other Materials)
   Waivers
   Ash Pond Closure (combined with Ash Pond Operations condition)
   Ash Pond (Capacity) (combined with Ash Pond Operations condition)
   Structural Integrity of Ash Pond Dam (combined with Ash Pond Operations condition)

2. Special Conditions Revised

   a. Definitions. By agreement, the ELG definitions in the existing permit have been abbreviated.

   b. Chronic Toxicity. Chronic toxicity limits continue to apply at Outfall 002, but the IWC is corrected to 90%, because the river channel has now closed to form a cove and provides no dilution.

      Similar limits will apply at new Outfalls 001A, 006, and 007. All three discharge to the mainstem of the river and have an IWC of 0.1%.

      The IWCs for Outfalls 002 and 007 apply for all discharges, that is, process discharges and discharges from decanting and dewatering of the ash ponds.

   c. Instream Monitoring – Toxicants. The permit requires monthly instream monitoring (4,000 ft. upstream and 10,000 ft. downstream of the Outfall 002) for total arsenic, total selenium, total mercury, total chromium, dissolved lead, dissolved cadmium, dissolved copper, dissolved zinc, total bromide, total hardness, temperature, turbidity, and total dissolved solids (TDS).

      Rationale for use of total vs. dissolved metals:

      - Mercury and selenium water quality standards are still expressed as total metals.
      - Total Arsenic - aquatic life standards are expressed as dissolved metals, but the 10 µg/L standard for Water Supply and Human Health waters is the total form and is, therefore, more stringent and the controlling standard.
      - Total Chromium – the PQL for total chromium is 5 µg/L. If instream samples are < 10 or < 5 µg/L, they indicate compliance with Cr^{3+} and Cr^{6+}. If the instream total chromium value exceeds the allowable Cr^{3+} concentration, instream testing should be modified to include dissolved Cr^{3+} sampling.
      - Dissolved lead, cadmium, copper, zinc – the instream standards are dissolved, and the dissolved metal results and concurrent total hardness results allow for direct comparison to the instream standard.

   d. CWA Section 316(a) Temperature Variance – Thermal/ Mixing Study. The Division has granted a temperature variance for operation of the Buck Steam Station since the mid-1970s. Duke Energy has requested that the temperature variance be continued in this permit term. With the variance, the Division approved a thermal mixing zone extending to the High Rock Lake Dam. Duke Energy monitors temperature at multiple depths at the dam and uses the

average to determine compliance with temperature limits. Historically, the facility has met the requirements of the 316(a) variance.

By agreement with the Division, Duke Energy conducts biological monitoring each permit cycle to evaluate the possible impacts of its discharges upon the macroinvertebrate and fish community in the Yadkin River near Buck Steam Station. The latest BIP (balanced and indigenous population) report was submitted to DWR in November of 2011. The report concluded that the indigenous macroinvertebrate community in the river varied with the extreme high- and low-flow years in the study period (2003-2008) but remained within the historic range of densities; and that the river has a balanced and indigenous fish community.

Retirement of the Buck Steam Station in 2013 eliminated the cooling water flows for which the variance and mixing zone were originally approved. The CTCC discharges a lesser thermal load in its cooling tower blowdowns: approximately 1% of the previous flow rate, at significantly lower temperatures. The difference in impacts to the river have yet not been evaluated, and it is not clear whether the variance and mixing zone are necessary.

The Division proposes to grant the variance request for this permit term and retain the variance condition from the 2011 permit. In order to continue the variance in the next permit term, Duke Energy must conduct a thermal/ mixing study at the facility. The study would evaluate the thermal impacts of its discharges, determine whether a variance is still necessary, and, if so, determine the extent of the corresponding mixing zone. The permit calls for Duke Energy to submit a study plan to the Division in Year 1 of the permit and to include the findings of the study with its next application for permit renewal.

e. CWA Section 316(b) – Intake Structure Requirements. Duke Energy must comply with the revised Cooling Water Intake Structure Rule, 40 CFR 125.95. The Division approved Duke Energy's request for an alternate schedule in accordance with 40 CFR 125.95(a)(2). The permit requires Duke Energy to submit all the materials required by the Rule with the next permit renewal application.

f. Fish Tissue Monitoring Near Ash Pond Discharge. Monitoring is required once during the permit term, and results are to be submitted with the next application for renewal.

g. Emergency Overflow – Ash Pond. DEQ's Dam Safety Program (in DEMLR) has issued an order requiring Duke Energy to install an emergency overflow structure at the final ash pond (Cell 3). Duke Energy requested that the permit include specific authorization for the overflow structure, as well as any necessary effluent limitations. The Supplement to Cover Page in the permit will note the addition of the structure. Because limits would be waived in the event of a 10-year 24-hour design storm, and monitoring is already conducted at Outfall 002, the permit does not specify limits or require additional monitoring for any overflows from the ponds.

3. Special Conditions Added

Several new conditions have been added or existing conditions modified in most or all Duke Energy permits as the result of deliberations among EPA Region 4, Duke Energy, and DEQ.

The first four conditions are existing and new requirements that are collected in Section C rather than being repeated multiple times throughout the permit.

a. Notifications and Submittals. Provides standard Division addresses.

b. Chemical Discharges. Combines several existing special conditions regarding toxic/ hazardous chemicals.

c. Discharges of Other Materials. A combination of existing and new general requirements.

d. Effluent Sampling Locations. Specifies general location for any effluent sampling point.

e. Waste Treatment Modifications. The current application mentions a new waste holding pond but provides no details as to how it will be configured or operated. This condition requires the Permittee to provide that information prior to startup and to do the same for any future treatment changes.

f. Flow Monitoring and Reporting. Combines two new conditions regarding flow.

g. Electronic Reporting Requirements. Adds standard language pertaining to the new federal requirements for electronic reporting.

h. Applicable State Law. The permit cites the Coal Ash Management Act of 2014, noting that it can only be enforced by the state.

i. Ash Pond Closure Agreement. Negotiated language regarding ash pond closure is added.

j. Groundwater Compliance Boundary. Adds standard language pertaining to said boundary.

k. Attachment 1 – Groundwater Compliance Boundary Map. The attachment is a map of the groundwater compliance boundary for the Buck site.

4. Special Conditions Deleted

a. Chemical Metal Cleaning Wastes. Metal cleaning wastes from the BSS have been eliminated, and the CTCC collects its wastes in a blind sump for disposal off-site.

b. Toxicity Reopener. This condition duplicates language already found in the chronic toxicity limit condition.

c. Monitoring Frequencies. This condition is no longer necessary.

d. Groundwater Monitoring Well Construction and Sampling. The negotiated approach for addressing groundwater requirements has been revised and this condition is no longer necessary. Attachment 1 has been added as part of the new approach.

VII. SUMMARY OF BASES FOR AND MODIFICATIONS OF PERMIT

The permit includes extensive additions, deletions, and revisions to reflect actual and anticipated changes in the facility operations, outfall configuration, ash pond remediation, seep management, and the associated waste discharges. The permit incorporates conditions agreed upon by EPA Region 4, Duke Energy, and DEQ.

Part I of the permit has been divided into three sections to improve its organization, and a table of contents has been added to aid navigation through the document. Sections A contains effluent limits and other requirements for the steam electric discharges. Section B contains requirements for the ash basin remediation discharges and for two constructed seep discharges. Section C contains other special conditions applicable to activities in any or all of the first two sections.

A. Bases for Effluent Limitations

- Effluent limitations in the permit are based on applicable water quality standards and federal treatment performance standards.
- The temperature limits (Outfalls 001A, 006) are based on the North Carolina water quality standards (15A NCAC 2B .0200) and the current 316(a) Thermal Variance.
- The limits for Oil and Grease and Total Suspended Solids (all outfalls) were established in accordance with the effluent guidelines for steam electric facilities, 40 CFR Part 423.
- The pH limits in the permit (all outfalls) are based on the North Carolina water quality standards (15A NCAC 2B .0200), in addition to 40 CFR Part 423 for Outfalls 002, 001A, 006.
- The turbidity limits in the permit (Outfalls 002 and 007, Decanting and Dewatering) are based on the North Carolina water quality standards (15A NCAC 2B .0200).

- The Whole Effluent Toxicity limit (Outfalls 002, 001A, 006, and 007) is based on the requirements of 15A NCAC 2B .0500.
- The limits for metals in the permit (Outfall 001A, 006, 002/ 007 [Decanting & Dewatering], 111, and 117) are based on the North Carolina water quality standards (15A NCAC 2B .0200), except that the 1.0 mg/L limits for copper, iron, and zinc and the 0.2 mg/L limits for chromium are based on 40 CFR Part 423.
- The limits for Hg at Outfall 002 are based on the Division's *Permitting Guidelines for Statewide Mercury TMDL*.

B. Key Modifications

- Deletion of Outfall 001, previously used for once-through cooling waters but now inactive.
- Provisions for new Outfalls 001A and 006 for the discharge of all wastes from the CTCC to the Yadkin River.
- Provisions for new Outfall 007 for the discharge of decanting and dewatering waters to the Yadkin River
- Addition of effluent limitations and monitoring requirements for Outfall 002 to address phased changes in process wastestreams piped to the ash basins (two phases).
- Addition of new effluent limitations and monitoring requirements for Outfall 002 to address the remediation and closure of the ash basins. One set of conditions will govern decanting operations, and the second will govern discharges from dewatering of the ash deposits (and any subsequent discharge from the closed basins).
- Addition of new effluent limitations and monitoring requirements for the decanting/ dewatering operations once those flows are diverted to a new Outfall 007 to the Yadkin River.
- Addition of new effluent limitations and monitoring requirements for discharge from the ash basin constructed seeps, designated as Outfalls 111 and 117.
- Updating of conditions regarding Clean Water Act 316(a) (temperature) and 316(b) (intake structure) variances.
- Removal of the Metal Cleaning Wastes Special Condition due to Duke Energy capturing these wastes and ceasing their discharge.
- Addition of new water quality-based limits based on the dissolved metals standards, including hardness-dependent standards.
- Addition of Total Hardness monitoring at Outfalls 002, 001A, 006, and 007 to implement new dissolved metals standards.
- Addition of an Applicable State Law special condition to acknowledge the Coal Ash Management Act and Senate Bill 729.
- Addition of a new condition to reflect the final NPDES Electronic Reporting Rule adopted by the EPA and effective as of December 21, 2015.
- Addition of the Groundwater Compliance Boundary map for the site (Attachment 1).

Proposed Schedule for Permit Issuance:

Draft Permit to Public Notice:	May, 2018
Permit Scheduled to Issue:	August 15, 2018

State Contact:

If you have any questions on any of the above information or the attached permits, please contact Mike Templeton at (919) 807-6402.