I/A

Hart Exhibit 52
Docket No. E-2, Sub 1219

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THE ELM CONSULTING GROUP INTERNATIONAL LLC

ENVIRONMENTAL AUDIT IN SUPPORT OF THE COURT APPOINTED MONITOR

Cape Fear Plant
Moncure, North Carolina
USA

October 2019

Final Report Issued To:

Duke Energy and the Court Appointed Monitor

Prepared By:

Advanced GeoServices Corp.
and
The Elm Consulting Group International LLC

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1.0 INTRODUCTION

Advanced GeoServices Corp. (AGC) and The Elm Consulting Group International LLC (Elm) (collectively, the Audit Team) are conducting environmental compliance audits (the Audits) of certain coal combustion residuals (CCR) management locations owned or operated by Duke Energy Business Services LLC, Duke Energy Carolinas, LLC, and Duke Energy Progress, Inc. (collectively, Duke Energy). The Audits are being conducted under the direction of Mr. Benjamin Wilson, the Court Appointed Monitor (CAM), pursuant to an Order issued by the U.S. District Court, Eastern District of North Carolina, in case numbers 5:15-CR-62-H, 5:15-CR-67-H, and 5:15-CR-68-H.

The scope of the Audits is set forth in the plea agreements entered into by Duke Energy and the United States in the above cases, the Court's judgments in these cases, and a written Audit scoping document agreed to by Duke Energy and the United States.

1.1 BACKGROUND INFORMATION

The subject of this report is the Audit completed at Duke Energy's Cape Fear Plant located in Moncure, Chatham County, North Carolina. The Audit was conducted on August 14 and 15, 2019, for a total of two days on-site. The Audit Team members were:

- Mr. Christopher Reitman, P.E. AGC	Project Director, Audit Team Leader, Sr. Subject Matter Expert (on-site)
- Mr. Joseph Cotier, CPEA, Elm	Sr. Environmental Auditor (on-site)
- Mr. Bernie Beegle, P.G., AGC	Sr. Subject Matter Expert (off-site)

The facility was represented by:

- Mr. Sharat Gollamudi , CCP System Owner, CCP Engineering
- Ms. Gretchen Schroeder, CCP Engineering
- Ms. Asha Sree, CCP Engineering
- Mr. Bobby Barnes, Manager, CCP Engineering
- Mr. Danny Wimberly, CCP Projects
- Mr. Issa Zarzar, General Manager, CCP Project Management
- Mr. Jon Stamas, EHS CCP Environmental Field Support
- Mr. Phil Orlowski, EHS CCP Health and Safety Field Support
- Ms. Joyce Dishmon, EHS CCP Permitting and Compliance
- Mr. Andrew Shull, EHS CCP Waste and Groundwater
- Mr. Randy Hart, Regulatory Affairs
- Mr. Shane Johnson, Environmental Rover, EHS CCP Compliance
- Mr. Steve Struble, Director, EHS CCP Compliance
- Mr. Keith Higgins, EHS CCP Compliance

1.2 FACILITY OVERVIEW

The Cape Fear Plant (the Cape Fear Facility) is located at 500 C P & L Road, in Moncure, Chatham County, North Carolina. Duke Energy personnel stated the Cape Fear Facility is a decommissioned coal-fired electric generating plant that contained six (6) units that produced a total of 400 megawatts of power. In addition to the six (6) coal-fired units, there were four (4) 15-megawatt gas turbine units added to make the steam for the 1 & 2 steam turbines. The generation of electrical power at the facility ended in 2012. Demolition of the remaining remnants of the power plant structures was completed over the last three (3) years.

1.2.1 Ash Management Activities

The following information regarding the five on-site ash basins was provided by Duke Energy or was contained in the Operations and Maintenance Manual for the Cape Fear Facility.

- 1956 Ash Basin – The 1956 Ash Basin has an area of approximately 12 acres and was formed by the 1956 Ash Basin Dam (NCDEQ ID No. CHATH-075). The 1956 Ash Basin Dam is an approximately 20-foot high earthen embankment and has a length of approximately 3,200 feet. The 1956 Ash Basin contains about 420,000 tons of CCR (which would be about 350,000 cubic yards at a 1.2 tons/cubic yard conversion factor utilized by Duke Energy). The 1956 Ash Basin is covered predominantly with hardwood and pine trees along with some grass. Normally, there is no standing water within the 1956 Ash Basin, and the Audit Team noted the basin was dry during the Audit.

- 1963 Ash Basin – The 1963 Ash Basin has an area of approximately 21 acres and was formed by the 1963 Ash Basin Dam (NCDEQ ID No. CHATH-076). The 1963 Ash Basin Dam is an approximately 22-foot high earthen embankment and has a length of approximately 4,000 feet. The 1963 Ash Basin contains about 860,000 tons of CCR. The 1963 Ash Basin is covered predominantly with hardwood and pine trees along with some grass. The 1963 Ash Basin during the Audit was dry during the Audit.

- 1970 Ash Basin – The 1970 Ash Basin has an area of approximately 30 acres and is formed by the 1970 Ash Basin Dam (NCDEQ ID No. CHATH-077). The 1970 Ash Basin Dam is an approximately 27-foot high earthen embankment and has a length of approximately 4,600 feet. The 1970 Ash Basin contains about 830,000 tons of CCR. There is a small area of standing water normally observed at the southeast corner of the basin near an outlet discharge structure. The 1970 Ash

Basin is covered predominantly with hardwood and pine trees along with some grass. At the time of the Audit, a small area of the 1970 Ash Basin had water with an estimated depth of three to four feet.

- 1978 Ash Basin – The 1978 Ash Basin, sometimes referred to as the West Ash Basin, has an area of approximately 35 acres and is formed by the 1978 Ash Basin Dam (NCDEQ ID No. CHATH-078). The 1978 Ash Basin Dam has an approximately 27-foot high earthen embankment. The 1978 Ash Basin contains about 900,000 tons of CCR. A portion at the southern end of the 1978 Ash Basin retains water near the discharge outlet structure. The 1978 Ash Basin is partially covered with trees and shrubs along with grass. The lower portion of the downstream slope of the dam parallel to the Drainage Canal is armored with riprap, and a small area (< 1 acre) within the 1978 Ash Basin was observed to have water in it during the Audit.

- 1985 Ash Basin – The 1985 Ash Basin, sometimes referred to as the East Ash Basin, has an area of approximately 60 acres and is formed by the 1985 Ash Basin Dam (NCDEQ ID No. CHATH-079). The 1985 Ash Basin Dam is an approximately 28-foot high earthen embankment. The 1985 Ash Basin contains about 2,820,000 tons of CCR. The southwest corner of the 1985 Ash Basin retains water near the discharge outlet structure. An interior Ash Stack is present within the 1985 Ash Basin and has a spray-on ash stabilizer (Ecogreen™). The 1985 Ash Basin is predominantly covered with grass. The lower portion of the downstream slope of the 1985 Ash Basin and southern portions of the upstream slope are armored with riprap. Water collecting in the southern end of the 1985 Ash Basin was being decanted at the time of the Audit. This water is generally made up of collected rainwater.

1.2.2 Environmental Permits and Programs

The Cape Fear Facility operates under a number of environmental permits and programs, including:

- **National Pollutant Discharge Elimination System (NPDES) Wastewater Permitting –** North Carolina Department of Environmental Quality (NCDEQ) issued NPDES Permit No. NC0003433 to the Cape Fear Facility with an effective date of September 1, 2011 and an expiration date of July 31, 2016 (the 2011 Permit). A timely permit renewal application package was submitted to NCDEQ on July 31, 2014. As it relates to ash management activities, the 2011 Permit covers:

    - Internal Outfall 001 - West Ash Basin discharge to Outfall 007;
    - Internal Outfall 003 - Once-through cooling water and stormwater with discharge to Outfall 007;
    - Internal Outfall 005 - East Ash Basin discharge to Outfall 007; and
    - Outfall 007 - Combined wastewater streams discharge to the Cape Fear River.

    Several updates to the July 31, 2014 NPDES permit renewal application were submitted to NCDEQ for review including a request for action submitted on February 22, 2016. The permit renewal application included a request for coverage for discharges from the Waste Water Treatment System that were authorized in accordance with a July 20, 2016 decant letter and the addition of outfalls for previously identified seeps. The most recent permit renewal application amendment was submitted to NCDEQ on March 1, 2018 and addressed discussion items from Duke Energy’s meeting with NCDEQ on February 20, 2018, including clarifications on: use of the ash beneficiation plant; use of Outfalls 008 and 007 as they pertain to dewatering of the ash basins; potential plans to build an ash landfill at the Cape Fear Facility; and submittal of an updated groundwater compliance boundary map.

Part III.B of the 2011 Permit's "Other Requirements" section provided for implementation of groundwater monitoring if requested by NCDEQ. Under the previous permit the Cape Fear Facility operated a network of 11 compliance wells and 2 background wells for determining compliance with groundwater limits pursuant to 15A NCAC 02L.0200 and which were sampled three times per year. The last sampling event was completed in June 2018.

The renewed NPDES Permit No. NC0003433 was issued by NCDEQ on August 30, 2018 and became effective on October 1, 2018 (the 2018 Permit). The 2018 Permit carries an expiration date of June 30, 2023. As it relates to ash management activities, the 2018 Permit covers:

- Internal Outfall 001 – 1978 Basin emergency discharge of decant water to Outfall 007;
- Internal Outfall 005 – 1985 Basin emergency discharge of decant water to Outfall 007;
- Outfall 007 – Combined wastewater streams discharge to the Cape Fear River;
- Outfall 008 – Combined wastewater streams including decanting/ dewatering during discharge to the Cape Fear River after treatment (Outfall 008 functionally replaces Outfall 007, although Outfall 007 remains a viable outfall under the 2018 Permit.);
- Outfall 008A – 1963/1970 Basin emergency discharge of decant water to the Cape Fear River;

- Outfall 009 – episodic discharge of beneficiation operation waters to the Cape Fear River (At the time of the Audit, this outfall had not yet been constructed.); and
- Internal Outfall S-05 – combined flow from 2 French Drains to the Effluent Canal which discharges to Outfall 007.

Of note is the removal of the groundwater monitoring requirements from the 2018 Permit.

As required by the 2018 Permit, quarterly monitoring for November 2018 included a sample and analysis for chronic toxicity. The sample was collected from Outfall 007 on November 6, 2018. The sample failed (chronic toxicity is a "Pass/Fail" test depending on mortality of the test organisms). This was reported on the Cape Fear Facility electronic Discharge Monitoring Report (eDMR) for November 2018 that was submitted to NCDEQ on December 18, 2018. The comments section of the eDMR included a description of the Fail event. At the time, Duke Energy believed the "Fail" was caused by excessive flood waters from the Cape Fear River backing up into the effluent canal. The flooding was due to Hurricane Michael. Subsequent to this eDMR, NCDEQ issued a Notice of Violation (NOV) NC NOV-2019-TX-0010 to Duke Energy on February 12, 2019. There were no specific action items or civil penalties identified in the NOV for the Cape Fear Facility. Duke Energy responded to the NOV on March 4, 2019. Duke Energy discontinued discharge from Outfall 007 on the date it received the toxicity lab results, November 21, 2018. The 2018 Permit does require two consecutive months of sampling for toxicity if a fail is noted. The DMRs for December 2018 through June 2019 indicated no flow from Outfall 007, and therefore subsequent toxicity samples have not yet been collected. Duke Energy did collect an in-process wastewater sample for toxicity on December 6, 2018. This sample showed "Pass" for toxicity. Duke Energy has reportedly received no further correspondence from NCDEQ on the issue.

Duke Energy personnel anticipate that a Special Order by Consent (SOC) will be issued by the North Carolina Environmental Management Commission during 2019 and will likely include coverage of all non-constructed seeps at the Cape Fear Facility. The draft SOC was not available for review by the Audit Team at the time of the Cape Fear Facility Audit.

- **NPDES Industrial Stormwater Permitting –** NCDEQ issued individual stormwater permit No. NCS000574 to the Cape Fear Facility, which became effective May 27, 2016 and allows stormwater discharges to Shaddox Creek, which flows to the Cape Fear River. The permit has an expiration date of April 30, 2021. It covers outfalls SW-002 and SW-003 located along the railroad tracks and site access road, respectively. A Stormwater Pollution Prevention Plan (SWPPP) was implemented in July 2016.

- **NPDES Construction Stormwater Permitting –** NCDEQ has issued stormwater construction permits for activities related to the ash basins and CCR management at the Cape Fear Facility. These permits were issued by NCDEQ under its Stormwater General Permit for Construction Activities, No. NCG010000, and include the following:

  - CHATH-2017-009 was issued March 28, 2017 for the Groundwater Treatment Trench (seep mitigation);
  - CHATH-2018-008 was issued December 19, 2017 for Tree and Root Ball Removal; and
  - CHATH-2019-001 was issued June 27, 2019 for the CCP 1985 Basin Haul Road. Work on this project had not started at the time of the Audit.

Erosion and Sediment Control Plans have been implemented for each permit.

- **Title V Permitting –** The Title V Permit No. 010157T29 was rescinded by NCDEQ on November 25, 2013. There is no air permit in place at the Cape Fear facility, and based on Audit Team observations, a permit is not required.

- **Spill Prevention, Control and Countermeasure (SPCC) Plan** – Based on current Cape Fear Facility activities, oil storage quantities, and observations made by the Audit team during the Audit, it appeared that the SPCC regulations were not applicable to the Cape Fear Facility. Total estimated oil storage was 1,052 gallons of diesel fuel for pumps located in the basins.

- **Tier II Reporting –** Hazardous chemicals inventory reporting on Tier II for 2018 was completed and submitted on February 5, 2019.

- **Waste Unit Compliance Boundaries** – NCDEQ issued a letter dated August 25, 2017 to Duke Energy regarding compliance boundaries for North Carolina coal ash facilities. On February 15, 2018, Duke Energy submitted to NCDEQ an updated compliance boundary map for the Cape Fear Facility that eliminated the 1956 Ash Basin, the 1963 Ash Basin, and the 1970 Ash Basin.

- **North Carolina Coal Ash Management Act of 2014 (CAMA) –** CAMA requires identification of drinking water supply wells within one half-mile of the facility, submission of Groundwater Assessment Plans, installation and multiple rounds of sampling from Assessment Wells, submission of Groundwater Assessment Reports summarizing groundwater investigations, submission of an Annual Groundwater Protection and Restoration Report, submission of Discharge Assessment Plans to characterize seeps, submission of a Groundwater Corrective Action Plan, and ash basin closure/removal. The required activities associated with these items have been completed in accordance with the schedule provided under CAMA.

CAMA allows for a modification of the current intermediate risk ranking and provides a potential closure extension of these basins until 2028 if specific dam improvements are completed and approved by NCDEQ and an alternative permanent local water supply is provided to local residents. However, Duke Energy has announced that the ash at the Cape Fear Facility will be beneficially used. The beneficial use will involve burning the ash to create a very low carbon residual material that can be utilized in cement. In accordance with CAMA, this would allow the closure date to be extended to December 31, 2029.

The NCDEQ-approved 2019 Interim Monitoring Plan for the Cape Fear Facility includes 61 monitoring wells sampled semi-annually and three (3) wells sampled quarterly. The CAMA groundwater results are reported on a quarterly basis.

On October 11, 2017, NCDEQ approved provisional background threshold values (PBTVs) for the Cape Fear Facility. Duke Energy submitted to the NCDEQ the Cape Fear Facility's 2018 Groundwater Protection and Restoration Annual Report on January 25, 2019 and its 2018 Surface Water Protection and Restoration Annual Report on January 21, 2019. Duke Energy submitted to NCDEQ the 2018 Cape Fear CAMA Annual Report on July, 31, 2019

- **Federal Coal Combustion Residuals Rule (CCR Rule)** – Information provided by Duke Energy indicates that electricity has not been generated at the Cape Fear Facility since October 19, 2015 and that no CCR has been placed in any of the basins since that date. Therefore, the CCR Rule (40 CFR Part 257) does not apply to the Cape Fear Facility.

1.2.3 Dam and Other Structural Permits and Approvals

The 1956 Ash Basin Dam (CHATH-075), 1963 Ash Basin Dam (CHATH-076), 1970 Ash Basin Dam (CHATH-077), 1978 Ash Basin Dam (CHATH-078), and the 1985 Ash Basin Dam (CHATH-079) at the Cape Fear Facility are all associated with ash management operations. All five (5) dams referenced above have a high hazard classification under the North Carolina Dam Safety system. These dams were grandfathered under North Carolina's Session Law 2009-390 (Senate Bill 1004, effective January 1, 2010). Under this grandfathering, the original design of the dams is not subject to the current design standards for new construction, although modifications after the effective date may be subject to these standards.

NCDEQ Dam Safety personnel walked the 1956 Ash Basin on March 6, 2019 and noted in their March 19, 2019 Notice of Deficiency that a few areas of the slope eroded, leaving less than a two horizontal to one vertical (2H:1V) slope. NCDEQ also noted many large trees remain on the slope which should be removed to reduce erosion. On October 25, 2018, NDEQ approved a one-year extension on the requirements to remove trees on the slope. Duke Energy submitted a response to the NCDEQ letter on May 7, 2019 and identified their plan to monitor tree growth on basin slopes and to retain an engineer to develop plans to address the steep slope area.

Duke Energy submitted plans to NCDEQ to address slope erosion issues on July 23, 2019. Duke Energy personnel stated that their documentation shows that the observed conditions have not changed over the last four years. The Audit Team did not review the historical documentation or records referenced by Duke Energy.

NCDEQ identified similar vegetation and tree removal issues on the 1963 and 1970 Ash Basin Dams during their March 6, 2019 Site visit. Notices of Deficiencies were issued on March 19, 2019, and Duke Energy provided a similar response to NCDEQ on May 7, 2019, which stated their intention to continue to monitor the situation.

NCDEQ also completed inspections on the 1978 and the 1985 Ash Basins on March 6, 2019, and no deficiencies were noted.

On February 1, 2019, Chapter 15A Section 02K.0224 of the North Carolina Administrative Code (15A NCAC 02K.0224) was published in the North Carolina Register. These regulations created new standards for the CCR impoundments during specific flood events. Duke Energy met with NCDEQ to discuss these regulations on March 13, 2019 and completed analysis and submitted the results of the analysis to NCDEQ on July 10, 2019. The analysis showed the Cape Fear 1956, 1963, and 1970 Ash Basins, which are scheduled to be excavated, did not meet the new basin spillway requirements. Duke Energy is scheduled to meet with NCDEQ on August 21, 2019 to determine the applicability of these new regulations to the basins to be excavated. NCDEQ has previously noted these regulations were not applicable to portions of the basins being excavated at Dan River and did not note deficiencies associated with these new regulations during the March 6, 2019 inspection of the ash basins at the Cape Fear Facility.

1.2.4 CCR Management Projects and Other Facility Activities

Planning and installation of infrastructure is continuing regarding the operational and logistical details of beneficiation of the CCR ash material within the Cape Fear Facility basins. Commercial beneficiation is expected to start in late 2020. Beneficiation will be done using thermal treatment to remove carbon from the ash and make it more suitable for use in cement. Duke Energy is awaiting permits for haul roads to facilitate movement of ash across the site to the area designated for beneficiation.

Over the last year, the 1978 Ash Basin was decanted, a new outfall for discharge (Outfall 8) was installed, and decanting of the 1985 Ash Basin started. The Emergency Action Plan (EAP) was also activated for a Level 3 event (a slowly developing abnormal event), on February 6 and 7, 2019. The event was due to unusual historical animal burrows on the 1985 Ash Basin.

2.0 AUDIT SCOPE AND SUBJECT MATTER

The Audit was completed in accordance with the court documents and the Audit scoping document agreed to by Duke Energy and the United States. A description of the scope is provided as Attachment A. The Audit included ash management activities, including aspects of generation that affect the nature of the waste streams from the point of generation into surface impoundments or ash management basins, landfills, and/or storage piles. The Audit focused on the activities at the facility since the date of the last Audit which was August 15-16, 2018.

3.0 AUDIT FINDINGS

The following Findings at the Cape Fear Facility were identified by the Audit Team.

3.1 SEEPAGE UNDER THE CLEAN WATER ACT

Requirement – The Clean Water Act (CWA) prohibits the discharge from a point source of any pollutant into the waters of the United States except in compliance with a permit issued pursuant to the CWA under the National Pollutant Discharge Elimination System (NPDES) by the United States Environmental Protection Agency (EPA) or a state with an approved program. 33 U.S.C. §§ 1311(a) & 1342. NCDEQ implements an approved NPDES program in North Carolina under 15A NCAC 02H.0100 *et seq*. Additionally, under N.C.G.S.A. § 143-215.1(a), unauthorized discharges of a pollutant to waters of the State are a violation of North Carolina law.

Finding – The Audit Team reviewed documentation about observed seeps at the Cape Fear Facility that contain pollutants and that discharge from point sources through discrete conveyances to waters of the United States. While Duke Energy had requested these seeps be included in the new NPDES permit, these seeps were not authorized by the new NPDES permit and therefore constitute violations of the CWA, the NCDEQ NPDES permitting program, and N.C.G.S.A. § 143-215.1(a). Duke Energy expects these seeps to be covered under the new SOC described in the NPDES Wastewater Permitting discussion in Section 1.2.2 of this Audit Report. The seep conditions remain substantially the same as last year.

Point source discharges to surface waters were identified at Area of Wetness (AOW) sampling locations S-15 and S-16 in and around the 1963 Ash Basin present at the Cape Fear Facility. The locations of these discharges are shown on the figure provided in Attachment B. The discharges from S-15 and S-16, identified here as seeps, discharge directly to the Cape Fear River. S-16 includes the discharge from S-18. Sampling conducted during 2018 and 2019 showed these discharges contained pollutants including pH, boron, arsenic, nickel, sulfate, total dissolved solids

(TDS), and elevated hardness levels. A summary of the sampling results is provided on the table in Attachment B. Flow or dampness was located at other AOWs, but the flow rates were very low and the discharge could not be sampled accurately.

Duke Energy modified the discharge outlet point from S-16 during Spring/Summer 2017. This modification passively captures and treats the discharge to raise the pH to within the anticipated range of the expected NPDES permit. Duke anticipates that this modification will position S-16 to be in compliance at the time the new permit is issued.

However, at this time, the discharges from seeps S-15 and S-16 flow into the Cape Fear River, which is a water of both the State and the United States. The seeps contain pollutants, and the discharges are not authorized by the Cape Fear Facility's currently effective NPDES permit. Duke Energy reports that it and NCDEQ are developing a Special Order by Consent (SOC), which will cover non-constructed seeps (i.e., seeps that are not on or within the dam structure or that do not convey wastewater via a pipe or constructed channel directly to a receiving stream) at the facility. According to Duke Energy, the SOC will, among other things, commit Duke Energy to initiate and complete dewatering of the basins on a specified timeline, which is expected to eliminate or substantially reduce the seeps from the basin.

A new NPDES permit was issued and became effective on October 1, 2018. Seeps S-15 and S-16 were not covered by the NPDES permit. Duke Energy expects the seeps to be covered by a new SOC for the facility to be issued sometime over the next year.

3.2 EXCEEDANCES OF THE STATE GROUNDWATER QUALITY STANDARDS

Requirement – The State groundwater rules establish maximum contaminant levels for groundwater at or beyond the compliance boundaries for the ash basins. *See* 15A NCAC 02L.0202. 15A NCAC 02L.0103(d) provides that "[n]o person shall conduct or cause to be conducted, any activity which causes the concentration of any substance to exceed that specified" under the Class GA standards or the interim maximum acceptable concentrations (IMACs) established for groundwater quality pursuant to 15A NCAC 02L.0202. Further, under N.C.G.S.A. § 143-215.1(i), "[a]ny person … who is required to obtain an individual permit … for a disposal system under the authority of N.C.G.S.A. § 143-215.1 [water pollution control] … shall have a compliance boundary … beyond which groundwater quality standards may not be exceeded." *See also* 15A NCAC 02L.0102(3) (defining "compliance boundary" as "a boundary around a disposal system at and beyond which groundwater quality standards may not be exceeded").

In addition, under N.C.G.S.A. § 143-215.6A(a)(1), civil penalties may be assessed against any person who violates any standard established by the NCDEQ under the authority of N.C.G.S.A. § 143-214.1, which covers groundwater standards.

Finding – Constituents exceeding the standards for Class GA waters, established in 15A NCAC 02L.0202, were documented in monitoring wells located at or beyond the compliance boundaries for the 1978 Ash Basin and 1985 Ash Basin. Based on a review of the 2018 and 2019 CAMA groundwater monitoring analyses, pH, antimony, arsenic, boron, cobalt, iron, sulfate, TDS, vanadium, and manganese were observed to exceed the 02L or IMAC groundwater standards or the NCDEQ-approved PBTVs, if the PBTV was greater than the 02L or IMAC groundwater standards, one or more times at or beyond the compliance boundaries of the 1978 Ash Basin and the 1985 Ash Basin. A summary of the 2018 and 2019 CAMA groundwater monitoring results is presented in Attachment C to this report.

Duke Energy has stated its opinion that, pursuant to a September 2015 Settlement Agreement with the NCDEQ, "Duke Energy is not subject to any further financial penalties for exceedances of groundwater standards" and "Duke Energy is not subject to any further enforcement action based on exceedances of groundwater standards as long as it remains in substantial compliance with CAMA groundwater requirements."

The CAM has advised the Audit Team that the Audit scope does not include an evaluation of compliance with the September 2015 Settlement Agreement, and therefore the Audit Team does not take a position on Duke Energy’s opinion.

4.0 OPEN LINES OF INQUIRY

Open Lines of Inquiry are items identified by the Audit Team while on-site that, due to limited available information or the need for additional research, could not be determined as being in compliance or out of compliance. There were no Open Lines of Inquiry identified during the Audit.

5.0 AUDIT APPROACH

5.1 ON-SITE ACTIVITIES

During its time on-site, the Audit Team conducted an opening conference with facility personnel to discuss the scope of work and the plan for accomplishing necessary tasks while at the facility. A site tour of the coal ash management and program support areas was subsequently completed. Following the tour, the Audit Team conducted a review of pertinent files, interviews with facility representatives, and verification of facility activities related to the Environment Compliance Plans (ECPs), written programs, and permits. A debrief was conducted each Audit day to advise the facility representatives of Audit progress, open lines of inquiry, possible Audit findings, and needs for the next day. At the completion of the Audit, the Audit Team led a verbal discussion of draft Audit findings with facility representatives.

5.2 STANDARDS OF PRACTICE

The fieldwork portion of the Audit was conducted on August 14-15, 2019 with compliance reporting commencing May 14, 2015, the date of the court's judgments. The Audit focused on the activities at the facility since the date of the last Audit, which was August 15-16, 2018. The Audit was based on:

- Physical inspections of the facility;
- Examination of selected administrative and operating records made available by facility staff at the Audit Team's request;
- Interviews and discussions with key facility management and staff; and
- Verification procedures designed to assess the facility's application of, and adherence to, terms of the probation, environment laws and regulations, and site policies and procedures. In addition, the Audit Team reviewed the facility's adherence to good management practices.

The Audit followed established audit protocols and procedures. It should be understood that the Audit consisted of evaluating a sample of practices and was conducted over a short period of time. Efforts were made toward sampling major facets of environmental performance during the period under review. This method is intended to uncover major system deficiencies and the Audit may not have identified all potential problems.

To support the overall independence of the Audit process, the Audit included an auditing professional certified by the Board of Environmental, Health and Safety Auditor Certifications (BEAC). BEAC is an accredited professional certification board that issues the Certified Professional Environmental Auditor (CPEA) designation to qualified auditors. Under BEAC, auditor independence is a key criterion for the implementation of an effective third-party audit program. The Audit was implemented in accordance with the standards related to auditor independence.

The process by which the Audit was conducted was consistent with the general state of the art of environment auditing and the best professional judgment of the Audit Team. To conduct the Audit, the team implemented a formal approach, drawing on process guidance from both BEAC and the Auditing Roundtable (AR) guidance documents. Guidance documents included:

- *Standards for the Professional Practice of Environmental, Health and Safety Auditing*. Prepared by the Board of Environmental, Health and Safety Auditor Certifications, 2008.

- ISO 19011:2002 – Guidelines for Quality and/or Environmental Management Systems Auditing. Prepared by the International Organization for Standardization, 2002.

- Standard for the Design and Implementation of an Environmental, Health and Safety Audit Program. Prepared by The Auditing Roundtable, Inc., 1995.

- Minimum Criteria for the Conduct of Environmental, Health and Safety Audits, Prepared by The Auditing Roundtable, Inc.

5.3 REPRESENTATIVE SAMPLING

When confronted with a large population of data to review or equipment to inspect, the Audit Team employed representative sampling techniques to evaluate records over the Audit period requested, and as necessary, for physical inspection of some types of common equipment. The sample size for records reviews or equipment inspections required professional judgment.

The Audit Team's judgement considered the following:

- The outcome of the evaluation of the records sampled. If problems are found in the representative sample, more records may need to be examined to evaluate compliance status.
- Potential for or severity of non-compliance.
- The general appearance and observed practices of certain operating areas.
- Information obtained during an interview that indicates a potential problem.
- Other specific information or guidance from the CAM.
- Time available during the Audit.

The Audit Team also employed the following types of sampling techniques, depending upon the characteristics of a specific population:

- Random sampling – every item has an equal chance of being selected.
- Interval sampling – select every nth item, (e.g., every third manifest in chronological order as contained in facility files).
- Block sampling – auditor uses his/her judgment to select a specific block of items, (e.g., petroleum storage tank inspections from April to October).
- Stratified sampling – population is divided into groups, which are then sampled through random or judgmental techniques.

ATTACHMENT A

ATTACHMENT A
AUDIT SCOPE

A-1 GENERAL AUDIT SCOPE ITEMS

The general Audit scope items included:

- Review and evaluation of documentation for maintenance and repair of structures and equipment used for coal ash disposal,

- Review and evaluation of documentation of modifications, failures, leaks, damage, disrepair and other problems at the coal ash management units,

- Review and evaluation of documentation of efforts to correct failures, leaks, damage, disrepair and other problems where they determine that employee/contractor actions were likely a primary or contributing cause to a compliance finding,

- Review and evaluation of documentation of communication of the items above within the organization,

- Review and evaluation of documentation associated with the specific environmental compliance items described below and laws, regulations, and policies associated these items and

- Review of compliance with administrative aspects and regulatory submissions related to coal ash management-specific regulations, including:

–	Coal Combustion Residuals	40 CFR Part 257 Subpart D
–	NC Coal Ash Management Act of 2014	NC General Statutes Chapter 130A, Article 9

More specific items which were addressed in the Audits to comply with the General Audit Scope are described below.

A-2 SPECIFIC COMPLIANCE WITH THE ECP-NC

The following items related to specific ECP-NC compliance were reviewed as part of the Audit:

1. Verify maintenance and sufficient funding of corporate compliance organizations (ABSAT, CCP organization, National Ash Management Advisory Board). Where a root cause of a compliance finding appears in an auditor's judgment to result from inadequate funding, the AGC/ELM Audit Team will identify this in the Audit finding.

2. Verify timely production of satisfactory Compliance Officer (CO) reports to the CAM relating to the development, implementation, and enforcement of the ECP-NC. No auditing work is associated with this work at this time.

3. Evaluate existence and efficacy of toll-free hotline/e-mail inbox for violation reporting, including the appropriateness of the follow-up investigation and disposition of each reported matter. This requirement will be evaluated for the first year of audits and then reassessed.

4. Evaluate completion and efficacy of periodic notices (via Internet, Intranet, email, notices in employee work areas, and publication in community outlets) to employees and the public of the availability of the toll-free hotline and electronic mail inbox.

5. Evaluate training materials and curricula utilized in the mandated training program, particularly those tailored to employee's specific job descriptions, to determine whether it advances the goal of "ensuring that every domestic employee of Duke Energy Corporation and its wholly-owned or operated affiliates understands applicable compliance policies and is able to integrate the compliance objectives in the performance of his/her job." Ensure that the subjects specifically named in the plea agreements are covered by the training (namely, notice and reporting requirements in the event of a release or discharge and the safe and proper handling of pollutants, hazardous substances and/or wastes.)

6. Evaluate whether Defendants are using "Best Efforts" to comply with the obligations under the ECP-NC. Where the Audit Team makes compliance findings, the Audit Team will, upon request, provide their opinion on whether this best efforts standard applies, and if so, whether best efforts have been used.

7. Verify compliance at each facility with the specific procedures and protocols set forth in the ECP-NC.

A-3 SPECIFIC COMPLIANCE WITH OTHER PROVISIONS OF THE PLEA AGREEMENT

The following items related to specific items in the Plea Agreement were reviewed as part of the Audit:

1. Determine whether Defendants have opened, expanded, or reopened any coal ash or coal ash wastewater impoundment and, if so, verify that they are lined and do not allow unpermitted discharges of coal ash or coal ash wastewater to waters of the United States.

2. Verify that Defendants have determined the volume of wastewater and coal ash in each wet-storage coal ash impoundment in North Carolina as described in the plea agreements and that written or electronic records of this information is maintained in a location available to facility staff and employees responsible for making environmental or emergency reports.

3. Review citations/notices of violation/notices of deficiency related to violations of federal, state, or local law to assure that they have been properly relayed to the Court and, as appropriate under the plea agreements, determine their materiality.

4. Evaluate Defendants' efforts to close coal ash impoundments at Dan River, Riverbend, Asheville, and Sutton for legal compliance.

5. Note any observations made during the Audit that cause concern regarding the assets and/or security available to the Defendants to meet the obligations imposed by the Judgment in this case.

A-4 GENERAL ENVIRONMENTAL COMPLIANCE SUBJECT AREAS

The following items related to General Environmental Compliance were reviewed as part of the Audit:

1. Assess all waste streams from Duke Energy facilities with coal ash impoundments. Review Duke Energy’s processes, procedures, and practices, as well as compliance with those processes, procedures, and practices, for:

   a. identifying waste streams (especially, but not limited to, waste streams with discharge points into bodies of water),
   b. identifying and communicating any modifications or changes, or potential modifications or changes, to waste streams,
   c. ensuring proper handling/disposal of waste streams,
   d. identifying, preventing, and mitigating any risks or hazards that could affect waste streams and/or the disposal of waste streams, and
   e. ensuring proper permitting for waste streams.

For Item 1.d., the Audit Team evaluated such risk/hazard issues where there were compliance findings associated with waste streams.

2. Review and evaluate documentation of:

   a. Maintenance and repair of structures and equipment related to coal ash disposal,
   b. Modification of the coal ash impoundments and related pollution prevention equipment and structures,
   c. Failures, leaks, damage, disrepair, and other problems,
   d. Communication of the information described in a-c within the organization, and

e. Efforts to correct failures, leaks, damage, disrepair, and other problems.

3. Assess the employees responsible for inspection, maintenance, and repair of coal ash basins and related structures and equipment. The assessment included an assessment of the workloads of such employees to assure that Duke Energy's facilities are adequately staffed. These assessments were made where the Audit Team determines that employee/contractor actions were likely a primary or contributing cause to a compliance finding.

4. Review the results and recommendations of any other Audits (internal or external/state mandated) and assess Duke Energy's implementation of those recommendations.

5. Review and assess Duke Energy's processes, procedures, and practices for identifying, communicating, and addressing problems and potential problems at its coal ash basins (leaks, unpermitted discharges, etc.).

6. Review and assess Duke Energy's policies, procedures, practices, and equipment for handling emergency releases from its coal ash basins and evaluate the personnel with duties in such situations.

7. Verify that Duke Energy is complying with its NPDES wastewater and stormwater permits, as well as other relevant environmental permits. This should include verifying Duke Energy's timely submission of permit applications, permit renewal applications, and responses to requests for additional information from the relevant regulatory authority.

8. Review and assess any actions or measures Duke Energy has undertaken to assure accountability and prevent recurrences when problems and/or failures occur (i.e. disciplinary actions, re-training, revision to policies and procedures, etc.). This

review will be completed where the Audit Team determines that employee/contractor actions were likely a primary or contributing cause to a compliance finding.

9. Review and assess compliance with the following environmental regulations, as applicable to the management of coal ash:

a. Wastewater Discharges	40 CFR 122; 15A NCAC 2H.0100 *et seq.*
b. Stormwater Discharges	40 CFR 122.26; 15A NCAC 2H.1000 *et seq.;* NC General Permit (Construction) No. NCG010000
c. NC Groundwater Standards	15A NCAC 02L.0202(h)
d. Hazardous Waste Management	15A NCAC 13A.0100 to 13A.0107
e. Oil Pollution Prevention	40 CFR Part 112
f. Air Pollution (Title V)	15A NCAC 2Q, and
g. Hazardous Chemicals (Tier II)	40 CFR Part 370.

Reviews also included an analysis of overall compliance and the status and security of the asset. Subsequent reviews of individual facilities will evaluate the movement towards compliance. The Audit did not include an evaluation of compliance with the September 2015 Settlement Agreement with NCDEQ.

A–5 LIST OF PERMITS AND PROGRAMS DEEMED TO BE EITHER DIRECTLY OR INDIRECTLY IN SUPPORT OF ASH MANAGEMENT

During the Audit, the Audit Team reviewed a variety of written programs developed and implemented by Duke Energy and facility staff. State-issued permits and supporting documentation relative to environmental programs and geotechnical aspects of ash basin management were also requested and reviewed.

Requested documents, pertinent to management of ash in basins, landfills, ponds, etc. were outlined in the pre-audit questionnaire for each facility and included, but were not limited to:

1. The Compliance Register developed for ETrac for the Site.

2. The Duke Energy Operations Manual for the facility.

3. A site plan, site map, or aerial photo which shows the entire facility and key features, of the facility including NPDES outfalls associated environmental monitoring locations, storage tanks, etc.

4. Most recent 2 years of maintenance, monitoring, and inspection records for each coal ash/CCR basin (just the physical inspections, not the groundwater records).

5. A “Phase 1 and Phase 2” summary of ash basin conditions prepared by an outside consultant.

6. Duke Energy’s permitting plans for addressing ash impoundments and landfills at this facility.

7. Applicable pages from the Duke Energy basin-by-basin coal ash/CCR project tracking document for this facility.

8. Original basin/landfill/coal ash management unit construction records.

9. Documentation of changes to these units.

10. Coal ash unit construction permit application and approval.

11. State-issued permits and application materials for permits associated with coal ash/CCR management (including, e.g., dam permits).

12. Any currently effective state order, consent order, or similar state direction that addresses coal ash/CCR management at the site.

13. Records required to be maintained in the site's operating record under the federal CCR regulation and/or any state CCR regulatory program.

14. Records of off-site ash shipments from May 2015 forward.

15. Stormwater permit application and approval for all outfalls.

16. Industrial wastewater (NPDES/POTW) permit application and approval for all outfalls/discharges.

17. Industrial and stormwater sampling and monitoring records, and any corrective action plans (last 2 years).

18. Stormwater pollution prevention plan.

19. Landfill operating permit with maintenance and monitoring requirements.

20. Landfill leak detection and groundwater monitoring records from the last 2 years along with any workplans that describes the rationale for the monitoring system at the Site.

21. Landfill operating permit with maintenance and monitoring requirements.

22. Copies of any air permits and applications for coal ash units and ancillary operations.

23. Any testing and monitoring records completed to comply with the air permits.

24. Any notices of violation~~s~~ associated with the coal ash/CCR management activities received over the last 2 years.

25. Copy of SPCC Plan.

26. Community Right-to-Know

    a. Copies of lists of hazardous chemicals or MSDSs submitted;
    b. Copies of Tier I or II reports; and
    c. Copies of Form R (toxic release inventory) reports.

27. Copies of communications with employees and the public regarding availability of toll-free hotline and electronic mail inbox for reporting suspected environmental violations.

28. Management Systems:

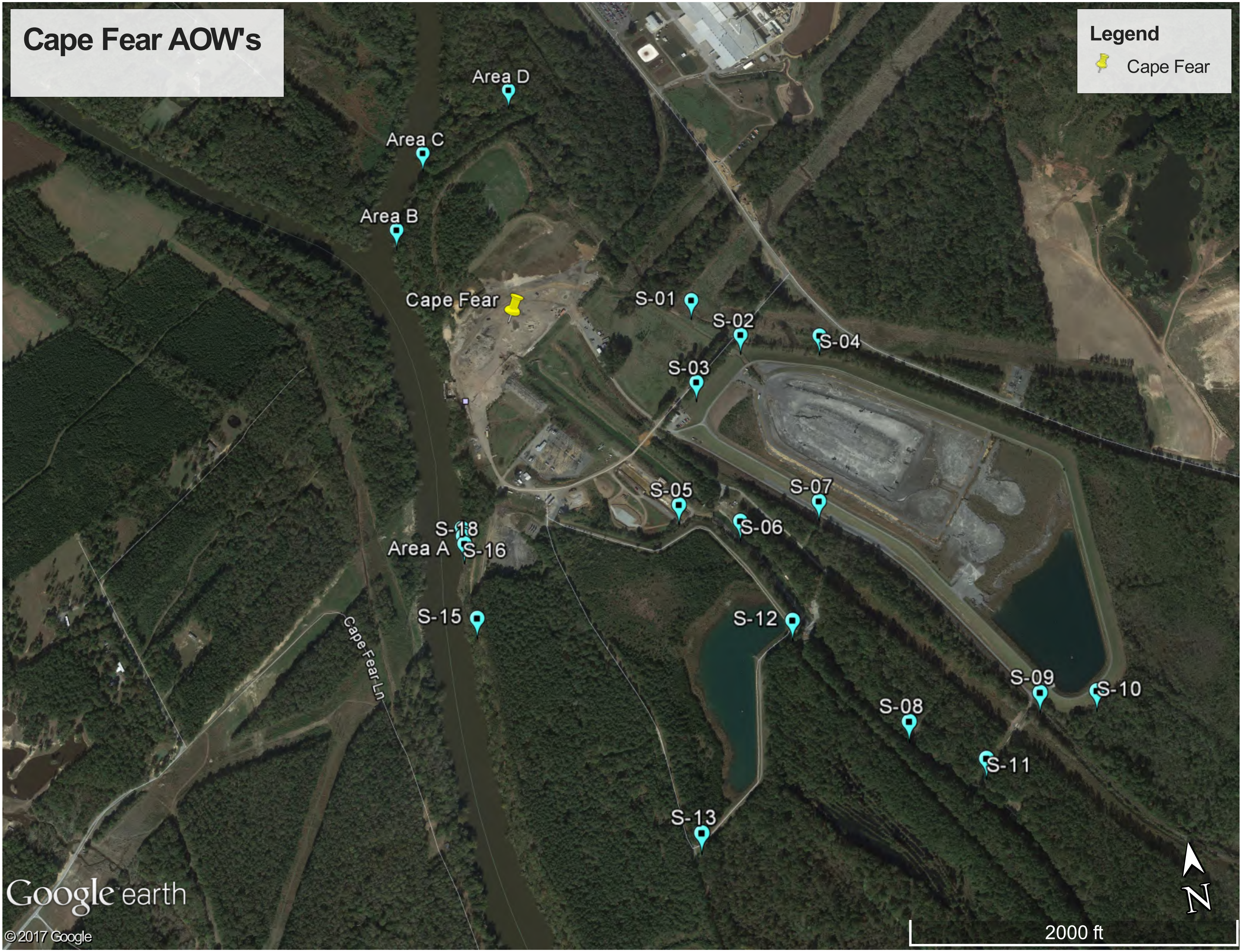
    a. List of responsible party for each environmental activity.
    b. All environmental-related training records.
    c. All environmental policies and procedures.
    d. Organization chart.
    e. Site diagram identifying storage areas, tanks, etc.

29. Employee training records related to environmental programs and ash management policies.

ATTACHMENT B

AOW Locations and 2018 and 2019 Sampling Results

Cape Fear AOW's



	FIELD PARAMETERS			CFR257 APPENDIX III CONSTIT			METERS (TOTAL C		
Reporting Units	**S.U.**	**mg/L**	**NTUs**	**ug/L**	**mg/L**	**mg/L**	**ug/L**	**ug/L**	**mg/L**
15A NCAC 02B (Class C)	**6.0-9.0**	**4**	**25**	**NE**	**250**	**500**	**10**	**25**	**100**

		FIELD PARAMETERS			CFR257 APPENDIX III CONSTIT			METERS (TOTAL C		ER PARAMET
Sample ID	**Sample Collection Date**	**pH**	**Dissolved Oxygen**	**Turbidity**	**Boron**	**Sulfate**	**Total Dissolved Solids**	**Arsenic**	**Nickel**	**Hardness**
S-05	05/16/2019	4.7	4.84	1.7	415	540	570	<1	17	232
S-07	10/23/2018	6.6	5.08	10.0	6560	240	440	<1	4.52	269
S-07	05/16/2019	6.7	4.20	3.0	6790	240	470	<1	4.42	269
S-08	10/23/2018	6.7	8.07	16.0	3380	150	300	<1	7.1	157
S-08	05/16/2019	7.1	8.15	12.6	3750	140	340	<1	6.32	193
S-15	10/23/2018	6.7	5.69	26.1	1500	170	560	92.2	6.82	335
S-15	05/16/2019	7.3	7.61	14.7	1320	170	590	36.2	4.09	337
S-16	10/23/2018	6.4	0.73	3.9	867	1500	2300	6.43	217	1230
S-16	05/16/2019	6.4	1.33	3.9	815	1500	2100	15.5	138	1220

COLOR NOTES

Bold highlighted concentration indicates exceedance of the current respective standard or criteria [15A NCAC 02B(Class C), NPDES permit value]. All hardness-dependent dissolved metal standards in this table assume ≤ 25 mg/L in-stream hardness.

Provisional Background Threshold Values reflect the values represented in the NCDEQ letter dated 10/11/2017.

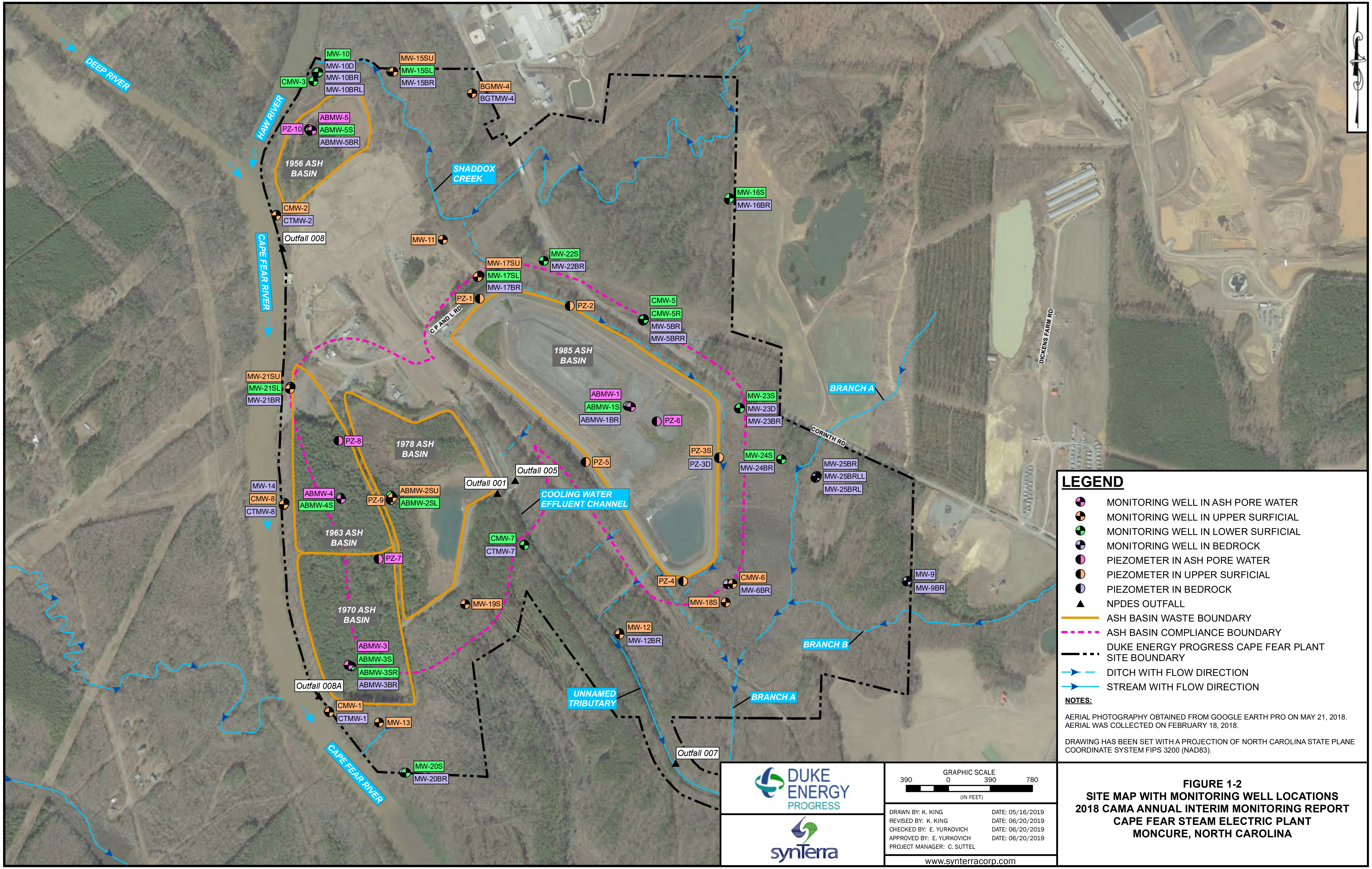
Analytical data review has not been completed for this dataset.

ABBREVIATION NOTES

BGS - below ground surface	NA - Not available or Not Applicable
BOD - Biologic Oxygen Demand	NE - Not established
CB - Compliance Boundary	NF - No Flow
COD - Chemical Oxygen Demand	NM - Not measured
Deg C - Degrees Celsius	NTUs - Nephelometric Turbidity Units
DMAs - dimethylarsinic acid	pCi/L - picocuries per liter
DUP - Duplicate	PSRG - Primary Soil Remediation Goals
Eh - Redox Potential	RL - Reporting Limit
ft - Feet	SeCN - selnocynante
GPM - gallons per minute	SeMe (IV) - Selenomethionine
IMAC - Interim Maximum Allowable Concentrations. From the 15A NCAC 02L Standard, Appendix 1, April, 1, 2013.	SPLP - Synthetic Precipitation Leaching Procedure
MDC - Minimum Detectable Concentration	S.U. - Standard Units
MeSe - Methylseleninic acid	TCLP - Toxicity Characteristic Leaching Procedure
mg/kg - milligrams per kilogram	ug/L - micrograms per liter
mg/L - milligrams per liter	ug/mL - microgram per milliliter
mg-N/L - Milligram nitrogen per liter	umhos/cm - micromhos per centimenter
MMAs - monomethylarsonic acid	Well Locations referenced to NAD83 and elevations referenced to NAVD88
mV - millivolts	umhos/cm - micromhos per centimenter

ATTACHMENT C

2018 and 2019 Summary of CAMA Groundwater Data and Well Location Map



LEGEND

- ● MONITORING WELL IN ASH PORE WATER
- ● MONITORING WELL IN UPPER SURFICIAL
- ● MONITORING WELL IN LOWER SURFICIAL
- ● MONITORING WELL IN BEDROCK
- ◐ PIEZOMETER IN ASH PORE WATER
- ◐ PIEZOMETER IN UPPER SURFICIAL
- ◐ PIEZOMETER IN BEDROCK
- ▲ NPDES OUTFALL
- ASH BASIN WASTE BOUNDARY
- ASH BASIN COMPLIANCE BOUNDARY
- DUKE ENERGY PROGRESS CAPE FEAR PLANT SITE BOUNDARY
- DITCH WITH FLOW DIRECTION
- STREAM WITH FLOW DIRECTION

NOTES:

AERIAL PHOTOGRAPHY OBTAINED FROM GOOGLE EARTH PRO ON MAY 21, 2018. AERIAL WAS COLLECTED ON FEBRUARY 18, 2018.

DRAWING HAS BEEN SET WITH A PROJECTION OF NORTH CAROLINA STATE PLANE COORDINATE SYSTEM FIPS 3200 (NAD83).

DUKE ENERGY PROGRESS

synTerra

GRAPHIC SCALE
390 0 390 780
(IN FEET)

DRAWN BY: K. KING	DATE: 05/16/2019
REVISED BY: K. KING	DATE: 06/20/2019
CHECKED BY: E. YURKOVICH	DATE: 06/20/2019
APPROVED BY: E. YURKOVICH	DATE: 06/20/2019
PROJECT MANAGER: C. SUTTEL	

www.synterracorp.com

FIGURE 1-2
SITE MAP WITH MONITORING WELL LOCATIONS
2018 CAMA ANNUAL INTERIM MONITORING REPORT
CAPE FEAR STEAM ELECTRIC PLANT
MONCURE, NORTH CAROLINA

CAPE FEAR
07/16/2019
BRANDON RUSSO
EVAN YURKOVICH

	PARAM	D 40CFR257 APPENDIX III CONSTITUENT				INORGANIC PARAMETERS (TOTAL CONCENTRATION)															ADIONUCLID	R PARAME
Reporting Units	**S.U.**	**ug/L**	**mg/L**	**mg/L**	**mg/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/mL**	**mg/L**
15A NCAC 02L Standard	**6.5-8.5**	**700**	**250**	**250**	**500**	**1***	**10**	**700**	**4***	**2**	**10**	**1***	**300**	**15**	**50**	**100**	**20**	**0.2***	**0.3***	**1000**	**0.03^**	**2**
Provisional Background (Surficial Aquifer)	**5.8-6.4**	**177**	**250**	**510**	**1200**	**1**	**3**	**183**	**1**	**1**	**1**	**89**	**37500**	**1**	**9170**	**48**	**1**	**0.2**	**1.268**	**62**	**0.0167**	**NE**
Provisional Background (Bedrock Unit)	**5.5-8.2**	**50**	**220**	**96**	**675**	**1**	**6**	**471**	**1**	**1**	**1**	**1.15**	**750**	**1**	**901**	**2**	**1.98**	**0.2**	**2.37**	**5**	**0.00196**	**NE**

							PARAM	D 40CFR257 APPENDIX III CONSTITUENT				INORGANIC PARAMETERS (TOTAL CONCENTRATION)															ADIONUCLID	R PARAME
Sample ID	**Location Description**	**Associated Unit**	**Location With Respect to Groundwater Flow Direction**	**Well Screen Location**	**Sample Location Aquifer Name**	**Sample Collection Date**	**pH**	**Boron**	**Chloride**	**Sulfate**	**Total Dissolved Solids**	**Antimony**	**Arsenic**	**Barium**	**Beryllium**	**Cadmium**	**Chromium**	**Cobalt**	**Iron**	**Lead**	**Manganese**	**Nickel**	**Selenium**	**Thallium**	**Vanadium**	**Zinc**	**Total Uranium**	**Fluoride**
ABMW-01	In 1985 WB	1985 Basin	Source Area	Ash Pore Water	Ash Pore Water	06/13/2018	7.5	**3650**	10	110	440	<1	**811**	136	<1	<1	<1	<1	**2560**	<1	**169**	1.22	<1	<0.2	**0.567**	<5	**0.0407**	**2.3**
ABMW-01	In 1985 WB	1985 Basin	Source Area	Ash Pore Water	Ash Pore Water	08/29/2018	7.5	**3540**	11	110	420	<1	**757**	125	<1	<1	<1	<1	**2330**	<1	**156**	1.93	<1	0.088 j	**0.505**	1.873 j	**0.0383**	2
ABMW-01	In 1985 WB	1985 Basin	Source Area	Ash Pore Water	Ash Pore Water	12/06/2018	7.5	**3520**	9.7	110	420	<1	**948**	135	<1	<1	<1	<1	**2680 B2**	<1	**169**	2.41	<1	0.148 j	**0.546**	2.714 j,B	**0.0502**	**2.4**
ABMW-01	In 1985 WB	1985 Basin	Source Area	Ash Pore Water	Ash Pore Water	02/06/2019	7.2	**3590**	9	100	460	<1	**946**	149	<1	NA	0.495 j	0.431 j	**2930**	NA	**178**	3	<1	<0.2	**2.11**	<5	NA	NA
ABMW-01BR	In 1985 WB	1985 Basin	Source Area	Bedrock	Bedrock	06/13/2018	8.1	**1530**	17	120	430	<1	**10.2**	195	<1	<1	0.386 j	<1	143	<1	**720**	1.57	<1	0.189 j	0.287 j	<5	0.000209	0.1376 j
ABMW-01BR	In 1985 WB	1985 Basin	Source Area	Bedrock	Bedrock	08/29/2018	7.7	**1620**	22	160	440	<1	**10.2**	191	<1	<1	0.478 j	<1	238	<1	**840**	2.57	<1	0.125 j	**0.376**	6	0.000208	0.132 j
ABMW-01BR	In 1985 WB	1985 Basin	Source Area	Bedrock	Bedrock	12/06/2018	7.6	**1380**	23	160	410	<1	**10.2**	183	<1	<1	0.402 j	<1	161 B2	<1	**814**	2.42	<1	<0.2	0.194 j	<5	0.000211	<0.5
ABMW-01BR	In 1985 WB	1985 Basin	Source Area	Bedrock	Bedrock	02/07/2019	7.2	**1480**	22	150	420	<1	**10.5**	193	<1	NA	1.4	0.856 j	**2140**	NA	**910**	3.35	<1	0.196 j	**2.13**	6	NA	NA
ABMW-01S	In 1985 WB	1985 Basin	Source Area	Surficial Lower	Surficial	06/13/2018	6.9	**2610**	15	120	370	<1	3.53	54	<1	<1	2.14	**2.01**	**1210**	<1	**1010**	3.85	<1	0.12 j	**0.834**	<5	0.000411	0.95
ABMW-01S	In 1985 WB	1985 Basin	Source Area	Surficial Lower	Surficial	08/29/2018	6.9	**2640**	15	120	360	<1	2.08	54	<1	<1	1.92	**1.31**	**1380**	<1	**928**	3.98	<1	<0.2	**1.22**	<5	0.000497	0.96
ABMW-01S	In 1985 WB	1985 Basin	Source Area	Surficial Lower	Surficial	12/06/2018	6.8	**2620**	14	130	350	<1	2.7	59	<1	<1	0.984 j	**2.44**	**1180 B2**	<1	**1100**	3.93	<1	<0.2	**1.44**	<5	0.000543	1.1
ABMW-01S	In 1985 WB	1985 Basin	Source Area	Surficial Lower	Surficial	02/06/2019	6.6	**2780**	13	120	350	<1	2.3	65	<1	NA	1.01	**2.53**	**1660**	NA	**983**	3.97	<1	<0.2	**3.24**	<5	NA	NA
ABMW-02SL	In 1978 WB	1978 Basin	Source Area	Surficial Lower	Surficial	06/13/2018	**6.0**	<50	7	3.1	54	<1	2.22	10	<1	<1	<1	**2.25**	**6250**	<1	**417**	4.83	<1	<0.2	0.158 j	5	NA	0.084 j
ABMW-02SL	In 1978 WB	1978 Basin	Source Area	Surficial Lower	Surficial	08/28/2018	**6.0**	44.453 j	6.4	3.1	78	<1	2.72	31	<1	<1	<1	0.72 j	**13000**	<1	**790**	1.38	<1	<0.2	<0.3	3.2 j	NA	0.1
ABMW-02SL	In 1978 WB	1978 Basin	Source Area	Surficial Lower	Surficial	12/05/2018	**6.1**	<50	6	4.1	60	<1	2.51	24	<1	<1	<1	**1.24**	**7300**	<1	**453**	3.33	<1	<0.2	<0.3	7	NA	0.0573 j
ABMW-02SL	In 1978 WB	1978 Basin	Source Area	Surficial Lower	Surficial	02/05/2019	**5.9**	<50	6	3.8	55	<1	1.54	16	<1	NA	<1	**1.8**	**4660**	NA	**395**	5.22	<1	<0.2	<0.3	6	NA	NA
ABMW-02SU	In 1978 WB	1978 Basin	Source Area	Surficial Upper	Surficial	06/13/2018	**4.1**	177	42	**360 M2**	470	<1	0.81 j	20	0.388 j	0.366 j	0.345 j	**21.3**	296	3.71	**1620**	19.7	8.25	0.2	0.2 j	51	NA	0.551 j
ABMW-02SU	In 1978 WB	1978 Basin	Source Area	Surficial Upper	Surficial	08/28/2018	**4.3**	182	44	**380**	**560**	<1	0.503 j	22	<1	<1	0.4 j	**28.4**	**480**	3.23	**2230**	17	13.7	0.181 j	<0.3	28	NA	0.512 j
ABMW-02SU	In 1978 WB	1978 Basin	Source Area	Surficial Upper	Surficial	12/05/2018	6.7	283	5.9	110	380	<1	**12.3**	47	<1	<1	<1	**3.04**	**597**	<1	**723**	2.99	1.54	<0.2	0.148 j	2.341 j	NA	0.309 j
ABMW-02SU	In 1978 WB	1978 Basin	Source Area	Surficial Upper	Surficial	02/05/2019	**6.2**	265	8.7	150	400	<1	6.24	46	<1	NA	<1	**3.77**	**394 S1**	NA	**608**	3.13	1.79	<0.2	<0.3	<5	NA	NA
ABMW-03	In 1970 WB	1970 Basin	Source Area	Ash Pore Water	Ash Pore Water	06/13/2018	7.7	**6220**	8.7	**410**	**810**	**4.82**	**281**	156	<1	<1	<1	<1	18	<1	**148**	4.99	0.954 j	**0.954**	**50.5**	<5	**0.0626**	0.653 j
ABMW-03	In 1970 WB	1970 Basin	Source Area	Ash Pore Water	Ash Pore Water	08/28/2018	7.9	**5970**	9.6	**410**	**870**	**5.08**	**281**	162	<1	<1	<1	0.442 j	20	<1	**166**	5.91	0.874 j	**1.05**	**52.2**	<5	**0.074**	0.585 j
ABMW-03	In 1970 WB	1970 Basin	Source Area	Ash Pore Water	Ash Pore Water	12/05/2018	8.1	**6250**	8.6	**420**	**810**	**5.14**	**281**	149	<1	<1	<1	<1	49	<1	**150**	5.85	0.781 j	**0.82**	**39.3**	3.492 j	**0.074**	0.337 j
ABMW-03	In 1970 WB	1970 Basin	Source Area	Ash Pore Water	Ash Pore Water	02/05/2019	7.8	**6470**	8.3	**420**	**830**	**5.27**	**265**	173	<1	NA	<1	<1	71 S1	NA	**195 S1**	6.23	0.705 j	**1.1**	**42.8**	28	NA	NA
ABMW-03BR	In 1970 WB	1970 Basin	Source Area	Bedrock	Bedrock	06/13/2018	6.9	196	36	160	**560**	<1	1.68	111	<1	<1	<1	<1	**1550**	<1	**1630**	<1	<1	0.089 j	<0.3	<5	NA	0.2835 j
ABMW-03BR	In 1970 WB	1970 Basin	Source Area	Bedrock	Bedrock	08/28/2018	7.1	197	36	160	**570**	<1	1.61	108	<1	<1	<1	<1	**1630**	<1	**1680**	0.451 j	<1	<0.2	<0.3	3.577 j	NA	0.27 j
ABMW-03BR	In 1970 WB	1970 Basin	Source Area	Bedrock	Bedrock	12/05/2018	7.0	198	34	160	**550**	<1	1.42	107	<1	<1	<1	<1	**1610**	<1	**1720**	<1	<1	<0.2	0.134 j	2.083 j	NA	0.107 j
ABMW-03BR	In 1970 WB	1970 Basin	Source Area	Bedrock	Bedrock	02/05/2019	6.9	214	33	160	**560**	<1	1.79	107	<1	NA	0.338 j	<1	**1620**	NA	**1670**	0.573 j	<1	0.148 j	0.127 j	<5	NA	NA
ABMW-03SR	In 1970 WB	1970 Basin	Source Area	Surficial Lower	Surficial	06/13/2018	**6.2**	**5870**	17	**340**	**620**	**1.85**	**59.2**	81	<1	<1	<1	**6.22**	**339**	<1	**5110**	4.42	<1	<0.2	**3.59**	<5	0.00355	0.527 j
ABMW-03SR	In 1970 WB	1970 Basin	Source Area	Surficial Lower	Surficial	08/28/2018	**6.4**	**5440**	17	**360**	**630**	**1.69**	**49.7**	76	<1	<1	<1	**6.46**	294	<1	**5110**	4.95	<1	<0.2	**3.83**	3.242 j	0.00377	<1
ABMW-03SR	In 1970 WB	1970 Basin	Source Area	Surficial Lower	Surficial	12/05/2018	**6.5**	**6020**	16	**380**	**620**	**1.56**	**57.9**	77	<1	<1	<1	**6.53**	287	<1	**4980**	4.93	0.458 j	<0.2	**2.56**	3.614 j	0.00568	<1
ABMW-03SR	In 1970 WB	1970 Basin	Source Area	Surficial Lower	Surficial	02/05/2019	**6.2**	**5480**	15	**340**	**610**	**1.34**	**48.2**	74	<1	NA	<1	**7.21**	**333 S1**	NA	**5520**	5.23	0.463 j	0.121 j	**2.51**	<5	NA	NA
ABMW-04	In 1963 WB	1963 Basin	Source Area	Ash Pore Water	Ash Pore Water	06/13/2018	6.6	**1300**	44	87	500	<1	**353**	366	<1	<1	<1	<1	**351**	<1	**478**	2.66	<1	<0.2	**0.726**	<5	0.000259	0.24
ABMW-04	In 1963 WB	1963 Basin	Source Area	Ash Pore Water	Ash Pore Water	08/27/2018	6.6	**1310**	44	80	**510**	<1	**242**	377	<1	<1	<1	<1	271	<1	**471**	2.09	<1	<0.2	**0.58**	13	0.000234	0.21
ABMW-04	In 1963 WB	1963 Basin	Source Area	Ash Pore Water	Ash Pore Water	12/05/2018	6.9	**1380**	41	71	**510**	<1	**404**	428	<1	<1	<1	<1	**383**	<1	**579**	2.44	<1	<0.2	**0.563**	2.073 j	0.000288	0.1786 j
ABMW-04	In 1963 WB	1963 Basin	Source Area	Ash Pore Water	Ash Pore Water	02/04/2019	6.8	**1370**	40	64	**520**	<1	**314**	406	<1	NA	<1	<1	**332**	NA	**529**	2.47	<1	<0.2	**0.482**	<5	NA	NA
ABMW-04S	In 1963 WB	1963 Basin	Source Area	Surficial Lower	Surficial	06/13/2018	**6.1**	<50	26	7.3	200	<1	3.66	91	<1	<1	<1	0.492 j	**24700**	<1	**1110**	<1	<1	<0.2	0.287 j	<5	<0.0002	0.11
ABMW-04S	In 1963 WB	1963 Basin	Source Area	Surficial Lower	Surficial	08/27/2018	**6.1**	<50	26	8.6	220	<1	3.65	94	<1	<1	<1	0.501 j	**26400**	<1	**1150**	<1	<1	<0.2	0.129 j	16	<0.0002	0.12
ABMW-04S	In 1963 WB	1963 Basin	Source Area	Surficial Lower	Surficial	12/05/2018	**6.1**	25.935 j	26	11	220	<1	3.54	92	<1	<1	<1	0.887 j	**23000**	<1	**1130**	<1	<1	<0.2	0.152 j	3.725 j	<0.0002	0.091 j
ABMW-04S	In 1963 WB	1963 Basin	Source Area	Surficial Lower	Surficial	02/04/2019	**6.0**	<50	26	10	220	<1	3.46	90	<1	NA	<1	0.464 j	**23600**	NA	**1060**	<1	<1	<0.2	0.139 j	1.7 j	NA	NA
ABMW-05BR	In 1956 WB	1956 Basin	Source Area	Bedrock	Bedrock	06/13/2018	7.6	60	4.2	3.6	150	<1	1.22	343	<1	<1	<1	<1	90	<1	**55**	<1	<1	<0.2	0.149 j	<5	NA	0.26
ABMW-05BR	In 1956 WB	1956 Basin	Source Area	Bedrock	Bedrock	08/28/2018	7.6	68	4.4	4.2	160	<1	1.21	350	<1	<1	<1	<1	92	<1	**54**	<1	<1	0.134 j	<0.3	2.317 j	NA	0.26
ABMW-05BR	In 1956 WB	1956 Basin	Source Area	Bedrock	Bedrock	12/04/2018	8.0	61	3.8	3.6	160	<1	1.2	345	<1	<1	<1	<1	69	<1	43	<1	<1	<0.2	<0.3	13	NA	0.28
ABMW-05BR	In 1956 WB	1956 Basin	Source Area	Bedrock	Bedrock	02/04/2019	7.9	62	3.6	3.6	150	<1	1.07	351	<1	NA	<1	<1	77	NA	46	<1	<1	<0.2	<0.3	<5	NA	NA
ABMW-05S	In 1956 WB	1956 Basin	Source Area	Surficial Lower	Surficial	06/13/2018	**5.4**	194	37	**870**	**1200**	<1	0.454 j	22	<1	<1	0.408 j	**292**	**84500**	<1	**24200**	**134**	<1	0.169 j	**0.41**	293	NA	<1
ABMW-05S	In 1956 WB	1956 Basin	Source Area	Surficial Lower	Surficial	08/28/2018	**5.8**	196	38	**900**	**1300**	<1	0.449 j	20	<1	<1	0.488 j	**258**	**90800**	<1	**25000**	**126**	<1	0.135 j	0.297 j	293	NA	<1
ABMW-05S	In 1956 WB	1956 Basin	Source Area	Surficial Lower	Surficial	12/04/2018	**6.0**	215	38	**780**	**1200**	<1	0.459 j	27	<1	<1	0.72 j	**242**	**88900**	<1	**21700**	**111**	<1	0.085 j	**0.525**	245	NA	<2
ABMW-05S	In 1956 WB	1956 Basin	Source Area	Surficial Lower	Surficial	02/04/2019	**5.4**	195	34	**840**	**1200**	<1	0.341 j	17	<1	NA	0.405 j	**270**	**88600**	NA	**23600**	**129**	<1	0.103 j	**0.365**	315	NA	NA
BGMW-04 IMP	East of 1956 WB, outside of CB	Background	Background	Surficial Upper	Surficial	06/11/2018	**5.5**	<50	7.7	24	110	<1	<1	31	<1	<1	1.5	<1	147	<1	6	0.56 j	<1	<0.2	**0.741**	1.781 j	<0.0002	0.0566 j
BGMW-04	East of 1956 WB, outside of CB	Background	Background	Surficial Upper	Surficial	06/11/2018	**5.5**	<50	7.3	25	130	<1	<1	31	<1	<1	1.71 j	<1	163	<1	6	<5	<1	<0.2	**0.89**	<5	NA	NA
BGMW-04	East of 1956 WB, outside of CB	Background	Background	Surficial Upper	Surficial	08/22/2018	**5.1**	17.5 j	6.7	23	140	<1	<1	26	<1	<1	1.32	<1	32	<1	7	0.875 j	<1	<0.2	**0.456**	4.5 j	<0.0002	0.0542 j
BGMW-04	East of 1956 WB, outside of CB	Background	Background	Surficial Upper	Surficial	12/05/2018	**5.7**	<50	7.5	38	140	<1	<1	28	<1	<1	1.67	<1	126	<1	39	0.596 j	<1	<0.2	**0.934**	2.495 j	<0.0002	0.0397 j
BGMW-04	East of 1956 WB, outside of CB	Background	Background	Surficial Upper	Surficial	02/04/2019	**5.8**	<50	9.4	140	280	<1	<1	35	<1	NA	0.985 j	<1	61	NA	47	3.12	<1	<0.2	**0.562**	20	NA	NA
BGTMW-04 IMP	East of 1956 WB, outside of CB	Background	Background	Bedrock	Bedrock	06/11/2018	7.7	24.151 j	18	5.5	160	<1	1.37	138	<1	<1	<1	<1	97	<1	**114**	<1	<1	<0.2	0.227 j	<5	<0.0002	0.13
BGTMW-04	East of 1956 WB, outside of CB	Background	Background	Bedrock	Bedrock	06/11/2018	7.7	21.494 j	18	5.4	180	<1	1.4	135	<1	<1	<5	<1	75	<1	**100**	<5	<1	<0.2	**0.347**	<5	NA	NA
BGTMW-04	East of 1956 WB, outside of CB	Background	Background	Bedrock	Bedrock	08/22/2018	7.6	28.7 j	18	5.1	180	<1	1.23	134	<1	<1	<1	<1	115	<1	**104**	<1	<1	0.124 j	<0.3	2.2 j	<0.0002	0.13
BGTMW-04	East of 1956 WB, outside of CB	Background	Background	Bedrock	Bedrock	12/05/2018	7.5	23.34 j	19	5	180	<1	1.01	126	<1	<1	<1	<1	187	<1	**168**	<1	<1	<0.2	<0.3	3.049 j	<0.0002	0.1
BGTMW-04	East of 1956 WB, outside of CB	Background	Background	Bedrock	Bedrock	02/04/2019	7.8	21.499 j	19	4.4	170	<1	1.05	128	<1	NA	<1	<1	87	NA	**142**	<1	<1	<0.2	<0.3	<5	NA	NA
CMW-01 IMP	Southwest of 1970 WB, outside CB	1970 Basin	Downgradient	Surficial Upper	Surficial	06/11/2018	**6.1**	**1970**	18	<0.1	220	<1	<1	200	<1	<1	0.557 j	0.478 j	**38300**	<1	**1220**	1.6	<1	0.081 j	**1.58**	<5	<0.0002	0.0654 j
CMW-01	Southwest of 1970 WB, outside CB	1970 Basin	Downgradient	Surficial Upper	Surficial	06/11/2018	**6.1**	**2000**	17	<0.1	240	<1	<1	196	<1	<1	<5	0.45 j	**37200**	<1	**1220**	0.502 j	<1	<0.2	**1.5**	<5	NA	NA
CMW-01	Southwest of 1970 WB, outside CB	1970 Basin	Downgradient	Surficial Upper	Surficial	08/28/2018	**6.3**	**2130**	19	1.2	220	<1	<1	170	<1	<1	0.774 j	0.433 j	**28000**	<1	**987**	2.07	<1	<0.2	**2.35**	2.002 j	<0.0002	0.0782 j
CMW-01	Southwest of 1970 WB, outside CB	1970 Basin	Downgradient	Surficial Upper	Surficial	12/05/2018	**6.3**	**1590**	17	0.3	180	<1	<1	190	<1	<1	2.75	0.525 j	**37000**	<1	**1460**	2.6	<1	<0.2	**2.04**	3.001 j	<0.0002	0.0356 j
CMW-01	Southwest of 1970 WB, outside CB	1970 Basin	Downgradient	Surficial Upper	Surficial	02/05/2019	**6.0**	**1110**	47	41	280	<1	0.553 j	185	<1	NA	0.589 j	**8.86**	**28500**	NA	**2940**	1.64	<1	<0.2	**1.67**	<5	NA	NA
CMW-02 IMP	Southwest of 1956 WB, outside CB	1956 Basin	Downgradient	Surficial Upper	Surficial	06/12/2018	**5.2**	67	9.1	250	410	<1	<1	20	<1	<1	<1	**6.17**	**1350**	<1	**4170**	41.4	<1	0.098 j	**0.522**	11	NA	<0.5
CMW-02	Southwest of 1956 WB, outside CB	1956 Basin	Downgradient	Surficial Upper	Surficial	06/12/2018	**5.2**	61	9.3	250	440	<1	<1	20	<1	<1	0.489 j	**6.3**	**1380**	<1	**3990**	43	<1	<0.2	**0.733**	14 B2	NA	NA
CMW-02	Southwest of 1956 WB, outside CB	1956 Basin	Downgradient	Surficial Upper	Surficial	08/28/2018	**5.3**	84	9.8	240	430	<1	<1	22	<1	0.34 j	<1	**8.6**	**917**	<1	**5380**	44.5	<1	<0.2	**0.532**	22	NA	<0.5
CMW-02	Southwest of 1956 WB, outside CB	1956 Basin	Downgradient	Surficial Upper	Surficial	12/04/2018	**5.4**	91	12	**290**	480	<1	<1	31	<1	<1	<1	**13.7**	**684**	<1	**5460**	42.9	<1	<0.2	**0.608**	17 B2	NA	<0.5
CMW-02	Southwest of 1956 WB, outside CB	1956 Basin	Downgradient	Surficial Upper	Surficial	02/06/2019	**5.2**	74	25	**310**	**530**	<1	<1	30	<1	NA	<1	**21.1**	**1690**	NA	**7170**	57	<1	<0.2	**0.465**	14 B2	NA	NA
CMW-03 IMP	North of 1956 WB, outside CB	1956 Basin	Downgradient	Surficial Lower	Surficial	06/12/2018	**5.9**	**899**	29	**260**	480	<1	<1	54	<1	<1	<1	**3.98**	292	<1	**1850**	1.72	5.38	<0.2	**0.375**	1.942 j	<0.0002	<0.5
CMW-03	North of 1956 WB, outside CB	1956 Basin	Downgradient	Surficial Lower	Surficial	06/12/2018	**5.9**	**862**	29	250	500	<1	<1	52	<1	<1	0.602 j	**3.82**	**314**	<1	**1820**	1.508 j	5.72	0.087 j	**0.618**	2.958 j,B2	NA	NA
CMW-03	North of 1956 WB, outside CB	1956 Basin	Downgradient	Surficial Lower	Surficial	08/28/2018	**6.0**	**994**	29	**270**	**540**	<1	<1	50	<1	<1	<1	**2.83**	230	<1	**2090**	1.15	8.07	<0.2	**0.333**	1.964 j	<0.0002	<0.5
CMW-03	North of 1956 WB, outside CB	1956 Basin	Downgradient	Surficial Lower	Surficial	12/04/2018	**5.5**	186	4.2	48	120	<1	<1	57	<1	<1	0.564 j	0.527 j	17	<1	**83**	1.39	4.32	<0.2	**0.34**	3.748 j,B2	<0.0002	<0.5
CMW-03	North of 1956 WB, outside CB	1956 Basin	Downgradient	Surficial Lower	Surficial	02/07/2019	**5.8**	379	13	110	250	<1	<1	97	<1	NA	0.655 j	0.59 j	5.684 j	NA	**552**	1.11	3.81	<0.2	**0.402**	<5	NA	NA
CMW-05R IMP	North of 1985 WB, in CB	1985 Basin	Downgradient	Surficial Lower	Surficial	06/11/2018	**5.7**	459	6.5	24	110	<1	<1	41	<1	<1	<1	<1	5.931 j	<1	42	1.42	<1	<0.2	**0.816**	<5	NA	0.0582 j
CMW-05R	North of 1985 WB, in CB	1985 Basin	Downgradient	Surficial Lower	Surficial	06/11/2018	**5.7**	435	6.1	24	120	<1	<1	39	<1	<1	<5	<1	14	<1	41	1.321 j	<1	<0.2	**0.865**	<5	NA	NA
CMW-05R	North of 1985 WB, in CB	1985 Basin	Downgradient	Surficial Lower	Surficial	08/22/2018	**5.6**	382	6	19	130	<1	<1	34	<1	<1	<1	<1	<10	<1	14	1.49	<1	<0.2	**0.569**	1.7 j	NA	0.0601 j
CMW-05R	North of 1985 WB, in CB	1985 Basin	Downgradient	Surficial Lower	Surficial	12/05/2018	**6.0**	354	5.9	17	100	<1	<1	38	<1	<1	<1	<1	23	<1	15	1.1	<1	<0.2	**0.859**	3.513 j	NA	<0.1

CAPE FEAR
07/16/2019
BRANDON RUSSO
EVAN YURKOVICH

	PARAM	D 40CFR257 APPENDIX III CONSTITUENT				INORGANIC PARAMETERS (TOTAL CONCENTRATION)															ADIONUCLID	R PARAME
Reporting Units	**S.U.**	**ug/L**	**mg/L**	**mg/L**	**mg/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/mL**	**mg/L**
15A NCAC 02L Standard	**6.5-8.5**	**700**	**250**	**250**	**500**	**1***	**10**	**700**	**4***	**2**	**10**	**1***	**300**	**15**	**50**	**100**	**20**	**0.2***	**0.3***	**1000**	**0.03^**	**2**
Provisional Background (Surficial Aquifer)	**5.8-6.4**	**177**	**250**	**510**	**1200**	**1**	**3**	**183**	**1**	**1**	**1**	**89**	**37500**	**1**	**9170**	**48**	**1**	**0.2**	**1.268**	**62**	**0.0167**	**NE**
Provisional Background (Bedrock Unit)	**5.5-8.2**	**50**	**220**	**96**	**675**	**1**	**6**	**471**	**1**	**1**	**1**	**1.15**	**750**	**1**	**901**	**2**	**1.98**	**0.2**	**2.37**	**5**	**0.00196**	**NE**

							PARAM	D 40CFR257 APPENDIX III CONSTITUENT				INORGANIC PARAMETERS (TOTAL CONCENTRATION)															ADIONUCLID	R PARAME
Sample ID	**Location Description**	**Associated Unit**	**Location With Respect to Groundwater Flow Direction**	**Well Screen Location**	**Sample Location Aquifer Name**	**Sample Collection Date**	**pH**	**Boron**	**Chloride**	**Sulfate**	**Total Dissolved Solids**	**Antimony**	**Arsenic**	**Barium**	**Beryllium**	**Cadmium**	**Chromium**	**Cobalt**	**Iron**	**Lead**	**Manganese**	**Nickel**	**Selenium**	**Thallium**	**Vanadium**	**Zinc**	**Total Uranium**	**Fluoride**
CMW-05R	North of 1985 WB, in CB	1985 Basin	Downgradient	Surficial Lower	Surficial	02/05/2019	**5.8**	357	5.7	16	110	<1	<1	36	<1	NA	<1	<1	<10	NA	8 S1	1.28	<1	0.081 j	**0.776**	<5	NA	NA
CMW-06 IMP	South of 1985 WB, in CB	1985 Basin	Downgradient	Surficial Upper	Surficial	06/12/2018	**5.3**	**757**	62	130	340	<1	0.561 j	39	<1	<1	0.79 j	**9.6**	**2760**	<1	**2100**	3.89	<1	<0.2	**3.05**	3.211 j	<0.0002	0.1198 j
CMW-06	South of 1985 WB, in CB	1985 Basin	Downgradient	Surficial Upper	Surficial	06/12/2018	**5.3**	**734**	62	130	350	<1	0.663 j	36	<1	<1	0.983 j	**8.75**	**2860**	<1	**1970**	3.955 j	<1	<0.2	**3.39**	8 B2	NA	NA
CMW-06	South of 1985 WB, in CB	1985 Basin	Downgradient	Surficial Upper	Surficial	08/23/2018	**5.4**	643	26	98	400	<1	0.762 j	45	0.392 j	<1	5.19	**2.5**	**6010**	2.78	**418**	4.88	0.359 j	<0.2	**14.7**	21	0.000821	0.145 j
CMW-06	South of 1985 WB, in CB	1985 Basin	Downgradient	Surficial Upper	Surficial	12/06/2018	**6.0**	349	27	83	260	<1	0.449 j	39	<1	<1	2.78	**5.17**	**3860**	0.675 j	**1520**	3.56	<1	<0.2	**7.07**	15 B2	0.000104 j	0.046 j
CMW-06	South of 1985 WB, in CB	1985 Basin	Downgradient	Surficial Upper	Surficial	02/05/2019	**5.9**	280	21	71	240	<1	0.35 j	33	<1	NA	1.51	**5.11**	**2150**	NA	**1300**	2.45	<1	0.193 j	**3.85**	2.414 j	NA	NA
CMW-07	Southeast of 1978 WB, outside CB	1978 Basin	Downgradient	Surficial Lower	Surficial	06/12/2018	**5.8**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CMW-07	Southeast of 1978 WB, outside CB	1978 Basin	Downgradient	Surficial Lower	Surficial	08/29/2018	**4.9**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CMW-07	Southeast of 1978 WB, outside CB	1978 Basin	Downgradient	Surficial Lower	Surficial	02/05/2019	**5.4**	<50	2.3	7.7	63	<1	1.18	70	<1	NA	0.759 j	**8.39**	**3670**	NA	**1130**	2.87	<1	<0.2	**2.14**	9	NA	NA
CMW-08 IMP	West of 1963 WB, outside CB	1963 Basin	Downgradient	Surficial Upper	Surficial	06/11/2018	**6.2**	**1490**	16	140	420	<1	<1	259	<1	<1	<1	**1.58**	**54900**	<1	**14500**	3.03	<1	<0.2	**0.306**	3.515 j	<0.0002	0.1332 j
CMW-08	West of 1963 WB, outside CB	1963 Basin	Downgradient	Surficial Upper	Surficial	06/11/2018	**6.2**	**1400**	17	150	480	<1	0.454 j	255	<1	<1	<5	**1.54**	**58200**	<1	**14400**	3.535 j	<1	<0.2	**0.614**	<5	NA	NA
CMW-08	West of 1963 WB, outside CB	1963 Basin	Downgradient	Surficial Upper	Surficial	08/27/2018	**6.2**	**1430**	17	150	460	<1	<1	209	<1	<1	<1	**2.08**	**42300**	<1	**11800**	2.82	<1	<0.2	0.171 j	1.723 j	<0.0002	0.1206 j
CMW-08	West of 1963 WB, outside CB	1963 Basin	Downgradient	Surficial Upper	Surficial	12/06/2018	**6.4**	**1460**	17	140	420	<1	<1	245	<1	<1	3.48	**1.08**	**58400 B2**	<1	**13800**	4.56	<1	<0.2	0.274 j	<5	<0.0002	<0.5
CMW-08	West of 1963 WB, outside CB	1963 Basin	Downgradient	Surficial Upper	Surficial	02/06/2019	**6.4**	**1360**	17	140	420	<1	0.402 j	260	<1	NA	<1	**1.14**	**63500**	NA	**14200**	3.07	<1	0.087 j	0.245 j	<5	NA	NA
CTMW-01 IMP	Southwest of 1970 WB, outside CB	1970 Basin	Downgradient	Bedrock	Bedrock	06/11/2018	6.8	432	28	140	460	<1	<1	135	<1	<1	<1	<1	**1310**	<1	**1680**	0.849 j	<1	<0.2	0.161 j	3.17 j	<0.0002	0.1462 j
CTMW-01	Southwest of 1970 WB, outside CB	1970 Basin	Downgradient	Bedrock	Bedrock	06/11/2018	6.8	423	28	140	490	<1	<1	132	<1	<1	<5	<1	**1080**	<1	**1720**	1.019 j	<1	0.157 j	0.3	<5	NA	NA
CTMW-01	Southwest of 1970 WB, outside CB	1970 Basin	Downgradient	Bedrock	Bedrock	08/28/2018	7.0	423	28	140	480	<1	<1	134	<1	<1	<1	<1	**1440**	<1	**1740**	0.711 j	<1	<0.2	<0.3	2.471 j	<0.0002	0.1606 j
CTMW-01	Southwest of 1970 WB, outside CB	1970 Basin	Downgradient	Bedrock	Bedrock	12/05/2018	6.9	453	27	140	490	<1	<1	134	<1	<1	<1	<1	**1280**	<1	**1800**	0.543 j	<1	0.092 j	<0.3	2.172 j	<0.0002	0.0856 j
CTMW-01	Southwest of 1970 WB, outside CB	1970 Basin	Downgradient	Bedrock	Bedrock	02/05/2019	6.9	444	27	140	480	<1	<1	130	<1	NA	<1	<1	**1360**	NA	**1720**	0.745 j	<1	<0.2	<0.3	<5	NA	NA
CTMW-02	Southwest of 1956 WB, outside CB	1956 Basin	Downgradient	Bedrock	Bedrock	06/11/2018	7.8	45.632 j	3.5	8.3	170	<1	8	261	<1	<1	<5	<1	35	<1	3.334 j	<5	<1	<0.2	**1.44**	2.683 j	NA	NA
CTMW-02 IMP	Southwest of 1956 WB, outside CB	1956 Basin	Downgradient	Bedrock	Bedrock	06/12/2018	7.8	41.135 j	3.6	8.1	150	<1	7.51	253	<1	<1	<1	<1	41	<1	2.812 j	0.588 j	<1	<0.2	**1.26**	<5	NA	0.12
CTMW-02	Southwest of 1956 WB, outside CB	1956 Basin	Downgradient	Bedrock	Bedrock	08/28/2018	7.7	42.266 j	3.6	7.5	180	<1	7.96	254	<1	<1	<1	<1	29	<1	3.299 j	<1	<1	<0.2	**1.24**	3.25 j	NA	0.13
CTMW-02	Southwest of 1956 WB, outside CB	1956 Basin	Downgradient	Bedrock	Bedrock	12/04/2018	8.1	41.971 j	3.6	6.4	180	<1	7	250	<1	<1	<1	<1	42	<1	3.043 j	<1	<1	<0.2	**1.26**	4.111 j,B2	NA	0.092 j
CTMW-02	Southwest of 1956 WB, outside CB	1956 Basin	Downgradient	Bedrock	Bedrock	02/05/2019	7.8	39.316 j	3.5	5.6	170	<1	7.65	263	<1	NA	0.41 j	<1	295 S1	NA	22 S1	0.692 j	<1	<0.2	**1.41**	2.804 j	NA	NA
CTMW-07 IMP	Southeast of 1978 WB, outside CB	1978 Basin	Downgradient	Bedrock	Bedrock	06/12/2018	7.3	51	32	88	330	<1	1.22	38	<1	<1	<1	<1	17	<1	**92**	0.582 j	<1	<0.2	**1.4**	<5	NA	0.131 j
CTMW-07	Southeast of 1978 WB, outside CB	1978 Basin	Downgradient	Bedrock	Bedrock	06/12/2018	7.3	45.696 j	33	89	350	<1	2.05	64	<1	<1	0.337 j	<1	24	<1	**127**	0.653 j	<1	<0.2	**1.69**	2.507 j,B2	NA	NA
CTMW-07	Southeast of 1978 WB, outside CB	1978 Basin	Downgradient	Bedrock	Bedrock	08/29/2018	7.1	64	33	92	370	<1	1.65	58	<1	<1	<1	<1	63	<1	**251**	1.01	<1	<0.2	**1.21**	2.232 j	NA	0.1454 j
CTMW-07	Southeast of 1978 WB, outside CB	1978 Basin	Downgradient	Bedrock	Bedrock	12/17/2018	7.5	65	33	93	360	<1	2.77	112	<1	<1	<1	<1	176	<1	**149**	0.581 j	<1	<0.2	**1.56**	2.394 j	NA	0.1172 j
CTMW-07	Southeast of 1978 WB, outside CB	1978 Basin	Downgradient	Bedrock	Bedrock	02/05/2019	7.4	60	31	89	380	<1	2.94	123	<1	NA	0.349 j	<1	163 S1	NA	**317**	1.61	<1	<0.2	**1.68**	2.147 j	NA	NA
CTMW-08 IMP	West of 1963 WB, outside CB	1963 Basin	Downgradient	Bedrock	Bedrock	06/11/2018	7.0	**1480**	17	110	410	<1	<1	259	<1	<1	<1	**1.68**	**55200**	<1	**14600**	3.15	<1	0.123 j	**0.334**	<5	<0.0002	0.1282 j
CTMW-08	West of 1963 WB, outside CB	1963 Basin	Downgradient	Bedrock	Bedrock	06/11/2018	7.0	478	17	110	430	<1	4.91	139	<1	<1	<5	<1	**7650**	<1	**1360**	2.367 j	<1	<0.2	0.175 j	<5	NA	NA
CTMW-08	West of 1963 WB, outside CB	1963 Basin	Downgradient	Bedrock	Bedrock	08/27/2018	7.0	494	17	110	450	<1	4.2	142	<1	<1	<1	<1	**4520**	<1	**1290**	1.76	<1	<0.2	0.104 j	4.136 j	<0.0002	0.1496 j
CTMW-08	West of 1963 WB, outside CB	1963 Basin	Downgradient	Bedrock	Bedrock	12/06/2018	7.1	498	14	110	380	<1	**16.8**	177	<1	<1	<1	**1.69**	**3440 B2**	<1	**1580**	3.61	<1	<0.2	**0.486**	4.068 j,B	0.00033	<0.2
CTMW-08	West of 1963 WB, outside CB	1963 Basin	Downgradient	Bedrock	Bedrock	02/06/2019	6.6	524	15	110	400	<1	**17.8**	180	<1	NA	0.357 j	0.668 j	**6050**	NA	**1440**	3.21	<1	0.152 j	0.157 j	5	NA	NA
MW-05BRR	North of 1985 WB, in CB	1985 Basin	Downgradient	Bedrock	Bedrock	06/11/2018	7.2	50	24	15	230	<1	0.856 j	**773**	<1	<1	<1	<1	188	<1	**726**	0.334 j	<1	<0.2	<0.3	<5	NA	0.0885 j
MW-05BRR	North of 1985 WB, in CB	1985 Basin	Downgradient	Bedrock	Bedrock	08/22/2018	7.2	59	24	15	250	<1	0.949 j	**801**	<1	<1	<1	<1	133	<1	**677**	0.504 j	<1	<0.2	<0.3	<5	NA	0.0778 j
MW-05BRR	North of 1985 WB, in CB	1985 Basin	Downgradient	Bedrock	Bedrock	12/05/2018	7.3	46.925 j	25	15	220	<1	0.957 j	**782**	<1	<1	<1	<1	137	<1	**664**	0.591 j	<1	<0.2	<0.3	<5	NA	0.0724 j
MW-06BR	South of 1985 WB, in CB	1985 Basin	Downgradient	Bedrock	Bedrock	06/12/2018	6.9	21.392 j	170	69	**570**	<1	<1	236	<1	<1	<1	<1	64	<1	**551**	0.457 j	<1	0.087 j	**0.623**	<5	0.00155	0.317 j
MW-06BR	South of 1985 WB, in CB	1985 Basin	Downgradient	Bedrock	Bedrock	08/23/2018	7.1	25.585 j	170	69	**590**	<1	<1	220	<1	<1	<1	<1	88	<1	**506**	<1	0.362 j	<0.2	**0.649**	13	0.00149	0.2485 j
MW-06BR	South of 1985 WB, in CB	1985 Basin	Downgradient	Bedrock	Bedrock	12/06/2018	7.3	25.684 j	180	73	**570**	<1	0.401 j	217	<1	<1	0.38 j	<1	54	<1	**522**	<1	<1	<0.2	**0.799**	2.011 j,B2	0.0014	<0.5
MW-06BR	South of 1985 WB, in CB	1985 Basin	Downgradient	Bedrock	Bedrock	02/05/2019	7.1	25.257 j	180	67	**580**	<1	<1	234	<1	NA	<1	<1	56 S1	NA	**511**	0.344 j	<1	<0.2	**0.565**	<5	NA	NA
MW-09	East of 1985 WB, outside CB	Background	Background	Bedrock	Bedrock	06/14/2018	**5.6**	<50	160	38	470	<1	<1	86	<1	<1	<1	0.66 j	293	<1	**539**	2.03	<1	<0.2	0.252 j	6	0.000362	0.1886 j
MW-09	East of 1985 WB, outside CB	Background	Background	Bedrock	Bedrock	08/22/2018	**5.6**	<50	150	29	480	<1	<1	99	<1	<1	<1	0.805 j	**428**	<1	**692**	1.75	<1	<0.2	0.249 j	9	0.000467	0.282 j
MW-09	East of 1985 WB, outside CB	Background	Background	Bedrock	Bedrock	12/05/2018	**6.1**	<50	150	27	430	<1	<1	118	<1	<1	<1	0.931 j	**725**	<1	**682**	1.18	<1	<0.2	0.132 j	4.439 j	0.000636	<0.5
MW-09	East of 1985 WB, outside CB	Background	Background	Bedrock	Bedrock	02/06/2019	**5.7**	<50	180	51	440	<1	<1	38	<1	NA	<1	<1	6.055 j	NA	**71**	1.34	<1	<0.2	0.133 j	2.175 j	NA	NA
MW-09BR	East of 1985 WB, outside CB	Background	Background	Bedrock	Bedrock	06/14/2018	7.3	<50	120	8	420	<1	<1	462	<1	<1	<1	<1	77	<1	**221**	<1	<1	<0.2	**0.483**	<5	<0.0002	0.1968 j
MW-09BR	East of 1985 WB, outside CB	Background	Background	Bedrock	Bedrock	08/22/2018	7.3	23.8 j	120	8	450	<1	NA	488	<1	<1	<1	<1	146	<1	**717**	<1	<1	<0.2	0.286 j	11	<0.0002	0.1596 j
MW-09BR	East of 1985 WB, outside CB	Background	Background	Bedrock	Bedrock	12/05/2018	7.4	<50	110	7	390	<1	<1	447	<1	<1	<1	<1	267	<1	**1020**	<1	<1	0.149 j	0.142 j	1.847 j	<0.0002	<0.2
MW-09BR	East of 1985 WB, outside CB	Background	Background	Bedrock	Bedrock	02/06/2019	7.3	<50	110	6.7	350	<1	<1	450	<1	NA	<1	<1	**370**	NA	**874**	<1	<1	0.089 j	<0.3	<5	NA	NA
MW-10	North of 1956 WB, outside CB	1956 Basin	Downgradient	Surficial Lower	Surficial	06/12/2018	**5.9**	**881**	32	**600**	**980**	<1	<1	27	<1	<1	<1	**19.4**	**754**	<1	**12700**	4.63	<1	<0.2	**0.488**	2.193 j	0.0000976 j	<1
MW-10	North of 1956 WB, outside CB	1956 Basin	Downgradient	Surficial Lower	Surficial	08/28/2018	**5.9**	**878**	31	**550**	**970**	<1	<1	26	<1	<1	<1	**18.2**	**776**	<1	**12500**	2.75	<1	<0.2	**0.529**	6	0.000077 j	<1
MW-10	North of 1956 WB, outside CB	1956 Basin	Downgradient	Surficial Lower	Surficial	12/04/2018	**6.2**	**820**	23	**520**	**670**	<1	<1	29	<1	0.384 j	0.771 j	**4.64**	**587**	<1	**6900**	2.64	<1	0.081 j	**1.57**	8 B2	0.00013 j	<1
MW-10	North of 1956 WB, outside CB	1956 Basin	Downgradient	Surficial Lower	Surficial	02/07/2019	**6.0**	**829**	22	**400**	**740**	<1	<1	26	<1	NA	<1	**7.84**	**408**	NA	**8850**	2.26	<1	0.092 j	**0.476**	2.667 j	NA	NA
MW-10BR	North of 1956 WB, outside CB	1956 Basin	Downgradient	Bedrock	Bedrock	06/12/2018	7.9	97	21	**360**	**710**	<1	1.94	116	<1	<1	<1	<1	77	<1	**457**	<1	<1	0.114 j	0.156 j	<5	0.0013	0.279 j
MW-10BR	North of 1956 WB, outside CB	1956 Basin	Downgradient	Bedrock	Bedrock	08/28/2018	7.9	118	22	**380**	**770**	<1	1.7	108	<1	<1	<1	<1	90	<1	**502**	<1	<1	<0.2	0.238 j	<5	0.00138	0.2775 j
MW-10BR	North of 1956 WB, outside CB	1956 Basin	Downgradient	Bedrock	Bedrock	12/04/2018	7.9	103	22	**410**	**790**	<1	1.58	96	<1	<1	<1	<1	116	<1	**598**	0.347 j	<1	<0.2	<0.3	1.724 j	0.00191	<0.5
MW-10BR	North of 1956 WB, outside CB	1956 Basin	Downgradient	Bedrock	Bedrock	02/06/2019	7.7	105	21	**370**	**730**	<1	1.92	98	<1	NA	<1	<1	85	NA	**525**	<1	<1	<0.2	<0.3	<5	NA	NA
MW-10BRL	North of 1956 WB, outside CB	1956 Basin	Downgradient	Bedrock	Bedrock	06/12/2018	8.1	123	5	47	180	<1	4.14	66	<1	<1	<1	<1	101	<1	43	<1	<1	<0.2	**0.315**	<5	NA	1.5
MW-10BRL	North of 1956 WB, outside CB	1956 Basin	Downgradient	Bedrock	Bedrock	08/28/2018	8.2	133	5.1	41	220	<1	3.37	69	<1	<1	<1	<1	116	<1	46	<1	<1	<0.2	**0.367**	5	NA	1.4
MW-10BRL	North of 1956 WB, outside CB	1956 Basin	Downgradient	Bedrock	Bedrock	12/04/2018	**9.6**	121	4.9	41	220	<1	1.89	43	<1	<1	0.54 j	<1	69	<1	15	<1	<1	<0.2	**1.77**	4.939 j,B2	NA	1.8
MW-10BRL	North of 1956 WB, outside CB	1956 Basin	Downgradient	Bedrock	Bedrock	02/07/2019	**9.0**	124	4.9	38	200	<1	1.57	50	<1	NA	0.539 j	<1	12	NA	5	<1	<1	<0.2	**1.13**	<5	NA	NA
MW-10D	North of 1956 WB, outside CB	1956 Basin	Downgradient	Bedrock	Bedrock	06/12/2018	**6.2**	546	33	**790**	**1300**	<1	0.924 j	28	<1	<1	<1	0.446 j	**346**	<1	**1560**	3.24	<1	<0.2	**0.424**	<5	NA	<2
MW-10D	North of 1956 WB, outside CB	1956 Basin	Downgradient	Bedrock	Bedrock	08/28/2018	**6.3**	537	34	**790**	**1400**	<1	1.11	28	<1	<1	<1	0.511 j	**542**	<1	**1670**	2.41	<1	<0.2	**0.344**	5	NA	<1
MW-10D	North of 1956 WB, outside CB	1956 Basin	Downgradient	Bedrock	Bedrock	12/04/2018	6.6	470	34	**970**	**1300**	<1	0.659 j	27	<1	<1	<1	0.455 j	208	<1	**1650**	2.47	<1	<0.2	0.245 j	4.886 j,B2	NA	<1
MW-10D	North of 1956 WB, outside CB	1956 Basin	Downgradient	Bedrock	Bedrock	02/06/2019	**6.2**	444	30	**710**	**1300**	<1	0.6 j	27	<1	NA	<1	0.414 j	277	NA	**1600**	2.12	<1	<0.2	0.269 j	<5	NA	NA
MW-11	North of 1985 WB, outside CB	1985 Basin	Downgradient	Surficial Upper	Surficial	06/13/2018	**6.4**	22.036 j	29	150	**550**	<1	0.966 j	77	<1	<1	<1	**1.19**	**5410**	<1	**1900**	2.29	0.445 j	0.113 j	**1.51**	<5	0.000126 j	0.52
MW-11	North of 1985 WB, outside CB	1985 Basin	Downgradient	Surficial Upper	Surficial	08/23/2018	**6.2**	31.098 j	20	180	500	<1	0.46 j	56	<1	<1	<1	0.67 j	**2260**	<1	**795**	3.23	<1	0.112 j	**0.622**	1.673 j	<0.0002	0.4115 j
MW-11	North of 1985 WB, outside CB	1985 Basin	Downgradient	Surficial Upper	Surficial	12/05/2018	**6.2**	27.689 j	24	170	480	<1	1.24	72	<1	<1	<1	0.764 j	**5850**	<1	**1330**	2.75	<1	<0.2	**0.792**	2.096 j	0.0000949 j	0.386 j
MW-11	North of 1985 WB, outside CB	1985 Basin	Downgradient	Surficial Upper	Surficial	02/05/2019	**6.0**	25.746 j	18	190	470	<1	0.379 j	57	<1	NA	<1	0.452 j	**1400**	NA	**668**	3.29	<1	<0.2	**0.44**	<5	NA	NA
MW-12	Southwest of 1985 WB, outside CB	1985 Basin	Downgradient	Surficial Upper	Surficial	06/12/2018	6.7	**760**	47	220	**570**	<1	<1	51	<1	<1	<1	**1.1**	77	<1	**666**	1.47	<1	<0.2	**0.603**	<5	0.000471	0.55
MW-12	Southwest of 1985 WB, outside CB	1985 Basin	Downgradient	Surficial Upper	Surficial	08/23/2018	6.6	413	55	230	**690**	<1	<1	48	<1	<1	<1	0.948 j	53	<1	**524**	0.878 j	<1	<0.2	**0.624**	1.701 j	0.000669	0.58
MW-12	Southwest of 1985 WB, outside CB	1985 Basin	Downgradient	Surficial Upper	Surficial	12/06/2018	6.9	641	52	250	**580**	<1	<1	50	<1	<1	<1	0.72 j	48	<1	**481**	0.906 j	<1	<0.2	**0.954**	2.435 j,B2	0.000356	0.405 j
MW-12	Southwest of 1985 WB, outside CB	1985 Basin	Downgradient	Surficial Upper	Surficial	02/04/2019	6.8	166	66	230	**690**	<1	<1	57	<1	NA	<1	0.957 j	42	NA	**560**	1.03	<1	<0.2	**1.06**	<5	NA	NA
MW-12BR	Southwest of 1985 WB, outside CB	1985 Basin	Downgradient	Bedrock	Bedrock	06/12/2018	7.3	<50	63	37	350	<1	1.24	**779**	<1	<1	0.375 j	<1	184	<1	**731**	<1	<1	<0.2	0.293 j	<5	NA	0.0977 j
MW-12BR	Southwest of 1985 WB, outside CB	1985 Basin	Downgradient	Bedrock	Bedrock	08/23/2018	7.2	17.996 j	63	37	360	<1	1.08	**786**	<1	<1	<1	<1	66	<1	**735**	<1	<1	<0.2	0.202 j	<5	NA	0.1
MW-12BR	Southwest of 1985 WB, outside CB	1985 Basin	Downgradient	Bedrock	Bedrock	12/06/2018	7.5	<50	61	38	340	<1	1.1	**774**	<1	<1	<1	<1	109	<1	**736**	<1	<1	<0.2	0.238 j	2.307 j,B2	NA	0.065 j
MW-12BR	Southwest of 1985 WB, outside CB	1985 Basin	Downgradient	Bedrock	Bedrock	02/04/2019	7.5	<50	61	37	350	<1	1.19	**800**	<1	NA	0.374 j	<1	16	NA	**743**	<1	<1	<0.2	0.18 j	<5	NA	NA
MW-13	South of 1970 WB, outside CB	1970 Basin	Downgradient	Surficial Upper	Surficial	06/13/2018	**5.6**	211	25	78	220	<1	<1	91	<1	<1	<1	0.878 j	39	<1	**615**	4.09	<1	<0.2	**0.943**	4.651 j	NA	0.0992 j

		PARAM	D 40CFR257 APPENDIX III CONSTITUENT				INORGANIC PARAMETERS (TOTAL CONCENTRATION)															ADIONUCLID	R PARAME
CAPE FEAR	Reporting Units	S.U.	ug/L	mg/L	mg/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/mL	mg/L
07/16/2019	15A NCAC 02L Standard	6.5-8.5	700	250	250	500	1*	10	700	4*	2	10	1*	300	15	50	100	20	0.2*	0.3*	1000	0.03^	2
BRANDON RUSSO	Provisional Background (Surficial Aquifer)	5.8-6.4	177	250	510	1200	1	3	183	1	1	1	89	37500	1	9170	48	1	0.2	1.268	62	0.0167	NE
EVAN YURKOVICH	Provisional Background (Bedrock Unit)	5.5-8.2	50	220	96	675	1	6	471	1	1	1	1.15	750	1	901	2	1.98	0.2	2.37	5	0.00196	NE

							PARAM	D 40CFR257 APPENDIX III CONSTITUENT				INORGANIC PARAMETERS (TOTAL CONCENTRATION)															ADIONUCLID	R PARAME
Sample ID	**Location Description**	**Associated Unit**	**Location With Respect to Groundwater Flow Direction**	**Well Screen Location**	**Sample Location Aquifer Name**	**Sample Collection Date**	**pH**	**Boron**	**Chloride**	**Sulfate**	**Total Dissolved Solids**	**Antimony**	**Arsenic**	**Barium**	**Beryllium**	**Cadmium**	**Chromium**	**Cobalt**	**Iron**	**Lead**	**Manganese**	**Nickel**	**Selenium**	**Thallium**	**Vanadium**	**Zinc**	**Total Uranium**	**Fluoride**
MW-13	South of 1970 WB, outside CB	1970 Basin	Downgradient	Surficial Upper	Surficial	08/28/2018	**5.8**	281	28	90	270	<1	<1	97	<1	<1	<1	**1.71**	95	<1	**757**	3.39	<1	<0.2	**0.586**	5	NA	0.1182 j
MW-13	South of 1970 WB, outside CB	1970 Basin	Downgradient	Surficial Upper	Surficial	12/05/2018	**5.4**	<50	12	32	120	<1	<1	55	<1	<1	0.53 j	<1	186	<1	**180**	2.97	<1	<0.2	**0.827**	5	NA	<0.2
MW-15BR	Northeast of 1956 WB, outside CB	Background	Background	Bedrock	Bedrock	06/13/2018	7.3	28.977 j	13	38	220	<1	4.46	294	<1	<1	0.351 j	<1	44	<1	20	<1	1.4	0.147 j	**2.37**	<5	0.00079	0.12
MW-15BR	Northeast of 1956 WB, outside CB	Background	Background	Bedrock	Bedrock	08/22/2018	7.7	42.5 j	13	36	260	<1	4.46	330	<1	<1	<1	<1	70	<1	39	<1	2.2	0.178 j	**2.5**	3.7 j	0.000809	0.11
MW-15BR	Northeast of 1956 WB, outside CB	Background	Background	Bedrock	Bedrock	12/05/2018	7.8	26.38 j	13	31	240	<1	4.8	341	<1	<1	<1	<1	6.159 j	<1	**64**	<1	2.18	<0.2	**2.77**	3.536 j	0.000831	<0.1
MW-15BR	Northeast of 1956 WB, outside CB	Background	Background	Bedrock	Bedrock	02/05/2019	7.9	30.514 j	13	34	230	<1	4.59	350	<1	NA	<1	<1	3.382 j,S1	NA	**51 S1**	<1	2.03	<0.2	**2.75**	<5	NA	NA
MW-15SL	Northeast of 1956 WB, outside CB	Background	Background	Surficial Lower	Surficial	06/13/2018	**6.0**	<50	5.7	58	160	<1	3.22	87	<1	<1	<1	**23.6**	**46400**	<1	**2680**	1.68	<1	<0.2	**0.523**	<5	<0.0002	<0.1
MW-15SL	Northeast of 1956 WB, outside CB	Background	Background	Surficial Lower	Surficial	08/22/2018	**5.9**	<50	5.7	54	170	<1	4.49	84	<1	<1	<1	**19.9**	**47100**	<1	**2350**	1.76	<1	<0.2	**0.554**	4 j	<0.0002	<0.1
MW-15SL	Northeast of 1956 WB, outside CB	Background	Background	Surficial Lower	Surficial	12/05/2018	**6.0**	<50	5.6	43	140	<1	2.6	61	<1	<1	<1	**18**	**29800**	<1	**1870**	1.4	<1	<0.2	0.264 j	1.719 j	<0.0002	<0.1
MW-15SL	Northeast of 1956 WB, outside CB	Background	Background	Surficial Lower	Surficial	02/06/2019	**6.1**	<50	5.3	56	130	<1	1.93	66	<1	NA	0.419 j	**19.1**	**32000**	NA	**2180**	1.77	<1	<0.2	0.28 j	<5	NA	NA
MW-15SU	Northeast of 1956 WB, outside CB	Background	Background	Surficial Upper	Surficial	06/13/2018	**6.3**	76	3.1	230	**510**	<1	0.338 j	22	<1	<1	0.381 j	**6.43**	233	<1	**1830**	12.5	0.477 j	<0.2	**0.802**	18	0.0102	0.584 j
MW-15SU	Northeast of 1956 WB, outside CB	Background	Background	Surficial Upper	Surficial	08/22/2018	**6.1**	116	3.1	210	**600**	<1	<1	32	<1	<1	<1	**1.54**	50	<1	**514**	3.5	0.975 j	<0.2	**0.525**	6	0.0162	0.559 j
MW-15SU	Northeast of 1956 WB, outside CB	Background	Background	Surficial Upper	Surficial	12/05/2018	**6.3**	68	2.5	240	**570**	<1	<1	34	<1	<1	<1	**1.27**	21	<1	**795**	4.45	0.617 j	<0.2	**0.341**	4.874 j	0.016	<0.5
MW-15SU	Northeast of 1956 WB, outside CB	Background	Background	Surficial Upper	Surficial	02/06/2019	**6.3**	48.101 j	2.6	200	430	<1	<1	32	<1	NA	0.755 j	**5.42**	223	NA	**2080**	6.48	0.379 j	<0.2	**0.557**	9	NA	NA
MW-16BR	Northeast of 1985 WB, outside CB	Background	Background	Bedrock	Bedrock	06/13/2018	7.5	40.573 j	39	83	380	<1	0.611 j	428	<1	<1	<1	<1	**343**	<1	**280**	<1	<1	<0.2	<0.3	<5	0.000195 j	0.1944 j
MW-16BR	Northeast of 1985 WB, outside CB	Background	Background	Bedrock	Bedrock	08/29/2018	7.7	45.893 j	41	92	400	<1	0.51 j	387	<1	<1	<1	<1	**303**	<1	**289**	<1	<1	<0.2	0.114 j	2.546 j	0.00018 j	0.2
MW-16BR	Northeast of 1985 WB, outside CB	Background	Background	Bedrock	Bedrock	12/04/2018	7.8	43.236 j	36	47	310	<1	**11.9**	320	<1	<1	0.454 j	<1	208	<1	**151**	0.461 j	<1	<0.2	**1.35**	2.372 j	0.000995	0.082 j
MW-16BR	Northeast of 1985 WB, outside CB	Background	Background	Bedrock	Bedrock	02/05/2019	7.5	44.073 j	37	51	340	<1	8.3	398	<1	NA	<1	<1	198 S1	NA	**229 S1**	0.458 j	<1	<0.2	0.14 j	<5	NA	NA
MW-16S	Northeast of 1985 WB, outside CB	Background	Background	Surficial Lower	Surficial	06/13/2018	**6.3**	62	240	22	**620**	<1	<1	172	<1	<1	<1	0.621 j	132	<1	28	1.89	<1	<0.2	**1.18**	2.605 j	0.000546	0.244 j
MW-16S	Northeast of 1985 WB, outside CB	Background	Background	Surficial Lower	Surficial	08/29/2018	**6.3**	49.658 j	230	15	**580**	<1	<1	170	<1	<1	<1	0.995 j	164	<1	25	1.8	<1	<0.2	**1.42**	2.411 j	0.000429	0.2595 j
MW-16S	Northeast of 1985 WB, outside CB	Background	Background	Surficial Lower	Surficial	12/04/2018	**6.3**	73	**270**	21	**600**	<1	<1	176	<1	<1	<1	**2.04**	**435**	<1	**113**	2.92	<1	<0.2	**0.687**	3.42 j	0.000376	<0.5
MW-16S	Northeast of 1985 WB, outside CB	Background	Background	Surficial Lower	Surficial	02/05/2019	**6.2**	94	250	24	**620**	<1	<1	187	<1	NA	<1	**1.83**	184 S1	NA	**79 S1**	2.78	<1	<0.2	**0.601**	<5	NA	NA
MW-17BR	Northwest of 1985 WB, in CB	1985 Basin	Downgradient	Bedrock	Bedrock	06/12/2018	7.7	38.888 j	28	34	290	<1	0.347 j	624	<1	<1	<1	<1	204	<1	**79**	<1	<1	<0.2	0.19 j	<5	NA	0.22
MW-17BR	Northwest of 1985 WB, in CB	1985 Basin	Downgradient	Bedrock	Bedrock	08/22/2018	7.5	37.6 j	28	19	300	<1	<1	599	<1	<1	<1	<1	122	<1	**67**	<1	<1	<0.2	<0.3	<5	NA	0.2
MW-17BR	Northwest of 1985 WB, in CB	1985 Basin	Downgradient	Bedrock	Bedrock	12/05/2018	7.6	40.777 j	27	23	270	<1	<1	592	<1	<1	<1	<1	181	<1	**62**	0.355 j	<1	0.105 j	0.198 j	2.611 j	NA	0.2
MW-17BR	Northwest of 1985 WB, in CB	1985 Basin	Downgradient	Bedrock	Bedrock	02/04/2019	7.8	47.639 j	24	17	240	<1	<1	571	<1	NA	<1	<1	113	NA	**51**	<1	<1	<0.2	0.123 j	<5	NA	NA
MW-17SL	Northwest of 1985 WB, in CB	1985 Basin	Downgradient	Surficial Lower	Surficial	06/12/2018	**5.6**	<50	16	**420**	**710**	<1	<1	51	<1	<1	<1	<1	**101000**	<1	**7860**	<1	<1	<0.2	**0.35**	<5	0.0000735 j	<0.5
MW-17SL	Northwest of 1985 WB, in CB	1985 Basin	Downgradient	Surficial Lower	Surficial	08/22/2018	**5.4**	<50	19	**320**	**630**	<1	<1	46	<1	<1	<1	1	**76300**	<1	**6950**	<1	<1	<0.2	0.149 j	2.1 j	<0.0002	<0.5
MW-17SL	Northwest of 1985 WB, in CB	1985 Basin	Downgradient	Surficial Lower	Surficial	12/05/2018	**5.5**	<50	18	**390**	**610**	<1	<1	57	<1	<1	0.341 j	0.358 j	**87200**	<1	**7160**	<1	<1	<0.2	**0.328**	2.644 j	<0.0002	<0.5
MW-17SL	Northwest of 1985 WB, in CB	1985 Basin	Downgradient	Surficial Lower	Surficial	02/04/2019	**5.7**	<50	17	**390**	**690**	<1	<1	61	<1	NA	0.442 j	<1	**95700**	NA	**7080**	<1	<1	<0.2	0.259 j	<5	NA	NA
MW-17SU	Northwest of 1985 WB, in CB	1985 Basin	Downgradient	Surficial Upper	Surficial	06/12/2018	**4.8**	<50	35	**690**	**910**	<1	0.638 j	19	0.955 j	<1	<1	**270**	**4610**	<1	**46900 M4**	58.4	<1	0.162 j	**0.846**	177	<0.0002	<1
MW-17SU	Northwest of 1985 WB, in CB	1985 Basin	Downgradient	Surficial Upper	Surficial	08/22/2018	**4.4**	<50	36	**740**	**940**	<1	0.647 j	18	1.39	0.54 j	<1	**255**	**2070**	<1	**45400**	61.4	<1	0.146 j	**0.962**	197	<0.0002	<1
MW-17SU	Northwest of 1985 WB, in CB	1985 Basin	Downgradient	Surficial Upper	Surficial	12/05/2018	**4.9**	<50	28	**470**	**750**	<1	0.357 j	21	0.674 j	0.428 j	<1	**187**	**5670**	<1	**37400**	43.2	<1	0.083 j	**0.814**	123	<0.0002	<1
MW-17SU	Northwest of 1985 WB, in CB	1985 Basin	Downgradient	Surficial Upper	Surficial	02/04/2019	**5.0**	<50	28	**470**	**650**	<1	<1	19	0.526 j	NA	<1	**128**	**6590**	NA	**30900**	29.1	<1	<0.2	**0.421**	74	NA	NA
MW-18S	South of 1985 WB, outside CB	1985 Basin	Downgradient	Surficial Upper	Surficial	06/12/2018	**5.6**	485	86	220	**520**	<1	0.552 j	28	<1	<1	<1	**3.66**	**1520**	<1	**1550**	5.17	<1	<0.2	**1.42**	14	<0.0002	0.214 j
MW-18S	South of 1985 WB, outside CB	1985 Basin	Downgradient	Surficial Upper	Surficial	08/23/2018	**5.7**	554	67	210	**510**	<1	0.446 j	32	<1	<1	0.35 j	**2.04**	**640**	<1	**1470**	3.48	<1	0.095 j	**1.37**	10	<0.0002	0.193 j
MW-18S	South of 1985 WB, outside CB	1985 Basin	Downgradient	Surficial Upper	Surficial	12/06/2018	**6.1**	260	43	160	390	<1	0.759 j	40	<1	<1	0.881 j	**10.1**	**5360**	0.406 j	**6060**	5.17	<1	<0.2	**4.01**	2.635 j,B2	<0.0002	<0.5
MW-19S	South of 1978 WB, in CB	1978 Basin	Downgradient	Surficial Upper	Surficial	12/17/2018	**5.0**	<50	13	1.8	41	<1	<1	31	<1	<1	0.462 j	0.482 j	185	<1	17	0.591 j	<1	<0.2	**0.508**	2.461 j	NA	<0.1
MW-20BR	South of 1970 WB, outside CB	1970 Basin	Sidegradient	Bedrock	Bedrock	06/13/2018	7.9	28.476 j	10	15	180	<1	0.827 j	138	<1	<1	<1	<1	106	<1	**123**	<1	<1	<0.2	**0.326**	<5	NA	0.21
MW-20BR	South of 1970 WB, outside CB	1970 Basin	Sidegradient	Bedrock	Bedrock	08/28/2018	7.5	36.083 j	10	14	200	<1	0.759 j	143	<1	<1	0.723 j	<1	169	<1	**130**	<1	<1	<0.2	0.242 j	2.02 j	NA	0.21
MW-20BR	South of 1970 WB, outside CB	1970 Basin	Sidegradient	Bedrock	Bedrock	12/05/2018	8.0	32.433 j	10	12	190	<1	0.835 j	136	<1	<1	<1	<1	107	<1	**117**	<1	<1	<0.2	<0.3	4.126 j	NA	0.16
MW-20S	South of 1970 WB, outside CB	1970 Basin	Sidegradient	Surficial Lower	Surficial	06/13/2018	**6.3**	17.855 j	36	85	340	<1	<1	191	<1	<1	0.368 j	<1	**6710**	<1	**1360**	<1	<1	<0.2	**1.06**	<5	NA	0.17
MW-20S	South of 1970 WB, outside CB	1970 Basin	Sidegradient	Surficial Lower	Surficial	08/28/2018	**6.2**	28.733 j	35	86	390	<1	<1	187	<1	<1	<1	<1	**5890**	<1	**1340**	<1	<1	<0.2	**0.644**	2.119 j	NA	0.23
MW-20S	South of 1970 WB, outside CB	1970 Basin	Sidegradient	Surficial Lower	Surficial	12/05/2018	**6.3**	<50	37	85	350	<1	<1	188	<1	<1	<1	0.359 j	**5100**	<1	**1380**	0.397 j	<1	<0.2	**0.737**	3.018 j	NA	<0.2
MW-21BR	West of 1963 WB, in CB	1963 Basin	Downgradient	Bedrock	Bedrock	06/13/2018	8.5	152	46	9.2	180	<1	2.05	116	<1	<1	<1	<1	33	<1	<5	<1	<1	<0.2	**0.868**	<5	NA	**9.1**
MW-21BR	West of 1963 WB, in CB	1963 Basin	Downgradient	Bedrock	Bedrock	08/27/2018	**8.6**	151	48	9.9	190	<1	2.86	110	<1	<1	<1	<1	16	<1	6	<1	<1	<0.2	0.279 j	1.947 j	NA	**9**
MW-21BR	West of 1963 WB, in CB	1963 Basin	Downgradient	Bedrock	Bedrock	12/05/2018	**8.9**	147	52	8.5	190	<1	2.88	116	<1	<1	<1	<1	19	<1	7	<1	<1	<0.2	0.266 j	1.973 j	NA	**9.6**
MW-21BR	West of 1963 WB, in CB	1963 Basin	Downgradient	Bedrock	Bedrock	02/04/2019	**8.7**	151	47	10	200	<1	1.89	119	<1	NA	<1	<1	<10	NA	4.512 j	<1	<1	<0.2	**0.391**	<5	NA	NA
MW-21SL	West of 1963 WB, in CB	1963 Basin	Downgradient	Surficial Lower	Surficial	06/13/2018	**5.5**	53	21	**840**	**1200**	<1	<1	18	<1	<1	<1	**12.8**	238	<1	**1740**	8.55	<1	<0.2	**0.398**	10	<0.0002	<2
MW-21SL	West of 1963 WB, in CB	1963 Basin	Downgradient	Surficial Lower	Surficial	08/27/2018	**5.7**	68	20	**780**	**1200**	<1	<1	19	<1	<1	<1	**11.8**	131	<1	**1820**	8.12	<1	<0.2	**0.417**	13	<0.0002	<2
MW-21SL	West of 1963 WB, in CB	1963 Basin	Downgradient	Surficial Lower	Surficial	12/06/2018	**5.7**	66	22	**870**	**1300**	<1	<1	16	<1	<1	<1	**12.7**	166 B2	<1	**1940**	8.64	<1	0.116 j	**0.352**	31 B	<0.0002	<1
MW-21SL	West of 1963 WB, in CB	1963 Basin	Downgradient	Surficial Lower	Surficial	02/04/2019	**5.6**	45.603 j	21	**790**	**1200**	<1	<1	17	<1	NA	<1	**12.4**	140	NA	**1910**	8.11	<1	<0.2	0.27 j	11	NA	NA
MW-21SU	West of 1963 WB, in CB	1963 Basin	Downgradient	Surficial Upper	Surficial	06/13/2018	**3.8**	39.4 j	4.5	250	340	<1	2.99	21	**10.1**	0.692 j	0.581 j	**150**	40	0.955 j	**7330**	48.7	0.828 j	<0.2	0.217 j	175	0.000544	0.56
MW-21SU	West of 1963 WB, in CB	1963 Basin	Downgradient	Surficial Upper	Surficial	08/27/2018	**3.8**	55	4.8	**300**	340	<1	2.01	24	**10.3**	0.645 j	0.537 j	**139**	35	0.86 j	**7220**	45.7	0.519 j	<0.2	0.27 j	174	0.000574	0.56
MW-21SU	West of 1963 WB, in CB	1963 Basin	Downgradient	Surficial Upper	Surficial	12/05/2018	**3.9**	52	4.3	**280**	320	<1	1.76	25	**9.14**	0.66 j	0.577 j	**134**	54	0.657 j	**7420**	43.1	0.588 j	<0.2	**0.374**	172	0.000514	0.452 j
MW-21SU	West of 1963 WB, in CB	1963 Basin	Downgradient	Surficial Upper	Surficial	02/04/2019	**4.0**	37.229 j	3.9	**290**	320	<1	1.68	21	**8.61**	NA	0.373 j	**138**	16	NA	**7390**	43.7	0.544 j	<0.2	<0.3	167	NA	NA
MW-22BR	North of 1985 WB, outside CB	1985 Basin	Downgradient	Bedrock	Bedrock	06/12/2018	7.6	44.19 j	26	25	310	<1	0.956 j	**938**	<1	<1	<1	<1	**509**	<1	**238**	<1	<1	0.177 j	0.208 j	<5	NA	0.31
MW-22BR	North of 1985 WB, outside CB	1985 Basin	Downgradient	Bedrock	Bedrock	08/22/2018	7.4	59	18	34	380	<1	0.637 j	**1190**	<1	<1	<1	<1	**612**	<1	**256**	<1	<1	<0.2	<0.3	3.1 j	NA	0.28
MW-22BR	North of 1985 WB, outside CB	1985 Basin	Downgradient	Bedrock	Bedrock	12/05/2018	7.5	46.255 j	18	41	350	<1	1.3	**1220**	<1	<1	<1	<1	**794**	<1	**285**	<1	<1	<0.2	**0.481**	2.353 j	NA	0.26
MW-22BR	North of 1985 WB, outside CB	1985 Basin	Downgradient	Bedrock	Bedrock	02/06/2019	7.5	42.54 j	17	42	340	<1	0.988 j	**1250**	<1	NA	<1	<1	**702**	NA	**285**	<1	<1	<0.2	0.22 j	<5	NA	NA
MW-22S	North of 1985 WB, outside CB	1985 Basin	Downgradient	Surficial Lower	Surficial	06/12/2018	**6.3**	359	21	170	**620**	<1	0.473 j	103	<1	<1	<1	**1.18**	**72400**	<1	**3810**	0.407 j	<1	<0.2	**0.494**	<5	NA	0.136 j
MW-22S	North of 1985 WB, outside CB	1985 Basin	Downgradient	Surficial Lower	Surficial	08/22/2018	**6.0**	328	22	**380**	**680**	0.339 j	0.468 j	100	<1	<1	<1	0.93 j	**90600**	<1	**3760**	0.408 j	<1	<0.2	**0.422**	2.7 j	NA	0.1206 j
MW-22S	North of 1985 WB, outside CB	1985 Basin	Downgradient	Surficial Lower	Surficial	12/05/2018	**6.1**	262	23	**440**	**680**	<1	1.99	183	<1	<1	0.351 j	**3.06**	**97200**	<1	**4360**	0.672 j	<1	<0.2	**1.1**	4.114 j	NA	<1
MW-22S	North of 1985 WB, outside CB	1985 Basin	Downgradient	Surficial Lower	Surficial	02/06/2019	**6.3**	320	20	**260**	**530**	<1	2.1	149	<1	NA	0.53 j	**1.33**	**59900**	NA	**3140**	0.742 j	<1	<0.2	**1.13**	<5	NA	NA
MW-23BR	East of 1985 WB, in CB	1985 Basin	Downgradient	Bedrock	Bedrock	06/14/2018	7.5	21.756 j	92	49	340	<1	3.71	247	<1	<1	0.435 j	<1	35	<1	**105**	<1	<1	0.153 j	**2.65**	2.551 j	NA	0.24
MW-23BR	East of 1985 WB, in CB	1985 Basin	Downgradient	Bedrock	Bedrock	08/22/2018	7.6	24.8 j	100	45	440	<1	1.89	370	<1	<1	<1	<1	118	<1	**188**	<1	<1	<0.2	**0.479**	<5	NA	0.151 j
MW-23BR	East of 1985 WB, in CB	1985 Basin	Downgradient	Bedrock	Bedrock	12/05/2018	7.6	20.301 j	100	42	400	<1	1.72	385	<1	<1	<1	<1	134	<1	**177**	<1	<1	<0.2	0.163 j	<5	NA	0.0966 j
MW-23BR	East of 1985 WB, in CB	1985 Basin	Downgradient	Bedrock	Bedrock	02/06/2019	7.6	21.599 j	99	41	380	<1	1.72	398	<1	NA	<1	<1	157	NA	**185**	<1	<1	0.199 j	<0.3	<5	NA	NA
MW-23D	East of 1985 WB, in CB	1985 Basin	Downgradient	Bedrock	Bedrock	06/14/2018	7.5	<50	100	45	410	<1	2.49	246	<1	<1	<1	<1	298	<1	**156**	<1	<1	<0.2	**1.89**	4.376 j	0.00262	0.1514 j
MW-23D	East of 1985 WB, in CB	1985 Basin	Downgradient	Bedrock	Bedrock	08/22/2018	7.6	24.5 j	100	43	430	<1	2.49	259	<1	<1	<1	<1	**400**	<1	**146**	<1	<1	0.124 j	**0.845**	<5	0.00326	0.127 j
MW-23D	East of 1985 WB, in CB	1985 Basin	Downgradient	Bedrock	Bedrock	12/05/2018	7.5	17.007 j	100	41	390	<1	2.53	234	<1	<1	<1	<1	284	<1	**137**	<1	<1	<0.2	**0.599**	1.683 j	0.00301	0.0822 j
MW-23D	East of 1985 WB, in CB	1985 Basin	Downgradient	Bedrock	Bedrock	02/06/2019	7.6	17.182 j	99	40	360	<1	2.85	232	<1	NA	<1	<1	**312**	NA	**122**	<1	<1	<0.2	**0.421**	<5	NA	NA
MW-23S	East of 1985 WB, in CB	1985 Basin	Downgradient	Surficial Lower	Surficial	06/14/2018	6.5	**3420**	21	170	340	<1	<1	48	<1	<1	<1	**3.15**	**463**	<1	**549**	3.21	<1	<0.2	**0.356**	<5	<0.0002	0.1536 j
MW-23S	East of 1985 WB, in CB	1985 Basin	Downgradient	Surficial Lower	Surficial	08/22/2018	**6.4**	**3530**	20	160	380	<1	0.36 j	47	<1	<1	<1	**4.46**	**550**	<1	**1020**	4.38	<1	<0.2	0.273 j	2.1 j	<0.0002	0.228 j
MW-23S	East of 1985 WB, in CB	1985 Basin	Downgradient	Surficial Lower	Surficial	12/05/2018	6.5	**3360**	21	160	340	<1	0.387 j	50	<1	<1	<1	**7.28**	**436**	<1	**1490**	4	<1	<0.2	**0.385**	2.757 j	<0.0002	0.105 j
MW-23S	East of 1985 WB, in CB	1985 Basin	Downgradient	Surficial Lower	Surficial	02/06/2019	**6.4**	**3460**	20	160	330	<1	<1	44	<1	NA	<1	**3.2**	186	NA	**558**	3.41	<1	<0.2	**0.444**	<5	NA	NA
MW-24BR	East of 1985 WB, outside CB	1985 Basin	Downgradient	Bedrock	Bedrock	06/14/2018	6.6	**1410**	67	140	430	<1	0.935 j	81	<1	<1	<1	<1	143	<1	**929**	0.529 j	<1	<0.2	**0.349**	<5	0.000128 j	0.24
MW-24BR	East of 1985 WB, outside CB	1985 Basin	Downgradient	Bedrock	Bedrock	08/22/2018	6.6	**1350**	77	130	480	<1	0.418 j	76	<1	<1	<1	<1	93	<1	**897**	0.713 j	<1	<0.2	0.163 j	2.1 j	0.000177 j	0.307 j

CAPE FEAR
07/16/2019
BRANDON RUSSO
EVAN YURKOVICH

	PARAM	D 40CFR257 APPENDIX III CONSTITUENT				INORGANIC PARAMETERS (TOTAL CONCENTRATION)															ADIONUCLID	R PARAME
Reporting Units	S.U.	ug/L	mg/L	mg/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/mL	mg/L
15A NCAC 02L Standard	6.5-8.5	700	250	250	500	1*	10	700	4*	2	10	1*	300	15	50	100	20	0.2*	0.3*	1000	0.03^	2
Provisional Background (Surficial Aquifer)	5.8-6.4	177	250	510	1200	1	3	183	1	1	1	89	37500	1	9170	48	1	0.2	1.268	62	0.0167	NE
Provisional Background (Bedrock Unit)	5.5-8.2	50	220	96	675	1	6	471	1	1	1	1.15	750	1	901	2	1.98	0.2	2.37	5	0.00196	NE

							PARAM	D 40CFR257 APPENDIX III CONSTITUENT				INORGANIC PARAMETERS (TOTAL CONCENTRATION)															ADIONUCLID	R PARAME
Sample ID	**Location Description**	**Associated Unit**	**Location With Respect to Groundwater Flow Direction**	**Well Screen Location**	**Sample Location Aquifer Name**	**Sample Collection Date**	**pH**	**Boron**	**Chloride**	**Sulfate**	**Total Dissolved Solids**	**Antimony**	**Arsenic**	**Barium**	**Beryllium**	**Cadmium**	**Chromium**	**Cobalt**	**Iron**	**Lead**	**Manganese**	**Nickel**	**Selenium**	**Thallium**	**Vanadium**	**Zinc**	**Total Uranium**	**Fluoride**
MW-24BR	East of 1985 WB, outside CB	1985 Basin	Downgradient	Bedrock	Bedrock	12/06/2018	6.8	**1110**	77	130	410	<1	1.24	86	<1	<1	<1	<1	50 B2	<1	**1140**	0.512 j	<1	<0.2	**0.331**	<5	0.000173 j	0.05 j
MW-24BR	East of 1985 WB, outside CB	1985 Basin	Downgradient	Bedrock	Bedrock	02/06/2019	6.7	**1050**	79	110	400	<1	1.31	86	<1	NA	<1	<1	46	NA	**1190**	0.513 j	<1	<0.2	**0.39**	<5	NA	NA
MW-24S	East of 1985 WB, outside CB	1985 Basin	Downgradient	Surficial Lower	Surficial	06/14/2018	**6.4**	**3500**	20	170	370	<1	0.371 j	68	<1	<1	<1	**8.31**	**334**	<1	**986**	5.52	<1	<0.2	**0.418**	<5	<0.0002	0.28
MW-24S	East of 1985 WB, outside CB	1985 Basin	Downgradient	Surficial Lower	Surficial	08/22/2018	**6.4**	**3420**	19	160	380	<1	0.335 j	57	<1	<1	<1	**3.6**	**373**	<1	**598**	4.7	<1	<0.2	0.221 j	5	<0.0002	0.346 j
MW-24S	East of 1985 WB, outside CB	1985 Basin	Downgradient	Surficial Lower	Surficial	12/06/2018	**6.4**	**3420**	20	170	360	<1	<1	61	<1	<1	<1	**1.93**	80 B2	<1	**414**	5.32	<1	<0.2	**1.32**	2.086 j,B	<0.0002	0.115 j
MW-24S	East of 1985 WB, outside CB	1985 Basin	Downgradient	Surficial Lower	Surficial	02/06/2019	**6.3**	**3350**	19	160	360	<1	<1	56	<1	NA	<1	**1.06**	23 S1	NA	**348**	5.49	<1	<0.2	**0.574**	<5	NA	NA
MW-25BR	of 1985 WB, outside CB, East of Bra	1985 Basin	Downgradient	Bedrock	Bedrock	12/17/2018	7.4	17.246 j	27	29	370	<1	0.975 j	148	<1	<1	0.512 j	<1	**361**	<1	**305**	<1	<1	<0.2	**2.53**	<5	0.00312	0.23
MW-25BR	of 1985 WB, outside CB, East of Bra	1985 Basin	Downgradient	Bedrock	Bedrock	02/04/2019	7.3	<50	31	17	400	<1	1.18	163	<1	NA	<1	<1	**560**	NA	**672**	<1	<1	<0.2	**1.1**	<5	NA	NA
MW-25BR	of 1985 WB, outside CB, East of Bra	1985 Basin	Downgradient	Bedrock	Bedrock	05/06/2019	7.3	18.326 j	36	9.8	420	<1	2.43	175	<1	NA	<1	<1	**1180**	NA	**491**	<1	<1	<0.2	**0.668**	<5	NA	NA
MW-25BRL	of 1985 WB, outside CB, East of Bra	1985 Basin	Downgradient	Bedrock	Bedrock	12/17/2018	7.4	19.052 j	120	10	400	<1	0.622 j	583	<1	<1	<1	<1	230	<1	**275**	<1	<1	<0.2	**1.16**	7	0.000776	0.1332 j
MW-25BRL	of 1985 WB, outside CB, East of Bra	1985 Basin	Downgradient	Bedrock	Bedrock	02/04/2019	7.5	<50	110	4.4	400	<1	1.08	589	<1	NA	<1	<1	**368**	NA	**318**	<1	<1	<0.2	**0.358**	<5	NA	NA
MW-25BRL	of 1985 WB, outside CB, East of Bra	1985 Basin	Downgradient	Bedrock	Bedrock	05/06/2019	7.6	20.01 j	120	3.9	410	<1	0.918 j	525	<1	NA	<1	<1	151	NA	**84**	<1	<1	<0.2	0.267 j	<5	NA	NA
PZ-01	Northwest of 1985 WB, in CB	1985 Basin	Downgradient	Surficial Upper	Surficial	06/12/2018	**6.2**	**744**	20	220	**530**	<1	0.338 j	37	<1	<1	<1	**3.76**	**16200**	<1	**3820**	3.79	<1	<0.2	**0.384**	<5	NA	0.1388 j
PZ-01	Northwest of 1985 WB, in CB	1985 Basin	Downgradient	Surficial Upper	Surficial	08/23/2018	**5.9**	472	25	**290**	**690**	<1	0.611 j	46	<1	<1	0.384 j	**13.3**	**20900**	<1	**15200**	5.82	<1	<0.2	**0.458**	4.636 j	NA	0.21 j
PZ-01	Northwest of 1985 WB, in CB	1985 Basin	Downgradient	Surficial Upper	Surficial	12/05/2018	**6.0**	**722**	22	**270**	**550**	<1	<1	62	<1	<1	<1	**2.75**	**14900**	<1	**3900**	3.46	<1	<0.2	**0.665**	6	NA	<0.5
PZ-01	Northwest of 1985 WB, in CB	1985 Basin	Downgradient	Surficial Upper	Surficial	02/04/2019	**6.0**	**748**	20	210	**540**	<1	<1	59	<1	NA	<1	**3.28**	**16400**	NA	**3670**	3.22	<1	<0.2	**0.311**	3.362 j	NA	NA
PZ-02	North of 1985 WB, in CB	1985 Basin	Downgradient	Surficial Upper	Surficial	06/12/2018	**6.4**	**4060**	21	200	420	<1	<1	59	<1	<1	<1	**6.85**	**540**	<1	**2540**	3.68	<1	<0.2	**1.31**	<5	NA	0.16
PZ-02	North of 1985 WB, in CB	1985 Basin	Downgradient	Surficial Upper	Surficial	08/23/2018	**6.4**	428	14	43	280	<1	0.825 j	56	<1	<1	<1	**2.87**	**388**	<1	**360**	1.31	2.08	<0.2	**3.57**	3.437 j	NA	0.2855 j
PZ-02	North of 1985 WB, in CB	1985 Basin	Downgradient	Surficial Upper	Surficial	12/06/2018	**6.4**	**1690**	17	99	280	<1	<1	39	<1	<1	<1	0.692 j	252	<1	**530**	1.52	1.21	<0.2	**2.35**	2.257 j,B2	NA	<0.5
PZ-02	North of 1985 WB, in CB	1985 Basin	Downgradient	Surficial Upper	Surficial	02/05/2019	**6.2**	**3840**	19	200	410	<1	<1	58	<1	NA	<1	**1.36**	32 S1	NA	**2580**	3.54	<1	0.121 j	**2.72**	<5	NA	NA
PZ-03D	East of 1985 WB, in CB	1985 Basin	Downgradient	Bedrock	Bedrock	06/12/2018	7.6	58	59	73	350	<1	4.06	171	<1	<1	0.376 j	<1	217	<1	**278**	0.908 j	<1	<0.2	**1**	<5	NA	0.2
PZ-03D	East of 1985 WB, in CB	1985 Basin	Downgradient	Bedrock	Bedrock	08/23/2018	7.7	62	59	72	370	<1	4.67	184	<1	<1	<1	<1	100	<1	**601**	0.724 j	<1	0.114 j	**0.367**	1.968 j	NA	0.18
PZ-03D	East of 1985 WB, in CB	1985 Basin	Downgradient	Bedrock	Bedrock	12/06/2018	7.5	63	58	72	350	<1	4.74	138	<1	<1	<1	<1	9.489 j,B2	<1	**497**	0.75 j	<1	0.095 j	0.151 j	<5	NA	0.17
PZ-03D	East of 1985 WB, in CB	1985 Basin	Downgradient	Bedrock	Bedrock	02/05/2019	7.5	89	58	70	360	<1	6.1	141	0.365 j	NA	0.482 j	0.95 j	11 S1	NA	**532**	1.53	0.576 j	**0.681**	**0.834**	<5	NA	NA
PZ-03S	East of 1985 WB, in CB	1985 Basin	Downgradient	Surficial Upper	Surficial	06/12/2018	6.9	**1830**	**280**	**380**	**1300**	<1	0.586 j	53	<1	<1	0.339 j	**5.04**	**2480**	<1	**7300**	2.3	<1	<0.2	**5.11**	2.665 j	NA	0.972 j
PZ-03S	East of 1985 WB, in CB	1985 Basin	Downgradient	Surficial Upper	Surficial	08/23/2018	**6.5**	**1720**	120	200	**760**	<1	<1	29	<1	<1	0.778 j	**1.39**	**827**	0.338 j	**1510**	1.83	<1	<0.2	**14.5**	3.614 j	NA	0.861 j
PZ-03S	East of 1985 WB, in CB	1985 Basin	Downgradient	Surficial Upper	Surficial	12/06/2018	7.0	**1850**	230	**290**	**940**	<1	<1	33	<1	<1	0.868 j	**2.35**	272	<1	**3560**	1.41	<1	<0.2	**10.5**	9 B2	NA	0.68 j
PZ-03S	East of 1985 WB, in CB	1985 Basin	Downgradient	Surficial Upper	Surficial	02/05/2019	6.8	**1500**	**270**	**280**	**1100**	<1	<1	42	<1	NA	<1	**2.53**	**564**	NA	**5260**	0.991 j	<1	<0.2	**3.51**	<5	NA	NA
PZ-04	South of 1985 WB, in CB	1985 Basin	Downgradient	Surficial Upper	Surficial	06/12/2018	**5.4**	548	120	**330**	**740**	<1	0.652 j	52	<1	<1	0.971 j	**73.4**	**12800**	<1	**7450**	15.9	<1	<0.2	**4.14**	5	NA	0.1202 j
PZ-04	South of 1985 WB, in CB	1985 Basin	Downgradient	Surficial Upper	Surficial	08/23/2018	**4.9**	333	67	180	480	<1	2.01	48	0.346 j	0.627 j	0.696 j	**50**	**3490**	1.19	**4800**	13.4	<1	<0.2	**7**	74	NA	0.2015 j
PZ-04	South of 1985 WB, in CB	1985 Basin	Downgradient	Surficial Upper	Surficial	12/06/2018	**5.6**	220	34	130	310	<1	1.05	52	<1	<1	4.19	**30.5**	**9470**	0.464 j	**3910**	9.44	<1	<0.2	**4.9**	13 B2	NA	<0.5
PZ-04	South of 1985 WB, in CB	1985 Basin	Downgradient	Surficial Upper	Surficial	02/07/2019	**5.4**	131	27	120	290	<1	0.693 j	42	<1	NA	0.873 j	**38.3**	**15000**	NA	**5230**	8.03	<1	<0.2	**3.7**	3.427 j	NA	NA
PZ-05	West of 1985 WB, in CB	1985 Basin	Downgradient	Surficial Upper	Surficial	06/12/2018	**5.7**	**4440**	26	**260**	440	<1	<1	25	<1	0.535 j	<1	**8.05**	140	<1	**2820**	7.15	<1	<0.2	**0.427**	3.521 j	<0.0002	0.396 j
PZ-05	West of 1985 WB, in CB	1985 Basin	Downgradient	Surficial Upper	Surficial	08/22/2018	**5.7**	**4970**	26	240	450	<1	<1	26	<1	0.403 j	<1	**9.76**	271	<1	**3010**	7.28	<1	0.094 j	**0.37**	7	<0.0002	0.368 j
PZ-05	West of 1985 WB, in CB	1985 Basin	Downgradient	Surficial Upper	Surficial	12/06/2018	**5.7**	**4460**	23	**300**	470	<1	<1	28	<1	0.673 j	<1	**17.5**	151 B2	<1	**3440**	9.58	<1	<0.2	**0.578**	15 B	<0.0002	0.11 j
PZ-05	West of 1985 WB, in CB	1985 Basin	Downgradient	Surficial Upper	Surficial	02/05/2019	**5.6**	**3750**	22	**350**	**590**	<1	0.577 j	20	<1	NA	<1	**28.4**	**12200**	NA	**4580**	12.8	<1	<0.2	0.221 j	20	NA	NA
PZ-06	In 1985 WB	1985 Basin	Source Area	Ash Pore Water	Ash Pore Water	06/13/2018	7.0	**5950**	18	230	**780**	**1.7**	**731**	352	<1	<1	<1	**20.1**	**7590**	<1	**1270**	31.6	<1	**0.313**	**7.22**	<5	NA	1.5
PZ-06	In 1985 WB	1985 Basin	Source Area	Ash Pore Water	Ash Pore Water	08/29/2018	7.4	**5700**	19	230	**800**	**1.68**	**702**	346	<1	<1	0.661 j	**16.5**	**6180**	0.805 j	**1150**	25.6	0.495 j	**0.284**	**8.52**	4.763 j	NA	1.3
PZ-06	In 1985 WB	1985 Basin	Source Area	Ash Pore Water	Ash Pore Water	12/06/2018	7.3	**6000**	19	**260**	**850**	**1.55**	**679**	349	<1	<1	0.411 j	**16.4**	**6340 B2**	<1	**1230**	26.1	<1	**0.215**	**7.11**	2.942 j,B	NA	1.4
PZ-06	In 1985 WB	1985 Basin	Source Area	Ash Pore Water	Ash Pore Water	02/07/2019	7.3	**5650**	18	230	**840**	**1.5**	**670 M4**	350	<1	NA	0.338 j	**16.4**	**6040**	NA	**1230**	26.2	<1	**0.214**	**7.31**	2.477 j	NA	NA
PZ-07	In 1970 WB	1970 Basin	Source Area	Ash Pore Water	Ash Pore Water	06/13/2018	**3.7**	**1420**	32	**13000**	**15000**	<10	**190**	47.799 j	**507**	**7.445 j**	**221**	**1580**	**1910000**	12.4	**24400**	**3210**	13.3	**18.7**	**2400**	**7100**	NA	**11.62 j**
PZ-07	In 1970 WB	1970 Basin	Source Area	Ash Pore Water	Ash Pore Water	08/27/2018	**4.0**	**1470**	38	**28000**	**14000**	<1	**157**	45.316 j	**422**	**10.4**	**197**	**1560**	**1810000**	**15.2**	**21900**	**3220**	7.18	**16.9**	**2300**	**7130**	NA	**8.96 j**
PZ-07	In 1970 WB	1970 Basin	Source Area	Ash Pore Water	Ash Pore Water	12/06/2018	**3.8**	**1840**	10 j	**11000**	**15000**	<1	**137**	48.93 j	**418**	**7.96**	**263**	**1430**	**1770000 B2**	**17.8**	**18900**	**3130**	6.989 j	**16.3**	**2050**	**5090**	NA	<50
PZ-08	In 1963 WB	1963 Basin	Source Area	Ash Pore Water	Ash Pore Water	06/13/2018	6.5	295	39	210	**550**	**2.78**	**249**	72	<1	0.498 j	<1	**36.3**	**5760**	<1	**1860**	36.8	<1	**2.47**	**6.2**	12	NA	<1
PZ-08	In 1963 WB	1963 Basin	Source Area	Ash Pore Water	Ash Pore Water	08/27/2018	**6.3**	283	38	220	**540**	**2.55**	**179**	66	<1	0.462 j	0.498 j	**37.8**	**5160**	<1	**2080**	38.5	1.14	**2.77**	**3.12**	18	NA	0.2995 j
PZ-08	In 1963 WB	1963 Basin	Source Area	Ash Pore Water	Ash Pore Water	12/05/2018	**6.2**	454	25	**270**	**580**	**1.96**	**106**	58	<1	0.587 j	0.403 j	**28.4**	**3130**	<1	**1570**	50.5	8.04	**2.98**	**3.9**	20	NA	0.1235 j
PZ-08	In 1963 WB	1963 Basin	Source Area	Ash Pore Water	Ash Pore Water	02/04/2019	**5.8**	**975**	15	**300**	**590**	**2.16**	**25.9**	66	<1	NA	0.464 j	**8.01**	**364**	NA	**1240**	**277**	**49.8**	**7.38**	**10.1**	136	NA	NA

COLOR NOTES

Bold highlighted concentration indicates exceedance of the 15A NCAC 02L .0202 Standard or the IMAC. (Effective date for 15A NCAC 02L .0202 Standard and IMAC is April 1, 2013)

Turbidity of Sample ≥ 10 NTUs

Provisional Background Threshold Values reflect the values represented in the NCDEQ letter dated 10/11/2017.

Analytical data review has not been completed for this dataset.

ABBREVIATION NOTES

BGS - below ground surface
BOD - Biologic Oxygen Demand
CB - Compliance Boundary
COD - Chemical Oxygen Demand
Deg C - Degrees Celsius
DMAs - dimethylarsinic acid
DUP - Duplicate
Eh - Redox Potential
ft - Feet
GPM - gallons per minute
IMAC - Interim Maximum Allowable Concentrations. From the 15A NCAC 02L Standard, Appendix 1, April, 1, 2013.
MDC - Minimum Detectable Concentration
MeSe - Methylseleninic acid
mg/kg - milligrams per kilogram
mg/L - milligrams per liter
mg-N/L - Milligram nitrogen per liter
MMAs - monomethylarsonic acid
mV - millivolts

mV - millivolts
NA - Not available or Not Applicable
NE - Not established
NF - No Flow
NM - Not measured
NTUs - Nephelometric Turbidity Units
pCi/L - picocuries per liter
PSRG - Primary Soil Remediation Goals
RL - Reporting Limit
SeCN - selnocynante
SeMe (IV) - Selenomethionine
SPLP - Synthetic Precipitation Leaching Procedure
S.U. - Standard Units
TCLP - Toxicity Characteristic Leaching Procedure
ug/L - micrograms per liter
ug/mL - microgram per milliliter
umhos/cm - micromhos per centimeter
Well Locations referenced to NAD83 and elevations referenced to NAVD88

Hart Exhibit 53
Docket No. E-2, Sub 1219

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THE ELM CONSULTING GROUP INTERNATIONAL LLC

ENVIRONMENTAL AUDIT IN SUPPORT OF THE COURT APPOINTED MONITOR

H.F. Lee Plant
Goldsboro, North Carolina
USA

October 2019

Final Report Issued To:

Duke Energy and the Court Appointed Monitor

Prepared By:

Advanced GeoServices Corp.
and
The Elm Consulting Group International LLC

TABLE OF CONTENTS

1.0 INTRODUCTION

Advanced GeoServices Corp. (AGC) and The Elm Consulting Group International LLC (Elm) (collectively, the Audit Team) are conducting environmental compliance audits (the Audits) of certain coal combustion residual (CCR) management locations owned or operated by Duke Energy Business Services LLC, Duke Energy Carolinas, LLC, and Duke Energy Progress, Inc. (collectively, Duke Energy). The Audits are being conducted under the direction of Mr. Benjamin Wilson, the Court Appointed Monitor (CAM), pursuant to an Order issued by the U.S. District Court, Eastern District of North Carolina, in case numbers 5:15-CR-62-H, 5:15-CR-67-H, and 5:15-CR-68-H.

The scope of the Audits is set forth in the plea agreements entered into by Duke Energy and the United States in the above cases, the Court's judgments in these cases, and a written Audit scoping document agreed to by Duke Energy and the United States.

1.1 BACKGROUND INFORMATION

The subject of this report is the Audit completed at Duke Energy's H.F. Lee Plant located in Goldsboro, North Carolina. The Audit was conducted on August 12 and 13, 2019, for a total of two days on-site. The Audit Team members were:

• Mr. Christopher Reitman, P.E. AGC	Project Director, Audit Team Leader, Sr. Subject Matter Expert (on-site)
• Mr. Joseph Cotier, CPEA, Elm	Sr. Environmental Auditor (on-site)
• Mr. Bernie Beegle, P.G., AGC	Sr. Subject Matter Expert (off-site)

The facility was represented by:

- Mr. Jeff Hines, Station General Manager
- Mr. Sharat Gollamudi, CCP System Owner, CCP Engineering
- Ms. Asha Sree, CCP Engineering
- Mr. Austin Mack, CCP Engineering
- Mr. Bobby Barnes, Manager, CCP Engineering
- Mr. Issa Zarzar, General Manager, CCP Project Management
- Mr. Steve Cahoon, EHS CCP Permitting and Compliance
- Ms. Cynthia Winston, Manager, EHS CCP Permitting and Compliance
- Mr. Andrew Shull, EHS CCP Waste & Groundwater
- Ms. Tammy Jett, EHS CCP Waste & Groundwater (by phone)
- Mr. Randy Hart, Regulatory Affairs
- Ms. Keeley McCormick, Environmental Rover, EHS CCP Compliance
- Mr. Steve Struble, Managing Director, EHS CCP Compliance
- Mr. Ricky Stroupe, EHS CCP Environmental Field Support
- Mr. Mike Graham, Station Environmental Field Support
- Mr. James Hailey, EHS CCP Health and Safety Field Support
- Mr. Keith Higgins, EHS CCP Compliance

1.2 FACILITY OVERVIEW

The H.F. Lee Plant (the H.F. Lee Facility) is located at 1677 Old Smithfield Road in Goldsboro, Wayne County, North Carolina. According to Duke Energy personnel, the H.F. Lee Facility is a decommissioned coal-fired electric generating plant that contained three (3) coal-fired units and four (4) oil-fired units. All seven of these units were retired in 2012 and subsequently demolished. In late 2012, a new natural gas-fired, combined-cycle plant went online at the H.F. Lee Facility.

1.2.1 Ash Management Activities

The following information regarding the onsite CCR management facilities was provided by Duke Energy personnel or was found in the Operations and Maintenance Manual for the H.F. Lee Facility. The H.F. Lee Facility includes four ash basins and a "Lay of Land Area." These features are described below:

- Active Ash Basin – The Active Ash Basin, also identified in Duke Energy project documentation as the 1982 Ash Basin, the Retired 1982 Ash Basin, the Retired Ash Basin, or the 1980 Ash Basin, has an area of approximately 62 acres and is formed by a 20-foot high earthen embankment (North Carolina Department of Environmental Quality (NCDEQ) ID No. WAYNE-022). The Active Ash Basin contains about 4,520,000 tons of ash. Process water flows into the Active Ash Basin associated with power generation were discontinued in 2012. The remaining flows into the basin were water pumped from the triangular basin, pumping of seepage discharges, and precipitation. An Ash Stack is present within the Active Ash Basin and is covered with vegetation. Although the Active Ash Basin no longer receives ash, this ash basin is often referred to by the historical names identified above. At the time of the Audit, the water in the Active Ash Basin had been decanted and a shallow area of ponded water (< 1 acre) remained in a small area within the basin. Duke Energy ceased placing CCR and non-CCR waste in the Active Ash Basin on April 4, 2019 and initiated the CCR closure process. Duke Energy plans on beneficiating the ash within the basin in an on-site unit.

- Ash Basins 1 and 2 – Ash Basins 1 and 2 are west of the H.F. Lee Facility across the Neuse River and were closed in 1962. Halfmile Branch, a creek, borders Ash Basins 1 and 2 to the south and west. The ash basins are formed by a 5 to 15-foot high earthen embankment and are heavily wooded. NCDEQ identifies the dams associated with Ash Basins 1 and 2 as WAYNE-031 and WAYNE-032, respectively. The combined surface area and total quantity of ash within Ash Basins 1 and 2 are 76 acres and 800,000 tons, respectively.

- Ash Basin 3 – Ash Basin 3 is located to the south of Ash Basins 1 and 2 and was closed in 1982. Ash Basin 3 is formed by an 8 to 10-foot high earthen embankment and is heavily wooded. NCDEQ identifies the dam associated with Ash Basin 3 as WAYNE-033. The surface area and total quantity of ash within Ash Basin 3 are 87 acres and 910,000 tons, respectively. Ash Basin 3 is separated from Ash Basins 1 and 2 by Halfmile Branch.

- Lay of Land Area – The Lay of Land Area (LOLA) or Ash Fill Area is an ash disposal area located between the Neuse River and the Cooling Pond of the H.F. Lee Facility and is about 9 acres in size. The Lay of Land Area is heavily wooded and contains about 72,000 cubic yards of ash.

Although the dams associated with Ash Basins 1, 2, and 3 are listed on the NCDEQ Dam Safety register, at the time of the Audit they were classified as non-jurisdictional. In 2015, NCDEQ requested characterization of Ash Basins 1, 2 and 3 from Duke Energy to revisit the classification of each of these basins. Duke Energy reported to the Audit Team that there has been no formal reclassification of Ash Basins 1, 2, and 3 by NCDEQ based on the information submitted.

Three historical ash fills have been identified at the H.F. Lee Facility. One fill area is located adjacent to the bypass canal; one is located along an area that was being evaluated for a CCR haul road, northeast of the three inactive basins; and the most recently identified area is located northwest of the railroad bridge located north of the decommissioned coal plant. The area near the bypass canal and northeast of the three inactive basins was previously delineated, and Duke Energy is planning additional investigations to characterize the amount of ash found near the railroad bridge over the next couple of months.

A 545-acre Cooling Pond sometimes referred to as the Cooling Lake exists to the east of the main power plant at the H.F. Lee Facility. The Cooling Pond is not considered part of the CCR facilities for purposes of this Audit because it is not related to any CCR management activities.

1.2.2 Environmental Permits and Programs

The H.F. Lee Facility operates under a number of environmental permits and programs, including:

- **National Pollutant Discharge Elimination System (NPDES) Wastewater Permitting** – NCDEQ issued NPDES Permit No. NC0003417 to the H.F. Lee Facility with an effective date of September 1, 2010 and an expiration date of May 31, 2013 (the 2010 Permit). A timely permit renewal application package was submitted to NCDEQ on November 19, 2012.

  As it relates to ash management activities, the permit covers:

  - Outfall 001: This outfall is permitted to discharge water from the ash pond treatment system (Active Ash Basin), which includes ash transport water, Rotamix System precipitator water, air pre-heater wash water, combustion turbine wash water, filter plant blowdown, and stormwater from the ash line trench. Discharges flow through a polishing pond and then to the Neuse River. Note that under the current operating configuration, there are no process waters being directed to the H.F. Lee Facility ash basins.

  Discharges from Outfall 001 recommenced in November 2017 after final decanting approval was received from NCDEQ on October 6, 2017. Duke Energy provided its notice of decanting to NCDEQ on November 17, 2017.

Part III.B of the permit's "Other Requirements" section requires groundwater monitoring if required by NCDEQ. The H.F. Lee Facility operates a network of 8 compliance wells at the Active Ash Basin (including 2 background wells) and 5 compliance wells at Ash Basins 1, 2, and 3 (including 1 background well), for assessing compliance with groundwater limits pursuant to 15A NCAC 02L.0200. These wells were sampled three times a year. Pursuant to the new NPDES Permit that became effect on July 1, 2019, the last NPDES groundwater sampling event occurred in June 2019.

NCDEQ issued NPDES permit renewal to Duke Energy with an effective date of July 1, 2019 and an expiration date of March 31, 2024 (the 2019 Permit). The primary outfall remains Outfall 001, which discharges from the Active Ash Basin to the Neuse River.

During August 2018, there was no flow at Outfall 001 from August 18 to 25, 2018, therefore no weekly samples were collected. This occurred as the Neuse River level was high enough to completely submerge the Outfall 001 discharge pipe. The Audit Team noted that "no flow" was recorded on the electronic Discharge Monitoring Report (eDMR) for the following dates: August 4, August 5, August 9 to 13, August 18, August 19, August 21, August 30, and August 31. The eDMR for August 2018, submitted to NCDEQ on September 24, 2018, included this information in the comments section. On April 12, 2019, NCDEQ issued a Notice of Deficiency (NOD), #NOD-2019-MV-0029, citing no weekly sample having been collected for pH, nitrite, TKN, and total nitrogen. On April 15, 2019, Duke Energy responded to the NOD in an email to NCDEQ explaining the high river level circumstances that led to the inability to collect the weekly sample. On July 10, 2019, NCDEQ issued a letter to Duke Energy indicating that no further action was due on the part of Duke Energy.

The 2010 Permit requires a quarterly chronic toxicity sample to be collected for Outfall 001. Duke Energy's schedule for collecting this sample at the H.F. Lee Facility was typically the 3rd month of the quarter (i.e., March, June, September and December) as there are no specific dates listed in the 2010 Permit. During 2018, Duke Energy ceased discharge from Outfall 001 on November 2 (completion of decanting) and did not recommence discharge until July 16, 2019 (initiation of dewatering), and therefore no quarterly toxicity sample was collected during the 4th quarter of 2018. Duke Energy submitted a letter to NCDEQ on January 29, 2019 explaining the reason for having no chronic toxicity result for the 4th quarter of 2018. On February 12, 2019, NCDEQ issued a Notice of Violation (NOV), #NOV-2019-TX-0008, to Duke Energy for failure to collect the required chronic toxicity sample. Duke Energy responded on March 7, 2019 and reiterated the reasons for having not collected the quarterly chronic toxicity sample at Outfall 001. Duke Energy has received no additional correspondence from NCDEQ on the matter.

On January 10, 2019, the North Carolina Environmental Management Commission Special Order by Consent No. EMC SOC WQ S18-006 (SOC) issued to Duke Energy became effective. The SOC has an expiration date of "no later than February 28, 2023." The SOC covers discharges from the following 46 seeps: LOLA S-01, LOLA S-01A, LOLA S-01B, S-01, S-02, S-03, S-03A, S-04, S-05, S-06, S-07, S-08, S-09, S-18, S-19, S-20, S-21, S-22, S-23, S-24, S-25, S-26, S-27, S-28, S-29, CPS-01, CPS-02, CPS-03, CPS-04, CPS-05, CPS-06, CPS-07, CPS-08, CPS-09, CPS-10, CPS-11, CPS-12, CPS-13, CPS-14, CPS-15, CPS-16, CPS-17, CPS-18, CPS-19, CPS-20, and CPS-21, all considered non-constructed seeps. Non-constructed seeps are not on or within a dam structure and do not convey wastewater via a pipe or constructed channel directly to a receiving stream.

The following Areas of Wetness (AOWs) have been dispositioned due to either lack of flow, lack of CCR constituents in flow, or the representation of the discharge by another seepage location: S-05, S-19, S-20, and S-21. Monitoring is required at S-03A, S-09, and instream locations both up and downstream in the Neuse River and up and downstream in Half Mile Branch. The SOC considers these monitoring locations sufficient to represent the 46 seeps in the SOC. S-03A and S-09 include interim action levels for arsenic, hardness, and total dissolved solids. The up and downstream locations in Half Mile Branch include interim action levels for mercury and selenium. The up and downstream locations in the Neuse River must cover NCDEQ's 2B standards. Quarterly monitoring is required for parameters specified in the SOC. At the time of the Audit, two rounds of sampling had been conducted. No exceedances of Interim Action Levels were noted. Additional requirements of the SOC included:

- Payment of an upfront civil penalty of $72,000 within 30 days of SOC issuance. This penalty was paid January 18, 2019.
- Completion of decanting of the Active Ash Basin by March 31, 2019. Decanting was completed November 2, 2018, with a notification letter sent to NCDEQ on March 26, 2019.
- Initiation of dewatering of the Active Ash Basin by July 31, 2019. Dewatering commenced on July 16, 2019, with a notification sent to NCDEQ on July 16, 2019.
- Annual completion of a comprehensive survey of existing and potential new seeps. New non-constructed seeps identified and reported to NCDEQ in the Annual Seep Report are deemed covered by the SOC. The Annual Seep Survey was conducted on March 29, 2019. No new seeps were identified during the 2018 annual seep survey.

  - Posting of a copy of the H.F. Lee Facility NPDES Permit, SOC, and related reports on Duke Energy's external website. All required documents have been posted.

- **NPDES Industrial Stormwater Permitting –** Duke Energy submitted an application for an individual stormwater permit under the NCDEQ stormwater program on February 2, 2016. NCDEQ responded on February 21, 2017 indicating that, based on the permit application submitted, an industrial stormwater permit was not required for the H.F. Lee Facility.

- **NPDES Construction Stormwater Permitting –** NCDEQ has issued stormwater construction permits for activities related to the ash basins and ash management at the H.F. Lee Facility. These permits were issued by NCDEQ under its General Permit for Construction Activities, No. NCG010000, and include three active permits and two permits that were issued for construction that has not yet commenced. The active permits related to ash management include:

  - WAYNE-2016-010 was issued September 28, 2015 for Ponds 1 & 2 Vegetation Removal;
  - WAYNE-2016-011 was issued October 1, 2015 for Inactive Basin 3 Restabilization; and
  - WAYNE-2019-011 was issued October 10, 2018 for Triangular Pond Dike Decommissioning.

Erosion and sedimentation control plans were in place for these projects.

The permits for which work has not yet commenced include:

- WAYNE-2017-022 was issued April 19, 2017 for Active Basin Seepage Collection System; and
- WAYNE-2019-032 was issued June 20, 2019 for the Haul Road from the 82 Basin.

Since this work had not started, these permits were not reviewed as part of the Audit scope of work.

- **Title V Permitting** – Title V Permit No. 01812T44, effective September 8, 2016 and with an expiration date of June 30, 2020, has been issued to the H.F. Lee Facility for all facility activities, including ash basin management. An April 11, 2019 modification was issued that included a new 200 kW diesel-fired generator to be used as back-up power for the electric pumps in the Active Ash Basin. The generator is listed as Insignificant Activity I-ASH-1. Fugitive dust from the ash basins (I-20), wet ash transfer systems (I-F-2, I-F-3, I-F-4), ash handling (I-F-5) and the haul roads (I-F-6) are also listed as Insignificant Activities. The Ash Basin is listed as source F-4 for fugitive dust and toxics emissions. Fugitive dust control was included in Section 3.MM of the permit.

- **Spill Prevention, Control and Countermeasure (SPCC) Plan** – The H.F. Lee Facility SPCC Plan, Amendment 19, developed and implemented by Duke Energy, covers all site activities including management of the Active Ash Basin and was last revised July 2017.

- **Tier II Reporting** – Hazardous chemicals inventory reporting on Tier II for 2018 has been completed and was submitted on February 5, 2019.

- **Waste Unit Compliance Boundaries** – NCDEQ issued a letter dated August 25, 2017 to Duke Energy regarding compliance boundaries for North Carolina coal ash facilities. On February 15, 2018, Duke Energy submitted to NCDEQ an updated compliance boundary map for the H.F. Lee Facility that eliminated Ash Basins 1, 2, and 3. On March 7, 2018, Duke Energy submitted to NCDEQ an updated compliance boundary map for the H.F. Lee Facility that eliminated the Triangle Basin.

- **North Carolina Coal Ash Management Act of 2014 (CAMA) –** CAMA requires identification of drinking water supply wells within one half mile of the facility, submission of Groundwater Assessment Plans, installation and multiple rounds of sampling from Assessment Wells, submission of Groundwater Assessment Reports summarizing groundwater investigations, submission of an Annual Groundwater Protection and Restoration Report, submission of Discharge Assessment Plans to characterize seeps, submission of a Groundwater Corrective Action Plan, and ash basin closure/removal. The required activities associated with these items have been completed in accordance with the schedule provided under CAMA.

  CAMA allows for a modification of the current intermediate risk ranking and provides a potential closure extension of these basins until 2028 if specific dam improvements are completed and approved by NCDEQ and an alternative permanent local water supply is provided to local residents. However, Duke Energy has announced that the ash at the H.F. Lee Facility will be beneficially used. The beneficial use will involve burning the ash and creating a very low carbon residual material which can be utilized in cement. In accordance with CAMA, this would allow the closure date to be extended to December 31, 2029.

NCDEQ approved the 2019 Interim Monitoring Plan for the H.F. Lee Facility. The Plan includes 50 monitoring wells sampled semi-annually and 12 wells sampled quarterly. The CAMA groundwater results are reported on a quarterly basis.

On October 11, 2017, NCDEQ approved provisional background threshold values (PBTVs) for the H.F. Lee Facility. In addition, Duke Energy submitted to NCDEQ the H.F. Lee Facility's 2018 Groundwater Protection and Restoration Annual Report on January 25, 2019, and its 2018 Surface Water Protection and Restoration Annual Report on January 21, 2019.

On July 31, 2019, Duke Energy submitted to NCDEQ the 2018 H.F. Lee Facility CAMA Annual Report.

- **Federal Coal Combustion Residuals Rule (CCR Rule)** – The CCR Rule (40 CFR, part 257, Subpart D) identifies standards for the disposal of CCR in landfills and surface impoundments. Ash Basins 1, 2, and 3 and the LOLA are exempt from the CCR Rule regulations because they were retired in 2012, prior to the CCR Rule's effective date, and they no longer impound water. The Active Ash Basin is subject to the CCR Rule because it does impound water and the H.F. Lee Facility continues to be used for power generation. Table 1 summarizes the reports and plans posted by Duke Energy to its publicly available website in accordance with the CCR Rule.

  The Active Ash Basin's CCR monitoring well network consists of 34 monitoring wells. On March 14, 2018, Duke Energy provided notice on Duke Energy's public website that the Active Ash Basin is now in the CCR assessment monitoring program due to statistically significant increases over the background values of the Appendix III parameters.

On November 7, 2018, Duke Energy posted on Duke Energy's public website the required location restrictions for the H.F. Lee Facility's impoundments, which stated the Active Ash Basin did not meet the surface impoundment standard for placement above the uppermost aquifer (40 CFR § 257.60(a)) and did not meet the surface impoundment standard for wetlands (40 CFR § 257.61(a)). Failure to meet the wetlands restriction requires Duke Energy to cease placing CCR and non-CCR waste streams into the Active Ash Basin and begin closure by April 12, 2019.

On December 14, 2018, Duke Energy provided notice on Duke Energy's public website that the following CCR Rule Appendix IV constituents were detected at levels above the applicable Groundwater Protection Standards.

Active Ash Basin

- Arsenic
- Cobalt
- Lithium

On May 7, 2019, Duke Energy provided notice on Duke Energy's public website of CCR Assessment of Corrective Measures Reports for the Active Ash Basin.

On April 24, 2019, Duke Energy posted on its public website the Notice of Intent to Close the Active Ash Basin and noted that flows to Active Ash Basin ceased on April 4, 2019.

1.2.3 Dam and Other Structural Permits and Approvals

The Active Ash Basin (WAYNE-022), Ash Basin 1 (WAYNE-031), Ash Basin 2 (WAYNE-032), and Ash Basin 3 (WAYNE-033) at the H.F. Lee Facility were associated with the ash management operations and were grandfathered under North Carolina's Session Law 2009-390 (Senate Bill

1004, effective January 1, 2010). Under this grandfathering, the original designs of the dams were not subject to the current design standards for new construction, although modifications after the effective date may be subject to these standards. On October 9, 2018, Duke Energy was provided a one-year extension on the requirement to remove vegetation on the inactive ash basin embankments. On July 2, 2019, Duke Energy submitted plans to remove pipes on the eastern side of the Active Ash Basin and make improvements to the haul road.

The Active Ash Basin dam referenced above has a high hazard classification under the North Carolina Dam Safety system. The dams at Ash Basins 1, 2, and 3 are currently classified as low hazard and are non-jurisdictional dams.

On February 1, 2019, Chapter 15A Section 02K.0224 of the North Carolina Administrative Code (15A NCAC 02K.0224) was published in the North Carolina Register. These regulations created new standards for the CCR impoundments during specific flood events. Duke Energy met with NCDEQ to discuss these regulations on March 13, 2019 and completed analysis and submitted the results of the analysis to NCDEQ on July 10, 2019. The analysis showed that Ash Basins 1, 2, and 3, which are scheduled to be excavated, would be flooded during a design storm event and did not meet the new basin spillway requirements. Duke Energy is scheduled to meet with NCDEQ on August 21, 2019 to determine the applicability of these new regulations to the inactive ash basins. NCDEQ has previously noted these regulations were not applicable to portions of the basins being excavated at Dan River and did not note deficiencies associated with these new regulations during their March 6, 2019 inspection of the ash basins at Duke Energy's Cape Fear Facility.

1.2.4 CCR Management Projects and Other Facility Activities

During the Audit, Duke Energy was installing upgrades to facility infrastructure, including haul roads to support the planned beneficial use of the excavated ash at the H.F. Lee Facility and development of the planned areas for beneficial use. The planned beneficial use involves heating the ash to remove organic carbon to make the ash more suitable for use in cement. Current plans call for system operation to start in late 2019 and the earliest ash deliveries to start in the first quarter of 2020.

During September 2018, following the Hurricane Florence, Ash Basins 1, 2, and 3 were inundated. The flooding events displaced a small amount of ash at the berm of Ash Basin 3 where ash reportedly sloughed from Ash Basin 3 and was deposited at the boundary of the Ash Basin 3 dam. Concentrated pockets of cenospheres, a residual CCR material which floats on water, were also seen within the footprint of the inactive Ash Basins 1, 2, and 3 in several locations. Testing of the adjacent Neuse River water was reportedly completed by both Duke Energy and NCDEQ, and results reportedly met state water quality standards.

2.0 AUDIT SCOPE AND SUBJECT MATTER

The Audit was completed in accordance with the court documents and the Audit scoping document agreed to by Duke Energy and the United States. A description of the scope is provided as Attachment A. The Audit included ash management activities, including aspects of generation that affect the nature of the waste streams from the point of generation into surface impoundments or ash management basins, landfills, and/or storage piles. The Audit focused on the activities at the facility since the date of the last Audit, which was August 12-13, 2018.

3.0 AUDIT FINDINGS

The following Findings at the H.F. Lee Facility were identified by the Audit Team.

3.1 EXCEEDANCES OF THE STATE GROUNDWATER QUALITY STANDARDS

Requirement – The State groundwater rules establish maximum contaminant levels for groundwater at or beyond the compliance boundary for the ash basins. *See* 15A NCAC 02L.0202. 15A NCAC 02L.0103(d) provides that "[n]o person shall conduct or cause to be conducted, any activity which causes the concentration of any substance to exceed that specified" under the Class GA standards or the interim maximum acceptable concentrations (IMACs) established for groundwater quality in 15A NCAC 02L.0202. Further, under N.C.G.S.A. § 143-215.1(i), "[a]ny person … who is required to obtain an individual permit … for a disposal system under the authority of G.S. 143-215.1 [water pollution control] … shall have a compliance boundary … beyond which groundwater quality standards may not be exceeded." *See also* 15A NCAC 02L.0102(3) (defining "compliance boundary" as "a boundary around a disposal system at and beyond which groundwater quality standards may not be exceeded").

In addition, under N.C.G.S.A. § 143-215.6A(a)(1), civil penalties may be assessed against any person who violates any standard established by NCDEQ under the authority of N.C.G.S.A. § 143-214.1, which covers groundwater standards.

Finding – Constituents exceeding the standards for Class GA waters, established in 15A NCAC 02L.0202, were documented in monitoring wells located at or beyond the compliance boundary for the Active Ash Basin. Based on a review of the 2018 and 2019 CAMA groundwater monitoring analyses and the NPDES groundwater monitoring analyses, arsenic, boron, cobalt, iron, manganese, total dissolved solids, and vanadium were observed to exceed the 02L or IMAC groundwater standards or the NCDEQ-approved PBTVs, if the PBTV was greater than the 02L or IMAC groundwater standards, one or more times at or beyond the compliance boundary of the Active Ash Basin. A summary of the 2018 and 2019 CAMA groundwater monitoring results is presented in Attachment B to this report. Attachment C provides the NPDES Groundwater Results.

Duke Energy has stated its opinion that pursuant to a September 2015 Settlement Agreement with NCDEQ, “Duke Energy is not subject to any further financial penalties for exceedances of groundwater standards” and “Duke Energy is not subject to any further enforcement action based on exceedances of groundwater standards as long as it remains in substantial compliance with CAMA groundwater requirements.”

The CAM has advised the Audit Team that the Audit scope does not include an evaluation of compliance with the September 2015 Settlement Agreement, and therefore the Audit Team does not take a position on Duke Energy’s opinion.

4.0 OPEN LINES OF INQUIRY

Open Lines of Inquiry are items identified by the Audit Team while on-site that, due to limited available information or the need for additional research, could not be determined as being in compliance or out of compliance. There were no Open Lines of Inquiry identified during the Audit.

5.0 AUDIT APPROACH

5.1 ON-SITE ACTIVITIES

During its time on-site, the Audit Team conducted an opening conference with facility personnel to discuss the scope of work and the plan for accomplishing necessary tasks while at the facilities. A site tour of the coal ash management and program support areas was subsequently completed. Following the tour, the Audit Team conducted a review of pertinent files, interviews with facility representatives, and verification of facility activities related to the ECPs, written programs, and permits. A debrief was conducted each Audit day to advise the facility representatives of Audit progress, open lines of inquiry, possible Audit findings, and needs for the next day. At the completion of the Audit, the Audit Team led a verbal discussion of draft Audit findings with facility representatives.

5.2 STANDARDS OF PRACTICE

The fieldwork portion of the Audit was conducted on August 12-13, 2019 with compliance reporting commencing May 14, 2015, the date of the court's judgments. The Audit focused on the activities at the facility since the date of the last Audit, which was August 13-14, 2018. The Audit was based on:

- Physical inspections of the facility;
- Examination of selected administrative and operating records made available by facility staff at the Audit Team's request;
- Interviews and discussions with key facility management and staff; and
- Verification procedures designed to assess the facility's application of, and adherence to, terms of the probation, environment laws and regulations, and site policies and procedures. In addition, the Audit Team reviewed the facility's adherence to good management practices.

The Audit followed established audit protocols and procedures. It should be understood that the Audit consisted of evaluating a sample of practices and was conducted over a short period of time. Efforts were made toward sampling major facets of environmental performance during the period under review. This method is intended to uncover major system deficiencies and the Audit may not have identified all potential problems.

To support the overall independence of the Audit process, the Audit included an auditing professional certified by the Board of Environmental, Health and Safety Auditor Certifications (BEAC). BEAC is an accredited professional certification board that issues the Certified Professional Environmental Auditor (CPEA) designation to qualified auditors. Under BEAC, auditor independence is a key criterion for the implementation of an effective third-party audit program. The Audit was implemented in accordance with the standards related to auditor independence.

The process by which the Audit was conducted was consistent with the general state of the art of environment auditing and the best professional judgment of the Audit Team. To conduct the Audit, the team implemented a formal approach, drawing on process guidance from both BEAC and the Auditing Roundtable (AR) guidance documents. Guidance documents included:

- *Standards for the Professional Practice of Environmental, Health and Safety Auditing*. Prepared by the Board of Environmental, Health and Safety Auditor Certifications, 2008.

- ISO 19011:2002 – Guidelines for Quality and/or Environmental Management Systems Auditing. Prepared by the International Organization for Standardization, 2002.

- Standard for the Design and Implementation of an Environmental, Health and Safety Audit Program. Prepared by The Auditing Roundtable, Inc., 1995.

- Minimum Criteria for the Conduct of Environmental, Health and Safety Audits, Prepared by The Auditing Roundtable, Inc.

5.3 REPRESENTATIVE SAMPLING

When confronted with a large population of data to review or equipment to inspect, the Audit Team employed representative sampling techniques to evaluate records over the Audit period requested, and as necessary, for physical inspection of some types of common equipment. The sample size for records reviews or equipment inspections required professional judgment.

The Audit Team's judgement considered the following:

- The outcome of the evaluation of the records sampled. If problems are found in the representative sample, more records may need to be examined to evaluate compliance status.
- Potential for or severity of non-compliance.
- The general appearance and observed practices of certain operating areas.
- Information obtained during an interview that indicates a potential problem.
- Other specific information or guidance from the CAM.
- Time available during the Audit.

The Audit Team also employed the following types of sampling techniques, depending upon the characteristics of a specific population:

- Random sampling – every item has an equal chance of being selected.
- Interval sampling – select every nth item, (e.g., every third manifest in chronological order as contained in facility files).
- Block sampling – auditor uses his/her judgment to select a specific block of items, (e.g., petroleum storage tank inspections from April to October).
- Stratified sampling – population is divided into groups, which are then sampled through random or judgmental techniques.

TABLE 1

TABLE 1
Active Ash Basin - Plans and Reports Posted by Duke Energy under the CCR Rule

Document Name	**Category**	**Release Date**
Closure Plan	Closure and Post Closure Care	08/01/2019
CCR Annual Surface Impoundment Inspection Report 2019	Operating Criteria	08/01/2019
Annual Meeting with Local Emergency Responders 2019	Design Criteria	06/18/2019
CCR Assessment of Corrective Measures Report	Groundwater Monitoring and Corrective Action	05/07/2019
Notice of Intent to Close	Closure and Post Closure Care	04/24/2019
CCR Annual Groundwater Monitoring and Corrective Action Report 2018	Groundwater Monitoring and Corrective Action	03/01/2019
Notice of Initiation of Assessment of Corrective Measures	Groundwater Monitoring and Corrective Action	02/19/2019
Notice of Groundwater Protection Standard Exceedance 2018	Groundwater Monitoring and Corrective Action	12/14/2018
Annual Fugitive Dust Control Report 2018	Operating Criteria	12/05/2018
Wetlands	Location Restriction	11/07/2018
Unstable Areas	Location Restriction	11/07/2018
Seismic Impact Zones	Location Restriction	11/07/2018
Fault Areas	Location Restriction	11/07/2018
Placement Above Uppermost Aquifer	Location Restriction	11/07/2018
Emergency Action Plan for HF Lee Active Ash Pond	Design Criteria	10/01/2018
CCR Annual Surface Impoundment Inspection Report 2018	Operating Criteria	07/31/2018
Annual Meeting with Local Emergency Responders 2018	Design Criteria	06/28/2018

TABLE 1
(Continued)
Active Ash Basin - Plans and Reports Posted by Duke Energy under the CCR Rule

Document Name	Category	Release Date
Notice of Establishment of an Assessment Monitoring Program - HF Lee Active Ash Basin	Groundwater Monitoring and Corrective Action	03/14/2018
CCR Annual Groundwater Monitoring and Corrective Action Report	Groundwater Monitoring and Corrective Action	02/06/2018
Emergency Action Plan for HF Lee Active Ash Pond Revision 006A	Design Criteria	01/25/2018
HF Lee Inundation Maps	Design Criteria	01/25/2018
2017 Annual CCR Fugitive Dust Control Report-HF Lee	Operating Criteria	11/29/2017
Groundwater Sampling and Analysis Program Selection of Statistical Method Certification-HF Lee Active Ash Basin	Groundwater Monitoring and Corrective Action	11/06/2017
Groundwater Monitoring System Certification-HF Lee Active Ash Basin	Groundwater Monitoring and Corrective Action	11/06/2017
HF Lee Fugitive Dust Control Plan Revision 1	Operating Criteria	08/17/2017
CCR Annual Surface Impoundment Inspection Report 2017	Operating Criteria	08/02/2017
Annual Meeting with Local Emergency Responders 2017	Design Criteria	06/29/2017
Annual Fugitive Dust Control Report 2016	Operating Criteria	12/05/2016
Initial Structural Stability Assessment	Design Criteria	11/16/2016
Initial Factor of Safety Assessment	Design Criteria	11/15/2016
Closure Plan for Impoundments	Closure and Post Closure Care	11/11/2016
Inflow Design Flood Control System	Operating Criteria	11/03/2016
History of Construction	Design Criteria	10/25/2016
Initial Hazard Classification Assessment Certification	Design Criteria	10/12/2016

TABLE 1
(Continued)
Active Ash Basin - Plans and Reports Posted by Duke Energy under the CCR Rule

Document Name	Category	Release Date
Existing Liner Design Criteria	Design Criteria	10/11/2016
Annual Surface Impoundment Report 2016	Operating Criteria	08/11/2016
Annual Surface Impoundment Report (Initial)	Operating Criteria	02/16/2016
Annual Surface Impoundment Report (Initial) Revision 1	Operating Criteria	02/19/2016

*This summary of reports was downloaded on August 10, 2019

ATTACHMENT

ATTACHMENT A
AUDIT SCOPE

A-1 GENERAL AUDIT SCOPE ITEMS

The general Audit scope items included:

- Review and evaluation of documentation for maintenance and repair of structures and equipment used for coal ash disposal,

- Review and evaluation of documentation of modifications, failures, leaks, damage, disrepair and other problems at the coal ash management units,

- Review and evaluation of documentation of efforts to correct failures, leaks, damage, disrepair and other problems where they determine that employee/contractor actions were likely a primary or contributing cause to a compliance finding,

- Review and evaluation of documentation of communication of the items above within the organization,

- Review and evaluation of documentation associated with the specific environmental compliance items described below and laws, regulations, and policies associated with these items, and

- Review of compliance with administrative aspects and regulatory submissions related to coal ash management-specific regulations, including:

–	Coal Combustion Residuals	40 CFR Part 257 Subpart D
–	NC Coal Ash Management Act of 2014	NC General Statutes Chapter 130A, Article 9

More specific items which were addressed in the Audits to comply with the General Audit Scope are described below.

A-2 SPECIFIC COMPLIANCE WITH THE ECP-NC

The following items related to specific ECP-NC compliance were reviewed as part of the Audit:

1. Verify maintenance and sufficient funding of corporate compliance organizations (ABSAT, CCP organization, National Ash Management Advisory Board). Where a root cause of a compliance finding appears in an auditor's judgment to result from inadequate funding, the AGC/ELM Audit Team will identify this in the Audit finding.

2. Verify timely production of satisfactory Compliance Officer (CO) reports to the CAM relating to the development, implementation, and enforcement of the ECP-NC. No auditing work is associated with this work at this time.

3. Evaluate existence and efficacy of toll-free hotline/e-mail inbox for violation reporting, including the appropriateness of the follow-up investigation and disposition of each reported matter. This requirement will be evaluated for the first year of audits and then reassessed.

4. Evaluate completion and efficacy of periodic notices (via Internet, Intranet, email, notices in employee work areas, and publication in community outlets) to employees and the public of the availability of the toll-free hotline and electronic mail inbox.

5. Evaluate training materials and curricula utilized in the mandated training program, particularly those tailored to employee's specific job descriptions, to determine whether it advances the goal of "ensuring that every domestic employee of Duke Energy Corporation and its wholly-owned or operated affiliates understands applicable compliance policies and is able to integrate the compliance objectives in the performance of his/her job." Ensure that the subjects specifically named in the plea agreements are covered by the training (namely, notice and reporting requirements in the event of a release or discharge and the safe and proper handling of pollutants, hazardous substances and/or wastes).

6. Evaluate whether Defendants are using "Best Efforts" to comply with the obligations under the ECP-NC. Where the Audit Team makes compliance findings, the Audit Team will, upon request, provide their opinion on whether this best efforts standard applies, and if so, whether best efforts have been used.

7. Verify compliance at each facility with the specific procedures and protocols set forth in the ECP-NC.

A-3 SPECIFIC COMPLIANCE WITH OTHER PROVISIONS OF THE PLEA AGREEMENT

The following items related to specific items in the Plea Agreement were reviewed as part of the Audit:

1. Determine whether Defendants have opened, expanded, or reopened any coal ash or coal ash wastewater impoundment and, if so, verify that they are lined and do not allow unpermitted discharges of coal ash or coal ash wastewater to waters of the United States.

2. Verify that Defendants have determined the volume of wastewater and coal ash in each wet-storage coal ash impoundment in North Carolina as described in the plea agreements and that written or electronic records of this information are maintained in a location available to facility staff and employees responsible for making environmental or emergency reports.

3. Review citations/notices of violations/notices of deficiency related to violations of federal, state, or local law to assure that they have been properly relayed to the Court and, as appropriate under the plea agreements, determine their materiality.

4. Evaluate Defendants' efforts to close coal ash impoundments at Dan River, Riverbend, Asheville, and Sutton for legal compliance.

5. Note any observations made during the Audit that cause concern regarding the assets and/or security available to the Defendants to meet the obligations imposed by the Judgment in this case.

A-4 GENERAL ENVIRONMENTAL COMPLIANCE SUBJECT AREAS

The following items related to General Environmental Compliance were reviewed as part of the Audit:

1. Assess all waste streams from Duke Energy facilities with coal ash impoundments. Review Duke Energy's processes, procedures, and practices, as well as compliance with those processes, procedures, and practices, for:

    a. identifying waste streams (especially, but not limited to, waste streams with discharge points into bodies of water),
    b. identifying and communicating any modifications or changes, or potential modifications or changes, to waste streams,
    c. ensuring proper handling/disposal of waste streams,
    d. identifying, preventing, and mitigating any risks or hazards that could affect waste streams and/or the disposal of waste streams, and
    e. ensuring proper permitting for waste streams.

For Item 1.d., the Audit Team evaluated such risk/hazard issues where there were compliance findings associated with waste streams.

2. Review and evaluate documentation of:

    a. Maintenance and repair of structures and equipment related to coal ash disposal,
    b. Modification of the coal ash impoundments and related pollution prevention equipment and structures,
    c. Failures, leaks, damage, disrepair, and other problems,
    d. Communication of the information described in a-c within the organization, and
    e. Efforts to correct failures, leaks, damage, disrepair, and other problems.

3. Assess the employees responsible for inspection, maintenance, and repair of coal ash basins and related structures and equipment. The assessment included an assessment of the workloads of such employees to assure that Duke Energy's

facilities are adequately staffed. These assessments were made where the Audit Team determines that employee/contractor actions were likely a primary or contributing cause to a compliance finding.

4. Review the results and recommendations of any other Audits (internal or external/state mandated) and assess Duke Energy's implementation of those recommendations.

5. Review and assess Duke Energy's processes, procedures, and practices for identifying, communicating, and addressing problems and potential problems at its coal ash basins (leaks, unpermitted discharges, etc.).

6. Review and assess Duke Energy's policies, procedures, practices, and equipment for handling emergency releases from its coal ash basins and evaluate the personnel with duties in such situations.

7. Verify that Duke Energy is complying with its NPDES wastewater and stormwater permits, as well as other relevant environmental permits. This should include verifying Duke Energy's timely submission of permit applications, permit renewal applications, and responses to requests for additional information from the relevant regulatory authority.

8. Review and assess any actions or measures Duke Energy has undertaken to assure accountability and prevent recurrences when problems and/or failures occur (i.e. disciplinary actions, re-training, revision to policies and procedures, etc.). This review will be completed where the Audit Team determines that employee/contractor actions were likely a primary or contributing cause to a compliance finding.

9. Review and assess compliance with the following environmental regulations, as applicable to the management of coal ash:

a.	Wastewater Discharges	40 CFR 122; 15A NCAC 2H.0100 *et seq*
b.	Stormwater Discharges	40 CFR 122.26; 15A NCAC 2H.1000 *et seq.;* NC General Permit (Construction) No. NCG010000
c.	NC Groundwater Standards	15A NCAC 02L.0202(h)
d.	Hazardous Waste Management	15A NCAC 13A.0100 to 13A.0107
e.	Oil Pollution Prevention	40 CFR Part 112
f.	Air Pollution (Title V)	15A NCAC 2Q, and
g.	Hazardous Chemicals (Tier II)	40 CFR Part 370.

Reviews also included an analysis of overall compliance and the status and security of the asset. Subsequent reviews of individual facilities will evaluate the movement towards compliance. The Audit did not include an evaluation of compliance with the September 2015 Settlement Agreement with NCDEQ.

A–5 LIST OF PERMITS AND PROGRAMS DEEMED TO BE EITHER DIRECTLY OR INDIRECTLY IN SUPPORT OF ASH MANAGEMENT

During the Audit, the Audit Team reviewed a variety of written programs developed and implemented by Duke Energy and facility staff. State-issued permits and supporting documentation relative to environmental programs and geotechnical aspects of ash basin management were also requested and reviewed.

Requested documents, pertinent to management of ash in basins, landfills, ponds, etc. were outlined in the pre-audit questionnaire for each facility and included, but were not limited to:

1. The Compliance Register developed for ETrac for the Site.

2. The Duke Energy Operations Manual for the facility.

3. A site plan, site map, or aerial photo which shows the entire facility and key features of the facility including NPDES outfalls associated environmental monitoring locations, storage tanks, etc.

4. Most recent 2 years of maintenance, monitoring, and inspection records for each coal ash/CCR basin (just the physical inspections, not the groundwater records).

5. A “Phase 1 and Phase 2” summary of ash basin conditions prepared by an outside consultant.

6. Duke Energy’s permitting plans for addressing ash impoundments and landfills at this facility.

7. Applicable pages from the Duke Energy basin-by-basin coal ash/CCR project tracking document for this facility.

8. Original basin/landfill/coal ash management unit construction records.

9. Documentation of changes to these units.

10. Coal ash unit construction permit application and approval.

11. State-issued permits and application materials for permits associated with coal ash/CCR management (e.g., dam permits).

12. Any currently effective state order, consent order, or similar state direction that addresses coal ash/CCR management at the site.

13. Records required to be maintained in the site's operating record under the federal CCR regulation and/or any state CCR regulatory program.

14. Records of off-site ash shipments from May 2015 forward.

15. Stormwater permit application and approval for all outfalls.

16. Industrial wastewater (NPDES/POTW) permit application and approval for all outfalls/discharges.

17. Industrial and stormwater sampling and monitoring records, and any corrective action plans (last 2 years).

18. Stormwater pollution prevention plan.

19. Landfill operating permit with maintenance and monitoring requirements.

20. Landfill leak detection and groundwater monitoring records from the last 2 years along with any workplans that describes the rationale for the monitoring system at the Site.

21. Landfill operating permit with maintenance and monitoring requirements.

22. Copies of any air permits and applications for coal ash units and ancillary operations.

23. Any testing and monitoring records completed to comply with the air permits.

24. Any notices of violation~~s~~ associated with the coal ash/CCR management activities received over the last 2 years.

25. Copy of SPCC Plan.

26. Community Right-to-Know
    a. Copies of lists of hazardous chemicals or MSDSs submitted;
    b. Copies of Tier I or II reports; and
    c. Copies of Form R (toxic release inventory) reports.

27. Copies of communications with employees and the public regarding availability of toll-free hotline and electronic mail inbox for reporting suspected environmental violations.

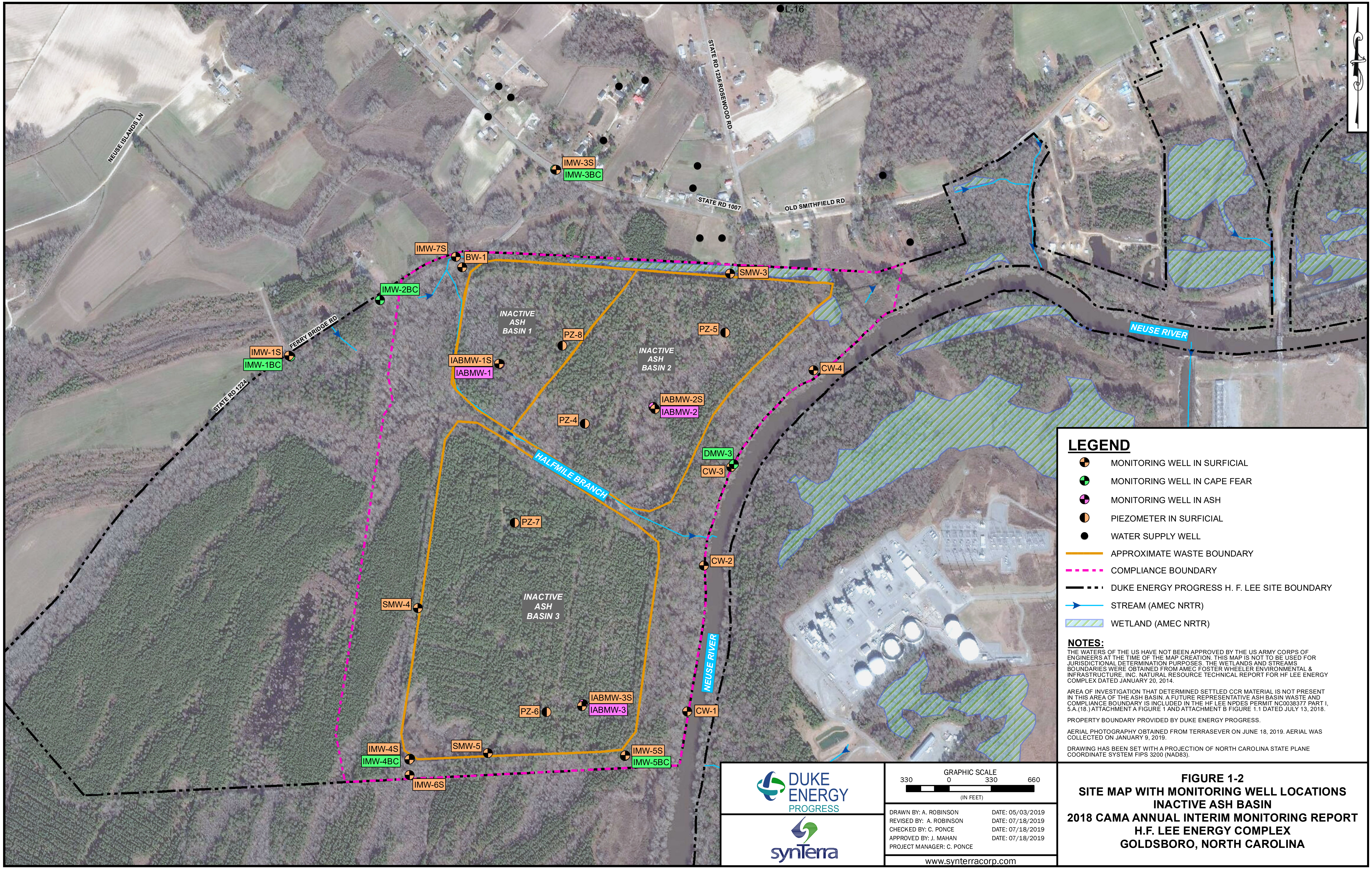
28. Management Systems:

    a. List of responsible party for each environmental activity.
    b. All environmental-related training records.
    c. All environmental policies and procedures.
    d. Organization chart.
    e. Site diagram identifying storage areas, tanks, etc.

29. Employee training records related to environmental programs and ash management policies.

ATTACHMENT B

2018 AND 2019 CAMA GROUNDWATER DATA SUMMARY AND WELL LOCATION MAP



LEGEND

●	MONITORING WELL IN SURFICIAL
●	MONITORING WELL IN CAPE FEAR
●	MONITORING WELL IN ASH
●	PIEZOMETER IN SURFICIAL
●	WATER SUPPLY WELL
—	APPROXIMATE WASTE BOUNDARY
- - -	COMPLIANCE BOUNDARY
—·—	DUKE ENERGY PROGRESS H. F. LEE SITE BOUNDARY
➤	STREAM (AMEC NRTR)
▨	WETLAND (AMEC NRTR)

NOTES:

THE WATERS OF THE US HAVE NOT BEEN APPROVED BY THE US ARMY CORPS OF ENGINEERS AT THE TIME OF THE MAP CREATION. THIS MAP IS NOT TO BE USED FOR JURISDICTIONAL DETERMINATION PURPOSES. THE WETLANDS AND STREAMS BOUNDARIES WERE OBTAINED FROM AMEC FOSTER WHEELER ENVIRONMENTAL & INFRASTRUCTURE, INC. NATURAL RESOURCE TECHNICAL REPORT FOR HF LEE ENERGY COMPLEX DATED JANUARY 20, 2014.

AREA OF INVESTIGATION THAT DETERMINED SETTLED CCR MATERIAL IS NOT PRESENT IN THIS AREA OF THE ASH BASIN. A FUTURE REPRESENTATIVE ASH BASIN WASTE AND COMPLIANCE BOUNDARY IS INCLUDED IN THE HF LEE NPDES PERMIT NC0038377 PART I, 5.A.(18.) ATTACHMENT A FIGURE 1 AND ATTACHMENT B FIGURE 1.1 DATED JULY 13, 2018.

PROPERTY BOUNDARY PROVIDED BY DUKE ENERGY PROGRESS.

AERIAL PHOTOGRAPHY OBTAINED FROM TERRASEVER ON JUNE 18, 2019. AERIAL WAS COLLECTED ON JANUARY 9, 2019.

DRAWING HAS BEEN SET WITH A PROJECTION OF NORTH CAROLINA STATE PLANE COORDINATE SYSTEM FIPS 3200 (NAD83).

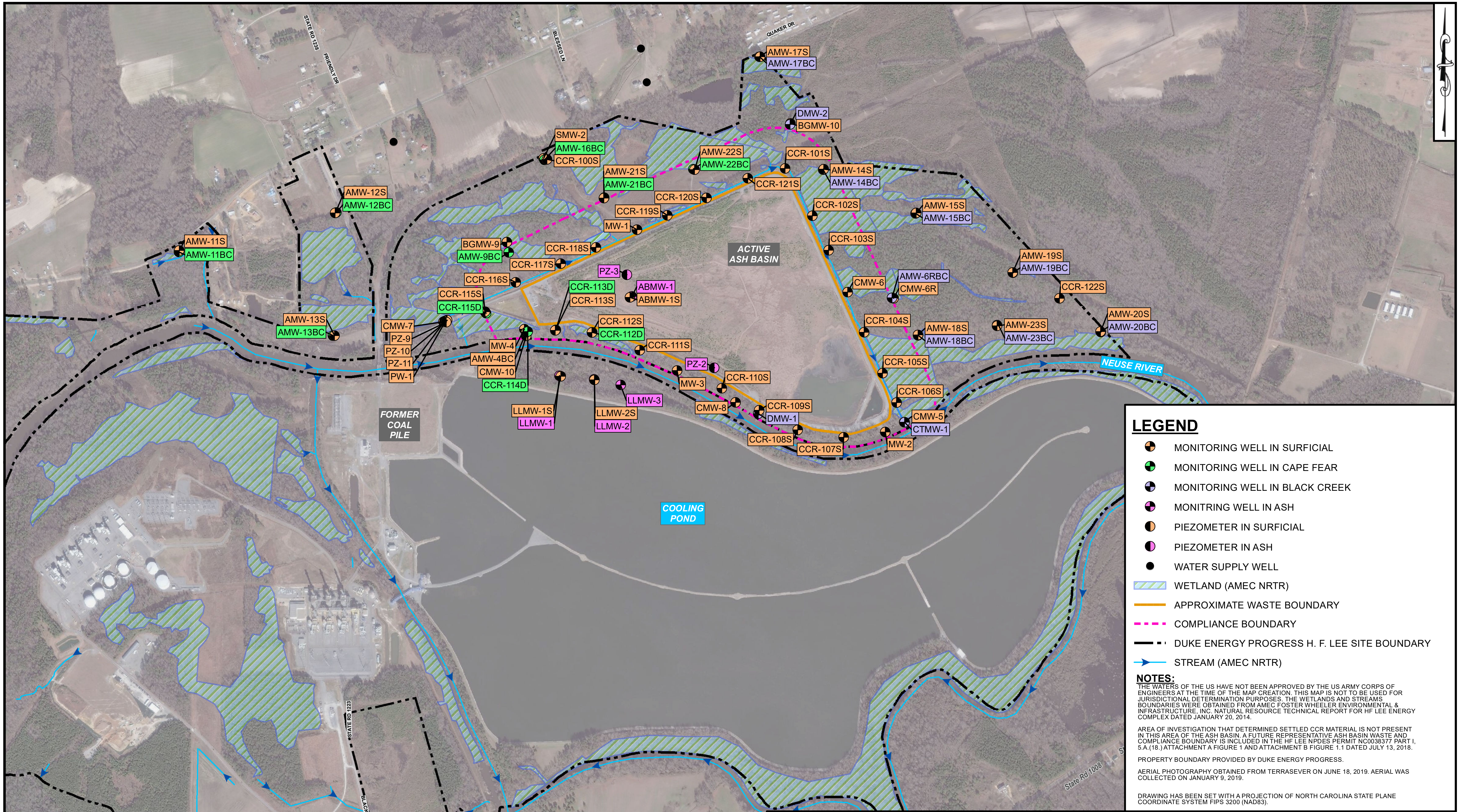
DUKE ENERGY PROGRESS

synTerra

DRAWN BY: A. ROBINSON	DATE: 05/03/2019
REVISED BY: A. ROBINSON	DATE: 07/18/2019
CHECKED BY: C. PONCE	DATE: 07/18/2019
APPROVED BY: J. MAHAN	DATE: 07/18/2019
PROJECT MANAGER: C. PONCE	

www.synterracorp.com

FIGURE 1-2
SITE MAP WITH MONITORING WELL LOCATIONS
INACTIVE ASH BASIN
2018 CAMA ANNUAL INTERIM MONITORING REPORT
H.F. LEE ENERGY COMPLEX
GOLDSBORO, NORTH CAROLINA



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DUKE ENERGY PROGRESS

synTerra

GRAPHIC SCALE
500 0 500 1,000
(IN FEET)

DRAWN BY: A. ROBINSON DATE: 05/03/2019
REVISED BY: A. ROBINSON DATE: 07/09/2019
CHECKED BY: C. PONCE DATE: 07/09/2019
APPROVED BY: J. MAHAN DATE: 07/09/2019
PROJECT MANAGER: C. PONCE

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FIGURE 1-3
SITE MAP WITH MONITORING WELL LOCATIONS
ACTIVE ASH BASIN
2018 CAMA ANNUAL INTERIM MONITORING REPORT
H.F. LEE ENERGY COMPLEX
GOLDSBORO, NORTH CAROLINA

	PARAME	40CFR257 APPENDIX III CONSTITUE			INORGANIC PARAMETERS (TOTAL CONCENTRATION)									IONUCLI
FACILITY NAME: Reporting Units	**S.U.**	**ug/L**	**mg/L**	**mg/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**pCi/L**
DATE UPDATED: CAC 02L Standard	**6.5-8.5**	**700**	**250**	**500**	**1***	**10**	**700**	**2**	**1***	**300**	**50**	**0.2***	**0.3***	**5^**
SPREADSHEET UPDATED BY: nd (Surficial Unit)	**3.4-6.8**	**50**	**54.7**	**163**	**1**	**1**	**641**	**1**	**13.7**	**413.8**	**838**	**0.2**	**0.471**	**23.4**
SPREADSHEET CHECKED BY: l (Cape Fear Unit)	**5.3-8.3**	**256**	**23**	**385**	**1**	**1**	**342**	**1**	**1**	**11600**	**1560**	**0.2**	**0.3**	**3.01**
Provisional Background (Black Creek Unit)	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**

		PARAME	40CFR257 APPENDIX III CONSTITUE			INORGANIC PARAMETERS (TOTAL CONCENTRATION)									IONUCLI
Sample ID	**Sample Collection Date**	**pH**	**Boron**	**Sulfate**	**Total Dissolved Solids**	**Antimony**	**Arsenic**	**Barium**	**Cadmium**	**Cobalt**	**Iron**	**Manganese**	**Thallium**	**Vanadium**	**Total Radium**
ABMW-01	02/25/2019	**6.4**	**4540**	**560**	**1500**	**2.68**	9.44	113	NA	**42**	**558**	**6400**	**1.69**	**51.7**	NA
ABMW-01S	08/16/2018	6.6	**3120**	12	**560**	<1	**987**	**778**	<1	**7**	**45900**	**1660**	<0.2	0.168 j	3.43
ABMW-01S	02/25/2019	**6.5**	**2910**	14	**570**	<1	**987**	**805**	NA	**6.93**	**42700**	**1580**	<0.2	0.104 j	NA
ABMW-01S	05/14/2019	6.68	**2810**	20	**550**	<1	**893**	**788**	NA	**5.74**	**38100**	**1480**	<0.2	0.135 j	NA
AMW-04BC CCR	10/24/2018	6.8	118	27	220	<1	0.585 j	204	<1	<1	NA	NA	<0.2	NA	1.519
AMW-04BC CCR	03/26/2019	6.8	125	36	300	<1	0.467 j	225	<1	<1	NA	NA	<0.2	NA	2.598
AMW-06RBC	08/20/2018	6.6	188	17	110	<1	<1	63	<1	<1	**5180**	**210**	<0.2	<0.3	NA
AMW-06RBC	02/25/2019	6.8	185	14	120	<1	<1	66	NA	<1	**5310**	**228**	<0.2	<0.3	NA
AMW-09BC	08/21/2018	7.0	80	1.3	130	<1	0.505 j	336	<1	<1	**1220**	**168**	<0.2	0.119 j	NA
AMW-11BC	08/16/2018	7.1	<50	<0.1	63	<1	<1	8	<1	0.42 j	**9270**	**1390**	<0.2	<0.3	NA
AMW-11BC	02/13/2019	6.5	<50	0.35	40	<1	<1	10	NA	**1.71**	**6780**	**1100**	<0.2	<0.3	NA
AMW-11S	08/16/2018	**4.5**	<50	6.2	<25	<1	<1	101	<1	**4.21**	12	33	<0.2	<0.3	0.908
AMW-11S	02/13/2019	**4.5**	<50	6.5	<25	<1	<1	115	NA	**4.14**	18	27	<0.2	<0.3	NA
AMW-12BC	08/16/2018	**5.7**	17.782 j	7.1	66	<1	1.19	49	<1	0.964 j	**4600**	**145**	<0.2	**0.844**	NA
AMW-12BC CCR	10/24/2018	**5.9**	23.392 j	7.3	52	<1	0.938 j	61	<1	**1.34**	NA	NA	<0.2	NA	1.3745
AMW-12BC	02/14/2019	**5.8**	<50	7.7	62	<1	0.944 j	52	NA	**1.18**	**5880**	**147**	<0.2	**1.6**	NA
AMW-12BC CCR	02/14/2019	**5.8**	19.774 j	7.2	75	<1	0.952 j	51	<1	**1.08**	NA	NA	<0.2	NA	1.326
AMW-12S	08/16/2018	**4.4**	<50	4.1 M2	<25	<1	<1	57	<1	0.986 j	87	9	<0.2	<0.3	NA
AMW-12S CCR	10/24/2018	**4.5**	<50	3.9	<25	<1	<1	55	<1	**1.04**	NA	NA	<0.2	NA	**8.46**
AMW-12S	02/14/2019	**4.5**	<50	5.4	35	<1	<1	62	NA	**1.07**	73	11	<0.2	0.184 j	NA
AMW-12S CCR	02/14/2019	**4.5**	<50	1.1	40	<1	<1	60	<1	**1.17**	NA	NA	<0.2	NA	**8.01**
AMW-13BC	08/16/2018	**6.5**	67	6.7	140	<1	1.03	361	<1	0.636 j	**12700**	**103**	<0.2	**0.401**	NA
AMW-13BC	02/13/2019	6.7	57	6.5	140	<1	0.908 j	356	NA	0.66 j	**11300**	**100**	<0.2	0.143 j	NA
AMW-13BC CCR	02/13/2019	6.7	74	6.8	140	<1	0.799 j	361	<1	0.594 j	NA	NA	<0.2	NA	1.541
AMW-13S	08/16/2018	**5.3**	<50	17	140	<1	<1	90	<1	0.681 j	80	**80**	<0.2	0.219 j	NA
AMW-13S	02/13/2019	**5.4**	<50	16	140	<1	<1	125	NA	<1	18	6	<0.2	<0.3	NA
AMW-14BC	08/20/2018	6.8	251	20	130	<1	<1	47	<1	<1	**2520**	**110**	<0.2	<0.3	NA
AMW-14BC	02/26/2019	6.9	239	21	120	<1	<1	53	NA	<1	**2820**	**126**	<0.2	<0.3	NA
AMW-14S	08/20/2018	**5.5**	53	24	87	<1	3.4	64	<1	**4.02**	**7120**	50	<0.2	**0.333**	NA
AMW-14S	02/26/2019	**5.7**	34.789 j	20	45	<1	1.98	51	NA	**2.54**	**3920**	33	<0.2	**0.303**	NA
AMW-15BC	08/20/2018	6.9	197	16	110	<1	<1	46	<1	<1	**1420**	**80**	<0.2	0.158 j	NA
AMW-15BC	02/26/2019	7.0	191	15	84	<1	<1	48	NA	<1	**1310**	**84**	<0.2	0.157 j	NA
AMW-15S	08/20/2018	**5.1**	94	25	93	<1	0.635 j	74	<1	**1.06**	**1320**	45	<0.2	**2.68**	NA
AMW-15S	02/26/2019	**5.3**	80	27	79	<1	<1	68	NA	**1.35**	**699**	44	0.097 j	**1.29**	NA
AMW-15S CCR	02/26/2019	**5.3**	78	26	65	<1	0.36 j	69	<1	**1.31**	NA	NA	<0.2	NA	0.79
AMW-15S	05/14/2019	**5.23**	89	23	83	<1	0.547 j	67	NA	**1.25**	**1170**	47	0.12 j	**1.9**	NA
AMW-16BC	08/21/2018	**5.6**	27.2 j	3.8	<25	<1	<1	18	<1	**11.4**	**306**	33	<0.2	**2.05**	NA
AMW-16BC CCR	10/23/2018	**5.9**	<50	4	<25	<1	<1	18	<1	**12.6**	NA	NA	<0.2	NA	0.6374
AMW-16BC	02/13/2019	**5.5**	17.556 j	2.9	<25	<1	<1	17	NA	**12.7**	23	26	<0.2	**2.11**	NA
AMW-16BC CCR	02/13/2019	**5.5**	<50	2.9	38	<1	<1	17	<1	**12.8**	NA	NA	<0.2	NA	1.369
AMW-17BC	08/21/2018	6.9	280	67	200	<1	1.58	45	<1	0.983 j	**898**	**68**	<0.2	0.24 j	NA
AMW-17BC	02/13/2019	7.1	288	65	210	<1	2.36	49	NA	**2.74**	**2060**	**130**	<0.2	<0.3	NA
AMW-17S	08/21/2018	**4.5**	75	26	30	<1	<1	86	<1	0.612 j	18	**70**	<0.2	0.197 j	NA
AMW-17S CCR	10/23/2018	**3.9**	61	21	45	<1	<1	86	<1	**1.34**	NA	NA	0.131 j	NA	2.744
AMW-17S	02/13/2019	**4.7**	62	25	47	<1	<1	97	NA	**1.08**	131	37	<0.2	**0.325**	NA
AMW-17S CCR	02/13/2019	**4.7**	64	21	66	<1	<1	95	<1	**1.08**	NA	NA	<0.2	NA	3.009
AMW-18S	08/20/2018	**5.9**	**2100**	59	220	<1	**16.5**	113	<1	**6.51**	**13400**	**316**	<0.2	**0.688**	2.66
AMW-18S	02/26/2019	**6.1**	**1580**	45	160	<1	**12.5**	92	NA	**5.22**	**11400**	**265**	<0.2	**0.687**	NA
AMW-18S CCR	02/26/2019	**6.1**	**1650**	49	170	<1	**11.3**	94	<1	**5.34**	NA	NA	<0.2	NA	1.858
AMW-19BC	08/17/2018	**6.2**	70	4.6	64	<1	<1	34	<1	<1	**2240**	**56**	<0.2	0.239 j	NA
AMW-19BC	02/25/2019	**6.3**	73	7.1	78	<1	<1	32	NA	<1	**2240**	**59**	<0.2	0.106 j	NA
AMW-19S	08/17/2018	**4.6**	46.632 j	15	52	<1	0.341 j	62	<1	**2.08**	**2390**	37	<0.2	**2.22**	NA
AMW-19S	02/25/2019	**5.1**	34.342 j	17	72	<1	<1	60	NA	**1.92**	**2410**	39	<0.2	**2.01**	NA
AMW-20BC	08/17/2018	**5.0**	24.295 j	14	55	<1	1.2	38	<1	**3.38**	**2850**	43	<0.2	**3.12**	NA
AMW-20BC	02/25/2019	**5.4**	23.366 j	14	88	<1	0.989 j	42	NA	**2.99**	**3010**	**53**	<0.2	**2.68**	NA
AMW-20S	08/17/2018	**4.7**	24.746 j	14	66	<1	1.86	33	<1	**4.49**	**3730**	42	<0.2	**3.02**	NA
AMW-20S	02/25/2019	**5.2**	22.392 j	17	77	<1	1.79	35	NA	**4.5**	**3670**	47	<0.2	**2.8**	NA
AMW-21BC	08/20/2018	**11.4**	48.1 j	0.59	390	<1	2.33	332	<1	0.568 j	**1380**	14	<0.2	**0.656**	NA
AMW-21S	08/20/2018	**5.3**	40.8 j	11	75	<1	0.441 j	39	<1	0.665 j	**1820**	36	<0.2	**2.4**	NA
AMW-22BC	08/20/2018	7.4	291	18	190	<1	2.17	65	<1	<1	**709**	**90**	<0.2	0.118 j	NA
AMW-22BC	02/27/2019	7.5	283	24	200	<1	2.04	64	NA	<1	**723**	**92**	<0.2	<0.3	NA
AMW-22S	08/20/2018	**4.6**	52	25	82	<1	0.427 j	200	0.436 j	**1.06**	**994**	46	0.147 j	**1.12**	NA
AMW-22S	02/27/2019	**4.7**	39.117 j	21	83	<1	0.369 j	126	NA	0.985 j	**466**	25	<0.2	**0.645**	NA
AMW-23BC	08/17/2018	**6.1**	97	19	79	<1	<1	40	<1	<1	**2090**	**71**	<0.2	**0.317**	NA
AMW-23BC	02/25/2019	**6.1**	96	21	110	<1	<1	42	NA	<1	**2180**	**77**	<0.2	**0.329**	NA
AMW-23S	08/17/2018	**5.5**	236	14	65	<1	<1	53	<1	**1.97**	**3720**	50	<0.2	**2.63**	NA
AMW-23S	02/25/2019	**5.3**	235	16	82	<1	<1	55	NA	**1.48**	**4720**	**54**	<0.2	**2.39**	NA
AMW-23S CCR	03/06/2019	**5.6**	222	14	80	<1	<1	52	<1	**1.57**	NA	NA	<0.2	NA	0.579
BGMW-09	08/21/2018	**5.5**	49.9 j	83	**570**	<1	0.54 j	203	0.543 j	**5.38**	**720**	**314**	<0.2	**2.92**	NA
BGMW-09	10/23/2018	**5.8**	<50	19	190	<1	<1	110	<1	**3.52**	**3180**	**120**	<0.2	**2.68**	NA
BGMW-09	02/27/2019	**5.8**	25.194 j	24	200	<1	0.402 j	133	NA	**2.42**	**2070**	**84**	<0.2	**1.74**	NA
BGMW-09 CCR	02/27/2019	**5.8**	23.307 j	23	220	<1	0.474 j	130	<1	**2.79**	NA	NA	0.136 j	NA	0.543
BGMW-09	03/06/2019	**6.0**	<50	22	210	<1	<1	136	<1	<1	**1190**	35	<0.2	**0.926**	NA
BGMW-09	05/14/2019	**5.73**	31.907 j	17	170	<1	0.612 j	138	NA	**6.4**	**4790**	**215**	<0.2	**1.69**	NA
BGMW-09	06/18/2019	**5.58**	<50	38	330	<1	<1	162	<1	**3.39**	**1100**	**123**	<0.2	**3.24**	NA
BGMW-10	08/16/2018	**5.4**	36.915 j	24	59	<1	<1	129	<1	**1.74**	**2580**	**82**	<0.2	0.14 j	NA
BGMW-10	10/23/2018	**4.7**	<50	27 M2	65	<1	<1	105	<1	**1.72**	**1420**	**94**	<0.2	**0.394**	NA
BGMW-10	03/06/2019	**4.7**	<50	31	90	<1	<1	147	<1	**3.52**	**3350**	**88**	<0.2	<0.3	NA
BGMW-10	06/17/2019	**4.94**	<50	23	80	<1	<1	110	<1	**2.14**	**3070**	**90**	<0.2	<0.3	NA
BW-01	08/15/2018	**6.0**	**772**	69	250	<1	<1	46	<1	**3.09**	**5430**	**513**	0.092 j	<0.3	NA
BW-01	10/22/2018	**6.0**	**764**	50	280	<1	<1	50	<1	**1.52**	**7350**	**560**	<0.2	<0.3	NA
BW-01	11/28/2018	**6.0**	**750**	48	270	<1	<1	54	<1	**1.94**	**4260**	**659**	0.092 j	<0.3	NA
BW-01	02/11/2019	**6.0**	538	41	220	<1	<1	35	NA	0.971 j	**2390**	**542**	0.088 j	<0.3	NA
BW-01	03/06/2019	**6.2**	590	47	220	<1	<1	35	<1	<1	**1610**	**333**	<0.2	<0.3	NA
BW-01	06/17/2019	**6.06**	448	23	160	<1	<1	32	<1	<1	**3850**	**630**	<0.2	<0.3	NA
CCR-100S IMP	08/20/2018	**4.5**	24.5 j	6.7 M2	110	<1	<1	518	<1	**4.78**	29	**100**	0.089 j	0.169 j	3.41
CCR-100S	10/23/2018	**4.3**	<50	4.9	83	<1	<1	554	<1	**5.05**	NA	NA	0.105 j	NA	3.99
CCR-100S IMP	02/13/2019	**4.4**	<50	12	81	<1	<1	574	NA	**5.16**	23	**110**	0.129 j	0.224 j	NA
CCR-100S	02/13/2019	**4.4**	<50	4.5	74	<1	<1	579	<1	**5.16**	NA	NA	0.166 j	NA	4.24
CCR-101S	10/23/2018	NM	30.502 j	4.2	39	<1	<1	80	<1	0.693 j	NA	NA	<0.2	NA	0.84
CCR-101S	10/24/2018	**5.4**	32.165 j	5	42	<1	<1	80	<1	0.686 j	NA	NA	<0.2	NA	0.799
CCR-101S	02/25/2019	**5.1**	31.479 j	0.64	42	<1	<1	76	<1	0.638 j	NA	NA	<0.2	NA	0.893
CCR-102S	10/23/2018	**6.0**	**1380**	16	150	<1	**44.7**	151	<1	<1	NA	NA	<0.2	NA	1.95
CCR-102S	02/26/2019	**5.9**	659	9.3	100	<1	**27.9**	82	<1	<1	NA	NA	<0.2	NA	1.614
CCR-103S	10/23/2018	**5.6**	399	83	180	<1	1.28	126	<1	0.466 j	NA	NA	<0.2	NA	1.821
CCR-103S	02/26/2019	**5.6**	457	85	200	<1	0.56 j	123	<1	0.355 j	NA	NA	<0.2	NA	1.95
CCR-104S	10/23/2018	6.5	**2740**	58	320	<1	**93.4**	218	<1	**4.68**	NA	NA	<0.2	NA	0.413
CCR-104S	02/26/2019	**6.2**	**2560**	61	300	<1	**70.9**	190	<1	**4.08**	NA	NA	0.081 j	NA	0.558
CCR-105S	10/23/2018	**5.8**	**825**	5.6	180	<1	0.563 j	133	<1	**5.81**	NA	NA	<0.2	NA	1.247
CCR-105S	03/26/2019	**5.8**	**891**	2.2	210	<1	0.584 j	133	<1	**5.44**	NA	NA	<0.2	NA	1.486
CCR-106S	10/23/2018	**5.8**	**1000**	48	160	<1	0.818 j	116	<1	**4.6**	NA	NA	<0.2	NA	0.655
CCR-106S	03/26/2019	**5.5**	**1100**	58	200	<1	<1	128	<1	**2.7**	NA	NA	<0.2	NA	0.463
CCR-107S	10/24/2018	**5.0**	147	12	65	<1	<1	109	<1	**5.42**	NA	NA	<0.2	NA	0.58
CCR-107S	02/13/2019	**4.8**	106	12	46	<1	<1	105	<1	**4.5**	NA	NA	<0.2	NA	1.134

	PARAME	40CFR257 APPENDIX III CONSTITUE			INORGANIC PARAMETERS (TOTAL CONCENTRATION)									IONUCLI
FACILITY NAME: Reporting Units	**S.U.**	**ug/L**	**mg/L**	**mg/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**pCi/L**
DATE UPDATED: CAC 02L Standard	**6.5-8.5**	**700**	**250**	**500**	**1***	**10**	**700**	**2**	**1***	**300**	**50**	**0.2***	**0.3***	**5^**
SPREADSHEET UPDATED BY: nd (Surficial Unit)	**3.4-6.8**	**50**	**54.7**	**163**	**1**	**1**	**641**	**1**	**13.7**	**413.8**	**838**	**0.2**	**0.471**	**23.4**
SPREADSHEET CHECKED BY: l (Cape Fear Unit)	**5.3-8.3**	**256**	**23**	**385**	**1**	**1**	**342**	**1**	**1**	**11600**	**1560**	**0.2**	**0.3**	**3.01**
Provisional Background (Black Creek Unit)	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**

		PARAME	40CFR257 APPENDIX III CONSTITUE			INORGANIC PARAMETERS (TOTAL CONCENTRATION)									IONUCLI
Sample ID	**Sample Collection Date**	**pH**	**Boron**	**Sulfate**	**Total Dissolved Solids**	**Antimony**	**Arsenic**	**Barium**	**Cadmium**	**Cobalt**	**Iron**	**Manganese**	**Thallium**	**Vanadium**	**Total Radium**
CCR-108S	10/24/2018	6.7	**865**	20	160	<1	5.35	124	<1	**2.12**	NA	NA	<0.2	NA	1.17
CCR-108S	02/13/2019	6.9	**956**	20	150	<1	4.52	124	<1	**2.22**	NA	NA	<0.2	NA	0.85
CCR-109S	10/24/2018	**6.3**	**997**	29	170	<1	0.756 j	95	<1	**5.1**	NA	NA	<0.2	NA	0.696
CCR-109S	02/13/2019	**6.3**	**877**	26	140	<1	0.515 j	80	<1	**4.56**	NA	NA	<0.2	NA	0.795
CCR-110S	10/24/2018	**6.2**	**2680**	37	340	<1	<1	90	<1	**22.4**	NA	NA	0.101 j	NA	0.656
CCR-110S	02/14/2019	**6.3**	**2280**	32	320	<1	<1	81	<1	**18.7**	NA	NA	<0.2	NA	0.49
CCR-111S	10/24/2018	6.6	**1710**	83	440	<1	6.34	114	<1	**15.2**	NA	NA	<0.2	NA	1.984
CCR-111S	02/14/2019	6.6	**1750**	73	460	<1	4.85	103	<1	**11.4**	NA	NA	<0.2	NA	2.042
CCR-112D	10/24/2018	**8.9**	121	10	100	<1	2.87	51	<1	<1	NA	NA	<0.2	NA	0.6159
CCR-112D	02/14/2019	8.1	148	14	170	<1	3.9	79	<1	<1	NA	NA	<0.2	NA	1.816
CCR-112S	10/24/2018	6.5	**2690**	96	390	<1	1.58	175	<1	**3.95**	NA	NA	<0.2	NA	1.165
CCR-112S	02/14/2019	**6.4**	**2550**	94	410	<1	1.25	168	<1	**4.11**	NA	NA	<0.2	NA	1.446
CCR-113D	10/24/2018	7.2	173	14	130	<1	5.33	188	<1	<1	NA	NA	<0.2	NA	1.559
CCR-113D	03/25/2019	7.5	175	14	150	<1	6.71	193	<1	<1	NA	NA	<0.2	NA	2.008
CCR-113S	10/24/2018	**6.2**	251	26	400	<1	<1	115	<1	<1	NA	NA	<0.2	NA	1.388
CCR-113S	03/26/2019	**6.3**	218	30	**510**	<1	<1	122	<1	0.453 j	NA	NA	0.111 j	NA	0.833
CCR-114D	10/24/2018	6.8	62	33	160	<1	3.22	40	<1	0.825 j	NA	NA	<0.2	NA	1.141
CCR-114D	03/26/2019	7.2	106	70	350	<1	2.08	51	<1	<1	NA	NA	<0.2	NA	0.85
CCR-115D	10/23/2018	6.7	29.785 j	1.7	220	<1	0.671 j	**735**	<1	**1.22**	NA	NA	<0.2	NA	0.196
CCR-115D	03/26/2019	6.8	29.605 j	1.3	260	<1	0.992 j	**867**	<1	**1.5**	NA	NA	<0.2	NA	1.029
CCR-115S	10/23/2018	**5.6**	236	29	160	<1	0.616 j	87	<1	**2.84**	NA	NA	<0.2	NA	0.614
CCR-115S	03/26/2019	**5.7**	214	31	190	<1	0.406 j	85	<1	**2.84**	NA	NA	<0.2	NA	0.523
CCR-116S	10/24/2018	**5.8**	29.636 j	2	33	<1	<1	4.286 j	<1	0.461 j	NA	NA	<0.2	NA	0.3717
CCR-116S	02/27/2019	**5.5**	28.036 j	1.6	52	<1	<1	2.51 j	<1	<1	NA	NA	<0.2	NA	0.626
CCR-117S	10/24/2018	**6.3**	422	16	150	<1	**72.9**	169	<1	**1.9**	NA	NA	<0.2	NA	1.519
CCR-117S	02/26/2019	6.8	**871**	30	180	<1	**124**	198	<1	**4.19**	NA	NA	<0.2	NA	1.499
CCR-118S	10/24/2018	**6.4**	78	7.1	71	<1	5.04	84	<1	<1	NA	NA	<0.2	NA	0.863
CCR-118S	02/26/2019	**5.6**	104	16	40	<1	1.41	74	<1	<1	NA	NA	<0.2	NA	2.652
CCR-119S	10/23/2018	**5.3**	78	22	89	<1	0.756 j	204	<1	0.604 j	NA	NA	0.09 j	NA	1.736
CCR-119S	02/25/2019	**5.3**	60	22	97	<1	0.586 j	164	<1	0.348 j	NA	NA	0.126 j	NA	2.193
CCR-120S	10/23/2018	**5.5**	70	24	74	<1	6.1	67	<1	**3.13**	NA	NA	<0.2	NA	0.948
CCR-120S	02/25/2019	**6.2**	75	21	66	<1	3.64	59	<1	0.644 j	NA	NA	<0.2	NA	1.002
CCR-121S	10/23/2018	**5.4**	661	52	98	<1	0.548 j	81	<1	0.949 j	NA	NA	<0.2	NA	1.081
CCR-121S	02/25/2019	**5.3**	545	46	95	<1	0.435 j	95	<1	**1.19**	NA	NA	<0.2	NA	1.575
CCR-122S	02/25/2019	**5.2**	31.7 j	13	74	<1	<1	49	<1	**1.54**	NA	NA	<0.2	NA	0.967
CMW-05	08/20/2018	**6.4**	**1680**	30	260	<1	0.705 j	113	<1	<1	198	30	<0.2	**12.6**	NA
CMW-05	10/23/2018	**6.1**	**940**	25	140	<1	1.21	84	<1	<1	**402**	**195**	<0.2	**2.08**	NA
CMW-05	02/13/2019	**6.2**	698	22	170	<1	0.393 j	105	NA	0.581 j	88	**239**	<0.2	**1.52**	NA
CMW-05	03/25/2019	**6.5**	**1420**	24	220	<1	1.11	100	<1	<1	**471**	**229**	<0.2	**1.47**	NA
CMW-05	05/14/2019	**6.11**	**1000**	26	180	<1	0.43 j	98	NA	<1	120	**97**	<0.2	**2.8**	NA
CMW-05	06/17/2019	**6.14**	**1640**	34	230	<1	<1	133	<1	<1	125	42	<0.2	**1.54**	NA
CMW-06 CCR	10/23/2018	6.6	**3440**	18	490	<1	**194**	525	<1	<1	NA	NA	<0.2	NA	2.555
CMW-06 CCR	02/26/2019	6.8	**3360**	7.9	490	<1	**162**	544	<1	<1	NA	NA	<0.2	NA	2.73
CMW-06R	08/20/2018	**5.7**	**1430**	47	170	<1	**12.9**	108	<1	**2.01**	**7880**	**175**	<0.2	**2.52**	NA
CMW-06R	10/23/2018	**6.3**	**2330**	60	260	<1	**41.5**	153	<1	**2.39**	**9310**	**344**	<0.2	**1.84**	NA
CMW-06R	02/25/2019	**5.4**	425	33	130	<1	1.77	65	NA	**3.28**	**5850**	**106**	<0.2	**1.81**	NA
CMW-06R CCR	02/25/2019	**5.4**	419	33	110	<1	1.93	65	<1	**3.33**	NA	NA	<0.2	NA	0.903
CMW-06R	03/06/2019	**5.6**	424	36	140	<1	1.94	66	<1	**3.54**	**5930**	**105**	<0.2	**1.87**	NA
CMW-06R	06/18/2019	**6.06**	**2230**	60	280	<1	**29**	150	<1	**2.42**	**9490**	**316**	<0.2	**1.64**	NA
CMW-07	08/21/2018	**5.7**	45.8 j	0.89	200	<1	1.18	158	<1	**6.88**	**9840**	**281**	<0.2	**0.666**	NA
CMW-07	10/23/2018	**5.7**	<50	1.9	240	<1	<1	172	<1	**9.22**	**10500**	**277**	<0.2	**0.867**	NA
CMW-07	03/06/2019	**6.0**	<50	1.4	180	<1	<1	304	**4**	**4.36**	**4220**	**230**	<0.2	**0.53**	NA
CMW-07	06/17/2019	**5.77**	<50	1.4	220	<1	<1	208	<1	**7.71**	**8050**	**289**	<0.2	**0.52**	NA
CMW-08	08/21/2018	**4.9**	233	14	37	<1	<1	35	<1	0.669 j	12	34	<0.2	0.256 j	NA
CMW-08	10/23/2018	**5.0**	78	14	54	<1	<1	36	<1	<1	**390**	19	<0.2	**0.675**	NA
CMW-08	03/25/2019	**5.0**	73	13	52	<1	<1	36	<1	<1	99	23	<0.2	<0.3	NA
CMW-08	06/18/2019	**4.90**	83	13	85	<1	<1	34	<1	<1	122	16	<0.2	**0.356**	NA
CMW-10	08/21/2018	6.6	120	47	**670**	<1	2.81	190	<1	**6.13**	**21200**	**271**	0.097 j	**32.2**	NA
CMW-10	10/23/2018	**6.1**	69	58	330	<1	<1	74	<1	**2.25**	**2500**	**116**	<0.2	**2.48**	NA
CMW-10	03/25/2019	**5.6**	<50	41	170	<1	<1	43	<1	<1	**382**	26	<0.2	**0.439**	NA
CMW-10	06/17/2019	**6.14**	80	57	300	<1	<1	88	<1	**4.66**	**1870**	**202**	<0.2	**0.756**	NA
CTMW-01	08/20/2018	**6.3**	172	36	120	<1	0.621 j	46	<1	**4**	**3700**	**133**	<0.2	**0.548**	NA
CTMW-01	10/23/2018	**6.2**	53	8.1	73	<1	3.27	27	<1	**5.16**	**2270**	**85**	<0.2	**5.93**	NA
CTMW-01	02/13/2019	**6.3**	115	32	120	<1	1.01	48	NA	**4.65**	**3800**	**134**	<0.2	**1.21**	NA
CTMW-01	03/25/2019	**6.2**	131	35	140	<1	<1	45	<1	**2.41**	**2610**	**115**	<0.2	**0.621**	NA
CTMW-01	06/17/2019	**6.17**	133	37	140	<1	<1	45	<1	**1.7**	**3240**	**128**	<0.2	**0.719**	NA
CW-01	08/15/2018	**5.9**	21.747 j	9.5	200	<1	2.5	168	<1	**11.8**	**32300**	**411**	**0.211**	**46.3**	NA
CW-01	10/22/2018	**5.9**	<50	20	200	<1	<1	50	<1	**2.8**	**1180**	**202**	<0.2	**1.48**	NA
CW-01	11/27/2018	**5.8**	<50	21	230	<1	<1	46	<1	**3.18**	**1130**	**177**	<0.2	**2.96**	NA
CW-01	02/12/2019	**5.6**	<50	23	280	<1	<1	56	NA	<1	114	**81**	0.114 j	0.101 j	NA
CW-01	03/25/2019	**5.9**	<50	26	270	<1	<1	57	<1	**1.45**	278	**87**	<0.2	<0.3	NA
CW-01	06/17/2019	**5.87**	<50	18	250	<1	<1	66	<1	**7.78**	**7360**	**607**	<0.2	<0.3	NA
CW-02	08/15/2018	**5.9**	<50	4.5	380	<1	1.17	68	<1	**8.39**	**18300**	**230**	0.133 j	**19.2**	NA
CW-02	10/22/2018	**6.5**	<50	3.6	120	<1	2.48	50	<1	**6.04**	**17500**	**359**	<0.2	**9.6**	NA
CW-02	11/27/2018	**5.8**	<50	5.5	180	<1	0.732 j	53	<1	**4.57**	**9220**	**84**	0.141 j	**14.9**	NA
CW-02	03/25/2019	**6.3**	<50	4.1	140	<1	<1	40	<1	**6.15**	**10500**	**254**	<0.2	**2.38**	NA
CW-02	06/17/2019	**6.18**	<50	5	140	<1	1.03	40	<1	**6.74**	**14900**	**292**	<0.2	**1.34**	NA
CW-03	08/16/2018	**5.7**	431	63	200	<1	<1	52	<1	0.542 j	**462**	40	<0.2	**0.937**	NA
CW-03	10/22/2018	**6.1**	**718**	95	320	<1	<1	68	<1	<1	132	24	<0.2	**0.528**	NA
CW-03	11/28/2018	**6.0**	574	74	260	<1	<1	61	<1	<1	133	36	<0.2	**0.362**	NA
CW-03	02/12/2019	**6.0**	297	26	140	<1	<1	35	NA	<1	69	31	<0.2	<0.3	NA
CW-03	03/25/2019	**5.9**	279	25	130	<1	<1	34	<1	<1	86	34	<0.2	<0.3	NA
CW-03	06/17/2019	**5.79**	218	17	110	<1	<1	31	<1	<1	**350**	42	<0.2	**0.5**	NA
CW-04	08/16/2018	**5.9**	21.083 j	20	170	<1	<1	90	<1	**9.07**	**8830**	**1240**	<0.2	<0.3	NA
CW-04	10/22/2018	**6.2**	<50	18	160	<1	<1	86	<1	**10.3**	**8880**	**1240**	<0.2	<0.3	NA
CW-04	11/28/2018	**5.4**	17.964 j	24	110	<1	<1	68	<1	**5.2**	**1590**	**515**	<0.2	0.122 j	NA
CW-04	02/12/2019	**5.2**	18.75 j	23	120	<1	<1	65	NA	**5.05**	**933**	**417**	<0.2	<0.3	NA
CW-04	03/25/2019	**5.3**	<50	23	120	<1	<1	67	<1	**6.44**	**1710**	**536**	<0.2	<0.3	NA
CW-04	06/17/2019	**5.90**	<50	11	160	<1	<1	94	<1	**12.9**	**9780**	**1510**	<0.2	<0.3	NA
DMW-01	08/21/2018	**5.9**	75	8.4	32	<1	<1	13	<1	<1	**2050**	**68**	0.173 j	0.119 j	NA
DMW-02	08/16/2018	**11.1**	260	24	160	<1	<1	323	<1	<1	48	1.815 j	<0.2	<0.3	NA
DMW-02	02/14/2019	**10.8**	259	22	120	<1	<1	208	NA	<1	11	<5	<0.2	**0.331**	NA
DMW-02	05/14/2019	**10.59**	270	26	120	<1	<1	200	NA	<1	6.885 j	<5	<0.2	0.113 j	NA
DMW-03	08/16/2018	**5.6**	293	55	180	<1	0.454 j	79	<1	**42.5**	**42300**	**3360**	<0.2	<0.3	NA
DMW-03	11/28/2018	**5.8**	316	59	170	<1	0.465 j	80	<1	**44.9**	**41200**	**3190**	<0.2	<0.3	NA
DMW-03	02/12/2019	**5.9**	303	58	200	<1	0.473 j	81	NA	**45.4**	**36400**	**3240**	<0.2	<0.3	NA
DMW-03	05/13/2019	**5.77**	343	58	180	<1	0.416 j	83	NA	**45.4**	**40400**	**3360**	0.098 j	<0.3	NA
IABMW-01	08/16/2018	6.5	**972**	29	**730**	**1.08**	**12.1**	476	<1	**3.81**	**3660**	**625**	**0.301**	**10.3**	NA
IABMW-01	11/28/2018	6.8	**959**	30	**700**	0.769 j	9.52	418	<1	**2.52**	**1190**	**461**	**0.391**	**13.5**	NA
IABMW-01	02/12/2019	6.7	**967**	30	**710**	0.606 j	7.8	406	NA	**2.34**	**925**	**410**	**0.316**	**9.4**	NA
IABMW-01S	08/16/2018	**6.0**	210	4.8	340	<1	1.38	184	<1	**35.7**	**42000**	**5230**	<0.2	<0.3	1.828
IABMW-01S	11/28/2018	**6.2**	212	4.9	330	<1	1.28	199	<1	**37.5**	**40700**	**5260**	<0.2	<0.3	1.47
IABMW-01S	02/12/2019	**6.1**	182	5	360	<1	0.843 j	179	NA	**36.3**	**28200**	**5200**	0.096 j	<0.3	NA
IABMW-02S	08/15/2018	**6.2**	**1280**	81	440	<1	1.01	206	<1	**61.8**	**24300**	**4060**	<0.2	<0.3	NA

	PARAME	40CFR257 APPENDIX III CONSTITUE			INORGANIC PARAMETERS (TOTAL CONCENTRATION)									IONUCLI
FACILITY NAME: Reporting Units	S.U.	ug/L	mg/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L
DATE UPDATED: CAC 02L Standard	6.5-8.5	700	250	500	1*	10	700	2	1*	300	50	0.2*	0.3*	5^
SPREADSHEET UPDATED BY: nd (Surficial Unit)	3.4-6.8	50	54.7	163	1	1	641	1	13.7	413.8	838	0.2	0.471	23.4
SPREADSHEET CHECKED BY: l (Cape Fear Unit)	5.3-8.3	256	23	385	1	1	342	1	1	11600	1560	0.2	0.3	3.01
Provisional Background (Black Creek Unit)	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE

		PARAME	40CFR257 APPENDIX III CONSTITUE			INORGANIC PARAMETERS (TOTAL CONCENTRATION)									IONUCLI
Sample ID	Sample Collection Date	pH	Boron	Sulfate	Total Dissolved Solids	Antimony	Arsenic	Barium	Cadmium	Cobalt	Iron	Manganese	Thallium	Vanadium	Total Radium
IABMW-02S	11/28/2018	**6.3**	**1190**	78	410	<1	1.29	171	<1	**42.6**	**17200**	**2830**	0.111 j	<0.3	NA
IABMW-02S	02/12/2019	**6.1**	**1220**	76	410	<1	0.657 j	175	NA	**59.3**	**12500**	**3230**	0.142 j	<0.3	NA
IABMW-03	11/27/2018	**6.0**	634	35	230	0.6 j	5.78	172	<1	**3.39**	57	**52**	**3.21**	**7.68**	NA
IABMW-03	02/12/2019	**5.8**	**738**	44	240	<1	4.06	188	NA	**6.52**	85	**112**	**2.64**	**2.56**	NA
IABMW-03S	08/16/2018	**6.0**	635	100	280	<1	1.78	240	<1	**1.61**	**70300**	**1480**	<0.2	**1.95**	NA
IABMW-03S	11/27/2018	**6.2**	**837**	56	300	<1	7.28	404	<1	**1.73**	**59600**	**1170**	<0.2	**0.787**	1.584
IABMW-03S	02/12/2019	**6.1**	621	110	340	<1	2.15	256	NA	**1.61**	**72300**	**1470**	<0.2	**0.405**	NA
IABMW-03S	05/13/2019	**5.99**	**716**	130	350	<1	2.15	280	NA	**1.68**	**80900**	**1640**	<0.2	**0.623**	NA
IMW-01BC	08/15/2018	6.7	152	19	200	<1	<1	121	<1	0.481 j	**1280**	**91**	<0.2	<0.3	NA
IMW-01BC	11/27/2018	6.7	156	18	250	<1	<1	131	<1	0.626 j	**4230**	**97**	<0.2	<0.3	NA
IMW-01BC	02/12/2019	6.9	155	18	230	<1	<1	120	NA	<1	**2150**	37	<0.2	<0.3	NA
IMW-01S	08/15/2018	**4.6**	<50	24	83	<1	<1	169	<1	**4.68**	98	**76**	<0.2	0.183 j	1.408
IMW-01S	11/27/2018	**4.9**	<50	23	110	<1	<1	162	<1	**7**	42	**115**	0.128 j	0.121 j	1.095
IMW-01S	02/12/2019	**4.9**	<50	23	100	<1	<1	162	NA	**3.42**	8.868999 j	**86**	0.091 j	<0.3	NA
IMW-02BC	08/15/2018	7.9	274	10	290	<1	1.19	42	<1	<1	246	28	<0.2	<0.3	NA
IMW-02BC	11/27/2018	7.7	274	11	310	<1	1.29	50	<1	<1	234	31	<0.2	0.105 j	NA
IMW-02BC	02/12/2019	7.9	283	13	310	<1	1.36	49	NA	<1	194	33	<0.2	<0.3	NA
IMW-03BC	08/15/2018	**6.4**	44.001 j	4.9	99	<1	<1	311	<1	**1.69**	**6430**	**178**	<0.2	<0.3	NA
IMW-03BC	11/27/2018	**6.4**	49.294 j	5.1	130	<1	<1	293	<1	0.859 j	**5940**	**94**	<0.2	<0.3	NA
IMW-03BC	02/12/2019	6.6	38.461 j	4.2	110	<1	<1	216	NA	<1	**1800**	24	<0.2	<0.3	NA
IMW-03S	08/15/2018	**6.4**	<50	0.19	92	<1	0.407 j	283	<1	**14**	**33100**	**577**	<0.2	<0.3	0.828
IMW-03S	11/27/2018	**6.1**	21.516 j	0.37	100	<1	<1	264	<1	**14.2**	**15700**	**554**	0.12 j	<0.3	0.831
IMW-03S	02/13/2019	**6.2**	<50	0.66	74	<1	<1	217	NA	**9.69**	**24000**	**480**	<0.2	**1.76**	NA
IMW-04BC	08/15/2018	**6.3**	18.463 j	3.4	51	<1	<1	38	<1	0.429 j	**23000**	**594**	0.134 j	0.251 j	NA
IMW-04BC	11/27/2018	**6.3**	18.725 j	3.1	89	<1	<1	39	<1	<1	**20900**	**598**	<0.2	0.196 j	NA
IMW-04BC	02/12/2019	**6.3**	<50	2.7	70	<1	<1	38	NA	<1	**20300**	**591**	<0.2	<0.3	NA
IMW-04S	08/15/2018	**6.2**	58	0.45	67	<1	**34**	108	<1	**1.72**	**16500**	**299**	<0.2	**6.74**	0.589
IMW-04S	11/27/2018	**6.3**	32.455 j	2.1	99	<1	**20.7**	62	<1	**1.35**	**12800**	**303**	<0.2	**5.75**	1.207
IMW-04S	02/12/2019	**6.2**	<50	2.9	70	<1	9.9	45	NA	**1.46**	**11500**	**364**	<0.2	**3.52**	NA
IMW-04S	05/13/2019	**6.13**	34.95 j	2.3	61	<1	**11.1**	70	NA	**1.58**	**15300**	**379**	0.174 j	**3.46**	NA
IMW-05BC	08/15/2018	**6.2**	56	29	140	<1	0.427 j	39	<1	0.515 j	**46100**	**566**	<0.2	**0.395**	NA
IMW-05BC	11/27/2018	6.9	59	26	210	<1	0.36 j	103	<1	<1	**37200**	**523**	<0.2	0.224 j	NA
IMW-05BC	02/12/2019	**6.5**	20.282 j	29	200	<1	0.393 j	71	NA	<1	**37700**	**539**	<0.2	<0.3	NA
IMW-05S	08/15/2018	**6.2**	164	16	90	<1	2.28	69	<1	**24**	**31700**	**847**	<0.2	<0.3	0.845
IMW-05S	11/27/2018	**6.4**	295	19	160	<1	2.53	101	<1	**30.5**	**41600**	**915**	<0.2	<0.3	0.755
IMW-05S	02/12/2019	**6.3**	287	24	160	<1	2.15	116	NA	**27.4**	**38000**	**796**	<0.2	<0.3	NA
IMW-06S	11/27/2018	**6.3**	72	1.2	110	<1	**20.1**	62	<1	**7.88**	**13800**	**1020**	<0.2	**2.29**	NA
IMW-06S	02/12/2019	**6.3**	45.772 j	1.4	79	<1	**17.6**	47	NA	**8.55**	**13300**	**1180**	<0.2	**1.1**	NA
IMW-06S	05/13/2019	**6.16**	49.511 j	0.32	83	<1	**20.7**	34	<1	**5.25**	**10300**	**669**	0.113 j	**2.29**	0.2951
IMW-07S	11/28/2018	**3.5**	110	81	68	<1	<1	75	<1	**11.5**	**12700**	**163**	0.16 j	**0.63**	NA
IMW-07S	02/12/2019	**3.5**	77	180	91	<1	<1	70	NA	**10.8**	**9900**	**177**	0.09 j	0.287 j	NA
IMW-07S	05/13/2019	**4.10**	182	54	100	<1	<1	66	<1	**10**	**14200**	**135**	0.105 j	**0.759**	1.059
LLMW-01	08/21/2018	**6.2**	137	5.1	270	**2.07**	**30.5**	**1160**	<1	0.713 j	**1080**	**602**	**1.95**	**12.3**	NA
LLMW-01	03/26/2019	6.7	90	4.6	260	**1.09**	**18.5**	**854**	NA	0.805 j	**657**	**406**	**0.611**	**5.38**	NA
LLMW-01S	08/21/2018	6.8	68	1	96	<1	0.405 j	63	<1	**7.88**	**745**	**1840**	0.174 j	<0.3	NA
LLMW-01S	03/26/2019	6.8	62	1	130	<1	0.486 j	64	NA	**8.02**	**826**	**1850**	0.113 j	0.118 j	NA
MW-01	08/20/2018	**5.3**	60	17	96	<1	3.23	93	<1	**4.94**	**442**	49	0.104 j	**7.03**	NA
MW-01 CCR	10/23/2018	**5.3**	54	16	92	<1	4.42	94	<1	**4.23**	NA	NA	0.122 j	NA	0.67
MW-01	02/13/2019	**5.4**	46.071 j	18	95	<1	2.53	91	NA	**4.93**	**421**	**57**	0.094 j	**5.57**	NA
MW-01 CCR	02/13/2019	**5.4**	51	17	68	<1	2.5	95	<1	**4.92**	NA	NA	0.109 j	NA	1.055
MW-01	05/14/2019	**5.26**	52	19	81	<1	2.04	96	NA	**3.47**	**354**	**55**	0.115 j	**3.39**	NA
MW-02	08/21/2018	**5.9**	**711**	18	110	<1	<1	86	<1	**1.18**	**2650**	**1390**	<0.2	**0.756**	NA
MW-02 CCR	10/24/2018	**5.4**	569	19	120	<1	<1	101	<1	<1	NA	NA	<0.2	NA	0.4805
MW-02	02/13/2019	**5.6**	351	15	87	<1	<1	68	NA	0.42 j	66	**407**	<0.2	**0.348**	NA
MW-02 CCR	02/13/2019	**5.6**	347	16	65	<1	<1	65	<1	0.431 j	NA	NA	<0.2	NA	0.977
MW-03	08/21/2018	7.1	**2070**	20	**510**	<1	**595 M4**	576	<1	**4.29**	**47900**	**2750**	<0.2	0.207 j	4.45
MW-03 CCR	10/24/2018	6.9	**2730**	32	490	<1	**588**	507	<1	**7.09**	NA	NA	<0.2	NA	1.814
MW-03	02/13/2019	7.0	**2560**	68	**520**	<1	**598**	477	NA	**6.63**	**49600**	**2610**	<0.2	0.231 j	NA
MW-03 CCR	02/13/2019	7.0	**2710**	74	**550**	<1	**610**	493	<1	**6.59**	NA	NA	<0.2	NA	2.82
MW-03	05/14/2019	6.80	**2500**	72	**540**	<1	**633**	531	NA	**9.5**	**55500**	**2650**	<0.2	<0.3	NA
SMW-03	08/15/2018	**5.4**	64	20	130	<1	0.499 j	61	<1	**82.9**	**6610**	**3470**	<0.2	**0.321**	NA
SMW-03	11/28/2018	**5.6**	71	23	120	<1	0.474 j	60	<1	**75.6**	**3340**	**2580**	<0.2	0.177 j	NA
SMW-03	02/12/2019	**5.4**	52	21	170	<1	<1	63	NA	**84.6**	**1200**	**3510**	<0.2	<0.3	NA
SMW-04	08/15/2018	**5.8**	405	11	140	<1	**13.1**	116	<1	0.585 j	**19000**	**215**	<0.2	**3.52**	NA
SMW-04	11/27/2018	**6.2**	556	19	250	<1	**44**	227	<1	**1.81**	**38300**	**392**	<0.2	**1.35**	NA
SMW-04	02/12/2019	**6.0**	432	17	210	<1	**40.7**	182	NA	**1.83**	**33800**	**358**	<0.2	**1.03**	NA
SMW-05	08/16/2018	**6.3**	200	35	150	<1	1.78	159	<1	**10.9**	**59900**	**1130**	<0.2	**0.319**	NA
SMW-05	11/27/2018	**6.3**	149	34	190	<1	2.88	170	<1	**1.96**	**46200**	**526**	<0.2	**0.697**	NA

COLOR NOTES
Bold highlighted concentration indicates exceedance of the 15A NCAC 02L .0202 Standard or the IMAC. (Effective date for 15A NCAC 02L .0202 Standard and IMAC is April 1, 2013)
Bold highlighted concentration indicates exceedance of the Inactive Hazardous Sites Branch PSRG Table (May 2019) for Industrial Health
Turbidity of Sample ≥ 10 NTUs
Provisional Background Threshold Values reflect the values represented in the NCDEQ letter dated 10/11/2017.
Analytical data review has not been completed for this dataset.

ABBREVIATION NOTES	
BGS - below ground surface	ND - Not detected
BOD - Biologic Oxygen Demand	NE - Not established
CB - Compliance Boundary	NF - No Flow
COD - Chemical Oxygen Demand	NM - Not measured
Deg C - Degrees Celsius	NTUs - Nephelometric Turbidity Units
DMAs - dimethylarsinic acid	pCi/L - picocuries per liter
DUP - Duplicate	PSRG - Primary Soil Remediation Goals
Eh - Redox Potential	RL - Reporting Limit
ft - Feet	SeCN - selnocynante
GPM - gallons per minute	SeMe (IV) - Selenomethionine
IMAC - Interim Maximum Allowable Concentrations. From the 15A NCAC 02L Standard, Appendix 1, April, 1	SPLP - Synthetic Precipitation Leaching Procedure
MDC - Minimum Detectable Concentration	S.U. - Standard Units
MeSe - Methylseleninic acid	TCLP - Toxicity Characteristic Leaching Procedure
mg/kg - milligrams per kilogram	ug/L - micrograms per liter
mg/L - milligrams per liter	ug/mL - microgram per milliliter
mg-N/L - Milligram nitrogen per liter	umhos/cm - micromhos per centimenter
MMAs - monomethylarsonic acid	Well Locations referenced to NAD83 and elevations referenced to NAVD88
mV - millivolts	
NA - Not available or Not Applicable	

ATTACHMENT C

2018 AND 2019 NPDES GROUNDWATER DATA

10172680000628508523 7/24/19

DUKE ENERGY

H.F. Lee Energy Complex
Duke Energy Progress
1199 Black Jack Church Road
Goldsboro, N.C. 27530

July 22, 2019

State of North Carolina
Department of Environmental Quality
Division of Water Quality
Information Processing Unit
1617 Mail Service Center
Raleigh, North Carolina 27699-1617

Subject: Duke Energy Progress LLC – H.F. Lee Energy Complex
June 2019 Groundwater Monitoring Sampling and Analysis Results

Dear Sir or Madam:

Duke Energy Progress, LLC (DEP) sampled the 13 compliance wells around the active ash basin and the inactive ash basins at the H.F. Lee Energy Complex (NPDES Permit #NC0003417) on June 17-18, 2019. Please find attached two copies of the results on the DEQ approved electronic version of the Groundwater Compliance Report Form (GW-59CCR).

All values reported on the attached reports are dependent on the accuracy of approved analytical methods used to measure parameters.

Should you have questions regarding this report, please contact Andrew Shull at (919) 546-2104.

> *I certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.*

Sincerely,

Jeffery D. Hines

Jeffery D. Hines
Station Manager
H.F. Lee Energy Complex

70172680000068308516

Cc: Mr. Michael Wagner
Public Utilities Director
City of Goldsboro
P.O. Drawer A
Goldsboro, NC 27533-9701

Duke eCc: Mr. Ed Sullivan – EC13K
Mr. John Toepfer – NC15
Mr. Ryan Czop – EC13K
Mr. Steve Cahoon – NC15
Mr. Matt Hanchey – NC20
Mr. Andrew Shull – NC15

Attachments

GROUNDWATER QUALITY MONITORING COMPLIANCE REPORT FORM

Mail original and 1 copy to: DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER QUALITY - INFORMATION PROCESSING UNIT
1617 MAIL SERVICE CENTER, RALEIGH, NC 27699-1617 Phone: (919) 733-3221

FACILITY INFORMATION Please Print Clearly or Type

Facility Name: Lee Steam Electric Plant
Permit Name (if different): Duke Energy Progress, LLC
Facility Address: 1677 Old Smithfield Road (Street)
Goldsboro (City) NC (State) 27530 (Zip) County Wayne

Permit Type: NPDES
PERMIT Number: NC0003417
Expiration Date: 05/31/2013
TYPE OF PERMITTED OPERATION BEING MONITORED: Ash Impoundment Groundwater

Contact Person: Andrew Shull
Telephone# (919) 546-2104
Well Location/Site Name: Lee Ash Pond Wells
No. of wells to be sampled: 13 (from Permit)

Monitoring Well Construction Information

Well ID Number (From Permit)

	Units	CTMW-1	CMW-5	CMW-6R	CMW-7	CMW-8	CMW-10	BGMW-9	BGMW-10	CW-1	CW-2	CW-3	CW-4	BW-1	MW-	MW-	MW-	MW-	MW-
Well Depth [ft below land surface]	ft	37.00	15.00	15.00	25.00	20.00	17.00	12.00	15.00	20.50	20.60	20.30	26.00	13.00					
Measuring Point (toc) [ft above land surface]	ft	3.52	3.52	2.21	-0.04	3.33	3.09	3.17	2.07	2.86	2.77	2.90	2.24	2.77					
Well Diameter	in	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0					
Screen Top [ft below land surface]	ft	32.00	5.00	5.00	15.00	10.00	7.00	2.00	5.00	5.50	5.60	5.30	11.00	3.00					
Screen Bottom [ft below land surface]	ft	37.00	15.00	15.00	25.00	20.00	17.00	12.00	15.00	20.50	20.60	20.30	26.00	13.00					
Relative Measuring Point Elevation	ft	69 70	69.78	75.37	78.78	77.43	73.29	76.17	78.46	72.83	73.90	74.83	76.03	77.64					

Sampling Information and Field Analysis

CHECK IF DRY WELL AT TIME OF SAMPLING			☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY
	15A-2L	Units	CTMW-1	CMW-5	CMW-6R	CMW-7	CMW-8	CMW-10	BGMW-9	BGMW-10	CW-1	CW-2	CW-3	CW-4	BW-1	MW-	MW-	MW-	MW-	MW-
Sample Date			06/17/2019	06/17/2019	06/18/2019	06/17/2019	06/18/2019	06/17/2019	06/18/2019	06/17/2019	06/17/2019	06/17/2019	06/17/2019	06/17/2019	06/17/2019					
Volume of Water pumped/bailed		gal	2.11	0.86	0 89	1.51	1.13	1.69	1.53	0.89	0.61	5.53	1.75	0.28	0.55					
Temperature (00010)		deg. C	21	22	18	21	19	21	20	21	21	19	20	20	21					
Odor (00085)			None	None	None	None	None	None	None	None	None	None	None	None	None					
Appearance			Clear	Clear	Clear	Clear	Clear/Floc	Clear	Clear/Floc	Clear	Clear	Clear/Fines	Clear	Clear	Clear					
Turbidity (82078)		NTU	9.7	1.2	2 4	8.8	5.7	9.6	2.9	2.9	1.7	9.7	9.6	7.8	7.4					
Dissolved Oxygen (00300)		mg/L	0.19	0.33	0.23	0.29	1.6	0.68	0.18	0.18	0.22	0.24	0.16	0.18	0.19					
Oxidation Reduction Potential (00090)		mV	128	350	141	246	460	242	308	392	221	180	340	242	232					
Specific Cond - field (00094)		umhos/cm	220	391	453	408	59	535	532	112	470	257	181	290	300					
Water Level [ft below measuring pt.] (82546)		ft	3 07	8.88	5.91	16.00	17.38	11.53	4.5	4.27	9.95	11.2	7.92	12.7	5.6					
pH - field (00400)	6.5 - 8.5	SU	**6.2**	**6.1**	**6.1**	**5.8**	**4.9**	**6.1**	**5.6**	**4.9**	**5.9**	**6.2**	**5.8**	**5.9**	**6.1**					

Laboratory Information

Laboratory Name: Duke Energy Analytical Laboratory[2]
Sample Analysis Date: June 18 - July 1, 2019
Certification #: NC DENR # 248
Samples for metals were collected unfiltered: ☑ Yes ☐ No
and field acidified: ☑ Yes ☐ No

	IMAC[1]	15A-2L	Units	CTMW-1	CMW-5	CMW-6R	CMW-7	CMW-8	CMW-10	BGMW-9	BGMW-10	CW-1	CW-2	CW-3	CW-4	BW-1	MW-	MW-	MW-	MW-	MW-
TDS - Total Diss. Solids (70300)	---	500	mg/l	140	230	280	220	85	300	330	80	250	140	110	160	160					
Cl - Chloride (00940)	---	250	mg/l	14	10	28	37	4	79	110	11	90	33	7.4	17	5.9					
As - Arsenic (01002)	---	10	ug/l	<1	<1	**29**	<1	<1	<1	<1	<1	<1	1.03	<1	<1	<1					
SO4 - Sulfate (00945)	---	250	mg/l	37	34	60	1.4	13	57	38	23	18	5.0	17	11	23					
Nitrate (NO3) as N (00620)	---	10	mg/l	<0.023	0.95	<0.023	<0.023	0.18	<0.023	<0.023	0.06	<0.046	<0.023	0.08	<0.023	0.07					
Cd - Cadmium (01027)	---	2	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1					
Cr - Chromium (01034)	---	10	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5					
Cu - Copper (01042)	---	1	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0 005	0 01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005					
Fe - Iron (01045)	---	300	ug/l	**3240**	125	**9490**	**8050**	122	**1870**	**1100**	**3070**	**7360**	**14900**	**350**	**9780**	**3850**					
Hg - Mercury (71900)	---	1	ug/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0 05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05					
Mn - Manganese (01055)	---	50	ug/l	**128**	42	**316**	**289**	16	**202**	**123**	**90**	**607**	**292**	42	**1510**	**630**					
Ni - Nickel (01067)	---	100	ug/l	<5	<5	<5	6	<5	<5	<5	<5	8	<5	<5	12	<5					
Pb - Lead (01051)	---	15	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1					
Zn - Zinc (01092)	---	1	mg/l	<0.005	<0.005	<0.005	0.043	<0.005	<0.005	0.014	<0.005	0.006	<0.005	<0.005	0.005	<0.005					
Ba - Barium (01007)	---	700	ug/l	45	133	150	208	34	88	162	110	66	40	31	94	32					
B - Boron (01022)	---	700	ug/l	133	**1640**	**2230**	<50	83	80	<50	<50	<50	<50	218	<50	448					
Tl - Thallium (01059)	0.2	NE	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2					
Sb - Antimony (01097)	1	NE	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1					
Se - Selenium (01147)	---	20	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	10.1	<1	<1					
Alkalinity - (00410)	---	NE	mg/l	41 9	143	122	145	5.59	72.7	42.6	7.58	77	57	61.2	89.7	109					
Al - Aluminum (01105)	---	NE	ug/l	187	52	80	27	136	324	108	96	59	73	333	20	64					
Be - Beryllium (01012)	4	NE	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1					
HCO3 - Bicarbonate (00440)	---	NE	mg/l	41.9	143	122	145	5.59	72.7	42.6	7.58	77	57	61.2	89.7	109					
Ca - Calcium (00916)	---	NE	mg/l	13.5	44.1	41.6	16.3	1.44	22.3	25.2	4.24	18.4	5.78	17.9	28.1	38.1					
CO3 - Carbonate (00445)	---	NE	mg/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5					
Co - Cobalt (01037)	1	NE	ug/l	1.7	<1	2.42	7.71	<1	4.66	3.39	2.14	7.78	6.74	<1	12.9	<1					
Mg - Magnesium (00927)	---	NE	mg/l	4.8	9.86	10.5	12.5	1.9	10.1	8.39	2.4	11	4.36	7.24	5.38	5.71					
Mo - Molybdenum (01062)	---	NE	ug/l	<1	10.6	34.2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1					
K - Potassium (00937)	---	NE	mg/l	4.6	6.97	6.26	0.574	0.458	2.19	0.677	4.84	1.04	0.977	2.3	0.384	4.12					
Na - Sodium (82035)	---	NE	mg/l	14.7	15.4	25.8	43.3	5.46	62.4	59.9	6.3	52.3	29.3	6.62	14	5.42					
TSS - Total Susp. Solids (70031)	---	NE	mg/l	<5	<5	<5	<5	<5	16	<5	<5	8	11	7	<5	<5					
V - Vanadium (01087)	0.3	NE	ug/l	0.719	1.54	1.64	0.52	0.356	0.756	3.24	<0.3	<0.3	1.34	0.50	<0.3	<0.3					
Sr - Strontium (01082)	---	NE	mg/l	0.099	1.27	0.953	0.116	0.028	0.154	0 16	0.064	0.098	0.049	0.302	0.101	0.886					

Notes
NE = Not Established
NS Not Sampled (insufficient volume)
urbidity is field analyzed for information use only

BOLD values equal or exceed the corresponding 2L standard

Qualifiers:

I certify that, to the best of my knowledge and belief, the information submitted in this report is true, accurate, and complete, and that the laboratory analytical data was produced using approved methods of analysis by a DWQ-certified laboratory. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Jeffery D. Hines
Permittee (or Authorized Agent) Name and Title Please print or type

Jeffery D. Hines
Signature of Permittee (or Authorized Agent)

7/22/2019
Date

GW-59CCR 09/2015

1 -The IMACs were issued in 2010, 2011, and 2012; however NCDEQ has not established a 2L for these constituents as described in 15A NCAD 02L.0202 (c). For this reason, IMAC's noted on the report are for reference only.
2 -Alkalinity, Bicarbonate, and Carbonate were subcontracted by Duke Energy Analytical Laboratory to Pace Analytical Services, LLC in Huntersville, NC.

H.F. Lee Energy Complex
Duke Energy Progress
1199 Black Jack Church Road
Goldsboro, N.C. 27530

April 17, 2019

State of North Carolina
Department of Environmental Quality
Division of Water Quality
Information Processing Unit
1617 Mail Service Center
Raleigh, North Carolina 27699-1617

Subject: Duke Energy Progress LLC – H.F. Lee Energy Complex
March 2019 Groundwater Monitoring Sampling and Analysis Results

Dear Sir or Madam:

Duke Energy Progress, LLC (DEP) sampled the 13 compliance wells around the active ash basin and the inactive ash basins at the H.F. Lee Energy Complex (NPDES Permit #NC0003417) on March 6 and March 25, 2019. Please find attached two copies of the results on the DEQ approved electronic version of the Groundwater Compliance Report Form (GW-59CCR).

All values reported on the attached reports are dependent on the accuracy of approved analytical methods used to measure parameters.

Should you have questions regarding this report, please contact Andrew Shull at (919) 546-2104.

> *I certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.*

Sincerely,

Jeffery D. Hines
Station Manager
H.F. Lee Energy Complex

Cc: Mr. Michael Wagner
Public Utilities Director
City of Goldsboro
P.O. Drawer A
Goldsboro, NC 27533-9701

Duke eCc: Mr. Ed Sullivan – EC13K
Mr. John Toepfer – NC15
Mr. Ryan Czop – EC13K
Mr. Steve Cahoon – NC15
Mr. Matt Hanchey – NC20
Mr. Andrew Shull – NC15

Attachments: GW59-CCR report

GROUNDWATER QUALITY MONITORING
COMPLIANCE REPORT FORM

Mail original and 1 copy to:
DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER QUALITY - INFORMATION PROCESSING UNIT
1617 MAIL SERVICE CENTER, RALEIGH, NC 27699-1617 Phone: (919) 733-3221

FACILITY INFORMATION

Please Print Clearly or Type

Facility Name: Lee Steam Electric Plant
Permit Name (if different): Duke Energy Progress, LLC
Facility Address: 1677 Old Smithfield Road (Street)
Goldsboro (City) NC (State) 27530 (Zip) County Wayne

Permit Type: NPDES
PERMIT Number: NC0003417
Expiration Date: 05/31/2013
TYPE OF PERMITTED OPERATION BEING MONITORED: Ash Impoundment Groundwater

Contact Person: Andrew Shull
Well Location/Site Name: Lee Ash Pond Wells
Telephone# (919) 546-2104
No. of wells to be sampled: 13 (from Permit)

Monitoring Well Construction Information

Well ID Number (From Permit)

	Units	CTMW-1	CMW-5	CMW-6R	CMW-7	CMW-8	CMW-10	BGMW-9	BGMW-10	CW-1	CW-2	CW-3	CW-4	BW-1	MW-	MW-	MW-	MW-	MW-
Well Depth [ft below land surface]	ft	37.00	15.00	15.00	25.00	20.00	17.00	12.00	15.00	20.50	20.60	20.30	26.00	13.00					
Measuring Point (toc) [ft above land surface]	ft	3.52	3.52	2.21	-0.04	3.33	3.09	3.17	2.07	2.86	2.77	2.90	2.24	2.77					
Well Diameter	in	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0					
Screen Top [ft below land surface]	ft	32.00	5.00	5.00	15.00	10.00	7.00	2.00	5.00	5.50	5.60	5.30	11.00	3.00					
Screen Bottom [ft below land surface]	ft	37.00	15.00	15.00	25.00	20.00	17.00	12.00	15.00	20.50	20.60	20.30	26.00	13.00					
Relative Measuring Point Elevation	ft	69.70	69.78	75.37	78.78	77.43	73.29	76.17	78.46	72.83	73.90	74.83	76.03	77.64					

Sampling Information and Field Analysis

CHECK IF DRY WELL AT TIME OF SAMPLING			☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY
	15A-2L	Units	CTMW-1	CMW-5	CMW-6R	CMW-7	CMW-8	CMW-10	BGMW-9	BGMW-10	CW-1	CW-2	CW-3	CW-4	BW-1	MW-	MW-	MW-	MW-	MW-
Sample Date			03/25/2019	03/25/2019	03/06/2019	03/06/2019	03/25/2019	03/25/2019	03/06/2019	03/06/2019	03/25/2019	03/25/2019	03/25/2019	03/25/2019	03/06/2019					
Volume of Water pumped/bailed		gal	2.38	0.97	0.78	2.72	0.81	1.07	0.45	0.83	1.17	5.02	1.48	1.18	1.32					
Temperature (00010)		deg. C	19	16	13	17	17	16	12	13	18	18	16	16	13					
Odor (00085)			Musty	None	None	Not Noted	None	None	None	None	None	None	None	None	None					
Appearance			Clear/Floc	Clear	Clear	Not Noted	Clear/Floc	Clear	Clear/Floc	Clear	Clear/Fines	Clear/Fines	Clear	Clr/Fines/Floc	Clear/Fines					
Turbidity (82078)		NTU	7.3	1.1	3.2	6.0	1.9	4.9	6.4	5.2	3.6	8.9	2.2	6.7	5.1					
Dissolved Oxygen (00300)		mg/L	0.23	0.27	0.24	0.32	3.33	1.33	1.11	0.13	1.67	0.23	0.10	0.32	1.50					
Oxidation Reduction Potential (00090)		mV	104	259	148	270	433	379	325	473	429	206	469	418	277					
Specific Cond - field (00094)		umhos/cm	214	371	167	334	62	219	368	144	477	207	220	164	377					
Water Level [ft below measuring pt.] (82546)		ft	1.19	6.14	4.18	8.40	12.75	8.00	3.47	3.36	6.64	9.42	3.80	9.53	4.18					
pH - field (00400)	6.5 - 8.5	SU	**6.2**	6.5	**5.6**	**6.0**	**5.0**	**5.6**	**6.0**	**4.7**	**5.9**	**6.3**	**5.9**	**5.3**	**6.2**					

Laboratory Information

Laboratory Name: Duke Energy Analytical Laboratory[2]
Sample Analysis Date: March 7 - 29, 2019
Certification #: NC DENR # 248
Samples for metals were collected unfiltered: ☑ Yes ☐ No
and field acidified: ☑ Yes ☐ No

	IMAC[1]	15A-2L	Units	CTMW-1	CMW-5	CMW-6R	CMW-7	CMW-8	CMW-10	BGMW-9	BGMW-10	CW-1	CW-2	CW-3	CW-4	BW-1	MW-	MW-	MW-	MW-	MW-
TDS - Total Diss. Solids (70300)	---	500	mg/l	140	220	140	180	52	170	210	90	270	140	130	120	220					
Cl - Chloride (00940)	---	250	mg/l	13	10	14	21	4.5	22	52	18	100	23	6.7	18	6.8					
As - Arsenic (01002)	---	10	ug/l	<1	1.11	1.94	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1					
SO4 - Sulfate (00945)	---	250	mg/l	35	24	36	1.4	13	41	22	31	26	4.1	25	23	47					
Nitrate (NO3) as N (00620)	---	10	mg/l	<0.023	<0.023	<0.023	<0.023	0.25	<0.023	0.03	<0.023	0.03	0.05	0.04	<0.023	<0.023					
Cd - Cadmium (01027)	---	2	ug/l	<1	<1	<1	**4**	<1	<1	<1	<1	<1	<1	<1	<1	<1					
Cr - Chromium (01034)	---	10	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5					
Cu - Copper (01042)	---	1	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005					
Fe - Iron (01045)	---	300	ug/l	**2610**	**471**	**5930**	**4220**	99	**382**	**1190**	**3350**	278	**10500**	86	**1710**	**1610**					
Hg - Mercury (71900)	---	1	ug/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05					
Mn - Manganese (01055)	---	50	ug/l	**115**	**229**	**105**	**230**	23	26	35	**88**	**87**	**254**	34	**536**	**333**					
Ni - Nickel (01067)	---	100	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	7	<5					
Pb - Lead (01051)	---	15	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1					
Zn - Zinc (01092)	---	1	mg/l	<0.005	<0.005	<0.005	0.135	<0.005	<0.005	0.016	<0.005	<0.005	<0.005	<0.005	0.008	<0.005					
Ba - Barium (01007)	---	700	ug/l	45	100	66	304	36	43	136	147	57	40	34	67	35					
B - Boron (01022)	---	700	ug/l	131	**1420**	424	<50	73	<50	<50	<50	<50	<50	279	<50	590					
Tl - Thallium (01059)	0.2	NE	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2					
Sb - Antimony (01097)	1	NE	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1					
Se - Selenium (01147)	---	20	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	13.9	<1	<1					
Alkalinity - (00410)	---	NE	mg/l	37.2	139	11	125	<5	21.3	62	<5	47.9	50.5	72	25.9	122					
Al - Aluminum (01105)	---	NE	ug/l	177	9	389	17	75	535	70	220	93	260	53	32	8					
Be - Beryllium (01012)	4	NE	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1					
HCO3 - Bicarbonate (00440)	---	NE	mg/l	37.2	139	11	125	<5	21.3	62	<5	47.9	50.5	72	25.9	122					
Ca - Calcium (00916)	---	NE	mg/l	13.3	40.9	8.69	23.1	1.56	7.16	22.8	4.52	15.1	6.54	22.2	8.07	51.9					
CO3 - Carbonate (00445)	---	NE	mg/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5					
Co - Cobalt (01037)	1	NE	ug/l	2.41	<1	3.54	4.36	<1	<1	<1	3.52	1.45	6.15	<1	6.44	<1					
Mg - Magnesium (00927)	---	NE	mg/l	4.77	9.46	2.94	11	2.01	3.46	7.54	2.66	10.1	4.33	9.54	3.5	8.82					
Mo - Molybdenum (01062)	---	NE	ug/l	<1	25.9	1.07	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1					
K - Potassium (00937)	---	NE	mg/l	4.63	5.9	1.49	0.762	0.541	0.818	0.693	3.86	0.885	1.19	2.33	0.205	3.85					
Na - Sodium (82035)	---	NE	mg/l	14.9 (B2)	14.9 (B2)	11.8	26.7	5.33 (B2)	30.2 (B2)	36.1	10.6	63.6 (B2, M4)	23.8 (B2)	6.14 (B2)	18.1 (B2)	8.71					
TSS - Total Susp. Solids (70031)	---	NE	mg/l	9	<5	6	<5	<5	6	<5	<5	<5	6	<5	<5	<5					
V - Vanadium (01087)	0.3	NE	ug/l	0.621	1.47	1.87	0.53	<0.3	0.439	0.926	<0.3	<0.3	2.38	<0.3	<0.3	<0.3					
Sr - Strontium (01082)	---	NE	mg/l	0.098	1.17	0.163	0.113	0.03	0.052	0.135	0.084	0.087	0.054	0.396	0.063	1.08					

Notes:
NE = Not Established
NS = Not Sampled (insufficient volume)
Turbidity is field analyzed for information use only.

BOLD values equal or exceed the corresponding 2L standard

Qualifiers: B2 - Target analyte was detected in Method/Prep Blank(s) at a concentration greater than 1/2 the reporting limit but less than the reporting limit. Analyte concentration in sample is valid and may be used for compliance. M4 - The spike recovery value was unusable since the analyte concentration in the sample was disproportionate to the spike level. The associated Laboratory Control Spike was acceptable.

I certify that, to the best of my knowledge and belief, the information submitted in this report is true, accurate, and complete, and that the laboratory analytical data was produced using approved methods of analysis by a DWQ-certified laboratory. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Jeffery D. Hines
Permittee (or Authorized Agent) Name and Title - Please print or type

Signature of Permittee (or Authorized Agent)

4/17/2019
Date

GW-59CCR 09/2015

1 -The IMACs were issued in 2010, 2011, and 2012; however NCDEQ has not established a 2L for these constituents as described in 15A NCAD 02L.0202 (c). For this reason, IMAC's noted on the report are for reference only.

2 -Alkalinity, Bicarbonate, and Carbonate were subcontracted by Duke Energy Analytical Laboratory to Pace Analytical Services, LLC in Huntersville, NC.

H.F. Lee Energy Complex
Duke Energy Progress
1199 Black Jack Church Road
Goldsboro, N.C. 27530

November 20, 2018

State of North Carolina
Department of Environmental Quality
Division of Water Quality
Information Processing Unit
1617 Mail Service Center
Raleigh, North Carolina 27699-1617

Subject: Duke Energy Progress LLC – H.F. Lee Energy Complex
October 2018 Groundwater Monitoring Sampling and Analysis Results

Dear Sir or Madam:

Duke Energy Progress, LLC (DEP) sampled the 13 compliance wells around the active ash basin and the inactive ash basins at the H.F. Lee Energy Complex (NPDES Permit #NC0003417) on October 22 - 23, 2018. Please find attached two copies of the results on the DEQ approved electronic version of the Groundwater Compliance Report Form (GW-59CCR).

All values reported on the attached reports are dependent on the accuracy of approved analytical methods used to measure parameters.

Should you have questions regarding this report, please contact Ryan Czop at (980) 373-2779.

> *I certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.*

Sincerely, Gary M Davis Ops. Supt
For

Jeffery D. Hines
Station Manager
H.F. Lee Energy Complex

Cc: Mr. Michael Wagner
Public Utilities Director
City of Goldsboro
P.O. Drawer A
Goldsboro, NC 27533-9701

Duke eCc: Mr. Ed Sullivan – EC13K
Mr. John Toepfer – NC14
Mr. Ryan Czop – EC13K
Mr. Steve Cahoon – NC14
Mr. Matt Hanchey – NC20
Mr. Andrew Shull – NC14

Attachments: GW-59CCR

GROUNDWATER QUALITY MONITORING COMPLIANCE REPORT FORM

Mail original and 1 copy to: **DEPARTMENT OF ENVIRONMENTAL QUALITY**
DIVISION OF WATER QUALITY - INFORMATION PROCESSING UNIT
1617 MAIL SERVICE CENTER, RALEIGH, NC 27699-1617 Phone: (919) 733-3221

FACILITY INFORMATION

Please Print Clearly or Type

Facility Name: Lee Steam Electric Plant
Permit Name (if different): Duke Energy Progress, LLC
Facility Address: 1677 Old Smithfield Road (Street)
Goldsboro (City) NC (State) 27530 (Zip) County Wayne

Permit Type: NPDES Expiration Date: 05/31/2013
PERMIT Number: NC0003417

TYPE OF PERMITTED OPERATION BEING MONITORED: Ash Impoundment Groundwater

Contact Person: Ryan Czop
Telephone# (980) 373-2779
Well Location/Site Name: Lee Ash Pond Wells
No. of wells to be sampled: 13 (from Permit)

Monitoring Well Construction Information

Well ID Number (From Permit)

		Units	CTMW-1	CMW-5	CMW-6R	CMW-7	CMW-8	CMW-10	BGMW-9	BGMW-10	CW-1	CW-2	CW-3	CW-4	BW-1	MW-	MW-	MW-	MW-
Well Depth [ft below land surface]		ft	37.00	15.00	15.00	25.00	20.00	17.00	12.00	15.00	20.50	20.60	20.30	26.00	13.00				
Measuring Point (toc) [ft above land surface]		ft	3.52	3.52	2.21	-0.04	3.33	3.09	3.17	2.07	2.86	2.77	2.90	2.24	2.77				
Well Diameter		in	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0				
Screen Top [ft below land surface]		ft	32.00	5.00	5.00	15.00	10.00	7.00	2.00	5.00	5.50	5.60	5.30	11.00	3.00				
Screen Bottom [ft below land surface]		ft	37.00	15.00	15.00	25.00	20.00	17.00	12.00	15.00	20.50	20.60	20.30	26.00	13.00				
Relative Measuring Point Elevation		ft	69.70	69.78	75.37	78.78	77.43	73.29	76.17	78.46	72.83	73.90	74.83	76.03	77.64				

Sampling Information and Field Analysis

CHECK IF DRY WELL AT TIME OF SAMPLING			☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ ☐YDRY	☐ DRY	☐ DRY
	15A-2L	Units	CTMW-1	CMW-5	CMW-6R	CMW-7	CMW-8	CMW-10	BGMW-9	BGMW-10	CW-1	CW-2	CW-3	CW-4	BW-1	MW-	MW-	MW-	MW-
Sample Date			10/23/2018	10/23/2018	10/23/2018	10/23/2018	10/23/2018	10/23/2018	10/23/2018	10/23/2018	10/22/2018	10/22/2018	10/22/2018	10/22/2018	10/22/2018				
Volume of Water pumped/bailed		gal	3.88	0.56	0.57	0.75	0.46	3.37	1.45	0.85	1.03	4.56	1.51	0.52	1.75				
Temperature (00010)		deg. C	19	22	18	17	20	21	19	19	19	18	19	19	21				
Odor (00085)			Minor Earthy	None	Minor Earthy	None	None	None	None	None	None	None	None	None	None				
Appearance			Clear	Clear	Clear	Clear	Clear	Cloudy/Turbid	Clear	Clear	Clear	Red/Iron w/ Fines; Surface Film	Clear	Clear	Clear				
Turbidity (82078)		NTU	9.8	2.1	1.6	8.8	8.2	26.2	3.9	9.3	9.1	21.4	6.6	4.6	4.3				
Dissolved Oxygen (00300)		mg/L	0.24	0.28	0.28	0.30	5.22	0.51	0.25	0.43	0.37	0.10	0.22	0.39	0.26				
Oxidation Reduction Potential (00090)		mV	207	280	166	289	374	260	275	412	289	164	300	204	242				
Specific Cond - field (00094)		umhos/cm	77	262	487	410	63	461	344	114	397	179	572	307	518				
Water Level [ft below measuring pt.] (82546)		ft	1.75	7.20	5.55	13.38	14.50	9.22	4.14	3.95	7.55	8.46	1.72	10.35	4.74				
pH - field (00400)	6.5 - 8.5	SU	**6.17**	**6.05**	**6.31**	**5.65**	**4.95**	**6.06**	**5.84**	**4.74**	**5.88**	**6.48**	**6.08**	**6.15**	**6.04**				

Laboratory Information

Laboratory Name: Duke Energy Analytical Laboratory[2]
Sample Analysis Date: October 23 - November 5, 2018
Certification #: NC DENR # 248
Samples for metals were collected unfiltered: ☑ Yes ☐ No
and field acidified: ☑ Yes ☐ No

	IMAC[1]	15A-2L	Units	CTMW-1	CMW-5	CMW-6R	CMW-7	CMW-8	CMW-10	BGMW-9	BGMW-10	CW-1	CW-2	CW-3	CW-4	BW-1	MW-	MW-	MW-	MW-
TDS - Total Diss. Solids (70300)	---	500	mg/l	73	140	260	240	54	330	190	65	200	120	320	160	280				
Cl - Chloride (00940)	---	250	mg/l	4.5	9.4	28	49	4.8	66	48	9.3	70	12	8.5	16	7.4				
As - Arsenic (01002)	---	10	ug/l	3.27	1.21	**41.5**	<1	<1	<1	<1	<1	<1	2.48	<1	<1	<1				
SO4 - Sulfate (00945)	---	250	mg/l	8.1	25	60	1.9	14	58	19	27 (M2)	20	3.6	95	18	50				
Nitrate (NO3) as N (00620)	---	10	mg/l	<0.023	0.14	<0.023	<0.023	0.18	<0.023	<0.046	0.06	<0.046	<0.023	0.11	<0.023	<0.023				
Cd - Cadmium (01027)	---	2	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1				
Cr - Chromium (01034)	---	10	ug/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5				
Cu - Copper (01042)	---	1	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.008	<0.005	<0.005	<0.005				
Fe - Iron (01045)	---	300	ug/l	**2270**	**402**	**9310**	**10500**	**390**	**2500**	**3180**	**1420**	**1180**	**17500**	132	**8880**	**7350**				
Hg - Mercury (71900)	---	1	ug/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.1	<0.05	<0.05				
Mn - Manganese (01055)	---	50	ug/l	**85**	**195**	**344**	**277**	19	**116**	**120**	**94**	**202**	**359**	24	**1240**	**560**				
Ni - Nickel (01067)	---	100	ug/l	<5	<5	<5	7	<5	<5	<5	<5	5	<5	<5	9	<5				
Pb - Lead (01051)	---	15	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	1.02	<1	<1	<1				
Zn - Zinc (01092)	---	1	mg/l	0.006	0.007	<0.005	0.012	<0.005	0.006	0.022	<0.005	0.011	0.009	<0.005	0.009	<0.005				
Ba - Barium (01007)	---	700	ug/l	27	84	153	172	36	74	110	105	50	50	68	86	50				
B - Boron (01022)	---	700	ug/l	53	**940**	**2330**	<50	78	69	<50	<50	<50	<50	**718**	<50	**764**				
Tl - Thallium (01059)	0.2	NE	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2				
Sb - Antimony (01097)	1	NE	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1				
Se - Selenium (01147)	---	20	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	9.69	<1	<1				
Alkalinity - (00410)	---	NE	mg/l	15.2	96.7	133	130	<5	57.3	58.9	<5	45	43	188	97	197				
Al - Aluminum (01105)	---	NE	ug/l	1160	67	188	69	247	3580	141	243	1110	2030	172	68	38				
Be - Beryllium (01012)	4	NE	ug/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1				
HCO3 - Bicarbonate (00440)	---	NE	mg/l	15.2	96.7	133	130	<5	57.3	58.9	<5	45	43	188	97	197				
Ca - Calcium (00916)	---	NE	mg/l	4.54 (B2)	27.0 (B2)	41.9 (B2)	10.8 (B2)	1.47 (B2)	16.4 (B2)	19.0 (B2)	4.04 (B2)	12.0	6.36	59.9	29.3	67.5				
CO3 - Carbonate (00445)	---	NE	mg/l	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5				
Co - Cobalt (01037)	1	NE	ug/l	5.16	<1	2.39	9.22	<1	2.25	3.52	1.72	2.80	6.04	<1	10.3	1.52				
Mg - Magnesium (00927)	---	NE	mg/l	1.86	6.72	10.4	12.0	1.87	7.69	6.04	2.42	7.70	3.21	28.7	4.63	10.2				
Mo - Molybdenum (01062)	---	NE	ug/l	<1	12.2	47.4	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1				
K - Potassium (00937)	---	NE	mg/l	3.94	4.97	7.12	0.528	0.633	1.82	0.792	5.18	1.30	2.14	2.87	0.503	5.27				
Na - Sodium (82035)	---	NE	mg/l	4.10	11.4	26.3	51.8	5.44	58.6	32.4	6.63	47.5	14.6	11.2	12.7	9.86				
TSS - Total Susp. Solids (70031)	---	NE	mg/l	9	<5	<5	<5	<5	120	<5	<5	7	20	<5	<5	<5				
V - Vanadium (01087)	0.3	NE	ug/l	5.93	2.08	1.84	0.867	0.675	2.48	2.68	0.394	1.48	9.60	0.528	<0.3	<0.3				
Sr - Strontium (01082)	---	NE	mg/l	0.033	0.754	1.13	0.107	0.029	0.116	0.116	0.061	0.070	0.053	1.03	0.086	1.43				

Notes:
NE = Not Established
Turbidity is field analyzed for information use only.

BOLD values equal or exceed the corresponding 2L standard

Qualifiers: (B2): Target analyte was detected in Method/Prep Blank(s) at a concentration greater than ½ the reporting limit but less than the reporting limit. Analyte concentration in sample is valid and may be used for compliance purposes.
(M2): Matrix Spike and/or Matrix Spike Duplicate recovery was Low: the associated Laboratory Control Spike (LCS) was acceptable

I certify that, to the best of my knowledge and belief, the information submitted in this report is true, accurate, and complete, and that the laboratory analytical data was produced using approved methods of analysis by a DWQ-certified laboratory. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Gary M Davis Ops Supt.
Permittee (or Authorized Agent) Name and Title - Please print or type

Gary M Davis
Signature of Permittee (or Authorized Agent)

11/20/18
Date

GW-59CCR 09/2015

1 -The IMACs were issued in 2010, 2011, and 2012; however NCDEQ has not established a 2L for these constituents as described in 15A NCAD 02L.0202 (c). For this reason, IMAC's noted on the report are for reference only.
2 -Alkalinity, Bicarbonate, and Carbonate were subcontracted by Duke Energy Analytical Laboratory to Pace Analytical Services, LLC in Huntersville, NC.

I/A

Hart Exhibit 54
Docket No. E-2, Sub 1219

ADVANCED GeoServices
Engineering for the Environment. Planning for People.™
1055 Andrew Drive, Suite A
West Chester, PA 19380-4293
tel 610.840.9100 fax 610.840.9199
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THE ELM CONSULTING GROUP INTERNATIONAL LLC

ENVIRONMENTAL AUDIT IN SUPPORT OF THE COURT APPOINTED MONITOR

Mayo Steam Electric Plant
Roxboro, North Carolina
USA

October 2019

Final Report Issued To:

Duke Energy and the Court Appointed Monitor

Prepared By:

Advanced GeoServices Corp.
and
The Elm Consulting Group International LLC

TABLE OF CONTENTS

1.0 INTRODUCTION

Advanced GeoServices Corp. (AGC) and The Elm Consulting Group International LLC (Elm) (collectively, the Audit Team) are conducting environmental compliance audits (the Audits) of certain coal combustion residuals (CCR) management locations owned or operated by Duke Energy Business Services LLC, Duke Energy Carolinas, LLC, and Duke Energy Progress, Inc. (collectively, Duke Energy). The Audits are being conducted under the direction of Mr. Benjamin Wilson, the Court Appointed Monitor (CAM), pursuant to an Order issued by the U.S. District Court, Eastern District of North Carolina, in case numbers 5:15-CR-62-H, 5:15-CR-67-H, and 5:15-CR-68-H.

The scope of the Audits is set forth in the plea agreements entered into by Duke Energy and the United States in the above cases, the Court's judgments in these cases, and a written Audit scoping document agreed to by Duke Energy and the United States.

1.1 BACKGROUND INFORMATION

The subject of this report is the Audit completed at Duke Energy's Mayo Steam Electric Plant located in Roxboro, North Carolina. The Audit was conducted on July 24-25, 2019, for a total of two days on-site. The Audit Team members were:

Mr. Christopher Reitman, P.E. AGC	Project Director, Audit Team Leader, Sr. Subject Matter Expert (on-site)
Mr. Joseph Cotier, CPEA, Elm	Sr. Environmental Auditor (on-site)
Mr. Bernie Beegle, P.G., AGC	Sr. Subject Matter Expert (off-site)

The facility was represented by:

- Mr. Tom Copolo, Station General Manager
- Mr. Cedric Fairbanks, CCP System Owner

- Mr. Mike Lazar, CCP Engineering & Closure Engineering
- Mr. Tim Hill, General Manager, Regional CCP Operations and Maintenance
- Mr. Bobby Barnes, Manager, Engineering & Closure Engineering
- Mr. Dan Kinateder, Duncan Brewer, CCP Projects
- Ms. Lori Tollie, EHS CCP Permitting and Compliance
- Ms. Kim Witt, EHS CCP Waste & Groundwater
- Mr. Randy Hart, Regulatory Affairs
- Ms. Keeley McCormick, Environmental Rover, EHS CCP Compliance
- Mr. Mike Phillips, Manager, EHS CCP Compliance
- Ms. Brian Fowler, EHS CCP Environmental Field Support
- Ms. Leanne Wilson, Station Environmental Field Support
- Mr. Tim Winters, Station Health and Safety Field Support
- Mr. Keith Higgins, EHS CCP Compliance

1.2 FACILITY OVERVIEW

The Mayo Steam Electric Plant (the Mayo Facility) is located at 10660 Boston Road in Roxboro, Person County, North Carolina. The Mayo Facility is a single unit coal-fired electric generating plant that began operation in 1983.

1.2.1 Ash Management Activities

The following information regarding the on-site CCR management facilities was provided by Duke Energy personnel, the Operations and Maintenance Manual, or the 2017 Annual CCR Inspection Report for the Mayo Facility:

- Active Ash Basin – The Active Ash Basin covers approximately 140 acres with a storage capacity of 1,921 acre-feet and includes the Ash Basin Dam. For regulatory purposes, the Ash Basin Dam has been identified as PERSO-035 by the North

Carolina Department of Environmental Quality (NCDEQ). The Active Ash Basin consists of two areas that are separated by an earthen dike: the Active Ash Basin Pond and the Release Forebay Basin. Historically, several waste streams were discharged/placed into the southern portion of the Active Ash Basin Pond via drainage conveyances and piping. These waste streams included coal pile runoff water, various stormwater flows, sewage treatment plant discharges, and cooling tower blowdown, as well as various low volume wastes including boiler blowdown, air pre-heater wash water, boiler wash water, precipitator wash, oily waste treatment, wastes/backwash water from water treatment processes, plant area washdown water, and the equipment heat exchanger water. The Active Ash Basin Pond flows to the Release Forebay Basin, which discharges into the Mayo Reservoir. According to the 2019 Annual Surface Impoundment Inspection Report, the Active Ash Basin impounds approximately 5.6 million tons of impounded CCR and 475 million gallons of water as of March 19, 2019. Discharges to the Active Ash Basin were terminated on June 27, 2019.

- CCP Monofill – The CCP Monofill is an operational solid waste facility. The CCP Monofill has 11 planned phases with a total area of 103.8 acres. The current Phase 1 has an area of 31 acres. The liner of the CCP Monofill consists of the following: a 60 mil HDPE bonded with a bentonite layer; a secondary 60 mil HDPE leak collection layer; a geocomposite leak detection layer; a primary HDPE liner; 24 inches of No. 57 coarse aggregate drainage/protective cover layer; and a 12-inch bottom ash filter. The CCP Monofill has been designed to provide separation of water that contacts waste surfaces (contact water) from non-contact water. Contact water is managed as leachate while non-contact water is managed as stormwater. Leachate had historically been collected and piped to either a one million-gallon tank system (on-site) or the FGD Settling Pond. The leachate conveyance piping currently directs leachate to the new FGD Settling Basin.

- Flue Gas Desulfurization (FGD) Ponds – There are two FGD Ponds at the Mayo Facility that were formed by two dams that share abutment features. These two ponds are the FGD Settling Pond (identified as PERSO-036 by NCDEQ) and the FGD Forward Flush Pond (identified as PERSO-037 by NCDEQ). The total length of the exterior dam is 2,145 feet. The FGD Settling Pond is active and receives the FGD blowdown water as well as leachate water from the CCP Monofill. Water is pumped out of the FGD Settling Pond to the Thermal Evaporator System. The FGD Settling Pond has an emergency spillway that will direct flow into the Active Ash Basin should the pond's freeboard be exceeded. The FGD Forward Flush Pond was originally used in the bioreactor treatment process. The bioreactor has been decommissioned, and the FGD Forward Flush Pond is inactive and no longer receives the back-flush of the bioreactor. Duke Energy is currently preparing plans to decommission the FGD Ponds starting in late 2019.

- New FGD Settling Basin (Wastewater Treatment) – The New FGD Settling Basin, became operational during the second quarter of 2019 and is utilized to manage leachate from the landfill, FGD blowdown water, and discharges from the thermal evaporator system sumps. The CCR groundwater monitoring system for the Mayo FGD Settling Basin (Wastewater Treatment) consists of 20 groundwater monitoring wells, which were installed in June 2017 through October 2018.

- Thermal Evaporator System – The Thermal Evaporator System is a process whereby the FGD wastewater is pumped to the system for evaporation and condensate recovery. The condensed water can be routed to the cooling tower or used as absorber make-up water. The collected distillate (brine) is used to condition, by wetting, the fly ash for transport and disposal.

- Gypsum Pad – A conveyor transports gypsum from the FGD Building to the Gypsum Pad. The Operations and Maintenance Manual states the Gypsum Pad includes a radial conveyor to deliver the conveyed gypsum to the pad, a truck wash, and truck scales. Most stockpiled gypsum is trucked to Duke Energy's Roxboro Facility. The material is sent via conveyor from the Roxboro Facility to the adjacent Certain-Teed Facility for use in wallboard. Off-spec gypsum at the Mayo Facility is disposed in the CCP Monofill.

Dry handling of fly and bottom ash is the primary management method used at the Mayo Facility. Dry fly ash is disposed of on-site in the CCP Monofill. Bottom ash is sold for beneficial reuse in cement or disposed in the CCP Monofill. Mayo can no longer sluice fly ash or bottom ash to the Active Ash Basin.

1.2.2 Environmental Permits and Programs

The Mayo Facility operates under a number of environmental permits and programs, including:

- **National Pollutant Discharge Elimination System (NPDES) Wastewater Permitting** – NCDEQ issued NPDES Permit No. NC0038377 with an effective date of November 1, 2009 and an expiration date of March 31, 2012. A timely permit renewal application package was submitted to NCDEQ on September 27, 2011. As it relates to CCR and ash management activities, the 2009 NPDES permit covers:
  - Outfall 002: This outfall discharges wastewaters from the Active Ash Basin and treatment system to Mayo Reservoir.
  - Internal outfall 008: This outfall discharges the cooling tower blowdown to the Active Ash Basin Pond and then to the Mayo Reservoir via outfall 002.
  - Internal outfall 009: This outfall discharges the FGD treatment system's wastewaters to the discharge channel upstream of outfall 002 but downstream of the Active Ash Basin, and then to Mayo Reservoir.
  - Eight stormwater outfalls including outfall 010, which discharges the drainage from the haul road for coal ash, limestone, gypsum, and gaseous anhydrous ammonia. All of the stormwater outfalls discharge to Mayo Reservoir.

The 2009 NPDES permit includes provisions for groundwater monitoring if required by NCDEQ. The facility operates a network of 10 compliance wells which are sampled three times a year to determine compliance with groundwater limits pursuant to 15A NCAC 02L.0200. The last groundwater sampling event under the 2009 NPDES permit was conducted in Aril 2018.

On July 13, 2018, NCDEQ issued the renewal of NPDES Permit No. NC0038377 with an effective date of August 1, 2018 and an expiration date of July 31, 2023 (the 2018 NPDES Permit).

As it relates to CCR and ash management activities, the 2018 NPDES permit covers:

- Outfall 002: This outfall discharges wastewaters from the Active Ash Basin and treatment system to Mayo Reservoir. There are a set of limits for normal operations/decanting and a set of limitations for dewatering from this Outfall.
- Outfall 002A: This outfall is for the newly constructed Lined Retention Basin (LRB) and discharges to Mayo Reservoir. Flows of Mayo Facility wastewaters that went to the Ash Basin and then Outfall 002 will be rerouted to the LRB and Outfall 002A and then Outfall 002.
- Internal Outfall 009: This outfall discharges the FGD treatment system's wastewaters to the discharge channel upstream of outfall 002 but downstream of the Active Ash Basin, and then to Mayo Reservoir.
- Outfalls 004, 005, 006c, 006d, 006e: These are stormwater outfalls that were formerly in the Mayo Facility Individual Stormwater permit. Outfalls 006c, 006d, and 006e have been grouted and permanently closed. The original locations for Outfalls 004 and 005 have been permanently closed with the new outfalls directed to Mayo Reservoir via the Effluent Canal and Outfall 002.

The 2018 NPDES Permit eliminated the previous groundwater monitoring requirements.

The constructed seeps are covered by the new NPDES permit. Constructed seeps are constructed features on or within dam structures, such as toe drains or filter blankets conveyed via a constructed channel directly to a receiving water.

- **Special Orders by Consent** – The Mayo Facility operated under a Special Order by Consent (SOC) dated June 25, 2012 (the 2012 SOC) that required installation of a "zero liquid discharge" facility (thermal evaporator) in place of the current FGD bioreactor as part of the wastewater treatment operations. The 2012 SOC included additional monitoring requirements for metals, including mercury, selenium, boron, manganese, and thallium. The 2012 SOC expired on September 1, 2017 with NCDEQ issuing its Final Written Account (closure letter) to Duke Energy on September 22, 2017.

  On August 15, 2018, the North Carolina Environmental Management Commission Special Order by Consent No. EMC SOC WQ S18-005 (SOC) issued to Duke Energy and became effective (the 2018 SOC). The 2018 SOC has an expiration date of "no later than June 30, 2022." The 2018 SOC covers discharges from the following non-constructed seeps: S-01, S-02, S-01A, S-02A, S-02B, S-03, S-04, S-05, S-06, S-07, S-08, S-09, and S-10. Non-constructed seeps are not on or within a dam structure and do not convey wastewater via a pipe or constructed channel directly to a receiving stream.

  The following seeps have been dispositioned due to lack of flow, lack of CCR related compounds, or the fact that their discharge is represented by other seeps: S-03, S-04, S-05, S-06, S-07, and S-09. S-01 and S-02 do not carry monitoring requirements. Seeps S-03, S-04, and S-05 are sampling locations and not seeps.

Seep S-06 is a seep flow to a small channel that originates southeast of the power plant and flows to Mayo Lake. Seeps S-07 and S-09 have no CCR impacts.

For monitoring purposes, the remaining seeps (S-01A, S-02A, S-02B, S-08, and S-10) are represented by instream monitoring in Crutchfield Branch, downstream of all seep contributions. Quarterly monitoring is required for parameters specified in the 2018 SOC. At the time of the Audit, four rounds of sampling had been conducted. No exceedances of Interim Action Levels were noted.

Additional requirements of the 2018 SOC included:

- Payment of an upfront civil penalty within 30 days of SOC issuance. This penalty was paid September 13, 2018.
- Initiation of decanting of the Ash Basin by June 30, 2019. In a letter to NCDEQ dated July 8, 2019, Duke Energy reported commencement of decanting had taken place on June 27, 2019.
- Annual completion of a comprehensive survey of existing and potential new seeps. New non-constructed seeps identified and reported to NCDEQ in the Annual Seep Report are deemed covered by the 2018 SOC. The Annual Seep Survey was conducted on October 16, 2018 with a subsequent report submitted to NCDEQ on April 24, 2019. The 2018 SOC requires the Annual Seep Survey to be submitted by April 30 each year. One new seep, S-11, was identified but determined to be along the same discharge path as S-10 and was subsequently dispositioned by Duke's seep survey contractor, SynTerra.
- Posting of a copy of the Mayo Facility NPDES Permit, the 2018 SOC, and related reports on Duke Energy's external website. All required documents have been posted.

- **NPDES Industrial Stormwater Permitting** – NCDEQ issued Individual Stormwater Permit No. NCS000580, effective January 27, 2017 with an expiration date of December 31, 2021. The permit includes stormwater outfalls 06a and 010, which drain to Mayo Reservoir. Former Outfalls 004, 005, 006c, 006d, and 006e are now covered under the Mayo Facility NPDES permit. Note that Outfalls 006c, 006d, and 006e have been grouted and permanently closed. A Stormwater Pollution Prevention Plan (SWPPP) dated May 2016 associated with the Industrial Stormwater Permit has been developed and implemented.

- **NPDES Construction Stormwater Permitting** – NCDEQ has issued 11 stormwater construction permits that govern activities related to CCR management at the Mayo Facility. These permits were issued by NCDEQ under its General Permit for Construction Activities, No. NCG010000.
  - PERSO-2017-003 was issued October 14, 2016 for Process Water Redirection;
  - PERSO-2018-018 was issued July 2, 2018 for an additional 6.2 acres related to the water redirect project;
  - PERSO-2018-019 was reissued January 22, 2019 for stormwater redirect project;
  - PERSO-2018-016 was issued May 2, 2018 for the Monofill stock pile;
  - PERSO-2018-015 was issued May 1, 2018 for the FGD Pond Decommissioning (work has not yet commenced);
  - PERSO-2018-011 was reissued August 4, 2018 and PERSO-2018-021 was issued July 17, 2018 for the stormwater redirect and LRB stockpiles;
  - PERSO-2018-006 was issued February 1, 2018 for Installation of FGD Monitoring Wells for the water redirect project.
  - PERSO-2013-006 was issued March 5, 2013 for Addendum 2 to Mayo Monofill Phase I;

- PERSO-2019-005 was issued November 26, 2018 for Water Treatment System Pad and Infrastructure; and
- PERSO-2019-007 was issued December 5, 2018 for Seep Collection System.

Erosion and sedimentation control plans were in place for these projects.

In the 2018 Audit, it was noted that Duke Energy self-reported unauthorized wetland and stream impacts in the area of the Lined Retention Basin on February 2, 2018. The area of the self-reported impacts was being implemented under permit Perso-2017-003. The impacts were associated with 227.39 linear feet of stream impact, approximately 1 acre of jurisdictional impacts, and 0.14 acres of permanent impacts in the area of Lined Retention Basin. The Audit Team understands the wetlands were not shown on the original project erosion and sediment control drawings and, as a result, were not incorporated into the project planning for the development of these areas. NCDEQ determined these unauthorized impacts represent violations of North Carolina Administrative codes associated with Wetland Standards (Title 15A NCAC 02B.0231(b)), Stream Standards – Removal of Use (Title 15A NCAC 02B.211(2)), and Failure to Secure a 401 Certification Title (15A NCAC 02H.501), and issued a Notice of Violation (NOV-2018-PC-0152) on June 18, 2018. Duke Energy is pursuing an after-the-fact U.S. Army Corps of Engineers (ACOE) permit for addressing the impacts to this area and submitted an application for a permit modification to ACOE following the 2018 Audit, on July 31, 2018. Duke reports that although it has had no further communications with ACOE on its efforts to permit the previously unpermitted impacts to wetlands and streams, Duke Energy did receive an ACOE individual Water Quality Certification 401 for the previously unpermitted impacts to wetlands and streams for the construction of the Lined Retention Basin, and Duke Energy is still waiting to receive the ACOE 404 Permit. The ACOE 401 Water Quality Certification was received on January 31, 2019.

- **NCDEQ Industrial Stormwater General Permit** – Coverage under NCDEQ's Industrial Stormwater General Permit No. NCG120000 (Landfills) was issued to Duke Energy for industrial stormwater associated with the facility's CCP Monofill. The Certificate of Coverage, No. NCG120101, was issued January 6, 2014 and renewed on November 6, 2018. The Permit includes requirements for outfall monitoring at Outfalls SW01, SW02, and SW03, storage of chemicals on secondary containment, and development of a Sedimentation and Erosion Control Plan. Historical sampling at the Monofill outfalls has shown elevated levels of fecal coliform, likely due to impacts of wildlife in the area. On February 20, 2018, NCDEQ granted Duke Energy regulatory relief for any fecal coliform results in excess of the general permit benchmark of 1,000 colonies per 100 mL. This relief continues through the term of Duke Energy's coverage.

  Duke Energy is continuing discussions with NCDEQ to discontinue stormwater coverage under the Landfills general permit and include Outfalls SW01, SW02, and SW03 in the Mayo Facility NPDES permit.

- **Title V Permitting** – Title V Permit No. 03478T47 was last revised by NCDEQ on September 15, 2017 and has an expiration date of November 30, 2021. The permit for the Mayo Facility covers all site activities including ash and ash basin management. Ash management activities, including fly and bottom ash handling, operation of the Monofill, gypsum handling, and truck transport of ash and gypsum, were listed as sources. Fugitive dust control was included in Section 3.MM of the permit.

- **Spill Prevention, Control, and Countermeasure (SPCC) Plan** – A Tier I Qualified Plan was prepared by Charah, Inc., a contractor to Duke Energy, for water redirect project work, including construction of the LRB. The Tier I SPCC Plan was dated March 20, 2018. The project work was largely completed and Charah had commenced demobilization of equipment and fuel storage tanks at the time of the Audit.

  Charah has also implemented a SPCC Plan that covers activities at the Monofill. This SPCC Plan was dated March 7, 2017.

- **Tier II Reporting** – Hazardous chemicals inventory reporting on Tier II for 2018 has been completed and was submitted on February 13, 2019.

- **CCP Monofill** – The CCP Monofill operates under Solid Waste Permit No. 7305-INDUS-2012 and began accepting brine-conditioned fly ash from the Mayo Facility in 2014. The permit requires semi-annual groundwater monitoring of five (5) monitoring wells and three (3) surface water locations, semi-annual sampling of untreated leachate, a record of the amount of waste received (compiled on a monthly basis), and submittal of an annual report.

  It was reported in the 2018 Audit that Duke Energy identified two integrity issues associated with the leachate force main used to transfer CCP monofill leachate to the FGD ponds in late March and early April 2018. These issues were reported to NCDEQ Division of Waste Management on March 29, 2018. During 2019, there were two additional leachate force main issues that led to releases on January 25, 2019 and June 12, 2019. As a result of these releases, NCDEQ issued a Notice of Violation and a Notice of Intent to enforce on July 22, 2019. NCDEQ stated Duke Energy has violated the following regulation:

"1. 15A NCAC 13B .0505(7)(c) which states in part "leachate shall be contained on site or *properly treated prior to discharge.*"

NCDEQ stated their concern that the issues at Mayo "may be indicative of future problems across the fleet..." NCDEQ requested Duke Energy have a 3rd party engineer review and evaluate the system and identify recommendations for future operations. As a result of these issues the leachate force main was not in service at the time of the 2019 Audit.

- **Waste Unit Compliance Boundaries** – NCDEQ issued a letter dated August 25, 2017 to Duke Energy regarding compliance boundaries for North Carolina coal ash facilities. On February 14, 2018, Duke Energy submitted to NCDEQ an updated compliance boundary map for the Mayo Facility that eliminated the area surrounding the 1981 demolition landfill. On April 19, 2018, Duke Energy submitted to NCDEQ a future compliance boundary for the Mayo Facility that will eliminate the small finger area of the southwest portion of the Ash Basin.

- **North Carolina Coal Ash Management Act of 2014 (CAMA)** – CAMA requires the identification of drinking water supply wells within one-half mile of the facility, submission of Groundwater Assessment Plans, installation and multiple rounds of sampling from Assessment Wells, submission of Groundwater Assessment Reports summarizing groundwater investigations, submission of an Annual Groundwater Protection and Restoration Report, submission of Discharge Assessment Plans to characterize seeps, submission of a Groundwater Corrective Action Plan, and ash basin closure/removal. These activities have been completed in accordance with the schedule required under CAMA.

NCDEQ has assigned the Active Ash Basin at the Mayo Facility an "intermediate risk" classification under CAMA. An intermediate risk classification requires excavation, removal, and safe storage of the facility's coal ash by December 31, 2024. Duke Energy completed improvements to the Active Ash Basin Dam structure and the water supply system of nearby residents, and as a result of these improvements, NCDEQ assigned a "low risk" classification for the Active Ash Basin on November 14, 2018. The low risk classification allows in-place closure activities at the Active Ash Basin and provides an extension of the closure deadline to June 2030. However, on April 1, 2019, NCDEQ issued a closure determination directing Duke Energy to excavate all of the CAMA-related coal ash from the Mayo Facility and properly dispose of it. On April 26, 2019, Duke Energy filed an administrative petition challenging NCDEQ's determination.

The current Interim Monitoring Plan (IMP) for groundwater monitoring at the Mayo Facility includes sampling 8 wells quarterly, 29 wells semi-annually, and 8 surface water locations. Duke Energy submitted the 2018 CAMA Interim Monitoring Report dated April 30, 2019 to NCDEQ.

Duke Energy submitted to NCDEQ the Mayo Facility's 2018 Groundwater Protection and Restoration Annual Report on January 25, 2019 and its 2018 Surface Water Protection and Restoration Annual Report on January 21, 2019.

- **Federal Coal Combustion Residuals Rule (CCR Rule)** – The CCR Rule (40 CFR, part 257, Subpart D) identifies standards for the disposal of CCR in landfills and surface impoundments. The Active Ash Basin, the CCP Monofill, the FGD Forward Flush Pond, the FGD Settling Pond, and the new FGD Settling Basin (Wastewater Treatment) are subject to the CCR Rule because the Mayo Facility continues to use coal for power generation. Tables 1a through 1e summarize the reports and plans posted by Duke Energy to its publicly available website in accordance with the CCR Rule.

The Active Ash Basin, the FGD Forward Flush Pond, and the FGD Settling Pond have a CCR multi-unit monitoring well network consisting of 17 CCR down gradient monitoring wells and three (3) background wells. The CCP Monofill's CCR monitoring network consists of 16 CCR down gradient monitoring wells and four (4) background wells.

On February 27, 2018, Duke Energy provided notice on Duke Energy's public website that the Active Ash Basin, the FGD Forward Flush Pond, and the FGD Settling Pond are now in the CCR assessment monitoring program due to statistically significant increases (SSIs) over the background values of the Appendix III parameters.

Duke Energy conducted an Alternative Source Demonstration (ASD) regarding the CCP Monofill CCR groundwater data that had SSIs over the background values of the Appendix III parameters. The ASD report dated July 2019 concluded the SSIs in Appendix III constituents in groundwater are from sources other than the CCP Monofill; therefore, the CCP Monofill will remain in detection monitoring. The ASD report identifies the truck wash station and leachate transfer station area (ancillary units to the landfill) as sources of the groundwater impact north of the CCP Monofill. As discussed in the 2018 Audit report, elevated boron concentrations were measured in groundwater samples from two CCR wells (CCR-210D and CCR-209BR) located just north of the CCP Monofill. The highest boron concentrations measured were 3,910 µg/l at CCR-209BR and 1,000 µg/l at CCR-210D. Both samples were collected on March 29, 2017.

Based on a review of the October 3, 2019 groundwater monitoring analyses, boron, chloride, cobalt, and total dissolved solids (TDS) were observed to exceed North Carolina's 02L groundwater standards one or more times at wells CCR-209BR and CCR-210D. Wells CCR-209BR and CCR-210D are located hydraulically down gradient of the Truck Wash Station and Leachate Transfer Station Area and within the compliance boundary of the CCP Monofill unit system.

On November 7, 2018, Duke Energy posted on Duke Energy's public website the required location restrictions for the Mayo Facility impoundments. Duke Energy stated that the Active Ash Basin, the FGD Forward Flush Pond, and the FGD Settling Pond did not meet the surface impoundment standard for placement above the uppermost aquifer (40 CFR § 257.60(a)).

On March 1, 2019, Duke Energy posted on its public website the CCR Annual Groundwater Monitoring and Corrective Action Reports, dated January 18, 2019, for the Active Ash Basin, the CCP Monofill, the FGD Forward Flush Pond, the FGD Settling Pond, and the FGD Settling Basin (Wastewater Treatment).

1.2.3 Dam and Other Structural Permits and Approvals

The Ash Basin Dam (PERSO-035) at the Mayo Facility is associated with ash management operations. The Ash Basin Dam was grandfathered under North Carolina's Session Law 2009-390 (Senate Bill 1004, effective January 1, 2010). Under this grandfathering, the original design of the Ash Basin Dam is not subject to the current design standards for new construction, although modifications after the effective date may be subject to these standards. The Ash Basin Dam has a high hazard classification under the North Carolina Dam Safety system.

The FGD Settling Pond (PERSO-036) and the FGD Forward Flush Pond (PERSO-037) are also dams, although they are significantly smaller, with a size of 4.36 acres and 0.56 acres respectively. Each of these dams has a low hazard classification under the North Carolina Dam Safety system. Duke Energy was developing plans for decommissioning these dams in late 2019 or early 2020.

New dams were also constructed and permitted for the new Lined Retention Basin and the new FGD Settling Basin.

1.2.4 Audit Observations and Update of the Mayo Facility's Activities

During the 2019 Audit, the Audit team observed completion of significant construction activities required for the implementation of the water redirection project. As part of these activities, a new FGD Settling Bain (the Wastewater Treatment Basin), a new Lined Retention Basin, and a new Coal Pile Holding Basin were installed along with associated piping infrastructure to connect these improvements. Duke Energy also was implementing improvements to the Truck Wash area at the landfill and improvements to the leachate force main to address identified integrity issues.

2.0 AUDIT SCOPE AND SUBJECT MATTER

The Audit was completed in accordance with the court documents and the Audit scoping document agreed to by Duke Energy and the United States. A description of the scope is provided in Attachment A. The Audit included ash management activities, including aspects of generation that affect the nature of the waste streams from the point of generation into surface impoundments or ash management basins, landfills, and/or storage piles. The Audit focused on the activities at the facility since the date of the last Audit, which was July 25-26, 2018.

3.0 AUDIT FINDINGS

There were no Findings at the Mayo Facility identified by the Audit Team.

4.0 OPEN LINES OF INQUIRY

Open Lines of Inquiry are items identified by the Audit Team while on-site that, due to limited available information or the need for additional research, could not be determined as being in compliance or out of compliance. There were no Open Lines of Inquiry identified during the Audit.

5.0 AUDIT APPROACH

5.1 ON-SITE ACTIVITIES

During its time on-site, the Audit Team conducted an opening conference with facility personnel to discuss the scope of work and the plan for accomplishing necessary tasks while at the facility. A site tour of the coal ash management and program support areas was subsequently completed. Following the tour, the Audit Team conducted a review of pertinent files, interviews with facility representatives, and verification of facility activities related to the ECPs, written programs, and permits. A debrief was conducted each Audit day to advise the facility representatives of Audit progress, open lines of inquiry, possible Audit findings, and needs for the next day. At the completion of the Audit, the Audit Team led a verbal discussion of draft Audit findings with facility representatives.

5.2 STANDARDS OF PRACTICE

The fieldwork portion of the Audit was conducted on July 24-25, 2019, with compliance reporting commencing May 14, 2015, the date of the Court's judgments. The Audit focused on the activities at the facility since the date of the last Audit, which was July 25-26, 2018 and was based on:

- Physical inspections of the facility;
- Examination of selected administrative and operating records made available by facility staff at the Audit Team's request;
- Interviews and discussions with key facility management and staff; and
- Verification procedures designed to assess the facility's application of, and adherence to, terms of the Probation, environment laws and regulations, and site policies and procedures. In addition, the Audit Team reviewed the facility's adherence to good management practices.

The Audit followed established audit protocols and procedures. It should be understood that the Audit consisted of evaluating a sample of practices and was conducted over a short period of time.

Efforts were made to sample major facets of environmental performance during the period under review. This method is intended to uncover major system deficiencies and the Audit may not have identified all potential problems.

To support the overall independence of the Audit process, the Audit included an auditing professional certified by the Board of Environmental, Health and Safety Auditor Certifications (BEAC). BEAC is an accredited professional certification board that issues the Certified Professional Environmental Auditor (CPEA) designation to qualified auditors. Under BEAC, auditor independence is a key criterion for the implementation of an effective third-party audit program. The Audit was implemented in accordance with the standards related to auditor independence.

The process by which the Audit was conducted was consistent with the general state of the art of environment auditing and the best professional judgment of the Audit Team. To conduct the Audit, the team implemented a formal approach, drawing on process guidance from both BEAC and the Auditing Roundtable (AR) guidance documents. Guidance documents included:

- *Standards for the Professional Practice of Environmental, Health and Safety Auditing*. Prepared by the Board of Environmental, Health and Safety Auditor Certifications, 2008.

- ISO 19011:2002 – *Guidelines for Quality and/or Environmental Management Systems Auditing*. Prepared by the International Organization for Standardization, 2002.

- *Standard for the Design and Implementation of an Environmental, Health and Safety Audit Program*. Prepared by The Auditing Roundtable, Inc., 1995.
- *Minimum Criteria for the Conduct of Environmental, Health and Safety Audits*. Prepared by The Auditing Roundtable, Inc.

5.3 REPRESENTATIVE SAMPLING

When confronted with a large population of data to review or equipment to inspect, the Audit Team employed representative sampling techniques to evaluate records over the Audit period requested, and as necessary, for physical inspection of some types of common equipment. The sample size for records reviews or equipment inspections required professional judgment.

The Audit Team's judgement considered the following:

- The outcome of the evaluation of the records sampled. If problems are found in the representative sample, more records may need to be examined to evaluate compliance status.
- Potential for or severity of non-compliance.
- The general appearance and observed practices of certain operating areas.
- Information obtained during an interview that indicates a potential problem.
- Other specific information or guidance from the CAM.
- Time available during the Audit.

The Audit Team also employed the following types of sampling techniques, depending upon the characteristics of a specific population:

- Random sampling – every item has an equal chance of being selected.

- Interval sampling – select every nth item, (e.g., every third manifest in chronological order as contained in facility files).
- Block sampling – auditor uses his/her judgment to select a specific block of items, (e.g., petroleum storage tank inspections from April to October).
- Stratified sampling – population is divided into groups, which are then sampled through random or judgmental techniques.

TABLES

TABLE 1A
Active Ash Basin - Plans and Reports Posted by Duke Energy Under the CCR Rule

Document Name	Category	Release Date
Emergency Action Plan Active Ash Basin and FGD Settling Basin	Design Criteria	08/28/2019
Notice of Intent to Close	Closure and Post Closure Care	08/01/2019
CCR Annual Surface Impoundment Inspection Report 2019	Operating Criteria	05/29/2019
Annual Meeting with Local Emergency Responders 2019	Design Criteria	04/24/2019
Emergency Action Plan	Design Criteria	04/04/2019
Fugitive Dust Control Plan	Operating Criteria	03/26/2019
CCR Annual Groundwater Monitoring and Corrective Action Report 2018	Groundwater Monitoring and Corrective Action	03/01/2019
Annual Fugitive Dust Control Report 2018	Operating Criteria	12/05/2018
Wetlands	Location Restriction	11/07/2018
Unstable Areas	Location Restriction	11/07/2018
CCR Annual Surface Impoundment Inspection Report 2018	Operating Criteria	06/06/2018
Annual Meeting with Local Emergency Responders 2018	Design Criteria	05/01/2018
Notice of Establishment of an Assessment Monitoring Program Mayo Ash Basin	Groundwater Monitoring and Corrective Action	02/27/2018
CCR Annual Groundwater Monitoring and Corrective Action Report	Groundwater Monitoring and Corrective Action	02/06/2018
Mayo Inundation Maps	Design Criteria	01/25/2018
2017 Annual CCR Fugitive Dust Control Report-Mayo	Operating Criteria	11/29/2017
Fugitive Dust Control Plan	Operating Criteria	11/29/2017
Groundwater Sampling and Analysis Program Selection of Statistical Method Certification-Mayo Ash Basin	Groundwater Monitoring and Corrective Action	10/25/2017
Groundwater Monitoring System Certification-Mayo Ash Basin	Groundwater Monitoring and Corrective Action	10/25/2017
CCR Annual Surface Impoundment Inspection Report 2017 - Mayo	Operating Criteria	06/06/2017

TABLE 1A
(Continued)

Document Name	**Category**	**Release Date**
Annual Meeting with Local Emergency Responders 2017	Design Criteria	05/24/2017
Annual Fugitive Dust Control Report 2016	Operating Criteria	12/05/2016
Initial Structural Stability Assessment	Design Criteria	11/16/2016
Initial Factor of Safety Assessment	Design Criteria	11/15/2016
Post Closure Plan for Impoundments	Closure and Post Closure Care	11/11/2016
Closure Plan for Impoundments	Closure and Post Closure Care	11/11/2016
Inflow Design Flood Control System	Operating Criteria	11/03/2016
History of Construction	Design Criteria	10/25/2016
Initial Hazard Classification Assessment Certification	Design Criteria	10/12/2016
Existing Liner Design Criteria	Design Criteria	10/11/2016
Annual Surface Impoundment Inspection Report 2016	Operating Criteria	06/15/2016
Annual Surface Impoundment Report (Initial)	Operating Criteria	02/16/2016
Annual Surface Impoundment Report (Initial) Revision 1	Operating Criteria	02/19/2016

*This summary of reports was downloaded on October 10, 2019

TABLE 1B
FGD Forward Flush Pond - Plans and Reports Posted by Duke Energy Under the CCR Rule

Document Name	Category	Release Date
CCR Annual Surface Impoundment Inspection Report 2019	Operating Criteria	05/29/2019
Annual Meeting with Local Emergency Responders 2019	Design Criteria	04/24/2019
Emergency Action Plan	Design Criteria	04/04/2019
Fugitive Dust Control Plan	Operating Criteria	03/26/2019
CCR Annual Groundwater Monitoring and Corrective Action Report 2018	Groundwater Monitoring and Corrective Action	03/01/2019
Annual Fugitive Dust Control Report 2018	Operating Criteria	12/05/2018
Wetlands	Location Restriction	11/07/2018
Unstable Areas	Location Restriction	11/07/2018
Seismic Impact Zones	Location Restriction	11/07/2018
Fault Areas	Location Restriction	11/07/2018
Placement Above Uppermost Aquifer	Location Restriction	11/07/2018
CCR Annual Surface Impoundment Inspection Report 2018	Operating Criteria	06/06/2018
Annual Meeting with Local Emergency Responders 2018	Design Criteria	05/01/2018
Notice of Establishment of an Assessment Monitoring Program Mayo FGD Forward Flush Pond	Groundwater Monitoring and Corrective Action	02/27/2018
CCR Annual Groundwater Monitoring and Corrective Action Report	Groundwater Monitoring and Corrective Action	02/06/2018
Mayo Inundation Maps	Design Criteria	01/25/2018
2017 Annual CCR Fugitive Dust Control Report-Mayo	Operating Criteria	11/29/2017
Fugitive Dust Control Plan	Operating Criteria	11/29/2017

TABLE 1B
(Continued)

Document Name	Category	Release Date
Groundwater Sampling and Analysis Program Selection of Statistical Method Certification-Mayo FGD Forward Flush	Groundwater Monitoring and Corrective Action	10/25/2017
Groundwater Monitoring System Certification-Mayo FGD Forward Flush Pond	Groundwater Monitoring and Corrective Action	10/25/2017
CCR Annual Surface Impoundment Inspection Report 2017 - Mayo	Operating Criteria	06/06/2017
Annual Meeting with Local Emergency Responders 2017	Design Criteria	05/24/2017
Structural Stability Assessment for May FGD Forward Flush Pond - Revision 1	Design Criteria	01/12/2017
Annual Fugitive Dust Control Report 2016	Operating Criteria	12/05/2016
Initial Structural Stability Assessment	Design Criteria	11/16/2016
Initial Factor of Safety Assessment	Design Criteria	11/15/2016
Post Closure Plan for Impoundments	Closure and Post Closure Care	11/11/2016
Closure Plan for Impoundments	Closure and Post Closure Care	11/11/2016
Inflow Design Flood Control System	Operating Criteria	11/03/2016
History of Construction	Design Criteria	10/25/2016
Initial Hazard Classification Assessment Certification	Design Criteria	10/12/2016
Existing Liner Design Criteria	Design Criteria	10/11/2016
Annual Surface Impoundment Inspection Report 2016	Operating Criteria	06/15/2016
Annual Surface Impoundment Report (Initial)	Operating Criteria	02/16/2016
Annual Surface Impoundment Report (Initial) Revision 1	Operating Criteria	02/19/2016

*This summary of reports was downloaded on October 10, 2019

TABLE 1C
FGD Settling Pond - Plans and Reports Posted by Duke Energy Under the CCR Rule

Document Name	Category	Release Date
Emergency Action Plan Active Ash Basin and FGD Settling Basin	Design Criteria	08/28/2019
CCR Annual Surface Impoundment Inspection Report 2019	Operating Criteria	05/29/2019
Annual Meeting with Local Emergency Responders 2019	Design Criteria	04/24/2019
Emergency Action Plan	Design Criteria	04/04/2019
Fugitive Dust Control Plan	Operating Criteria	03/26/2019
CCR Annual Groundwater Monitoring and Corrective Action Report 2018	Groundwater Monitoring and Corrective Action	03/01/2019
Annual Fugitive Dust Control Report 2018	Operating Criteria	12/05/2018
Wetlands	Location Restriction	11/07/2018
Unstable Areas	Location Restriction	11/07/2018
Seismic Impact Zones	Location Restriction	11/07/2018
Fault Areas	Location Restriction	11/07/2018
Placement Above Uppermost Aquifer	Location Restriction	11/07/2018
CCR Annual Surface Impoundment Inspection Report 2018	Operating Criteria	06/06/2018
Annual Meeting with Local Emergency Responders 2018	Design Criteria	05/01/2018
Notice of Establishment of an Assessment Monitoring Program Mayo FGD Settling Pond	Groundwater Monitoring and Corrective Action	02/27/2018
CCR Annual Groundwater Monitoring and Corrective Action Report	Groundwater Monitoring and Corrective Action	02/06/2018
Mayo Inundation Maps	Design Criteria	01/25/2018
2017 Annual CCR Fugitive Dust Control Report-Mayo	Operating Criteria	11/29/2017
Fugitive Dust Control Plan	Operating Criteria	11/29/2017

TABLE 1C
(Continued)

Document Name	**Category**	**Release Date**
Groundwater Sampling and Analysis Program Selection of Statistical Method Certification-Mayo FGD Settling Pond	Groundwater Monitoring and Corrective Action	10/25/2017
Groundwater Monitoring System Certification-Mayo FGD Settling Pond	Groundwater Monitoring and Corrective Action	10/25/2017
Notice of Corrective Measure to Address Structural Stability Deficiency-Mayo FGD Settling Pond	Operating Criteria	10/19/2017
CCR Annual Surface Impoundment Inspection Report 2017 - Mayo	Operating Criteria	06/06/2017
Annual Meeting with Local Emergency Responders 2017	Design Criteria	05/24/2017
Annual Fugitive Dust Control Report 2016	Operating Criteria	12/05/2016
Initial Structural Stability Assessment	Design Criteria	11/16/2016
Initial Factor of Safety Assessment	Design Criteria	11/15/2016
Post Closure Plan for Impoundments	Closure and Post Closure Care	11/11/2016
Closure Plan for Impoundments	Closure and Post Closure Care	11/11/2016
Inflow Design Flood Control System	Operating Criteria	11/03/2016
History of Construction	Design Criteria	10/25/2016
Initial Hazard Classification Assessment Certification	Design Criteria	10/12/2016
Existing Liner Design Criteria	Design Criteria	10/11/2016
Annual Surface Impoundment Inspection Report 2016	Operating Criteria	06/15/2016
Annual Surface Impoundment Report (Initial)	Operating Criteria	02/16/2016
Annual Surface Impoundment Report (Initial) Revision 1	Operating Criteria	02/19/2016

*This summary of reports was downloaded on October 10, 2019

TABLE 1D
CCP Monofill - Plans and Reports Posted by Duke Energy Under the CCR Rule

Document Name	Category	Release Date
Fugitive Dust Control Plan	Operating Criteria	03/26/2019
CCR Annual Groundwater Monitoring and Corrective Action Report 2018	Groundwater Monitoring and Corrective Action	03/01/2019
Run On and Run Off Control System Plan	Operating Criteria	02/19/2019
Annual Fugitive Dust Control Report 2018	Operating Criteria	12/05/2018
CCR Annual Landfill Inspection Report 2018	Operating Criteria	11/19/2018
Unstable Areas	Location Restriction	11/07/2018
CCR Annual Groundwater Monitoring and Corrective Action Report	Groundwater Monitoring and Corrective Action	02/06/2018
2017 Annual CCR Fugitive Dust Control Report-Mayo	Operating Criteria	11/29/2017
Fugitive Dust Control Plan	Operating Criteria	11/29/2017
CCR Annual Landfill Report 2017-Mayo CCP Monofill	Operating Criteria	11/29/2017
Groundwater Sampling and Analysis Program Selection of Statistical Method Certification-Mayo CCP Monofill	Groundwater Monitoring and Corrective Action	10/25/2017
Groundwater Monitoring System Certification-Mayo CCP Monofill	Groundwater Monitoring and Corrective Action	10/25/2017
Annual Fugitive Dust Control Report 2016	Operating Criteria	12/05/2016
CCR Annual Landfill Inspection Report 2016	Operating Criteria	11/22/2016
Post Closure Plan for CCP Monofill	Closure and Post Closure Care	11/11/2016
Closure Plan for CCP Monofill	Closure and Post Closure Care	11/11/2016
Run-on and Run-off Control System Plan	Operating Criteria	11/03/2016
Annual Landfill Report (Initial)	Operating Criteria	02/03/2016

*This summary of reports was downloaded on October 10, 2019

TABLE 1E
FGD Settling Basin (Wastewater Treatment) Plans and Reports Posted by Duke Energy under the CCR Rule

Document Name	Category	Release Date
Emergency Action Plan Active Ash Basin and FGD Settling Basin	Design Criteria	08/28/2019
Groundwater Sampling and Analysis Program Selection of Statistical Method Certification	Groundwater Monitoring and Corrective Action	04/24/2019
Groundwater Monitoring System Certification	Groundwater Monitoring and Corrective Action	04/24/2019
Annual Meeting with Local Emergency Responders 2018	Design Criteria	04/24/2019
Emergency Action Plan	Design Criteria	04/04/2019
Fugitive Dust Control Plan	Operating Criteria	03/26/2019
Inflow Design Flood Control System	Operating Criteria	03/26/2019
Wetlands	Location Restriction	03/26/2019
Unstable Areas	Location Restriction	03/26/2019
Initial Structural Stability Assessment	Design Criteria	03/26/2019
Seismic Impact Zones	Location Restriction	03/26/2019
Initial Factor of Safety Assessment	Design Criteria	03/26/2019
Initial Design Criteria Liner	Design Criteria	03/26/2019
Initial Hazard Potential Classification	Design Criteria	03/26/2019
Fault Areas	Location Restriction	03/26/2019
Design and Construction Criteria	Design Criteria	03/26/2019
Closure Plan	Closure and Post Closure Care	03/26/2019
Placement Above the Uppermost Aquifer FGD Settling Basin – (Wastewater	Location	03/26/2019

TABLE 1E
(Continued)

Document Name	Category	Release Date
Treatment)	Restriction	
CCR Annual Groundwater Monitoring and Corrective Action Report 2018	Groundwater Monitoring and Corrective Action	03/01/2019
Liner Design Criteria	Design Criteria	06/19/2018

*This summary of reports was downloaded on October 10, 2019

ATTACHMENTS

ATTACHMENT A

ATTACHMENT A
AUDIT SCOPE

A-1 GENERAL AUDIT SCOPE ITEMS

The general Audit scope items included:

- Review and evaluation of documentation for maintenance and repair of structures and equipment used for coal ash disposal,
- Review and evaluation of documentation of modifications, failures, leaks, damage, disrepair and other problems at the coal ash management units,
- Review and evaluation of documentation of efforts to correct failures, leaks, damage, disrepair and other problems where they determine that employee/contractor actions were likely a primary or contributing cause to a compliance finding,
- Review and evaluation of documentation of communication of the items above within the organization,
- Review and evaluation of documentation associated with the specific environmental compliance items described below and laws, regulations, and policies associated these items and

- Review of compliance with administrative aspects and regulatory submissions related to coal ash management-specific regulations, including:

– Coal Combustion Residuals	40 CFR Part 257 Subpart D
– NC Coal Ash Management Act of 2014	NC General Statutes Chapter 130A, Article 9

More specific items which were addressed in the audits to comply with the General Audit Scope are described below.

A-2 SPECIFIC COMPLIANCE WITH THE ECP-NC

The following items related to specific ECP-NC compliance were reviewed as part of the audit:

1. Verify maintenance and sufficient funding of corporate compliance organizations (ABSAT, CCP organization, National Ash Management Advisory Board). Where a root cause of a compliance finding appears in an auditor's judgment to result from inadequate funding, the AGC/ELM Audit Team will identify this in the Audit finding.

2. Verify timely production of satisfactory Compliance Officer (CO) reports to the CAM relating to the development, implementation, and enforcement of the ECP-NC. No auditing work is associated with this work at this time.

3. Evaluate existence and efficacy of toll-free hotline/e-mail inbox for violation reporting, including the appropriateness of the follow-up investigation and disposition of each reported matter. This requirement will be evaluated for the first year of audits and then reassessed.

4. Evaluate completion and efficacy of periodic notices (via Internet, Intranet, email, notices in employee work areas, and publication in community outlets) to employees and the public of the availability of the toll-free hotline and electronic mail inbox.

5. Evaluate training materials and curricula utilized in the mandated training program, particularly those tailored to employee's specific job descriptions, to determine whether it advances the goal of "ensuring that every domestic employee of Duke Energy Corporation and its wholly-owned or operated affiliates understands applicable compliance policies and is able to integrate the compliance objectives in the performance of his/her job." Ensure that the subjects specifically named in the plea agreements are covered by the training (namely, notice and reporting requirements in the event of a release or discharge and the safe and proper handling of pollutants, hazardous substances and/or wastes.)

6. Evaluate whether Defendants are using "Best Efforts" to comply with the obligations under the ECP-NC. Where the Audit Team makes compliance findings, the Audit Team will, upon request, provide their opinion on whether this best efforts standard applies, and if so, whether best efforts have been used.

7. Verify compliance at each facility with the specific procedures and protocols set forth in the ECP-NC.

A-3 SPECIFIC COMPLIANCE WITH OTHER PROVISIONS OF THE PLEA AGREEMENT

The following items related to specific items in the Plea Agreement were reviewed as part of the Audit:

1. Determine whether Defendants have opened, expanded, or reopened any coal ash or coal ash wastewater impoundment and, if so, verify that they are lined and do not allow unpermitted discharges of coal ash or coal ash wastewater to waters of the United States.

2. Verify that Defendants have determined the volume of wastewater and coal ash in each wet-storage coal ash impoundment in North Carolina as described in the plea agreements and that written or electronic records of this information is maintained in a location available to facility staff and employees responsible for making environmental or emergency reports.

3. Review citations/notices of violation/notices of deficiency related to violations of federal, state, or local law to assure that they have been properly relayed to the Court and, as appropriate under the plea agreements, determine their materiality.

4. Evaluate Defendants’ efforts to close coal ash impoundments at Dan River, Riverbend, Asheville, and Sutton for legal compliance.

5. Note any observations made during the Audit that cause concern regarding the assets and/or security available to the Defendants to meet the obligations imposed by the Judgment in this case.

A-4 GENERAL ENVIRONMENTAL COMPLIANCE SUBJECT AREAS

The following items related to General Environmental Compliance were reviewed as part of the Audit:

1. Assess all waste streams from Duke Energy facilities with coal ash impoundments. Review Duke Energy's processes, procedures, and practices, as well as compliance with those processes, procedures, and practices, for:

    a. identifying waste streams (especially, but not limited to, waste streams with discharge points into bodies of water),
    b. identifying and communicating any modifications or changes, or potential modifications or changes, to waste streams,
    c. ensuring proper handling/disposal of waste streams,
    d. identifying, preventing, and mitigating any risks or hazards that could affect waste streams and/or the disposal of waste streams, and
    e. ensuring proper permitting for waste streams.

For Item 1.d., the Audit Team evaluated such risk/hazard issues where there were compliance findings associated with waste streams.

2. Review and evaluate documentation of:

    a. Maintenance and repair of structures and equipment related to coal ash disposal,
    b. Modification of the coal ash impoundments and related pollution prevention equipment and structures,
    c. Failures, leaks, damage, disrepair, and other problems,
    d. Communication of the information described in a-c within the organization, and

e. Efforts to correct failures, leaks, damage, disrepair, and other problems.

3. Assess the employees responsible for inspection, maintenance, and repair of coal ash basins and related structures and equipment. The assessment included an assessment of the workloads of such employees to assure that Duke Energy's facilities are adequately staffed. These assessments were made where the Audit Team determine that employee/contractor actions were likely a primary or contributing cause to a compliance finding.

4. Review the results and recommendations of any other audits (internal or external/state mandated) and assess Duke Energy's implementation of those recommendations.

5. Review and assess Duke Energy's processes, procedures, and practices for identifying, communicating, and addressing problems and potential problems at its coal ash basins (leaks, unpermitted discharges, etc.).

6. Review and assess Duke Energy's policies, procedures, practices, and equipment for handling emergency releases from its coal ash basins and evaluate the personnel with duties in such situations.

7. Verify that Duke Energy is complying with its NPDES wastewater and stormwater permits, as well as other relevant environmental permits. This should include verifying Duke Energy's timely submission of permit applications, permit renewal applications, and responses to requests for additional information from the relevant regulatory authority.

8. Review and assess any actions or measures Duke Energy has undertaken to assure accountability and prevent recurrences when problems and/or failures occur (i.e. disciplinary actions, re-training, revision to policies and procedures, etc.). This

review will be completed where the Audit Team determines that employee/contractor actions were likely a primary or contributing cause to a compliance finding.

9. Review and assess compliance with the following environmental regulations, as applicable to the management of coal ash:

a.	Wastewater Discharges	40 CFR 122; 15A NCAC 2H.0100 *et seq*
b.	Stormwater Discharges	40 CFR 122.26; 15A NCAC 2H.1000 *et seq;* NC General Permit (Construction) No. NCG010000
c.	NC Groundwater Standards	15A NCAC 02L.0202(h)
d.	Hazardous Waste Management	15A NCAC 13A.0100 to 13A.0107
e.	Oil Pollution Prevention	40 CFR Part 112
f.	Air Pollution (Title V)	15A NCAC 2Q, and
g.	Hazardous Chemicals (Tier II)	40 CFR Part 370.

Reviews also included an analysis of overall compliance and the status and security of the asset. Subsequent reviews of individual facilities will evaluate the movement towards compliance. The Audit did not include an evaluation of compliance with the September 2015 Settlement Agreement with NCDEQ.

A–5 LIST OF PERMITS AND PROGRAMS DEEMED TO BE EITHER DIRECTLY OR INDIRECTLY IN SUPPORT OF ASH MANAGEMENT

During the Audit, the Audit Team reviewed a variety of written programs developed and implemented by Duke Energy and facility staff. State-issued permits and supporting documentation relative to environmental programs and geotechnical aspects of ash basin management were also requested and reviewed.

Requested documents, pertinent to management of ash in basins, landfills, ponds, etc. were outlined in the pre-audit questionnaire for each facility and included, but were not limited to:

1. The Compliance Register developed for ETrac for the Site.

2. The Duke Energy Operations Manual for the facility.

3. A site plan, site map, or aerial photo which shows the entire facility and key features, of the facility including NPDES outfalls associated environmental monitoring locations, storage tanks, etc.

4. Most recent 2 years of maintenance, monitoring, and inspection records for each coal ash/CCR basin (just the physical inspections, not the groundwater records).
5. A “Phase 1 and Phase 2” summary of ash basin conditions prepared by an outside consultant.

6. Duke Energy’s permitting plans for addressing ash impoundments and landfills at this facility.

7. Applicable pages from the Duke Energy basin-by-basin coal ash/CCR project tracking document for this facility.

8. Original basin/landfill/coal ash management unit construction records.

9. Documentation of changes to these units.

10. Coal ash unit construction permit application and approval.

11. State-issued permits and application materials for permits associated with coal ash/CCR management (including, e.g., dam permits).

12. Any currently effective state order, consent order, or similar state direction that addresses coal ash/CCR management at the site.

13. Records required to be maintained in the site’s operating record under the federal CCR regulation and/or any state CCR regulatory program.
14. Records of off-site ash shipments from May 2015 forward.

15. Stormwater permit application and approval for all outfalls.

16. Industrial wastewater (NPDES/POTW) permit application and approval for all outfalls/discharges.

17. Industrial and stormwater sampling and monitoring records, and any corrective action plans (last 2 years).

18. Stormwater pollution prevention plan.

19. Landfill operating permit with maintenance and monitoring requirements.

20. Landfill leak detection and groundwater monitoring records from the last 2 years along with any workplans that describes the rationale for the monitoring system at the Site.

21. Landfill operating permit with maintenance and monitoring requirements.

22. Copies of any air permits and applications for coal ash units and ancillary operations.

23. Any testing and monitoring records completed to comply with the air permits.

24. Any notices of violation~~s~~ associated with the coal ash/CCR management activities received over the last 2 years.

25. Copy of SPCC Plan.

26. Community Right-to-Know
    a. Copies of lists of hazardous chemicals or MSDSs submitted;
    b. Copies of Tier I or II reports; and
    c. Copies of Form R (toxic release inventory) reports.

27. Copies of communications with employees and the public regarding availability of toll-free hotline and electronic mail inbox for reporting suspected environmental violations.

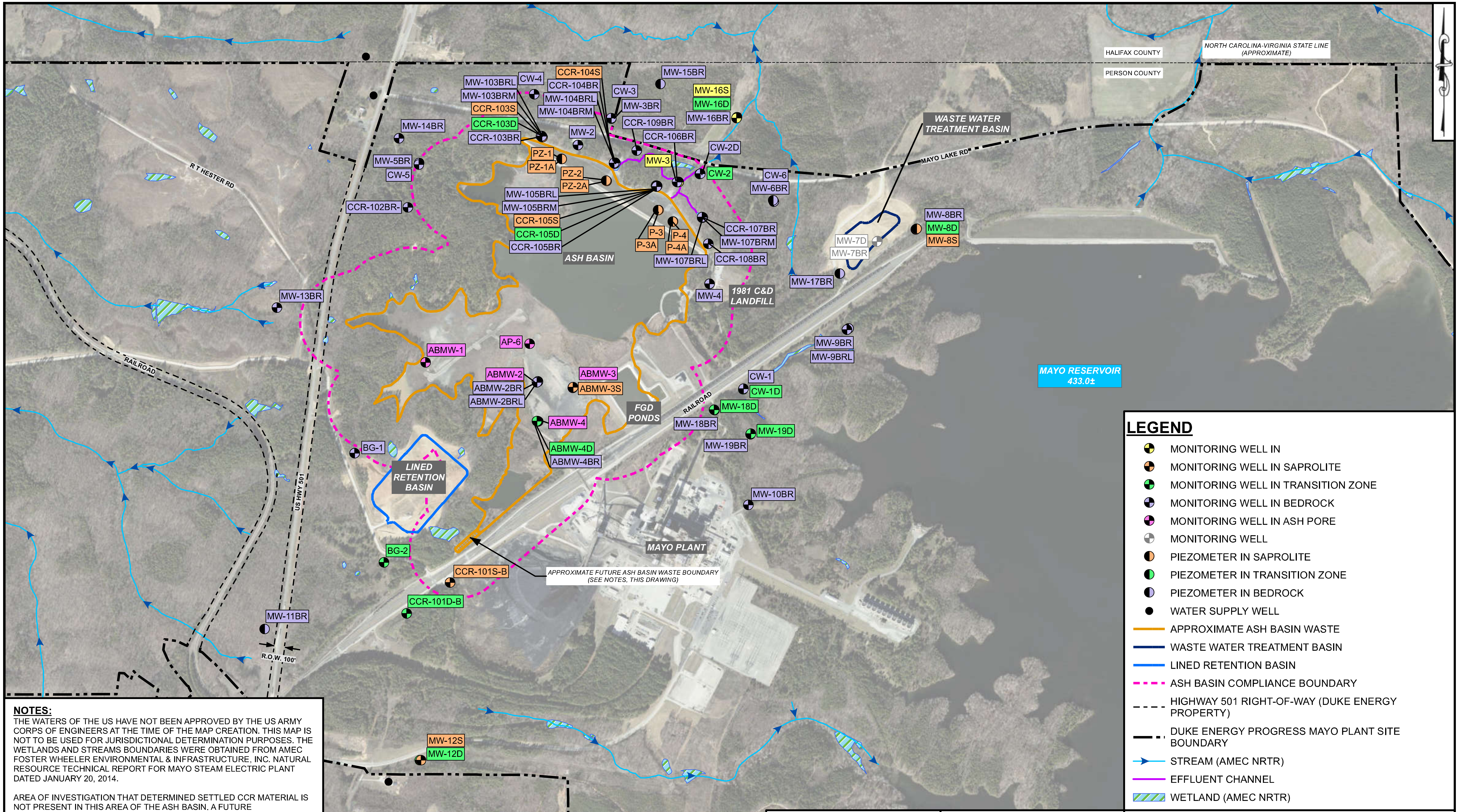
28. Management Systems:

    a. List of responsible party for each environmental activity.
    b. All environmental-related training records.
    c. All environmental policies and procedures.
    d. Organization chart.
    e. Site diagram identifying storage areas, tanks, etc.

29. Employee training records related to environmental programs and ash management policies.

ATTACHMENT B

2018 and 2019 CAMA GROUNDWATER DATA SUMMARY AND WELL LOCATION MAP



LEGEND

- MONITORING WELL IN
- MONITORING WELL IN SAPROLITE
- MONITORING WELL IN TRANSITION ZONE
- MONITORING WELL IN BEDROCK
- MONITORING WELL IN ASH PORE
- MONITORING WELL
- ◐ PIEZOMETER IN SAPROLITE
- ◐ PIEZOMETER IN TRANSITION ZONE
- ◐ PIEZOMETER IN BEDROCK
- ● WATER SUPPLY WELL
- APPROXIMATE ASH BASIN WASTE
- WASTE WATER TREATMENT BASIN
- LINED RETENTION BASIN
- ASH BASIN COMPLIANCE BOUNDARY
- HIGHWAY 501 RIGHT-OF-WAY (DUKE ENERGY PROPERTY)
- DUKE ENERGY PROGRESS MAYO PLANT SITE BOUNDARY
- STREAM (AMEC NRTR)
- EFFLUENT CHANNEL
- ▨ WETLAND (AMEC NRTR)

NOTES:

THE WATERS OF THE US HAVE NOT BEEN APPROVED BY THE US ARMY CORPS OF ENGINEERS AT THE TIME OF THE MAP CREATION. THIS MAP IS NOT TO BE USED FOR JURISDICTIONAL DETERMINATION PURPOSES. THE WETLANDS AND STREAMS BOUNDARIES WERE OBTAINED FROM AMEC FOSTER WHEELER ENVIRONMENTAL & INFRASTRUCTURE, INC. NATURAL RESOURCE TECHNICAL REPORT FOR MAYO STEAM ELECTRIC PLANT DATED JANUARY 20, 2014.

AREA OF INVESTIGATION THAT DETERMINED SETTLED CCR MATERIAL IS NOT PRESENT IN THIS AREA OF THE ASH BASIN. A FUTURE REPRESENTATIVE ASH BASIN WASTE AND COMPLIANCE BOUNDARY IS INCLUDED IN THE MAYO NPDES PERMIT NC0038377 PART I, 5.A.(18.) ATTACHMENT A FIGURE 1 AND ATTACHMENT B FIGURE 1.1 DATED JULY 13, 2018.

AERIAL PHOTOGRAPHY OBTAINED FROM GOOGLE EARTH PRO ON SEPTEMBER 27, 2017. AERIAL WAS COLLECTED ON JUNE 13, 2016.

DRAWING HAS BEEN SET WITH A PROJECTION OF NORTH CAROLINA STATE PLANE COORDINATE SYSTEM FIPS 3200 (NAD83/2011).

synTerra

DUKE ENERGY PROGRESS

400 200 0 400 800 1,200

GRAPHIC SCALE IN FEET

148 RIVER STREET, SUITE 220
GREENVILLE, SOUTH CAROLINA 29601
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www.synterracorp.com

DRAWN BY: A. ROBINSON
PROJECT MANAGER: J. WYLIE
CHECKED BY: E. KINSEY
DATE: 04/30/2019

FIGURE 1-2
SITE MAP WITH MONITORING WELL LOCATIONS
2018 CAMA ANNUAL INTERIM MONITORING REPORT
MAYO STEAM ELECTRIC PLANT
DUKE ENERGY PROGRESS, LLC
ROXBORO, NORTH CAROLINA

FACILITY NAME: MAYO
DATE UPDATED: 06/24/2019
PREADSHEET UPDATED BY: BRANDON RUSSO
PREADSHEET CHECKED BY: JERRY WYLIE

	ED 40CFR257 APPENDIX III CONSTITUENTS				INORGANIC PARAMETERS (TOTAL CONCENTRATION)																RADIONUCLIDES		R PARAME
Reporting Units	ug/L	mg/L	mg/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/mL	mg/L
CAC 02L Standard	700	250	250	500	1*	10	700	4*	2	10	10	1*	300	15	50	100	20	0.2*	0.3*	1000	5^	0.03^	2
Provisional Background Threshold Values (Surficial Unit)	50	3.3	1.6	85	1	1	19	1	1	0.088	3.23	1.02	385	1	253	3.03	1	0.2	0.974	227	4	0.000367	NE
Provisional Background Threshold Values (Transition Zone Unit)	50	33.3	7.5	430	1	1	78.3	1	1	1.26	6	1	1319	1	298	5	1	0.2	5.88	12	9	0.001	NE
Provisional Background Threshold Values (Bedrock Unit)	50	43	18	340	1	1	97	1	1	0.4	7	1.19	2550	1	544	5	1	0.2	5.52	37.9	7.6	0.00203	NE

						ED 40CFR257 APPENDIX III CONSTITUENTS				INORGANIC PARAMETERS (TOTAL CONCENTRATION)																RADIONUCLIDES		R PARAME
Sample ID	**Location Description**	**Associated Unit**	**Location With Respect to Groundwater Flow Direction**	**Sample Location Aquifer Name**	**Sample Collection Date**	**Boron**	**Chloride**	**Sulfate**	**Total Dissolved Solids**	**Antimony**	**Arsenic**	**Barium**	**Beryllium**	**Cadmium**	**Chromium (VI)**	**Chromium**	**Cobalt**	**Iron**	**Lead**	**Manganese**	**Nickel**	**Selenium**	**Thallium**	**Vanadium**	**Zinc**	**Total Radium**	**Total Uranium**	**Fluoride**
ABMW-01	In AB, west-side, west of ABMW-2	Ash Basin	Source Area	Ash Pore Water	07/19/2018	**4080**	16	11	500	**10.3**	**368**	**1010**	<1	<1	<0.025	0.371 j	**11.1**	**5600**	<1	**1870**	11.8	<1	**0.55**	**52.5**	7	0.722	**0.0762**	0.14
ABMW-01	In AB, west-side, west of ABMW-2	Ash Basin	Source Area	Ash Pore Water	11/08/2018	**5090**	15	23	340	**7.67**	**373**	546	<1	<1	<0.025	0.393 j	**1.78**	**1940**	<1	**627**	1.55	<1	<0.2	**27.4**	6	0.495	**0.0733**	0.21
ABMW-02	In AB, south-side	Ash Basin	Source Area	Ash Pore Water	07/19/2018	**8270**	14	36	410	<1	**896**	64	<1	<1	<0.025	<1	<1	33	<1	**152**	2.96	<1	<0.2	**0.852**	<5	NA	NA	1.1
ABMW-02	In AB, south-side	Ash Basin	Source Area	Ash Pore Water	11/07/2018	**8600**	15	35	340	**1.07**	**920**	53	<1	<1	0.027	<1	<1	12	<1	47	<1	<1	<0.2	**0.655**	<5	NA	NA	0.88
ABMW-02	In AB, south-side	Ash Basin	Source Area	Ash Pore Water	04/02/2019	**8670**	15	36	430	NA	**1050**	112	NA	NA	<0.025	<1	<1	113	NA	**483**	NA	NA	NA	**0.667**	NA	NA	NA	NA
ABMW-02BR	In AB, south-side	Ash Basin	Source Area	Bedrock	07/19/2018	<50	27	12	360	<1	3	104	<1	<1	<0.025 P4,R0	<1	<1	**1250**	<1	**228**	<1	<1	0.083 j	**0.335**	3.287 j	NA	NA	1.1
ABMW-02BR	In AB, south-side	Ash Basin	Source Area	Bedrock	11/07/2018	19.895 j	28	13	320	<1	3.11	110	<1	<1	<0.025	<1	<1	**1280**	<1	**227**	<1	<1	<0.2	0.161 j	<5	NA	NA	1.1
ABMW-02BR	In AB, south-side	Ash Basin	Source Area	Bedrock	04/02/2019	<50	27	10	330	NA	2.54	121	NA	NA	<0.025	0.764 j	<1	**977**	NA	**205**	NA	NA	NA	0.112 j	NA	NA	NA	NA
ABMW-02BRL	In AB, with ABMW-02	Ash Basin	Source Area	Bedrock	07/19/2018	<50	20	0.26	310	0.373 j	2.86	72	<1	<1	<0.025	<1	<1	**1860**	<1	**339**	<1	<1	<0.2	**0.375**	2.526 j	NA	NA	0.84
ABMW-02BRL	In AB, with ABMW-02	Ash Basin	Source Area	Bedrock	11/07/2018	<50	22	0.38	270	<1	2.23	72	<1	<1	<0.025	<1	<1	**1630**	<1	**328**	<1	<1	<0.2	<0.3	<5	NA	NA	0.77
ABMW-02BRL	In AB, with ABMW-02	Ash Basin	Source Area	Bedrock	04/02/2019	<50	21	0.39	320	NA	2.75	77	NA	NA	<0.025 M1,R1	<1	<1	**1740**	NA	**345**	NA	NA	NA	<0.3	NA	NA	NA	NA
ABMW-03	In AB, south-side, near FGD ponds	Ash Basin	Source Area	Ash Pore Water	07/18/2018	**1940**	64	23	320	<1	**67.2**	242	<1	<1	<0.025	0.383 j	<1	**6170**	<1	**785**	<1	<1	<0.2	**0.345**	2.173 j,B2	NA	NA	0.43
ABMW-03	In AB, south-side, near FGD ponds	Ash Basin	Source Area	Ash Pore Water	11/08/2018	**1960**	70	41	310	<1	**288**	203	<1	<1	<0.025	0.359 j	<1	**8160**	<1	**504**	<1	<1	0.1 j	**0.335**	2.029 j	NA	NA	0.43
ABMW-03S	In AB, south-side, near FGD ponds	Ash Basin	Source Area	Saprolite	07/18/2018	**1340**	12	0.39	94	<1	0.732 j	28	0.452 j	<1	<0.025	<1	**1.59**	**1100**	<1	**294**	<1	<1	<0.2	**0.39**	7 B2	NA	NA	<0.1
ABMW-03S	In AB, south-side, near FGD ponds	Ash Basin	Source Area	Saprolite	11/08/2018	**1340**	13	0.35	97	<1	0.862 j	30	0.473 j	<1	<0.025	<1	**1.45**	**1340**	<1	**285**	<1	<1	<0.2	**0.642**	4 j	NA	NA	0.0547 j
ABMW-04BR	In AB, south-side, south of ABMW-2	Ash Basin	Source Area	Bedrock	07/18/2018	<50	5.4	46	310	<1	2.02	109	<1	<1	<0.025	0.347 j	<1	**790**	<1	**483**	0.362 j	<1	<0.2	**0.349**	<5	NA	NA	1.1
ABMW-04BR	In AB, south-side, south of ABMW-2	Ash Basin	Source Area	Bedrock	11/08/2018	38.274 j	5.7	37	320	<1	1.97	118	<1	<1	<0.025	0.521 j	<1	**589**	<1	**435**	<1	<1	<0.2	0.189 j	<5	NA	NA	1.1
ABMW-04BR	In AB, south-side, south of ABMW-2	Ash Basin	Source Area	Bedrock	04/02/2019	25.329 j	5.7	43	340	NA	2.71	122	NA	NA	<0.025	<1	<1	**973**	NA	**507**	NA	NA	NA	<0.3	NA	NA	NA	NA
ABMW-04D	In AB, south-side, south of ABMW-2	Ash Basin	Source Area	Transition Zone	07/18/2018	**3430**	14	1.6	**530**	<1	**23.1**	**907**	<1	<1	<0.025 P4,R0	0.759 j	**5.34**	**54500**	<1	**6360**	0.893 j	<1	0.106 j	**8.52**	6 B2	NA	NA	0.14
ABMW-04D	In AB, south-side, south of ABMW-2	Ash Basin	Source Area	Transition Zone	11/08/2018	**3040**	13	2.3	500	<1	**21.4**	**901**	<1	<1	<0.025	0.795 j	**6.3**	**53600**	<1	**6590**	0.947 j	<1	<0.2	**9.75**	<5	NA	NA	0.11
ABMW-04D	In AB, south-side, south of ABMW-2	Ash Basin	Source Area	Transition Zone	04/02/2019	**3240**	15	1.2	**520**	NA	**15.5**	**870**	NA	NA	<0.025	0.78 j	**6.36**	**46800**	NA	**6960**	NA	NA	NA	**7.99**	NA	NA	NA	NA
ABMW-04X	In AB, south-side, south of ABMW-2	Ash Basin	Source Area	Ash Pore Water	11/08/2018	**5290**	12	43	430	<1	**63**	443	<1	<1	<0.025	0.692 j	0.444 j	**3570**	<1	**1390**	<1	0.508 j	<0.2	**2.81**	<5	1.494	0.000272	0.33
ABMW-04X	In AB, south-side, south of ABMW-2	Ash Basin	Source Area	Ash Pore Water	04/02/2019	**5580**	12	98	470	NA	**173**	452	NA	NA	<0.025	0.343 j	0.623 j	**7980**	NA	**1440**	NA	NA	NA	**1.6**	NA	NA	NA	NA
BG-01 IMP	SW of AB, outside compliance boundary	Background	Background	Bedrock	07/16/2018	<50	10	0.24	98	<1	<1	88	<1	<1	0.42	0.687 j	<1	91	<1	8	1.36	<1	<0.2	**3.94**	4.785 j	2.706	<0.0002	0.0658 j
BG-01	SW of AB, outside compliance boundary	Background	Background	Bedrock	07/16/2018	<50	10	0.25	100	<1	<1	90	<1	<1	NA	<5	<1	94	<1	8	<5	<1	<0.2	**3.77**	<5	NA	NA	NA
BG-01	SW of AB, outside compliance boundary	Background	Background	Bedrock	11/06/2018	<50	8.9	0.25	110	<1	<1	86	<1	<1	0.47	0.839 j	<1	286	<1	14	1.04	<1	<0.2	**4.58**	5	1.7433	<0.0002	0.0793 j
BG-01 CCR	SW of AB, outside compliance boundary	Background	Background	Bedrock	01/09/2019	<50	9.9	0.22	120	<1	<1	83	<1	<1	NA	0.627 j	<1	NA	<1	NA	NA	<1	<0.2	NA	NA	1.439	NA	<0.1
BG-01	SW of AB, outside compliance boundary	Background	Background	Bedrock	04/08/2019	<50	9.7	0.1942 j	110	NA	<1	80	NA	NA	0.34	0.752 j	<1	124	NA	9	NA	NA	NA	**3.83**	NA	-0.1365	<0.0002	NA
BG-02 IMP	SW of AB, outside compliance boundary	Background	Background	Transition Zone	07/17/2018	<50	42	5.5	340	<1	<1	38	<1	<1	<0.025 M1	<1	<1	94	<1	**62**	0.508 j	<1	<0.2	**4.72**	1.975 j	2.3047	0.00061	0.28
BG-02	SW of AB, outside compliance boundary	Background	Background	Transition Zone	07/17/2018	<50	42	5.4	280	<1	<1	38	<1	<1	NA	<5	<1	100	<1	**62**	<5	<1	<0.2	**5.03**	<5	NA	NA	NA
BG-02	SW of AB, outside compliance boundary	Background	Background	Transition Zone	11/06/2018	<50	39	5.2	290	<1	<1	42	<1	<1	<0.025	<1	<1	122	<1	**105**	0.355 j	<1	<0.2	**4.61**	<5	1.705	0.000639	0.26
BG-02	SW of AB, outside compliance boundary	Background	Background	Transition Zone	04/08/2019	<50	40	5.5	320	NA	<1	49	NA	NA	<0.025	<1	0.475 j	236	NA	**185**	NA	NA	NA	**3.78**	NA	0.2471	0.000818	NA
CCR-102BR-BG	West of AB, outside compliance boundary	Background	Background	Bedrock	10/02/2018	<50	12	110	470	0.354 j	0.595 j	20	<1	<1	NA	<1	0.768 j	NA	<1	NA	NA	0.773 j	<0.2	NA	NA	0.848	NA	0.28
CCR-102BR-BG IMP	West of AB, outside compliance boundary	Background	Background	Bedrock	04/11/2019	<50	11	65	380	NA	0.388 j	19	NA	NA	0.25	0.65 j	0.361 j	26	NA	**218**	NA	NA	NA	**0.842**	NA	2.35	0.00233	NA
CCR-103BR	Below Dam, North of Ash Basin	Ash Basin	Downgradient	Bedrock	01/07/2019	**2700**	59	200	420	<1	<1	113	<1	<1	NA	<1	<1	NA	<1	NA	NA	<1	<0.2	NA	NA	4.065	NA	<0.5
CCR-103D	Below Dam, North of Ash Basin	Ash Basin	Downgradient	Transition Zone	01/07/2019	**1580**	66	120	310	<1	<1	98	<1	<1	NA	0.672 j	<1	NA	<1	NA	NA	<1	<0.2	NA	NA	2.651	NA	<0.2
CCR-103S	Below Dam, North of Ash Basin	Ash Basin	Downgradient	Saprolite	01/07/2019	495	43	67	210	<1	<1	116	<1	<1	NA	<1	0.499 j	NA	<1	NA	NA	<1	<0.2	NA	NA	1.481	NA	0.0599 j
CCR-104BR	Below Dam, S of Mayo Lake Rd	Ash Basin	Downgradient	Bedrock	10/02/2018	<50	70	130	**600**	<1	0.4 j	23	<1	<1	NA	0.503 j	<1	NA	<1	NA	NA	<1	<0.2	NA	NA	**6.84**	NA	1.4
CCR-104BR	Below Dam, S of Mayo Lake Rd	Ash Basin	Downgradient	Bedrock	01/09/2019	<50	56	150	490	<1	0.49 j	25	<1	<1	NA	<1	<1	NA	<1	NA	NA	<1	<0.2	NA	NA	**11.31**	NA	1
CCR-104S	Below Dam, S of Mayo Lake Rd	Ash Basin	Downgradient	Saprolite	10/02/2018	338	23	32	190	<1	<1	32	<1	<1	NA	0.93 j	**1.23**	NA	<1	NA	NA	<1	<0.2	NA	NA	0.424	NA	0.13
CCR-104S	Below Dam, S of Mayo Lake Rd	Ash Basin	Downgradient	Saprolite	01/08/2019	192	15	23	160	<1	0.416 j	37	<1	<1	NA	2.87	**4.09**	NA	0.649 j	NA	NA	<1	<0.2	NA	NA	0.977	NA	0.05 j
CCR-105BR	Below Dam, S of Mayo Lake Rd	Ash Basin	Downgradient	Bedrock	10/02/2018	**854**	30	15	340	<1	<1	7	<1	<1	NA	0.355 j	<1	NA	<1	NA	NA	<1	<0.2	NA	NA	0.6723	NA	0.087 j
CCR-105BR	Below Dam, S of Mayo Lake Rd	Ash Basin	Downgradient	Bedrock	01/08/2019	**853**	32	15	340	<1	<1	5	<1	<1	NA	0.621 j	<1	NA	<1	NA	NA	<1	<0.2	NA	NA	1.3177	NA	0.063 j
CCR-105D	Below Dam, S of Mayo Lake Rd	Ash Basin	Downgradient	Transition Zone	10/02/2018	**831**	39	17	250	<1	<1	28	<1	<1	NA	<1	**1.03**	NA	<1	NA	NA	<1	<0.2	NA	NA	0.697	NA	0.14
CCR-105D	Below Dam, S of Mayo Lake Rd	Ash Basin	Downgradient	Transition Zone	01/08/2019	**789**	41	17	250	<1	<1	30	<1	<1	NA	<1	**1.2**	NA	<1	NA	NA	<1	<0.2	NA	NA	2.5629	NA	0.1
CCR-105S	Below Dam, S of Mayo Lake Rd	Ash Basin	Downgradient	Saprolite	10/02/2018	282	22	28	180	<1	<1	50	<1	<1	NA	0.486 j	0.707 j	NA	<1	NA	NA	<1	<0.2	NA	NA	0.62222	NA	0.037 j
CCR-105S	Below Dam, S of Mayo Lake Rd	Ash Basin	Downgradient	Saprolite	01/08/2019	353	25	19	160	<1	<1	62	<1	<1	NA	<1	**1.08**	NA	<1	NA	NA	<1	<0.2	NA	NA	1.466	NA	<0.1
CCR-106BR	Below Dam, S of Mayo Lake Rd	Ash Basin	Downgradient	Bedrock	10/02/2018	55	17	200	490	<1	<1	23	<1	<1	NA	<1	<1	NA	<1	NA	NA	<1	<0.2	NA	NA	1.298	NA	0.43 j
CCR-106BR	Below Dam, S of Mayo Lake Rd	Ash Basin	Downgradient	Bedrock	01/08/2019	88	20	210	490	<1	<1	24	<1	<1	NA	3.16	0.359 j	NA	<1	NA	NA	<1	<0.2	NA	NA	**5.7542**	NA	0.21 j
CCR-107BR	Below Dam, S of Mayo Lake Rd	Ash Basin	Downgradient	Bedrock	10/02/2018	**1060**	54	51	270	<1	<1	45	<1	<1	NA	<1	0.336 j	NA	<1	NA	NA	<1	<0.2	NA	NA	1.193	NA	0.11
CCR-107BR	Below Dam, S of Mayo Lake Rd	Ash Basin	Downgradient	Bedrock	01/08/2019	**1060**	52	50	240	<1	<1	45	<1	<1	NA	1.72	**1.28**	NA	<1	NA	NA	<1	<0.2	NA	NA	1.225	NA	0.081 j
CCR-108BR	Below Dam, S of Mayo Lake Rd	Ash Basin	Downgradient	Bedrock	10/02/2018	<50	48	22	340	<1	0.35 j	26	<1	<1	NA	0.489 j	<1	NA	<1	NA	NA	<1	<0.2	NA	NA	0.826	NA	0.08 j
CCR-108BR	Below Dam, S of Mayo Lake Rd	Ash Basin	Downgradient	Bedrock	01/09/2019	<50	46	21	270	<1	<1	18	<1	<1	NA	<1	<1	NA	<1	NA	NA	0.662 j	<0.2	NA	NA	1.5702	NA	0.036 j
CCR-109BR	Below Dam, S of Mayo Lake Rd	Ash Basin	Downgradient	Bedrock	10/02/2018	<50	27	**260**	**650**	<1	0.493 j	42	<1	<1	NA	<1	<1	NA	0.706 j	NA	NA	<1	<0.2	NA	NA	3.051	NA	1.1
CCR-109BR	Below Dam, S of Mayo Lake Rd	Ash Basin	Downgradient	Bedrock	01/09/2019	<50	30	**320**	**650**	<1	1.53	44	<1	<1	NA	<1	0.886 j	NA	0.475 j	NA	NA	<1	0.177 j	NA	NA	**5.25**	NA	1
CPA-01BR	N of coal pile	Coal Pile Area	---	Bedrock	04/03/2019	40.976 j	210	**890**	**1700**	<1	<1	140	<1	<1	<0.025	0.467 j	**43.9**	**2020**	<1	**13500**	22.6	**26.3**	0.118 j	0.128 j	13	3.29	0.000581	<1
CPA-01D	N of coal pile	Coal Pile Area	---	Transition Zone	04/03/2019	69	**300**	**1400**	**2500**	<1	0.76 j	31	0.426 j	0.614 j	<0.025	0.431 j	**254**	**18800**	<1	**66000**	**154**	0.545 j	<0.2	**0.448**	67	0.876	0.00071	<1
CPA-02BR	W of coal pile	Coal Pile Area	---	Bedrock	04/03/2019	<50	18	13	350	<1	<1	85	<1	<1	0.13	<1	0.553 j	144	<1	**791**	0.982 j	<1	<0.2	**0.632**	<5	**5.18**	0.00711	0.47
CPA-03BR	Near coal pile retention basin	Coal Pile Area	---	Bedrock	04/03/2019	<50	6.4	8.6	200	<1	0.403 j	13	<1	<1	0.077	0.837 j	0.379 j	117	<1	**397**	0.546 j	<1	<0.2	**0.742**	<5	**7.1**	0.00542	0.056 j
CPA-03D	Near coal pile retention basin	Coal Pile Area	---	Transition Zone	04/03/2019	48.296 j	34	190	480	<1	<1	55	<1	<1	0.12	<1	0.966 j	88	<1	**1170**	18.7	<1	<0.2	**0.604**	5	1.477	0.000754	<1
CPA-07D	N of coal pile	Coal Pile Area	---	Transition Zone	04/08/2019	559	**470**	**5000**	**5200**	<1	**104**	35	**31.5**	**31.5**	<0.025 P4,R0	1.36	**904**	**14200**	**27.4**	**187000**	**686**	**29.1**	**0.296**	<0.3	**1880**	1.275	0.0237	**4.46 j**
CW-01 IMP	SE of AB, outside compliance boundary	Ash Basin	Sidegradient	Transition Zone	07/16/2018	<50	16	9.1	110	<1	<1	<5	<1	<1	0.11	<1	<1	23	<1	4.043 j	0.649 j	<1	<0.2	**0.502**	9	NA	NA	0.0817 j
CW-01	SE of AB, outside compliance boundary	Ash Basin	Sidegradient	Transition Zone	07/16/2018	<50	16	8.8	140	<1	<1	<5	<1	<1	NA	<5	<1	26	<1	<5	<5	<1	<0.2	**0.651**	11	NA	NA	NA
CW-01	SE of AB, outside compliance boundary	Ash Basin	Sidegradient	Transition Zone	11/06/2018	<50	16	9.4	110	<1	<1	<5	<1	<1	0.15	0.425 j	<1	22	<1	3.707 j	0.376 j	<1	<0.2	**0.561**	11	NA	NA	0.0964 j
CW-01	SE of AB, outside compliance boundary	Ash Basin	Sidegradient	Transition Zone	04/03/2019	<50	17	12	130	NA	<1	3.487 j	NA	NA	0.14	0.913 j	<1	258	NA	14	NA	NA	NA	**0.797**	NA	NA	NA	NA
CW-01D IMP	SE of AB, outside compliance boundary	Ash Basin	Sidegradient	Bedrock	07/17/2018	<50	9.4	2.8	220	<1	<1	1.742 j	<1	<1	0.12	0.805 j	<1	21	<1	8	<1	<1	<0.2	**1.27**	2.447 j	NA	NA	0.15
CW-01D	SE of AB, outside compliance boundary	Ash Basin	Sidegradient	Bedrock	07/17/2018	<50	9	2.6	190	<1	<1	<5	<1	<1	NA	<5	<1	41	<1	14	<5	<1	<0.2	**1.34**	<5	NA	NA	NA
CW-01D	SE of AB, outside compliance boundary	Ash Basin	Sidegradient	Bedrock	11/06/2018	<50	8.3	2.4	180	<1	<1	2.008 j	<1	<1	0.063	0.646 j	<1	26	<1	17	<1	<1	<0.2	**1.37**	2.793 j	NA	NA	0.13

FACILITY NAME: **MAYO**
DATE UPDATED: **06/24/2019**
PREADSHEET UPDATED BY: **BRANDON RUSSO**
PREADSHEET CHECKED BY: **JERRY WYLIE**

	ED 40CFR257 APPENDIX III CONSTITUENTS				INORGANIC PARAMETERS (TOTAL CONCENTRATION)																RADIONUCLIDES		ER PARAME
Reporting Units	**ug/L**	**mg/L**	**mg/L**	**mg/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**pCi/L**	**ug/mL**	**mg/L**
CAC 02L Standard	**700**	**250**	**250**	**500**	**1***	**10**	**700**	**4***	**2**	**10**	**10**	**1***	**300**	**15**	**50**	**100**	**20**	**0.2***	**0.3***	**1000**	**5^**	**0.03^**	**2**
Provisional Background Threshold Values (Surficial Unit)	**50**	**3.3**	**1.6**	**85**	**1**	**1**	**19**	**1**	**1**	**0.088**	**3.23**	**1.02**	**385**	**1**	**253**	**3.03**	**1**	**0.2**	**0.974**	**227**	**4**	**0.000367**	**NE**
Provisional Background Threshold Values (Transition Zone Unit)	**50**	**33.3**	**7.5**	**430**	**1**	**1**	**78.3**	**1**	**1**	**1.26**	**6**	**1**	**1319**	**1**	**298**	**5**	**1**	**0.2**	**5.88**	**12**	**9**	**0.001**	**NE**
Provisional Background Threshold Values (Bedrock Unit)	**50**	**43**	**18**	**340**	**1**	**1**	**97**	**1**	**1**	**0.4**	**7**	**1.19**	**2550**	**1**	**544**	**5**	**1**	**0.2**	**5.52**	**37.9**	**7.6**	**0.00203**	**NE**

						ED 40CFR257 APPENDIX III CONSTITUENTS				INORGANIC PARAMETERS (TOTAL CONCENTRATION)																RADIONUCLIDES		ER PARAME
Sample ID	**Location Description**	**Associated Unit**	**Location With Respect to Groundwater Flow Direction**	**Sample Location Aquifer Name**	**Sample Collection Date**	**Boron**	**Chloride**	**Sulfate**	**Total Dissolved Solids**	**Antimony**	**Arsenic**	**Barium**	**Beryllium**	**Cadmium**	**Chromium (VI)**	**Chromium**	**Cobalt**	**Iron**	**Lead**	**Manganese**	**Nickel**	**Selenium**	**Thallium**	**Vanadium**	**Zinc**	**Total Radium**	**Total Uranium**	**Fluoride**
CW-01D	SE of AB, outside compliance boundary	Ash Basin	Sidegradient	Bedrock	04/03/2019	<50	13	3.7	200	NA	<1	1.776 j	NA	NA	0.03	<1	<1	<10	NA	<5	NA	NA	NA	**1.1**	NA	NA	NA	NA
CW-02 IMP	Below AB dam, S of Mayo Lake Road, inside CB	Ash Basin	Downgradient	Transition Zone	07/16/2018	**970**	43	42	140	<1	<1	109	<1	<1	0.095	<1	<1	3.724 j	<1	**313**	1.87	<1	<0.2	0.222 j	3.404 j	0.308	<0.0002	<0.1
CW-02	Below AB dam, S of Mayo Lake Road, inside CB	Ash Basin	Downgradient	Transition Zone	07/16/2018	**952**	44	42	150	<1	<1	107	<1	<1	NA	<5	<1	<10	<1	**311**	<5	<1	<0.2	<0.3	6	NA	NA	NA
CW-02	Below AB dam, S of Mayo Lake Road, inside CB	Ash Basin	Downgradient	Transition Zone	11/07/2018	661	26	33	100	<1	<1	78	<1	<1	0.1	<1	<1	92	<1	**107**	0.997 j	<1	<0.2	**0.441**	6	2.945	<0.0002	<0.1
CW-02	Below AB dam, S of Mayo Lake Road, inside CB	Ash Basin	Downgradient	Transition Zone	01/08/2019	407	20	29	110	NA	<1	58	NA	NA	0.035	<1	<1	39	NA	35	NA	NA	NA	**0.414**	NA	1.967	<0.0002	NA
CW-02	Below AB dam, S of Mayo Lake Road, inside CB	Ash Basin	Downgradient	Transition Zone	04/02/2019	421	22	33	120	NA	<1	60	NA	NA	0.041	<1	<1	16	NA	49	NA	NA	NA	0.156 j	NA	0.427	<0.0002	NA
CW-02D IMP	Below AB dam, S of Mayo Lake Road, inside CB	Ash Basin	Downgradient	Bedrock	07/16/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.796	0.00189	NA
CW-02D	Below AB dam, S of Mayo Lake Road, inside CB	Ash Basin	Downgradient	Bedrock	07/16/2018	271	37	72	310	<1	<1	26	<1	<1	NA	**34**	<1	**405**	<1	**109**	15	<1	<0.2	**1.17**	9	NA	NA	NA
CW-02D IMP	Below AB dam, S of Mayo Lake Road, inside CB	Ash Basin	Downgradient	Bedrock	07/17/2018	263	36	80	360	0.553 j	0.405 j	26	<1	<1	0.45	5.28	<1	208	<1	**201**	2.74	<1	<0.2	**1.45**	10	NA	NA	0.16
CW-02D	Below AB dam, S of Mayo Lake Road, inside CB	Ash Basin	Downgradient	Bedrock	11/07/2018	211	35	76	310	0.399 j	0.427 j	19	<1	<1	0.25	1.07	<1	45	<1	31	1.23	<1	<0.2	**1.19**	20	0.616	0.00252	0.12
CW-02D	Below AB dam, S of Mayo Lake Road, inside CB	Ash Basin	Downgradient	Bedrock	04/02/2019	244	35	75	360	NA	0.481 j	20	NA	NA	0.46	0.657 j	<1	7.763 j	NA	8	NA	NA	NA	**0.749**	NA	0.5	0.00245	NA
CW-03 IMP	Below AB dam, N of Mayo Lake Road, inside CB	Ash Basin	Downgradient	Transition Zone	07/17/2018	<50	88	16	370	<1	<1	17	<1	<1	0.053	0.583 j	<1	238	<1	15	0.495 j	<1	<0.2	**1.93**	4.662 j	NA	NA	0.16
CW-03	Below AB dam, N of Mayo Lake Road, inside CB	Ash Basin	Downgradient	Transition Zone	07/17/2018	<50	89	16	340	<1	<1	17	<1	<1	NA	<5	<1	**389**	<1	19	<5	<1	<0.2	**2.26**	5	NA	NA	NA
CW-03	Below AB dam, N of Mayo Lake Road, inside CB	Ash Basin	Downgradient	Transition Zone	11/08/2018	<50	88	17	350	<1	<1	14	<1	<1	0.065	0.381 j	<1	133	<1	9	<1	<1	<0.2	**1.81**	<5	NA	NA	0.1876 j
CW-03	Below AB dam, N of Mayo Lake Road, inside CB	Ash Basin	Downgradient	Transition Zone	04/10/2019	<50	83	17	360	NA	<1	17	NA	NA	0.057	<1	<1	9.419 j	NA	6	NA	NA	NA	**1.35**	NA	NA	NA	NA
CW-04 IMP	North of AB and Mayo Lake Road, inside CB	Ash Basin	Downgradient	Bedrock	07/17/2018	<50	8.8	26	180	<1	<1	29	<1	<1	0.22	<1	<1	12	<1	2.954 j	0.642 j	0.336 j	<0.2	**0.978**	1.786 j	NA	NA	0.11
CW-04	North of AB and Mayo Lake Road, inside CB	Ash Basin	Downgradient	Bedrock	07/17/2018	<50	8.4	25	140	<1	<1	29	<1	<1	NA	<5	<1	32	<1	<5	<5	<1	<0.2	**1.1**	<5	NA	NA	NA
CW-04	North of AB and Mayo Lake Road, inside CB	Ash Basin	Downgradient	Bedrock	11/08/2018	<50	6.1	17	140	<1	<1	24	<1	<1	0.053	<1	<1	84	<1	<5	<1	0.335 j	<0.2	**1.22**	4.048 j	NA	NA	0.13
CW-04	North of AB and Mayo Lake Road, inside CB	Ash Basin	Downgradient	Bedrock	04/10/2019	<50	7.5	26	160	NA	<1	29	NA	NA	0.3	0.418 j	<1	85	NA	2.1 j	NA	NA	NA	**0.906**	NA	NA	NA	NA
CW-05 IMP	West of AB, East of Boston Rd, inside CB	Ash Basin	Upgradient	Bedrock	07/17/2018	<50	35	6.8	290	<1	<1	52	<1	<1	<0.025	0.443 j	**1.08**	**413**	<1	**803**	0.711 j	<1	<0.2	0.244 j	5	NA	NA	0.26
CW-05	West of AB, East of Boston Rd, inside CB	Ash Basin	Upgradient	Bedrock	07/17/2018	<50	35	6.7	250	<1	<1	52	<1	<1	NA	<5	**1.06**	**398**	<1	**785**	<5	<1	<0.2	**0.301**	<5	NA	NA	NA
CW-05	West of AB, East of Boston Rd, inside CB	Ash Basin	Upgradient	Bedrock	11/06/2018	<50	33	6.6	260	<1	<1	55	<1	<1	<0.025	0.629 j	0.964 j	**810**	<1	**787**	0.343 j	<1	<0.2	0.149 j	2.451 j	NA	NA	0.24
CW-05	West of AB, East of Boston Rd, inside CB	Ash Basin	Upgradient	Bedrock	04/08/2019	<50	42	6.2	280	NA	<1	50	NA	NA	<0.025	<1	0.571 j	**329**	NA	**630**	NA	NA	NA	<0.3	NA	NA	NA	NA
CW-06 IMP	NE of AB, S of Mayo Lake Road, inside CB	Ash Basin	Downgradient	Bedrock	07/16/2018	<50	92	36	480	<1	<1	43	<1	<1	<0.025	<1	0.741 j	**1600**	<1	**1330**	1.31	<1	<0.2	0.166 j	7	**27.89**	0.000179 j	0.29
CW-06	NE of AB, S of Mayo Lake Road, inside CB	Ash Basin	Downgradient	Bedrock	07/16/2018	<50	95	37	480	<1	<1	42	<1	<1	NA	<5	<1	**1550**	<1	**1370**	<5	<1	<0.2	<0.3	<5	NA	NA	NA
CW-06	NE of AB, S of Mayo Lake Road, inside CB	Ash Basin	Downgradient	Bedrock	11/07/2018	<50	94	37	480	<1	<1	42	<1	<1	<0.025	<1	0.628 j	**1670**	<1	**1460**	0.863 j	<1	<0.2	0.248 j	<5	**118.76**	0.000216	0.26
CW-06	NE of AB, S of Mayo Lake Road, inside CB	Ash Basin	Downgradient	Bedrock	04/11/2019	<50	88	37	**510**	NA	<1	41	NA	NA	<0.025	<1	0.715 j	**1510**	NA	**1310**	NA	NA	NA	<0.3	NA	**32.25**	0.000164 j	NA
MW-02	Below AB dam, NW side, b/w dam and Mayo Lake Rd	Ash Basin	Downgradient	Bedrock	07/18/2018	<50	18	18	200	<1	0.343 j	74	<1	<1	<0.025	<1	**4.79**	**1240**	<1	**1310**	3.2	<1	<0.2	**0.76**	2.73 j,B2	NA	NA	0.23
MW-02 CCR	Below AB dam, NW side, b/w dam and Mayo Lake Rd	Ash Basin	Downgradient	Bedrock	10/02/2018	<50	24	17	210	**2.6**	0.39 j	72	<1	<1	NA	0.464 j	**5.32**	NA	<1	NA	NA	<1	<0.2	NA	NA	0.73	NA	0.2
MW-02	Below AB dam, NW side, b/w dam and Mayo Lake Rd	Ash Basin	Downgradient	Bedrock	11/06/2018	<50	14	18	180	**3.05**	<1	54	<1	<1	<0.025	0.575 j	**1.76**	**848**	<1	**537**	3.54	<1	<0.2	**1.27**	7	NA	NA	0.24
MW-02 CCR	Below AB dam, NW side, b/w dam and Mayo Lake Rd	Ash Basin	Downgradient	Bedrock	01/09/2019	<50	13	19	190	<1	<1	43	<1	<1	NA	0.765 j	**1.09**	NA	<1	NA	NA	<1	<0.2	NA	NA	1.126	NA	0.25
MW-02	Below AB dam, NW side, b/w dam and Mayo Lake Rd	Ash Basin	Downgradient	Bedrock	04/10/2019	<50	11	19	240	NA	<1	40	NA	NA	<0.025	0.516 j	0.855 j	**356**	NA	**270**	NA	NA	NA	**2.07**	NA	NA	NA	NA
MW-03	Below AB dam, along Crutchfield Branch, by SB-7	Ash Basin	Downgradient	Saprolite	07/18/2018	**1230**	47	25	200	<1	<1	56	<1	<1	0.2	<1	<1	4.883 j	<1	**1040**	2.12	<1	<0.2	**0.319**	<5	**6.485**	<0.0002	0.15
MW-03 CCR	Below AB dam, along Crutchfield Branch, by SB-7	Ash Basin	Downgradient	Saprolite	10/02/2018	**1080**	39	22	200	<1	<1	53	<1	<1	NA	<1	<1	NA	<1	NA	NA	<1	<0.2	NA	NA	0.368	NA	0.1
MW-03	Below AB dam, along Crutchfield Branch, by SB-7	Ash Basin	Downgradient	Saprolite	11/08/2018	**1090**	40	23	190	<1	<1	55	<1	<1	0.19	0.495 j	<1	12	<1	**1320**	2.19	<1	0.145 j	**0.335**	8	0.976	<0.0002	0.12
MW-03 CCR	Below AB dam, along Crutchfield Branch, by SB-7	Ash Basin	Downgradient	Saprolite	01/09/2019	**899**	39	21	190	<1	<1	50	<1	<1	NA	0.421 j	<1	NA	<1	NA	NA	<1	<0.2	NA	NA	1.488	NA	<0.1
MW-03	Below AB dam, along Crutchfield Branch, by SB-7	Ash Basin	Downgradient	Saprolite	04/10/2019	**982**	38	21	210	NA	<1	52	NA	NA	0.16	<1	<1	24	NA	**1070**	NA	NA	NA	0.104 j	NA	0.5774	<0.0002	NA
MW-03BR	North of Mayo Lake Rd, adjacent to CW-3	Ash Basin	Downgradient	Bedrock	07/17/2018	<50	150	11	**690**	<1	<1	40	<1	<1	<0.025	<1	<1	**331**	<1	**564**	<1	<1	<0.2	0.249 j	<5	NA	NA	0.24
MW-03BR	North of Mayo Lake Rd, adjacent to CW-3	Ash Basin	Downgradient	Bedrock	11/08/2018	<50	150	11	**610**	<1	<1	42	<1	<1	<0.025	0.505 j	<1	**361**	<1	**574**	<1	<1	<0.2	0.134 j	<5	NA	NA	0.28 j
MW-03BR	North of Mayo Lake Rd, adjacent to CW-3	Ash Basin	Downgradient	Bedrock	04/10/2019	<50	140	11	**640**	NA	<1	41	NA	NA	<0.025	<1	<1	266	NA	**540**	NA	NA	NA	<0.3	NA	NA	NA	NA
MW-04	Southeast of AB, northeast of forebay	Ash Basin	Sidegradient	Bedrock	07/18/2018	<50	8.7	38	210	<1	<1	6	<1	<1	0.028	<1	<1	25	<1	**53**	0.606 j	<1	<0.2	**0.6**	19 B2	NA	NA	0.21
MW-04	Southeast of AB, northeast of forebay	Ash Basin	Sidegradient	Bedrock	11/06/2018	<50	8.1	35	220	<1	<1	7	<1	<1	0.14	<1	<1	6.703 j	<1	**511**	1.27	<1	<0.2	**0.655**	37	NA	NA	0.19
MW-05BR	NW of AB, on compliance boundary, next to CW-5	Ash Basin	Upgradient	Bedrock	07/17/2018	<50	68	2.4	460	<1	0.698 j	35	<1	<1	<0.025	<1	<1	**5430**	<1	**1750**	<1	<1	<0.2	0.207 j	2.098 j	NA	NA	0.19
MW-05BR	NW of AB, on compliance boundary, next to CW-5	Ash Basin	Upgradient	Bedrock	11/06/2018	<50	64	2.6	380	<1	1	34	<1	<1	<0.025	1.76	<1	**5950**	<1	**1780**	<1	<1	<0.2	0.119 j	1.948 j	NA	NA	0.18
MW-05BR	NW of AB, on compliance boundary, next to CW-5	Ash Basin	Upgradient	Bedrock	04/08/2019	<50	64	1.8	390	NA	1.16	36	NA	NA	<0.025	<1	**1.2**	**8770**	NA	**1770**	NA	NA	NA	<0.3	NA	NA	NA	NA
MW-08BR	Northeast of AB, on 1500 ft offset	Reference Location	Reference Location	Bedrock	07/18/2018	<50	120	40	480	0.81 j	0.5 j	15	0.498 j	0.389 j	0.03	0.494 j	0.821 j	53	0.726 j	**188**	2.5	0.552 j	**0.608**	**1.52**	4.843 j,B2	NA	NA	0.1566 j
MW-08BR	Northeast of AB, on 1500 ft offset	Reference Location	Reference Location	Bedrock	11/06/2018	<50	110	36	400	<1	<1	14	<1	<1	<0.025	0.734 j	0.343 j	104	<1	**156**	1.73	<1	<0.2	**0.995**	6	NA	NA	0.1314 j
MW-09BRL	East of AB, southeast of railroad	Reference Location	Reference Location	Bedrock	07/19/2018	<50	46	9.5	220	0.681 j	0.574 j	16	<1	<1	<0.025	1.48	<1	**573**	<1	**493**	2.98	<1	<0.2	**1.97**	4.067 j	NA	NA	0.13
MW-09BRL	East of AB, southeast of railroad	Reference Location	Reference Location	Bedrock	11/06/2018	<50	19	8.8	220	<1	0.559 j	18	<1	<1	0.028	5.78	<1	**4620**	0.695 j	**223**	2.84	<1	0.136 j	**6.63**	9	NA	NA	0.15
MW-09BRL	East of AB, southeast of railroad	Reference Location	Reference Location	Bedrock	04/03/2019	<50	5	7.9	380	NA	0.648 j	21	NA	NA	0.088	**13**	0.541 j	**12000**	NA	**194**	NA	NA	NA	**14.4**	NA	NA	NA	NA
MW-103BRL	Below Dam, North of Ash Basin	Ash Basin	Downgradient	Bedrock	02/12/2019	<50	5	4.6	**2000**	<1	0.35 j	**1070**	<1	<1	**21.8**	**14.8**	<1	41	0.416 j	<5	1	0.431 j	**0.205**	**3.32**	5	**13.49**	<0.0002	0.3
MW-103BRL	Below Dam, North of Ash Basin	Ash Basin	Downgradient	Bedrock	04/22/2019	<50	5	1.2	**2200**	<1	<1	**1200**	<1	<1	**14.7**	**15.9 B2**	<1	42	0.571 j	<5	1.45	0.534 j	0.198 j	**2.52**	4.2 j,B1	4.2303	<0.0002	0.19
MW-103BRM	Below Dam, North of Ash Basin	Ash Basin	Downgradient	Bedrock	02/12/2019	<50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-103BRM	Below Dam, North of Ash Basin	Ash Basin	Downgradient	Bedrock	04/23/2019	<50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-104BRL	Below Dam, S of Mayo Lake Rd	Ash Basin	Downgradient	Bedrock	11/29/2018	<50	55	55	390	<1	<1	29	<1	<1	<0.025	<1	<1	224	<1	**80**	<1	<1	<0.2	<0.3	2.349 j	3.7	0.00124	0.78
MW-104BRL	Below Dam, S of Mayo Lake Rd	Ash Basin	Downgradient	Bedrock	02/11/2019	<50	53	54	420	<1	0.367 j	29	<1	<1	0.04	<1	<1	239	<1	**87**	<1	<1	<0.2	<0.3	<5	**5.56**	0.00122	0.79
MW-104BRL	Below Dam, S of Mayo Lake Rd	Ash Basin	Downgradient	Bedrock	04/23/2019	<50	55	56	440	<1	<1	30	<1	<1	<0.025	0.411 j	<1	**397**	<1	**92**	<1	<1	<0.2	0.286 j	1.954 j	4.71	0.00108	1
MW-104BRM	Below Dam, S of Mayo Lake Rd	Ash Basin	Downgradient	Bedrock	11/29/2018	<50	13	37	290	0.469 j	0.871 j	19	<1	<1	0.53	9.04	<1	158	<1	17	5.87	<1	<0.2	**3.63**	22	3.089	0.00306	1.3
MW-104BRM	Below Dam, S of Mayo Lake Rd	Ash Basin	Downgradient	Bedrock	02/12/2019	<50	12	38	310	0.704 j	0.812 j	18	<1	<1	0.25	0.85 j	<1	3.512 j	<1	10	<1	<1	<0.2	**2.42**	3.367 j	0.953	0.00376	1.4
MW-104BRM	Below Dam, S of Mayo Lake Rd	Ash Basin	Downgradient	Bedrock	04/23/2019	<50	19	39	320	<1	0.9 j	19	<1	<1	0.027	<1	<1	74	<1	**57**	<1	<1	<0.2	**0.637**	<5	0.654	0.00282	1.8
MW-105BRL	Below Dam, S of Mayo Lake Rd	Ash Basin	Downgradient	Bedrock	02/12/2019	<50	16	19	330	**3.26**	2.66	43	<1	<1	0.22 M1	2.28	<1	**369**	0.579 j	26	1.12	<1	<0.2	**1.91**	14	1.116	0.00444	0.92
MW-105BRL	Below Dam, S of Mayo Lake Rd	Ash Basin	Downgradient	Bedrock	04/23/2019	<50	15	15	400	**2.36**	4.01	52	<1	<1	0.081	2.7	<1	142	0.351 j	12	0.504 j	<1	<0.2	**1.52**	6	0.745	0.000802	1.5
MW-105BRM	Below Dam, S of Mayo Lake Rd	Ash Basin	Downgradient	Bedrock	11/29/2018	<50	26	29	350	**4.27**	<1	32	<1	<1	0.036	2.1	<1	**337**	<1	**347**	3.23	<1	<0.2	**1.2**	10	0.781	0.00133	0.25
MW-105BRM	Below Dam, S of Mayo Lake Rd	Ash Basin	Downgradient	Bedrock	02/11/2019	<50	26	32	370	<1	1.28	27	<1	<1	0.041 M1	0.433 j	<1	**788**	<1	**415**	0.984 j	<1	<0.2	0.224 j	1.837 j	0.223	0.00141	0.25
MW-105BRM	Below Dam, S of Mayo Lake Rd	Ash Basin	Downgradient	Bedrock	04/23/2019	<50	26	27	360	0.458 j	2.71	32	<1	<1	<0.025	<1	<1	**1150**	<1	**426**	<1	<1	<0.2	0.166 j	<5	0.4587	0.00161	0.31
MW-107BRL	Below Dam, S of Mayo Lake Rd	Ash Basin	Downgradient	Bedrock	02/11/2019	64	9.3	31	**1100**	**1.7**	1.23	313	<1	<1	8.2	6.49	<1	87	<1	11	0.535 j	0.362 j	0.098 j	**10**	5	4.37	0.000444	**2.9**
MW-107BRL	Below Dam, S of Mayo Lake Rd	Ash Basin	Downgradient	Bedrock	04/22/2019	68	9.5	32	**1200**	**1.45**	1.15	309	<1	<1	5.8	7.57 B2	<1	91	0.366 j	6	0.855 j	0.449 j	0.111 j	**9.82**	4.229 j,B1	3.7	0.00016 j	**2.7**
MW-107BRM	Below Dam, S of Mayo Lake Rd	Ash Basin	Downgradient	Bedrock	02/12/2019	44.891 j	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-107BRM	Below Dam, S of Mayo Lake Rd	Ash Basin	Downgradient	Bedrock	04/22/2019	83	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-10BR	E side of Plant, along 1500 ft offset, next to SB-	Upgradient	Upgradient	Bedrock	07/18/2018	<50	21	87	290	<1	<1	4.689 j	<1	<1	0.16	<1	<1	7.238 j	<1	40	1.79	<1	0.152 j	**1.93**	27 B2	**6.017**	0.0000671 j	0.37

FACILITY NAME: MAYO
DATE UPDATED: 06/24/2019
PREADSHEET UPDATED BY: BRANDON RUSSO
PREADSHEET CHECKED BY: JERRY WYLIE

	ED 40CFR257 APPENDIX III CONSTITUENTS				INORGANIC PARAMETERS (TOTAL CONCENTRATION)																RADIONUCLIDES		ER PARAME
Reporting Units	ug/L	mg/L	mg/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/mL	mg/L
CAC 02L Standard	**700**	**250**	**250**	**500**	**1***	**10**	**700**	**4***	**2**	**10**	**10**	**1***	**300**	**15**	**50**	**100**	**20**	**0.2***	**0.3***	**1000**	**5^**	**0.03^**	**2**
Provisional Background Threshold Values (Surficial Unit)	50	3.3	1.6	85	1	1	19	1	1	0.088	3.23	1.02	385	1	253	3.03	1	0.2	0.974	227	4	0.000367	NE
Provisional Background Threshold Values (Transition Zone Unit)	50	33.3	7.5	430	1	1	78.3	1	1	1.26	6	1	1319	1	298	5	1	0.2	5.88	12	9	0.001	NE
Provisional Background Threshold Values (Bedrock Unit)	50	43	18	340	1	1	97	1	1	0.4	7	1.19	2550	1	544	5	1	0.2	5.52	37.9	7.6	0.00203	NE

						ED 40CFR257 APPENDIX III CONSTITUENTS				INORGANIC PARAMETERS (TOTAL CONCENTRATION)																RADIONUCLIDES		ER PARAME
Sample ID	Location Description	Associated Unit	Location With Respect to Groundwater Flow Direction	Sample Location Aquifer Name	Sample Collection Date	Boron	Chloride	Sulfate	Total Dissolved Solids	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium (VI)	Chromium	Cobalt	Iron	Lead	Manganese	Nickel	Selenium	Thallium	Vanadium	Zinc	Total Radium	Total Uranium	Fluoride
MW-10BR	E side of Plant, along 1500 ft offset, next to SB-	Upgradient	Upgradient	Bedrock	11/06/2018	<50	19	85	290	<1	<1	4.263 j	<1	<1	0.14	0.404 j	<1	27	<1	34	1.44	<1	0.171 j	**2.05**	17	1.5201	<0.0002	0.35
MW-12D	South edge of property, southwest of Plant	Background	Background	Transition Zone	07/18/2018	<50	4.3	1.1	110	<1	<1	16	<1	<1	0.96	0.791 j	<1	48	<1	18	0.794 j	<1	<0.2	**0.747**	1.962 j,B2	**15.945**	0.0000928 j	0.0788 j
MW-12D CCR	South edge of property, southwest of Plant	Background	Background	Transition Zone	10/02/2018	<50	4.4	1.1	120	<1	<1	15	<1	<1	NA	0.949 j	<1	NA	<1	NA	NA	<1	<0.2	NA	NA	2.783	NA	<0.1
MW-12D	South edge of property, southwest of Plant	Background	Background	Transition Zone	11/07/2018	<50	4.4	1.1	86	<1	<1	15	<1	<1	0.82	1.02	<1	149	<1	28	0.371 j	<1	0.083 j	**0.68**	14	3.855	0.000107 j	<0.1
MW-12D CCR	South edge of property, southwest of Plant	Background	Background	Transition Zone	01/07/2019	<50	4.6	1.2	81	<1	<1	18	<1	<1	NA	1.13	<1	NA	<1	NA	NA	<1	<0.2	NA	NA	3.118	NA	0.0694 j
MW-12D	South edge of property, southwest of Plant	Background	Background	Transition Zone	04/10/2019	<50	4.6	1.1	98	NA	<1	17	NA	NA	0.72	1.14	<1	147	NA	27	NA	NA	NA	**0.664**	NA	1.36	0.000115 j	NA
MW-12S	South edge of property, southwest of Plant	Background	Background	Saprolite	07/18/2018	<50	2.5	1.6	52	<1	0.52 j	17	<1	<1	0.045	0.851 j	0.667 j	**510**	0.383 j	**101**	1.4	<1	<0.2	**1.5**	126 B2	0.3319	<0.0002	0.0703 j
MW-12S CCR	South edge of property, southwest of Plant	Background	Background	Saprolite	10/02/2018	<50	1.6	2.2	110	<1	1.53	15	<1	<1	NA	1.78	**2.14**	NA	1.96	NA	NA	<1	<0.2	NA	NA	0.5118	NA	0.041 j
MW-12S	South edge of property, southwest of Plant	Background	Background	Saprolite	11/07/2018	<50	2.4	1.3	<25	<1	0.53 j	16	<1	<1	0.063	0.996 j	0.948 j	**776**	0.597 j	**153**	0.837 j	<1	<0.2	**2.09**	94	0.76	0.0000899 j	0.0493 j
MW-12S CCR	South edge of property, southwest of Plant	Background	Background	Saprolite	01/07/2019	<50	2.1	1.8	<25	<1	0.334 j	12	<1	<1	NA	0.872 j	0.366 j	NA	<1	NA	NA	<1	<0.2	NA	NA	0.649	NA	0.051 j
MW-12S	South edge of property, southwest of Plant	Background	Background	Saprolite	04/10/2019	<50	2.5	1.2	<25	NA	<1	14	NA	NA	0.09	0.569 j	<1	178	NA	41	NA	NA	NA	**0.982**	NA	0.677	<0.0002	NA
MW-13BR	West of AB, west of US HWY 501	Background	Background	Bedrock	07/18/2018	<50	29	16	310	0.37 j	<1	40	<1	<1	<0.025	3.48	**5.99**	**2080**	1.27	**303**	1.87	<1	<0.2	**1.97**	9 B2	NA	NA	0.11
MW-13BR	West of AB, west of US HWY 501	Background	Background	Bedrock	11/08/2018	<50	28	16	280	<1	<1	18	<1	<1	0.045	0.727 j	**4.67**	**675**	<1	**260**	<1	<1	<0.2	0.282 j	<5	NA	NA	0.0772 j
MW-13BR	West of AB, west of US HWY 501	Background	Background	Bedrock	04/08/2019	<50	27	16	290	NA	<1	15	NA	NA	<0.025	<1	**4.83**	**503**	NA	**233**	NA	NA	NA	<0.3	NA	0.821	0.000399	NA
MW-14BR	Northwest of AB, outside compliance boundary	Background	Background	Bedrock	07/18/2018	<50	14	9.2	190	<1	0.538 j	17	<1	<1	<0.025 M1	<1	0.581 j	104	<1	**119**	0.42 j	<1	<0.2	**2.55**	3.146 j,B2	NA	NA	0.3
MW-14BR	Northwest of AB, outside compliance boundary	Background	Background	Bedrock	11/07/2018	<50	13	9.5	160	<1	0.582 j	16	<1	<1	0.028	<1	**1.53**	178	<1	**114**	<1	<1	<0.2	**2.74**	2.656 j	NA	NA	0.25
MW-16BR	Off Duke property, N of AB, near state boundary	Ash Basin	Downgradient	Bedrock	07/18/2018	25.78 j	8.6	0.75	180	<1	0.428 j	15	<1	<1	<0.025	<1	<1	**1950**	<1	**306**	<1	<1	<0.2	0.222 j	2.042 j,B2	0.1778	0.000114 j	0.4
MW-16BR	Off Duke property, N of AB, near state boundary	Ash Basin	Downgradient	Bedrock	11/06/2018	22.397 j	8.2	1.4	160	<1	<1	14	<1	<1	0.025	<1	<1	**2400**	<1	**319**	<1	<1	<0.2	0.103 j	3.136 j	0.1352	0.000151 j	0.32
MW-16BR	Off Duke property, N of AB, near state boundary	Ash Basin	Downgradient	Bedrock	01/08/2019	20.709 j	8.7	1.8	180	NA	<1	14	NA	NA	<0.025	<1	<1	**1270**	NA	**356**	NA	NA	NA	**0.384**	NA	1.158	0.000259	NA
MW-16BR	Off Duke property, N of AB, near state boundary	Ash Basin	Downgradient	Bedrock	04/02/2019	17.218 j	8.6	2.3	180	NA	<1	13	NA	NA	<0.025	<1	<1	**421**	NA	**327**	NA	NA	NA	<0.3	NA	NA	NA	NA
MW-16BR	Off Duke property, N of AB, near state boundary	Ash Basin	Downgradient	Bedrock	04/03/2019	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.532	0.000408	NA
MW-16D	Off Duke property, N of AB, near state boundary	Ash Basin	Downgradient	Transition Zone	07/18/2018	<50	11	7.7	140	<1	<1	4.956 j	<1	<1	0.14	0.37 j	<1	195	<1	**128**	<1	0.49 j	<0.2	**0.823**	<5	1.26	0.000276	0.22
MW-16D	Off Duke property, N of AB, near state boundary	Ash Basin	Downgradient	Transition Zone	11/06/2018	<50	11	7.3	130	<1	<1	4.907 j	<1	<1	0.15	0.447 j	<1	156	<1	**173**	0.404 j	<1	<0.2	**0.761**	7	3.64	0.000289	0.2
MW-16D	Off Duke property, N of AB, near state boundary	Ash Basin	Downgradient	Transition Zone	01/08/2019	<50	11	7.1	150	NA	<1	3.277 j	NA	NA	0.13	<1	<1	15	NA	26	NA	NA	NA	**0.866**	NA	1.2389	0.000259	NA
MW-16D	Off Duke property, N of AB, near state boundary	Ash Basin	Downgradient	Transition Zone	04/02/2019	<50	9.9	6.2	150	NA	<1	3.38 j	NA	NA	0.079	<1	<1	60	NA	**52**	NA	NA	NA	**0.589**	NA	NA	NA	NA
MW-16D	Off Duke property, N of AB, near state boundary	Ash Basin	Downgradient	Transition Zone	04/03/2019	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0726	0.000275	NA
MW-16S	Off Duke property, N of AB, near state boundary	Ash Basin	Downgradient	Saprolite	07/18/2018	164	9.7	8.7	80	0.364 j	<1	75	<1	<1	<0.025	<1	<1	**657**	<1	23	1.51	<1	<0.2	0.3	7 B2	NA	NA	0.0594 j
MW-16S	Off Duke property, N of AB, near state boundary	Ash Basin	Downgradient	Saprolite	11/06/2018	98	4.1	9.6	51	<1	<1	71	<1	<1	0.044	<1	<1	50	<1	10	0.599 j	<1	<0.2	0.144 j	4.052 j	NA	NA	<0.5
MW-16S	Off Duke property, N of AB, near state boundary	Ash Basin	Downgradient	Saprolite	01/08/2019	49.518 j	3.6	9.9	66	NA	<1	58	NA	NA	<0.025	<1	<1	45	NA	3.508 j	NA	NA	NA	0.147 j	NA	1.505	<0.0002	NA
MW-16S	Off Duke property, N of AB, near state boundary	Ash Basin	Downgradient	Saprolite	04/02/2019	100	8.6	9	58	NA	<1	63	NA	NA	<0.025	<1	<1	47	NA	25	NA	NA	NA	<0.3	NA	NA	NA	NA
MW-18BR	SE of AB, outside compliance boundary	Ash Basin	Sidegradient	Bedrock	07/18/2018	<50	69	21	420	<1	2.51	90	<1	<1	<0.025	<1	<1	**690**	<1	**1300**	<1	<1	<0.2	**0.398**	<5	NA	NA	0.19
MW-18BR	SE of AB, outside compliance boundary	Ash Basin	Sidegradient	Bedrock	09/12/2018	<50	65	17	410	<1	2.01	91	<1	<1	<0.025	<1	<1	**632**	<1	**1320**	<1	<1	<0.2	0.25 j	<5	0.646	0.00601	0.18
MW-18BR	SE of AB, outside compliance boundary	Ash Basin	Sidegradient	Bedrock	11/06/2018	<50	66	18	380	<1	1.96	92	<1	<1	<0.025	<1	<1	**625**	<1	**1380**	<1	<1	<0.2	0.284 j	2.331 j	NA	NA	0.16
MW-18BR	SE of AB, outside compliance boundary	Ash Basin	Sidegradient	Bedrock	12/05/2018	<50	67	17	390	<1	1.29	91	<1	<1	<0.025	<1	<1	**491**	<1	**1360**	<1	<1	<0.2	<0.3	2.298 j,B2	2.377	0.00485	0.14
MW-18BR	SE of AB, outside compliance boundary	Ash Basin	Sidegradient	Bedrock	04/11/2019	28.714 j	67	31	460	NA	4.72	85	NA	NA	<0.025	<1	<1	**791**	NA	**1250**	NA	NA	NA	<0.3	NA	NA	NA	NA
MW-18D	SE of AB, outside compliance boundary	Ash Basin	Sidegradient	Transition Zone	07/18/2018	<50	25	37	270	<1	<1	3.536 j	<1	0.385 j	0.034	<1	<1	28	<1	3.055 j	0.752 j	0.336 j	0.114 j	**1.5**	18 B2	NA	NA	0.16
MW-18D	SE of AB, outside compliance boundary	Ash Basin	Sidegradient	Transition Zone	09/12/2018	<50	23	36	260	<1	<1	3.691 j	<1	<1	<0.025	<1	<1	7.779 j	<1	2.249 j	0.57 j	0.401 j	<0.2	**1.29**	21	1.512	0.000224	0.16
MW-18D	SE of AB, outside compliance boundary	Ash Basin	Sidegradient	Transition Zone	11/06/2018	<50	22	36	260	<1	<1	6	<1	<1	<0.025	0.594 j	<1	**385**	<1	26	0.55 j	<1	<0.2	**1.9**	12	NA	NA	0.15
MW-18D	SE of AB, outside compliance boundary	Ash Basin	Sidegradient	Transition Zone	12/05/2018	<50	23	37	250	<1	<1	4.775 j	<1	<1	0.058	0.528 j	<1	144	<1	4.426 j	0.634 j	<1	<0.2	**1.36**	15 B2	2.8283	0.000204	0.11
MW-18D	SE of AB, outside compliance boundary	Ash Basin	Sidegradient	Transition Zone	04/11/2019	<50	23	37	260	NA	<1	4.593 j	NA	NA	<0.025	<1	<1	5.432 j	NA	22	NA	NA	NA	**1.1**	NA	NA	NA	NA
MW-19BR	SE of AB, outside compliance boundary	Ash Basin	Sidegradient	Bedrock	07/18/2018	<50	150	60	**670**	<1	0.415 j	58	<1	<1	<0.025	<1	0.387 j	**1360**	<1	**1340**	0.413 j	<1	<0.2	0.214 j	4.007 j,B2	NA	NA	0.1894 j
MW-19BR	SE of AB, outside compliance boundary	Ash Basin	Sidegradient	Bedrock	11/06/2018	<50	130	56	**560**	<1	0.442 j	58	<1	<1	<0.025	<1	0.41 j	**1330**	<1	**1360**	<1	<1	<0.2	0.19 j	<5	NA	NA	0.236 j
MW-19BR	SE of AB, outside compliance boundary	Ash Basin	Sidegradient	Bedrock	04/03/2019	<50	130	55	**600**	NA	0.534 j	59	NA	NA	<0.025	<1	0.4 j	**1380**	NA	**1380**	NA	NA	NA	<0.3	NA	NA	NA	NA
MW-19D	SE of AB, outside compliance boundary	Ash Basin	Sidegradient	Transition Zone	07/18/2018	<50	130	62	**580**	<1	<1	58	<1	<1	<0.025	<1	0.757 j	**1470**	0.478 j	**981**	0.589 j	<1	0.084 j	0.184 j	2.234 j,B2	NA	NA	0.1886 j
MW-19D	SE of AB, outside compliance boundary	Ash Basin	Sidegradient	Transition Zone	11/06/2018	<50	120	59	470	<1	0.39 j	61	<1	<1	<0.025	0.354 j	0.77 j	**2470**	5.98	**1190**	0.455 j	<1	<0.2	0.281 j	3.13 j	NA	NA	0.1626 j
MW-19D	SE of AB, outside compliance boundary	Ash Basin	Sidegradient	Transition Zone	04/03/2019	<50	120	63	490	NA	<1	55	NA	NA	<0.025 M1	<1	0.703 j	**1120**	NA	**896**	NA	NA	NA	<0.3	NA	NA	NA	NA

COLOR NOTES

🟨	Bold highlighted concentration indicates exceedance of the 15A NCAC 02L .0202 Standard or the IMAC. (Effective date for 15A NCAC 02L .0202 Standard and IMAC is April 1, 2013)
🟫	Turbidity of Sample ≥ 10 NTUs
	Provisional Background Threshold Values updated with Background Results through October 2017.
	Analytical data review has not been completed for this dataset.

ABBREVIATION NOTES

BGS - below ground surface
BOD - Biologic Oxygen Demand
CB - Compliance Boundary
COD - Chemical Oxygen Demand
Deg C - Degrees Celsius
DMAs - dimethylarsinic acid
DUP - Duplicate
Eh - Redox Potential
ft - Feet
GPM - gallons per minute
IMAC - Interim Maximum Allowable Concentrations. From the 15A NCAC 02L Standard, Appendix 1, April, 1, 2013.
MDC - Minimum Detectable Concentration
MeSe - Methylseleninic acid
mg/kg - milligrams per kilogram
mg/L - milligrams per liter
mg-N/L - Milligram nitrogen per liter

mV - millivolts
NA - Not available or Not Applicable
NE - Not established
NM - Not measured
NTUs - Nephelometric Turbidity Units
pCi/L - picocuries per liter
PSRG - Primary Soil Remediation Goals
RL - Reporting Limit
SeCN - selnocynante
SeMe (IV) - Selenomethionine
SPLP - Synthetic Precipitation Leaching Procedure
S.U. - Standard Units
TCLP - Toxicity Characteristic Leaching Procedure
ug/L - micrograms per liter
ug/mL - microgram per milliliter
umhos/cm - micromhos per centimenter

FACILITY NAME:	**MAYO**
DATE UPDATED:	**06/24/2019**
PREADSHEET UPDATED BY:	**BRANDON RUSSO**
PREADSHEET CHECKED BY:	**JERRY WYLIE**

	ED 40CFR257 APPENDIX III CONSTITUENTS				**INORGANIC PARAMETERS (TOTAL CONCENTRATION)**																**RADIONUCLIDES**		**ER PARAME**
Reporting Units	ug/L	mg/L	mg/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/mL	mg/L
CAC 02L Standard	700	250	250	500	1*	10	700	4*	2	10	10	1*	300	15	50	100	20	0.2*	0.3*	1000	5^	0.03^	2
Provisional Background Threshold Values (Surficial Unit)	50	3.3	1.6	85	1	1	19	1	1	0.088	3.23	1.02	385	1	253	3.03	1	0.2	0.974	227	4	0.000367	NE
Provisional Background Threshold Values (Transition Zone Unit)	50	33.3	7.5	430	1	1	78.3	1	1	1.26	6	1	1319	1	298	5	1	0.2	5.88	12	9	0.001	NE
Provisional Background Threshold Values (Bedrock Unit)	50	43	18	340	1	1	97	1	1	0.4	7	1.19	2550	1	544	5	1	0.2	5.52	37.9	7.6	0.00203	NE

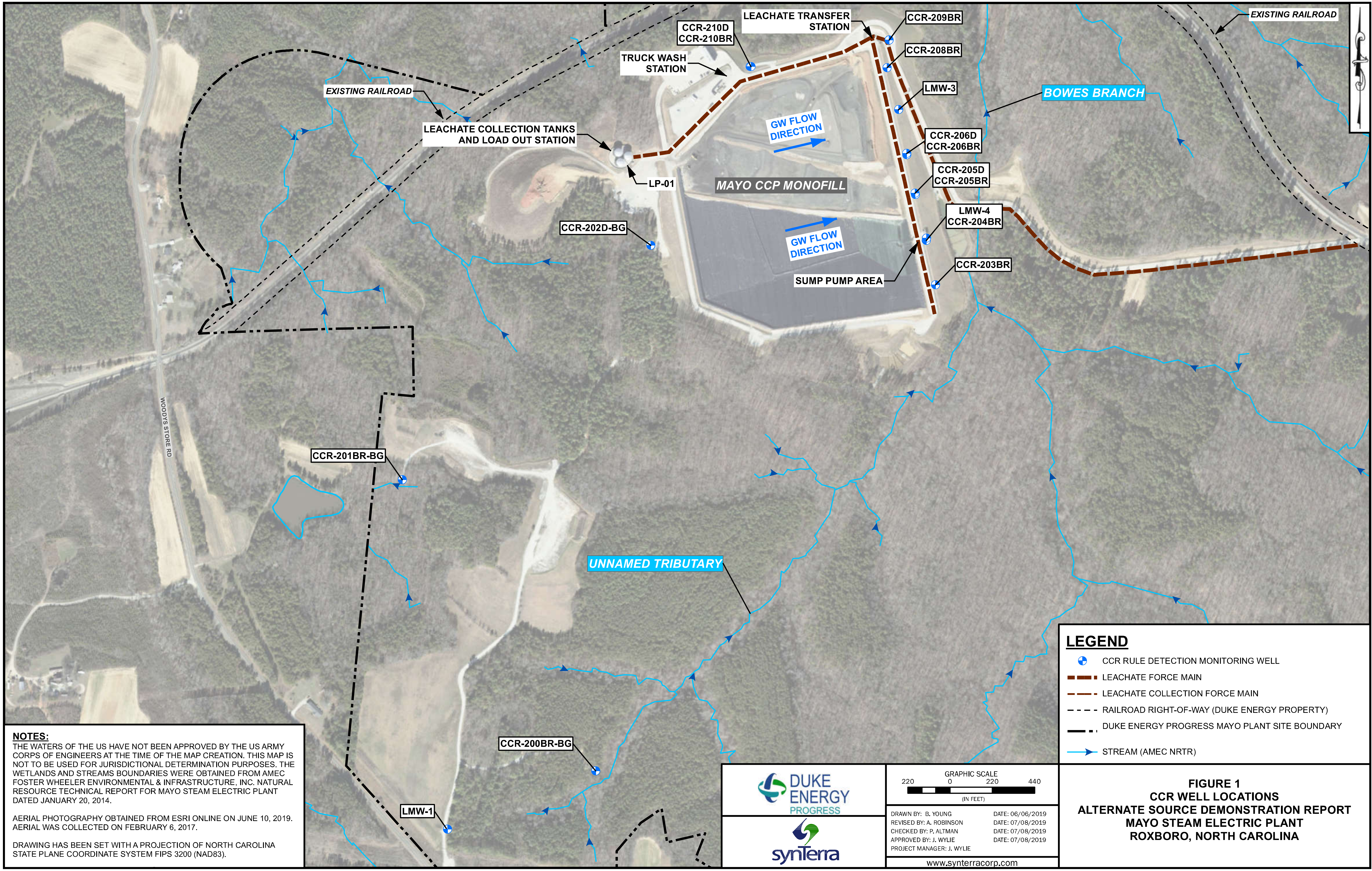
						ED 40CFR257 APPENDIX III CONSTITUENTS				**INORGANIC PARAMETERS (TOTAL CONCENTRATION)**																**RADIONUCLIDES**		**ER PARAME**
Sample ID	**Location Description**	**Associated Unit**	**Location With Respect to Groundwater Flow Direction**	**Sample Location Aquifer Name**	**Sample Collection Date**	**Boron**	**Chloride**	**Sulfate**	**Total Dissolved Solids**	**Antimony**	**Arsenic**	**Barium**	**Beryllium**	**Cadmium**	**Chromium (VI)**	**Chromium**	**Cobalt**	**Iron**	**Lead**	**Manganese**	**Nickel**	**Selenium**	**Thallium**	**Vanadium**	**Zinc**	**Total Radium**	**Total Uranium**	**Fluoride**

MMAs - monomethylarsonic acid

Well Locations referenced to NAD83 and elevations referenced to NAVD88

ATTACHMENT C

CCP MONOFILL CCR GROUNDWATER DATA SUMMARY AND WELL LOCATION MAP



NOTES:

THE WATERS OF THE US HAVE NOT BEEN APPROVED BY THE US ARMY CORPS OF ENGINEERS AT THE TIME OF THE MAP CREATION. THIS MAP IS NOT TO BE USED FOR JURISDICTIONAL DETERMINATION PURPOSES. THE WETLANDS AND STREAMS BOUNDARIES WERE OBTAINED FROM AMEC FOSTER WHEELER ENVIRONMENTAL & INFRASTRUCTURE, INC. NATURAL RESOURCE TECHNICAL REPORT FOR MAYO STEAM ELECTRIC PLANT DATED JANUARY 20, 2014.

AERIAL PHOTOGRAPHY OBTAINED FROM ESRI ONLINE ON JUNE 10, 2019. AERIAL WAS COLLECTED ON FEBRUARY 6, 2017.

DRAWING HAS BEEN SET WITH A PROJECTION OF NORTH CAROLINA STATE PLANE COORDINATE SYSTEM FIPS 3200 (NAD83).

LEGEND

●	CCR RULE DETECTION MONITORING WELL
▬ ▬	LEACHATE FORCE MAIN
— —	LEACHATE COLLECTION FORCE MAIN
- - -	RAILROAD RIGHT-OF-WAY (DUKE ENERGY PROPERTY)
▬ · ▬	DUKE ENERGY PROGRESS MAYO PLANT SITE BOUNDARY
→	STREAM (AMEC NRTR)

DUKE ENERGY PROGRESS

synTerra

GRAPHIC SCALE
220 0 220 440
(IN FEET)

DRAWN BY: B. YOUNG DATE: 06/06/2019
REVISED BY: A. ROBINSON DATE: 07/08/2019
CHECKED BY: P. ALTMAN DATE: 07/08/2019
APPROVED BY: J. WYLIE DATE: 07/08/2019
PROJECT MANAGER: J. WYLIE

www.synterracorp.com

FIGURE 1
CCR WELL LOCATIONS
ALTERNATE SOURCE DEMONSTRATION REPORT
MAYO STEAM ELECTRIC PLANT
ROXBORO, NORTH CAROLINA

P:\Duke Energy Progress.1026\00 GIS BASE DATA\Mayo\Map_Docs\CCR_Draft\Mayo_Monofill_Surveyed_CCR_Locations_20190708.mxd

Analytical Laboratory

13339 Hagers Ferry Road
Huntersville, NC 28078-7929
McGuire Nuclear Complex - MG03A2
Phone: 980-875-5245   Fax: 980-875-4349

Order Summary Report

Order Number:	**J18100179**
Project Name:	MAYO STEAM - MAYO MONOFILL CCR
Customer Name(s):	Kim Witt, Bryan Moeller, Ryan Czop, Fred Holt, K Webb, J Wylie, B Russo, M M
Customer Address:	Mayo Steam Plant 10660 Boston Road Roxboro,North Carolina 27574
Lab Contact:	Peggy Kendall Phone: 980-875-5848

Report Authorized By:
(Signature)
Peggy F Kendall
Peggy Kendall
Date: 10/29/2018

Program Comments:

Please contact the Program Manager (Peggy Kendall) with any questions regarding this report.

Data Flags & Calculations:

Any analytical tests or individual analytes within a test flagged with a Qualifier indicate a deviation from the method quality system or quality control requirement. The qualifier description is found at the end of the Certificate of Analysis (sample results) under the qualifiers heading. All results are reported on a dry weight basis unless otherwise noted. Subcontracted data included on the Duke Certificate of Analysis is to be used as information only. Certified vendor results can be found in the subcontracted lab final report. Duke Energy Analytical Laboratory subcontracts analyses to other vendor laboratories that have been qualified by Duke Energy to perform these analyses except where noted.

Data Package:

This data package includes analytical results that are applicable only to the samples described in this narrative. An estimation of the uncertainty of measurement for the results in the report is available upon request. This report shall not be reproduced, except in full, without the written consent of the Analytical Laboratory. Please contact the Analytical laboratory with any questions. The order of individual sections within this report is as follows:

Job Summary Report, Sample Identification, Technical Validation of Data Package, Analytical Laboratory Certificate of Analysis, Analytical Laboratory QC Reports, Sub-contracted Laboratory Results, Customer Specific Data Sheets, Reports & Documentation, Customer Database Entries, Test Case Narratives, Chain of Custody (COC)

Certification:

The Analytical Laboratory holds the following State Certifications : North Carolina (DENR) Certificate #248, South Carolina (DHEC) Laboratory ID # 99005. Contact the Analytical Laboratory for definitive information about the certification status of specific methods.

Sample ID's & Descriptions:

Sample ID	Plant/Station	Collection Date and Time	Collected By	Sample Description
2018031599	MAYO STEAM	03-Oct-18 9:10 AM	Greg Darnell	CCR-209BR
2018031600	MAYO STEAM	03-Oct-18 9:12 AM	Greg Darnell	CCR-210D
2018031601	MAYO STEAM	03-Oct-18 9:58 AM	Greg Darnell	CCR-210BR
2018031602	MAYO STEAM	03-Oct-18 10:10 AM	Greg Darnell	CCR-208BR
2018031603	MAYO STEAM	03-Oct-18 10:56 AM	Greg Darnell	CCR-203BR
2018031604	MAYO STEAM	03-Oct-18 10:56 AM	Greg Darnell	LMW-4
2018031605	MAYO STEAM	03-Oct-18 11:04 AM	Greg Darnell	LMW-3
2018031606	MAYO STEAM	03-Oct-18 11:34 AM	Greg Darnell	CCR-206D
2018031607	MAYO STEAM	03-Oct-18 11:45 AM	Greg Darnell	CCR-204BR
2018031608	MAYO STEAM	03-Oct-18 11:55 AM	Greg Darnell	CCR-206BR
2018031609	MAYO STEAM	03-Oct-18 12:02 PM	Greg Darnell	CCR-205D
2018031610	MAYO STEAM	03-Oct-18 12:50 PM	Greg Darnell	CCR-205BR
2018031611	MAYO STEAM	03-Oct-18 12:02 PM	Greg Darnell	CCR-205D Duplicate
2018031612	MAYO STEAM	03-Oct-18 11:58 AM	Greg Darnell	FIELD BLANK

14 Total Samples

Technical Validation Review

Checklist:

COC and .pdf report are in agreement with sample totals and analyses (compliance programs and procedures). ☑ Yes ☐ No

All Results are less than the laboratory reporting limits. ☐ Yes ☑ No

All laboratory QA/QC requirements are acceptable. ☑ Yes ☐ No

Report Sections Included:

☑ Job Summary Report

☑ Sample Identification

☑ Technical Validation of Data Package

☑ Analytical Laboratory Certificate of Analysis

☐ Analytical Laboratory QC Report

☑ Sub-contracted Laboratory Results

☐ Customer Specific Data Sheets, Reports, & Documentation

☐ Customer Database Entries

☑ Chain of Custody

☑ Electronic Data Deliverable (EDD) Sent Separately

Reviewed By: Peggy Kendall Date: 10/29/2018

Certificate of Laboratory Analysis

This report shall not be reproduced, except in full.

Order # J18100179

Site: CCR-209BR

Collection Date: 10/03/2018 09:10 AM

Sample #: 2018031599

Matrix: GW_RCRA

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
ALKALINITY (FIXED END POINT 4.5) - (Analysis Performed by Pace Laboratories)								
Vendor Parameter	**Complete**					Vendor Method		V_PACE
INORGANIC IONS BY IC - Q18100417								
Chloride	**1200**	mg/L		50	500	EPA 9056A	10/15/2018 18:31	BGN9034
Fluoride	**< 5**	mg/L		5	50	EPA 9056A	10/15/2018 18:31	BGN9034
Sulfate	**81**	mg/L		5	50	EPA 9056A	10/15/2018 18:31	BGN9034
MERCURY (COLD VAPOR) IN WATER - Q18100425								
Mercury (Hg)	**0.06**	ug/L		0.05	1	EPA 7470A	10/15/2018 14:23	DMFRANC
TOTAL RECOVERABLE METALS BY ICP - Q18100370								
Barium (Ba)	**0.248**	mg/L		0.005	1	SW 6010D	10/15/2018 16:47	MHALL3
Boron (B)	**8.85**	mg/L		0.05	1	SW 6010D	10/15/2018 16:47	MHALL3
Calcium (Ca)	**442**	mg/L		0.2	20	SW 6010D	10/15/2018 16:47	MHALL3
Lithium (Li)	**0.585**	mg/L		0.005	1	SW 6010D	10/15/2018 16:47	MHALL3
Magnesium (Mg)	**132**	mg/L		0.1	20	SW 6010D	10/15/2018 16:47	MHALL3
Potassium (K)	**14.3**	mg/L		0.1	1	SW 6010D	10/15/2018 16:47	MHALL3
Sodium (Na)	**171**	mg/L		1	20	SW 6010D	10/15/2018 16:47	MHALL3
TOTAL RECOVERABLE METALS BY ICP-MS - Q18100371								
Antimony (Sb)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 15:38	CWSPEN3
Arsenic (As)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 15:38	CWSPEN3
Beryllium (Be)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 15:38	CWSPEN3
Cadmium (Cd)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 15:38	CWSPEN3
Chromium (Cr)	**1.18**	ug/L		1	1	SW 6020B	10/15/2018 15:38	CWSPEN3
Cobalt (Co)	**44.8**	ug/L		1	1	SW 6020B	10/15/2018 15:38	CWSPEN3
Lead (Pb)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 15:38	CWSPEN3
Molybdenum (Mo)	**2.03**	ug/L		1	1	SW 6020B	10/15/2018 15:38	CWSPEN3
Selenium (Se)	**5.55**	ug/L		1	1	SW 6020B	10/15/2018 15:38	CWSPEN3
Thallium (Tl) Low Level	**< 0.2**	ug/L		0.2	1	SW 6020B	10/15/2018 15:38	CWSPEN3
RADIOLOGICAL - (Analysis Performed by GEL)								
Vendor Parameter	**Complete**					Vendor Method		v_GEL
TOTAL DISSOLVED SOLIDS - Q18100228								
TDS	**3100**	mg/L		500	1	SM2540C	10/08/2018 15:00	Mgigant

Certificate of Laboratory Analysis

This report shall not be reproduced, except in full.

Order # J18100179

Site: CCR-210D
Collection Date: 10/03/2018 09:12 AM

Sample #: **2018031600**
Matrix: GW_RCRA

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
ALKALINITY (FIXED END POINT 4.5) - (Analysis Performed by Pace Laboratories)								
Vendor Parameter	**Complete**					Vendor Method		V_PACE
INORGANIC IONS BY IC - Q18100417								
Chloride	**850**	mg/L		10	100	EPA 9056A	10/15/2018 18:49	BGN9034
Fluoride	**< 1**	mg/L		1	10	EPA 9056A	10/15/2018 18:49	BGN9034
Sulfate	**190**	mg/L		10	100	EPA 9056A	10/15/2018 18:49	BGN9034
MERCURY (COLD VAPOR) IN WATER - Q18100425								
Mercury (Hg)	**0.56**	ug/L		0.05	1	EPA 7470A	10/15/2018 14:25	DMFRANC
TOTAL RECOVERABLE METALS BY ICP - Q18100370								
Barium (Ba)	**0.203**	mg/L		0.005	1	SW 6010D	10/15/2018 16:52	MHALL3
Boron (B)	**5.73**	mg/L		0.05	1	SW 6010D	10/15/2018 16:52	MHALL3
Calcium (Ca)	**317**	mg/L		0.2	20	SW 6010D	10/15/2018 16:52	MHALL3
Lithium (Li)	**0.091**	mg/L		0.005	1	SW 6010D	10/15/2018 16:52	MHALL3
Magnesium (Mg)	**102**	mg/L		0.1	20	SW 6010D	10/15/2018 16:52	MHALL3
Potassium (K)	**7.40**	mg/L		0.1	1	SW 6010D	10/15/2018 16:52	MHALL3
Sodium (Na)	**104**	mg/L		1	20	SW 6010D	10/15/2018 16:52	MHALL3
TOTAL RECOVERABLE METALS BY ICP-MS - Q18100371								
Antimony (Sb)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 15:47	CWSPEN3
Arsenic (As)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 15:47	CWSPEN3
Beryllium (Be)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 15:47	CWSPEN3
Cadmium (Cd)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 15:47	CWSPEN3
Chromium (Cr)	**16.6**	ug/L		1	1	SW 6020B	10/15/2018 15:47	CWSPEN3
Cobalt (Co)	**1.45**	ug/L		1	1	SW 6020B	10/15/2018 15:47	CWSPEN3
Lead (Pb)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 15:47	CWSPEN3
Molybdenum (Mo)	**2.23**	ug/L		1	1	SW 6020B	10/15/2018 15:47	CWSPEN3
Selenium (Se)	**5.36**	ug/L		1	1	SW 6020B	10/15/2018 15:47	CWSPEN3
Thallium (Tl) Low Level	**< 0.2**	ug/L		0.2	1	SW 6020B	10/15/2018 15:47	CWSPEN3
RADIOLOGICAL - (Analysis Performed by GEL)								
Vendor Parameter	**Complete**					Vendor Method		v_GEL
TOTAL DISSOLVED SOLIDS - Q18100228								
TDS	**2200**	mg/L		500	1	SM2540C	10/08/2018 15:00	Mgigant

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Order # J18100179

Site: CCR-210BR
Collection Date: 10/03/2018 09:58 AM

Sample #: **2018031601**
Matrix: GW_RCRA

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
ALKALINITY (FIXED END POINT 4.5) - (Analysis Performed by Pace Laboratories)								
Vendor Parameter	**Complete**					Vendor Method		V_PACE
INORGANIC IONS BY IC - Q18100417								
Chloride	**55**	mg/L		1	10	EPA 9056A	10/15/2018 19:06	BGN9034
Fluoride	**0.19**	mg/L		0.1	1	EPA 9056A	10/15/2018 19:06	BGN9034
Sulfate	**85**	mg/L		1	10	EPA 9056A	10/15/2018 19:06	BGN9034
MERCURY (COLD VAPOR) IN WATER - Q18100425								
Mercury (Hg)	**< 0.05**	ug/L		0.05	1	EPA 7470A	10/15/2018 14:28	DMFRANC
TOTAL RECOVERABLE METALS BY ICP - Q18100370								
Barium (Ba)	**0.027**	mg/L		0.005	1	SW 6010D	10/15/2018 16:56	MHALL3
Boron (B)	**< 0.05**	mg/L		0.05	1	SW 6010D	10/15/2018 16:56	MHALL3
Calcium (Ca)	**111**	mg/L		0.2	20	SW 6010D	10/15/2018 16:56	MHALL3
Lithium (Li)	**0.005**	mg/L		0.005	1	SW 6010D	10/15/2018 16:56	MHALL3
Magnesium (Mg)	**18.7**	mg/L		0.005	1	SW 6010D	10/15/2018 16:56	MHALL3
Potassium (K)	**4.81**	mg/L		0.1	1	SW 6010D	10/15/2018 16:56	MHALL3
Sodium (Na)	**25.9**	mg/L		0.05	1	SW 6010D	10/15/2018 16:56	MHALL3
TOTAL RECOVERABLE METALS BY ICP-MS - Q18100371								
Antimony (Sb)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 15:55	CWSPEN3
Arsenic (As)	**1.03**	ug/L		1	1	SW 6020B	10/15/2018 15:55	CWSPEN3
Beryllium (Be)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 15:55	CWSPEN3
Cadmium (Cd)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 15:55	CWSPEN3
Chromium (Cr)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 15:55	CWSPEN3
Cobalt (Co)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 15:55	CWSPEN3
Lead (Pb)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 15:55	CWSPEN3
Molybdenum (Mo)	**12.6**	ug/L		1	1	SW 6020B	10/15/2018 15:55	CWSPEN3
Selenium (Se)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 15:55	CWSPEN3
Thallium (Tl) Low Level	**< 0.2**	ug/L		0.2	1	SW 6020B	10/15/2018 15:55	CWSPEN3
RADIOLOGICAL - (Analysis Performed by GEL)								
Vendor Parameter	**Complete**					Vendor Method		v_GEL
TOTAL DISSOLVED SOLIDS - Q18100228								
TDS	**500**	mg/L		25	1	SM2540C	10/08/2018 15:00	Mgigant

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Order # J18100179

Site: CCR-208BR

Sample #: 2018031602

Collection Date: 10/03/2018 10:10 AM

Matrix: GW_RCRA

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
ALKALINITY (FIXED END POINT 4.5) - (Analysis Performed by Pace Laboratories)								
Vendor Parameter	**Complete**					Vendor Method		V_PACE
INORGANIC IONS BY IC - Q18100417								
Chloride	**75**	mg/L		1	10	EPA 9056A	10/15/2018 19:24	BGN9034
Fluoride	**0.23**	mg/L		0.1	1	EPA 9056A	10/15/2018 19:24	BGN9034
Sulfate	**19**	mg/L		1	10	EPA 9056A	10/15/2018 19:24	BGN9034
MERCURY (COLD VAPOR) IN WATER - Q18100646								
Mercury (Hg)	**< 0.05**	ug/L		0.05	1	EPA 7470A	10/24/2018 12:22	DMFRANC
TOTAL RECOVERABLE METALS BY ICP - Q18100370								
Barium (Ba)	**0.077**	mg/L		0.005	1	SW 6010D	10/15/2018 17:01	MHALL3
Boron (B)	**< 0.05**	mg/L		0.05	1	SW 6010D	10/15/2018 17:01	MHALL3
Calcium (Ca)	**59.4**	mg/L		0.01	1	SW 6010D	10/15/2018 17:01	MHALL3
Lithium (Li)	**< 0.005**	mg/L		0.005	1	SW 6010D	10/15/2018 17:01	MHALL3
Magnesium (Mg)	**40.9**	mg/L		0.1	20	SW 6010D	10/15/2018 17:01	MHALL3
Potassium (K)	**6.01**	mg/L		0.1	1	SW 6010D	10/15/2018 17:01	MHALL3
Sodium (Na)	**23.6**	mg/L		0.05	1	SW 6010D	10/15/2018 17:01	MHALL3
TOTAL RECOVERABLE METALS BY ICP-MS - Q18100371								
Antimony (Sb)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 16:03	CWSPEN3
Arsenic (As)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 16:03	CWSPEN3
Beryllium (Be)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 16:03	CWSPEN3
Cadmium (Cd)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 16:03	CWSPEN3
Chromium (Cr)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 16:03	CWSPEN3
Cobalt (Co)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 16:03	CWSPEN3
Lead (Pb)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 16:03	CWSPEN3
Molybdenum (Mo)	**4.30**	ug/L		1	1	SW 6020B	10/15/2018 16:03	CWSPEN3
Selenium (Se)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 16:03	CWSPEN3
Thallium (Tl) Low Level	**< 0.2**	ug/L		0.2	1	SW 6020B	10/15/2018 16:03	CWSPEN3
RADIOLOGICAL - (Analysis Performed by GEL)								
Vendor Parameter	**Complete**					Vendor Method		v_GEL
TOTAL DISSOLVED SOLIDS - Q18100228								
TDS	**430**	mg/L		25	1	SM2540C	10/08/2018 15:00	Mgigant

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Order # J18100179

Site: CCR-203BR
Collection Date: 10/03/2018 10:56 AM

Sample #: **2018031603**
Matrix: GW_RCRA

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
ALKALINITY (FIXED END POINT 4.5) - (Analysis Performed by Pace Laboratories)								
Vendor Parameter	**Complete**					Vendor Method		V_PACE
INORGANIC IONS BY IC - Q18100417								
Chloride	**7.6**	mg/L		0.5	5	EPA 9056A	10/15/2018 19:42	BGN9034
Fluoride	**0.24**	mg/L		0.1	1	EPA 9056A	10/15/2018 19:42	BGN9034
Sulfate	**12**	mg/L		0.5	5	EPA 9056A	10/15/2018 19:42	BGN9034
MERCURY (COLD VAPOR) IN WATER - Q18100646								
Mercury (Hg)	**< 0.05**	ug/L		0.05	1	EPA 7470A	10/24/2018 12:24	DMFRANC
TOTAL RECOVERABLE METALS BY ICP - Q18100370								
Barium (Ba)	**0.115**	mg/L		0.005	1	SW 6010D	10/15/2018 17:06	MHALL3
Boron (B)	**< 0.05**	mg/L		0.05	1	SW 6010D	10/15/2018 17:06	MHALL3
Calcium (Ca)	**50.5**	mg/L		0.01	1	SW 6010D	10/15/2018 17:06	MHALL3
Lithium (Li)	**< 0.005**	mg/L		0.005	1	SW 6010D	10/15/2018 17:06	MHALL3
Magnesium (Mg)	**29.4**	mg/L		0.1	20	SW 6010D	10/15/2018 17:06	MHALL3
Potassium (K)	**5.20**	mg/L		0.1	1	SW 6010D	10/15/2018 17:06	MHALL3
Sodium (Na)	**16.1**	mg/L		0.05	1	SW 6010D	10/15/2018 17:06	MHALL3
TOTAL RECOVERABLE METALS BY ICP-MS - Q18100371								
Antimony (Sb)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 16:12	CWSPEN3
Arsenic (As)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 16:12	CWSPEN3
Beryllium (Be)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 16:12	CWSPEN3
Cadmium (Cd)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 16:12	CWSPEN3
Chromium (Cr)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 16:12	CWSPEN3
Cobalt (Co)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 16:12	CWSPEN3
Lead (Pb)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 16:12	CWSPEN3
Molybdenum (Mo)	**1.93**	ug/L		1	1	SW 6020B	10/15/2018 16:12	CWSPEN3
Selenium (Se)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 16:12	CWSPEN3
Thallium (Tl) Low Level	**< 0.2**	ug/L		0.2	1	SW 6020B	10/15/2018 16:12	CWSPEN3
RADIOLOGICAL - (Analysis Performed by GEL)								
Vendor Parameter	**Complete**					Vendor Method		v_GEL
TOTAL DISSOLVED SOLIDS - Q18100228								
TDS	**310**	mg/L		25	1	SM2540C	10/08/2018 15:00	Mgigant

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Order # J18100179

Site: LMW-4
Collection Date: 10/03/2018 10:56 AM

Sample #: 2018031604
Matrix: GW_RCRA

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
ALKALINITY (FIXED END POINT 4.5) - (Analysis Performed by Pace Laboratories)								
Vendor Parameter	**Complete**					Vendor Method		V_PACE
INORGANIC IONS BY IC - Q18100417								
Chloride	**180**	mg/L		2.5	25	EPA 9056A	10/15/2018 23:53	BGN9034
Fluoride	**< 0.5**	mg/L		0.5	5	EPA 9056A	10/15/2018 23:53	BGN9034
Sulfate	**47**	mg/L		2.5	25	EPA 9056A	10/15/2018 23:53	BGN9034
MERCURY (COLD VAPOR) IN WATER - Q18100646								
Mercury (Hg)	**< 0.05**	ug/L		0.05	1	EPA 7470A	10/24/2018 12:39	DMFRANC
TOTAL RECOVERABLE METALS BY ICP - Q18100370								
Barium (Ba)	**0.331**	mg/L		0.005	1	SW 6010D	10/15/2018 17:10	MHALL3
Boron (B)	**< 0.05**	mg/L		0.05	1	SW 6010D	10/15/2018 17:10	MHALL3
Calcium (Ca)	**85.2**	mg/L		0.01	1	SW 6010D	10/15/2018 17:10	MHALL3
Lithium (Li)	**< 0.005**	mg/L		0.005	1	SW 6010D	10/15/2018 17:10	MHALL3
Magnesium (Mg)	**72.3**	mg/L		0.1	20	SW 6010D	10/15/2018 17:10	MHALL3
Potassium (K)	**3.72**	mg/L		0.1	1	SW 6010D	10/15/2018 17:10	MHALL3
Sodium (Na)	**57.9**	mg/L		0.05	1	SW 6010D	10/15/2018 17:10	MHALL3
TOTAL RECOVERABLE METALS BY ICP-MS - Q18100371								
Antimony (Sb)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 16:45	CWSPEN3
Arsenic (As)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 16:45	CWSPEN3
Beryllium (Be)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 16:45	CWSPEN3
Cadmium (Cd)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 16:45	CWSPEN3
Chromium (Cr)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 16:45	CWSPEN3
Cobalt (Co)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 16:45	CWSPEN3
Lead (Pb)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 16:45	CWSPEN3
Molybdenum (Mo)	**1.29**	ug/L		1	1	SW 6020B	10/15/2018 16:45	CWSPEN3
Selenium (Se)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 16:45	CWSPEN3
Thallium (Tl) Low Level	**< 0.2**	ug/L		0.2	1	SW 6020B	10/15/2018 16:45	CWSPEN3
RADIOLOGICAL - (Analysis Performed by GEL)								
Vendor Parameter	**Complete**					Vendor Method		v_GEL
TOTAL DISSOLVED SOLIDS - Q18100228								
TDS	**720**	mg/L		25	1	SM2540C	10/08/2018 15:00	Mgigant

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Order # J18100179

Site: LMW-3 **Sample #: 2018031605**
Collection Date: 10/03/2018 11:04 AM Matrix: GW_RCRA

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
ALKALINITY (FIXED END POINT 4.5) - (Analysis Performed by Pace Laboratories)								
Vendor Parameter	**Complete**					Vendor Method		V_PACE
INORGANIC IONS BY IC - Q18100417								
Chloride	**77**	mg/L		1	10	EPA 9056A	10/16/2018 00:11	BGN9034
Fluoride	**0.29**	mg/L		0.1	1	EPA 9056A	10/16/2018 00:11	BGN9034
Sulfate	**17**	mg/L		1	10	EPA 9056A	10/16/2018 00:11	BGN9034
MERCURY (COLD VAPOR) IN WATER - Q18100646								
Mercury (Hg)	**< 0.05**	ug/L		0.05	1	EPA 7470A	10/24/2018 12:41	DMFRANC
TOTAL RECOVERABLE METALS BY ICP - Q18100370								
Barium (Ba)	**0.142**	mg/L		0.005	1	SW 6010D	10/15/2018 17:15	MHALL3
Boron (B)	**< 0.05**	mg/L		0.05	1	SW 6010D	10/15/2018 17:15	MHALL3
Calcium (Ca)	**60.7**	mg/L		0.01	1	SW 6010D	10/15/2018 17:15	MHALL3
Lithium (Li)	**< 0.005**	mg/L		0.005	1	SW 6010D	10/15/2018 17:15	MHALL3
Magnesium (Mg)	**35.7**	mg/L		0.1	20	SW 6010D	10/15/2018 17:15	MHALL3
Potassium (K)	**6.08**	mg/L		0.1	1	SW 6010D	10/15/2018 17:15	MHALL3
Sodium (Na)	**24.3**	mg/L		0.05	1	SW 6010D	10/15/2018 17:15	MHALL3
TOTAL RECOVERABLE METALS BY ICP-MS - Q18100371								
Antimony (Sb)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 16:54	CWSPEN3
Arsenic (As)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 16:54	CWSPEN3
Beryllium (Be)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 16:54	CWSPEN3
Cadmium (Cd)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 16:54	CWSPEN3
Chromium (Cr)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 16:54	CWSPEN3
Cobalt (Co)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 16:54	CWSPEN3
Lead (Pb)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 16:54	CWSPEN3
Molybdenum (Mo)	**2.71**	ug/L		1	1	SW 6020B	10/15/2018 16:54	CWSPEN3
Selenium (Se)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 16:54	CWSPEN3
Thallium (Tl) Low Level	**< 0.2**	ug/L		0.2	1	SW 6020B	10/15/2018 16:54	CWSPEN3
RADIOLOGICAL - (Analysis Performed by GEL)								
Vendor Parameter	**Complete**					Vendor Method		v_GEL
TOTAL DISSOLVED SOLIDS - Q18100228								
TDS	**430**	mg/L		25	1	SM2540C	10/08/2018 15:00	Mgigant

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Order # J18100179

Site: CCR-206D
Collection Date: 10/03/2018 11:34 AM

Sample #: 2018031606
Matrix: GW_RCRA

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
ALKALINITY (FIXED END POINT 4.5) - (Analysis Performed by Pace Laboratories)								
Vendor Parameter	**Complete**					Vendor Method		V_PACE
INORGANIC IONS BY IC - Q18100417								
Chloride	**14**	mg/L		0.5	5	EPA 9056A	10/16/2018 00:29	BGN9034
Fluoride	**0.16**	mg/L		0.1	1	EPA 9056A	10/16/2018 00:29	BGN9034
Sulfate	**5.9**	mg/L		0.1	1	EPA 9056A	10/16/2018 00:29	BGN9034
MERCURY (COLD VAPOR) IN WATER - Q18100646								
Mercury (Hg)	**< 0.05**	ug/L		0.05	1	EPA 7470A	10/24/2018 12:44	DMFRANC
TOTAL RECOVERABLE METALS BY ICP - Q18100370								
Barium (Ba)	**0.073**	mg/L		0.005	1	SW 6010D	10/15/2018 12:50	MHALL3
Boron (B)	**< 0.05**	mg/L		0.05	1	SW 6010D	10/15/2018 12:50	MHALL3
Calcium (Ca)	**24.3**	mg/L		0.01	1	SW 6010D	10/15/2018 12:50	MHALL3
Lithium (Li)	**< 0.005**	mg/L		0.005	1	SW 6010D	10/15/2018 12:50	MHALL3
Magnesium (Mg)	**14.9**	mg/L		0.005	1	SW 6010D	10/15/2018 12:50	MHALL3
Potassium (K)	**2.19**	mg/L		0.1	1	SW 6010D	10/15/2018 12:50	MHALL3
Sodium (Na)	**13.3**	mg/L		0.05	1	SW 6010D	10/15/2018 12:50	MHALL3
TOTAL RECOVERABLE METALS BY ICP-MS - Q18100371								
Antimony (Sb)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:02	CWSPEN3
Arsenic (As)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:02	CWSPEN3
Beryllium (Be)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:02	CWSPEN3
Cadmium (Cd)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:02	CWSPEN3
Chromium (Cr)	**1.79**	ug/L		1	1	SW 6020B	10/15/2018 17:02	CWSPEN3
Cobalt (Co)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:02	CWSPEN3
Lead (Pb)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:02	CWSPEN3
Molybdenum (Mo)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:02	CWSPEN3
Selenium (Se)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:02	CWSPEN3
Thallium (Tl) Low Level	**< 0.2**	ug/L		0.2	1	SW 6020B	10/15/2018 17:02	CWSPEN3
RADIOLOGICAL - (Analysis Performed by GEL)								
Vendor Parameter	**Complete**					Vendor Method		v_GEL
TOTAL DISSOLVED SOLIDS - Q18100228								
TDS	**210**	mg/L		25	1	SM2540C	10/08/2018 15:00	Mgigant

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Order # J18100179

Site:	CCR-204BR	**Sample #:**	**2018031607**
Collection Date:	10/03/2018 11:45 AM	Matrix:	GW_RCRA

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
ALKALINITY (FIXED END POINT 4.5) - (Analysis Performed by Pace Laboratories)								
Vendor Parameter	**Complete**					Vendor Method		V_PACE
INORGANIC IONS BY IC - Q18100417								
Chloride	**8.5**	mg/L		0.5	5	EPA 9056A	10/16/2018 00:47	BGN9034
Fluoride	**1.7**	mg/L		0.5	5	EPA 9056A	10/16/2018 00:47	BGN9034
Sulfate	**190**	mg/L		5	50	EPA 9056A	10/16/2018 00:47	BGN9034
MERCURY (COLD VAPOR) IN WATER - Q18100646								
Mercury (Hg)	**< 0.05**	ug/L		0.05	1	EPA 7470A	10/24/2018 12:46	DMFRANC
TOTAL RECOVERABLE METALS BY ICP - Q18100370								
Barium (Ba)	**0.038**	mg/L		0.005	1	SW 6010D	10/15/2018 12:55	MHALL3
Boron (B)	**0.095**	mg/L		0.05	1	SW 6010D	10/15/2018 12:55	MHALL3
Calcium (Ca)	**52.8**	mg/L		0.01	1	SW 6010D	10/15/2018 12:55	MHALL3
Lithium (Li)	**< 0.005**	mg/L		0.005	1	SW 6010D	10/15/2018 12:55	MHALL3
Magnesium (Mg)	**10.6**	mg/L		0.005	1	SW 6010D	10/15/2018 12:55	MHALL3
Potassium (K)	**2.39**	mg/L		0.1	1	SW 6010D	10/15/2018 12:55	MHALL3
Sodium (Na)	**76.2**	mg/L		0.05	1	SW 6010D	10/15/2018 12:55	MHALL3
TOTAL RECOVERABLE METALS BY ICP-MS - Q18100371								
Antimony (Sb)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:10	CWSPEN3
Arsenic (As)	**10.7**	ug/L		1	1	SW 6020B	10/15/2018 17:10	CWSPEN3
Beryllium (Be)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:10	CWSPEN3
Cadmium (Cd)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:10	CWSPEN3
Chromium (Cr)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:10	CWSPEN3
Cobalt (Co)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:10	CWSPEN3
Lead (Pb)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:10	CWSPEN3
Molybdenum (Mo)	**29.6**	ug/L		1	1	SW 6020B	10/15/2018 17:10	CWSPEN3
Selenium (Se)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:10	CWSPEN3
Thallium (Tl) Low Level	**< 0.2**	ug/L		0.2	1	SW 6020B	10/15/2018 17:10	CWSPEN3
RADIOLOGICAL - (Analysis Performed by GEL)								
Vendor Parameter	**Complete**					Vendor Method		v_GEL
TOTAL DISSOLVED SOLIDS - Q18100228								
TDS	**460**	mg/L		25	1	SM2540C	10/08/2018 15:00	Mgigant

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Order # J18100179

Site: CCR-206BR

Collection Date: 10/03/2018 11:55 AM

Sample #: 2018031608

Matrix: GW_RCRA

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
ALKALINITY (FIXED END POINT 4.5) - (Analysis Performed by Pace Laboratories)								
Vendor Parameter	**Complete**					Vendor Method		V_PACE
INORGANIC IONS BY IC - Q18100417								
Chloride	**19**	mg/L		0.5	5	EPA 9056A	10/16/2018 01:05	BGN9034
Fluoride	**0.14**	mg/L		0.1	1	EPA 9056A	10/16/2018 01:05	BGN9034
Sulfate	**5.8**	mg/L		0.1	1	EPA 9056A	10/16/2018 01:05	BGN9034
MERCURY (COLD VAPOR) IN WATER - Q18100646								
Mercury (Hg)	**< 0.05**	ug/L		0.05	1	EPA 7470A	10/24/2018 12:49	DMFRANC
TOTAL RECOVERABLE METALS BY ICP - Q18100370								
Barium (Ba)	**0.073**	mg/L		0.005	1	SW 6010D	10/15/2018 12:59	MHALL3
Boron (B)	**< 0.05**	mg/L		0.05	1	SW 6010D	10/15/2018 12:59	MHALL3
Calcium (Ca)	**25.9**	mg/L		0.01	1	SW 6010D	10/15/2018 12:59	MHALL3
Lithium (Li)	**< 0.005**	mg/L		0.005	1	SW 6010D	10/15/2018 12:59	MHALL3
Magnesium (Mg)	**17.7**	mg/L		0.005	1	SW 6010D	10/15/2018 12:59	MHALL3
Potassium (K)	**3.52**	mg/L		0.1	1	SW 6010D	10/15/2018 12:59	MHALL3
Sodium (Na)	**12.6**	mg/L		0.05	1	SW 6010D	10/15/2018 12:59	MHALL3
TOTAL RECOVERABLE METALS BY ICP-MS - Q18100371								
Antimony (Sb)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:19	CWSPEN3
Arsenic (As)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:19	CWSPEN3
Beryllium (Be)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:19	CWSPEN3
Cadmium (Cd)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:19	CWSPEN3
Chromium (Cr)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:19	CWSPEN3
Cobalt (Co)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:19	CWSPEN3
Lead (Pb)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:19	CWSPEN3
Molybdenum (Mo)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:19	CWSPEN3
Selenium (Se)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:19	CWSPEN3
Thallium (Tl) Low Level	**< 0.2**	ug/L		0.2	1	SW 6020B	10/15/2018 17:19	CWSPEN3
RADIOLOGICAL - (Analysis Performed by GEL)								
Vendor Parameter	**Complete**					Vendor Method		v_GEL
TOTAL DISSOLVED SOLIDS - Q18100228								
TDS	**210**	mg/L		25	1	SM2540C	10/08/2018 15:00	Mgigant

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Order # J18100179

Site: CCR-205D

Collection Date: 10/03/2018 12:02 PM

Sample #: 2018031609

Matrix: GW_RCRA

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
ALKALINITY (FIXED END POINT 4.5) - (Analysis Performed by Pace Laboratories)								
Vendor Parameter	**Complete**					Vendor Method		V_PACE
INORGANIC IONS BY IC - Q18100417								
Chloride	**15**	mg/L		0.5	5	EPA 9056A	10/16/2018 01:23	BGN9034
Fluoride	**0.33**	mg/L		0.1	1	EPA 9056A	10/16/2018 01:23	BGN9034
Sulfate	**13**	mg/L		0.5	5	EPA 9056A	10/16/2018 01:23	BGN9034
MERCURY (COLD VAPOR) IN WATER - Q18100646								
Mercury (Hg)	**< 0.05**	ug/L		0.05	1	EPA 7470A	10/24/2018 12:51	DMFRANC
TOTAL RECOVERABLE METALS BY ICP - Q18100370								
Barium (Ba)	**0.117**	mg/L		0.005	1	SW 6010D	10/15/2018 17:19	MHALL3
Boron (B)	**< 0.05**	mg/L		0.05	1	SW 6010D	10/15/2018 17:19	MHALL3
Calcium (Ca)	**39.9**	mg/L		0.01	1	SW 6010D	10/15/2018 17:19	MHALL3
Lithium (Li)	**< 0.005**	mg/L		0.005	1	SW 6010D	10/15/2018 17:19	MHALL3
Magnesium (Mg)	**30.9**	mg/L		0.1	20	SW 6010D	10/15/2018 17:19	MHALL3
Potassium (K)	**4.27**	mg/L		0.1	1	SW 6010D	10/15/2018 17:19	MHALL3
Sodium (Na)	**22.6**	mg/L		0.05	1	SW 6010D	10/15/2018 17:19	MHALL3
TOTAL RECOVERABLE METALS BY ICP-MS - Q18100371								
Antimony (Sb)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:27	CWSPEN3
Arsenic (As)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:27	CWSPEN3
Beryllium (Be)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:27	CWSPEN3
Cadmium (Cd)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:27	CWSPEN3
Chromium (Cr)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:27	CWSPEN3
Cobalt (Co)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:27	CWSPEN3
Lead (Pb)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:27	CWSPEN3
Molybdenum (Mo)	**2.34**	ug/L		1	1	SW 6020B	10/15/2018 17:27	CWSPEN3
Selenium (Se)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:27	CWSPEN3
Thallium (Tl) Low Level	**< 0.2**	ug/L		0.2	1	SW 6020B	10/15/2018 17:27	CWSPEN3
RADIOLOGICAL - (Analysis Performed by GEL)								
Vendor Parameter	**Complete**					Vendor Method		v_GEL
TOTAL DISSOLVED SOLIDS - Q18100228								
TDS	**300**	mg/L		25	1	SM2540C	10/08/2018 15:00	Mgigant

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Order # J18100179

Site: CCR-205BR

Collection Date: 10/03/2018 12:50 PM

Sample #: 2018031610

Matrix: GW_RCRA

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
ALKALINITY (FIXED END POINT 4.5) - (Analysis Performed by Pace Laboratories)								
Vendor Parameter	**Complete**					Vendor Method		V_PACE
INORGANIC IONS BY IC - Q18100417								
Chloride	**22**	mg/L		0.5	5	EPA 9056A	10/16/2018 01:40	BGN9034
Fluoride	**0.34**	mg/L		0.1	1	EPA 9056A	10/16/2018 01:40	BGN9034
Sulfate	**12**	mg/L		0.5	5	EPA 9056A	10/16/2018 01:40	BGN9034
MERCURY (COLD VAPOR) IN WATER - Q18100646								
Mercury (Hg)	**< 0.05**	ug/L		0.05	1	EPA 7470A	10/24/2018 12:32	DMFRANC
TOTAL RECOVERABLE METALS BY ICP - Q18100370								
Barium (Ba)	**0.029**	mg/L		0.005	1	SW 6010D	10/15/2018 17:24	MHALL3
Boron (B)	**< 0.05**	mg/L		0.05	1	SW 6010D	10/15/2018 17:24	MHALL3
Calcium (Ca)	**58.9**	mg/L		0.01	1	SW 6010D	10/15/2018 17:24	MHALL3
Lithium (Li)	**< 0.005**	mg/L		0.005	1	SW 6010D	10/15/2018 17:24	MHALL3
Magnesium (Mg)	**27.1**	mg/L		0.1	20	SW 6010D	10/15/2018 17:24	MHALL3
Potassium (K)	**4.36**	mg/L		0.1	1	SW 6010D	10/15/2018 17:24	MHALL3
Sodium (Na)	**17.5**	mg/L		0.05	1	SW 6010D	10/15/2018 17:24	MHALL3
TOTAL RECOVERABLE METALS BY ICP-MS - Q18100371								
Antimony (Sb)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:35	CWSPEN3
Arsenic (As)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:35	CWSPEN3
Beryllium (Be)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:35	CWSPEN3
Cadmium (Cd)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:35	CWSPEN3
Chromium (Cr)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:35	CWSPEN3
Cobalt (Co)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:35	CWSPEN3
Lead (Pb)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:35	CWSPEN3
Molybdenum (Mo)	**4.68**	ug/L		1	1	SW 6020B	10/15/2018 17:35	CWSPEN3
Selenium (Se)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:35	CWSPEN3
Thallium (Tl) Low Level	**< 0.2**	ug/L		0.2	1	SW 6020B	10/15/2018 17:35	CWSPEN3
RADIOLOGICAL - (Analysis Performed by GEL)								
Vendor Parameter	**Complete**					Vendor Method		v_GEL
TOTAL DISSOLVED SOLIDS - Q18100228								
TDS	**320**	mg/L		25	1	SM2540C	10/08/2018 15:00	Mgigant

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Order # J18100179

Site: CCR-205D Duplicate

Collection Date: 10/03/2018 12:02 PM

Sample #: 2018031611

Matrix: GW_RCRA

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
ALKALINITY (FIXED END POINT 4.5) - (Analysis Performed by Pace Laboratories)								
Vendor Parameter	**Complete**					Vendor Method		V_PACE
INORGANIC IONS BY IC - Q18100417								
Chloride	**15**	mg/L		0.5	5	EPA 9056A	10/16/2018 01:58	BGN9034
Fluoride	**0.33**	mg/L		0.1	1	EPA 9056A	10/16/2018 01:58	BGN9034
Sulfate	**13**	mg/L		0.5	5	EPA 9056A	10/16/2018 01:58	BGN9034
MERCURY (COLD VAPOR) IN WATER - Q18100646								
Mercury (Hg)	**< 0.05**	ug/L		0.05	1	EPA 7470A	10/24/2018 12:54	DMFRANC
TOTAL RECOVERABLE METALS BY ICP - Q18100370								
Barium (Ba)	**0.114**	mg/L		0.005	1	SW 6010D	10/15/2018 17:28	MHALL3
Boron (B)	**< 0.05**	mg/L		0.05	1	SW 6010D	10/15/2018 17:28	MHALL3
Calcium (Ca)	**38.8**	mg/L		0.01	1	SW 6010D	10/15/2018 17:28	MHALL3
Lithium (Li)	**< 0.005**	mg/L		0.005	1	SW 6010D	10/15/2018 17:28	MHALL3
Magnesium (Mg)	**29.9**	mg/L		0.1	20	SW 6010D	10/15/2018 17:28	MHALL3
Potassium (K)	**4.15**	mg/L		0.1	1	SW 6010D	10/15/2018 17:28	MHALL3
Sodium (Na)	**22.1**	mg/L		0.05	1	SW 6010D	10/15/2018 17:28	MHALL3
TOTAL RECOVERABLE METALS BY ICP-MS - Q18100371								
Antimony (Sb)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:44	CWSPEN3
Arsenic (As)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:44	CWSPEN3
Beryllium (Be)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:44	CWSPEN3
Cadmium (Cd)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:44	CWSPEN3
Chromium (Cr)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:44	CWSPEN3
Cobalt (Co)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:44	CWSPEN3
Lead (Pb)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:44	CWSPEN3
Molybdenum (Mo)	**2.22**	ug/L		1	1	SW 6020B	10/15/2018 17:44	CWSPEN3
Selenium (Se)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:44	CWSPEN3
Thallium (Tl) Low Level	**< 0.2**	ug/L		0.2	1	SW 6020B	10/15/2018 17:44	CWSPEN3
RADIOLOGICAL - (Analysis Performed by GEL)								
Vendor Parameter	**Complete**					Vendor Method		v_GEL
TOTAL DISSOLVED SOLIDS - Q18100228								
TDS	**300**	mg/L		25	1	SM2540C	10/08/2018 15:00	Mgigant

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Order # J18100179

Site: FIELD BLANK **Sample #: 2018031612**

Collection Date: 10/03/2018 11:58 AM Matrix: GW_RCRA

Analyte	**Result**	**Units**	**Qualifiers**	**RDL**	**DF**	**Method**	**Analysis Date/Time**	**Analyst**
ALKALINITY (FIXED END POINT 4.5) - (Analysis Performed by Pace Laboratories)								
Vendor Parameter	**Complete**					Vendor Method		V_PACE
INORGANIC IONS BY IC - Q18100417								
Chloride	**< 0.1**	mg/L		0.1	1	EPA 9056A	10/15/2018 23:17	BGN9034
Fluoride	**< 0.1**	mg/L		0.1	1	EPA 9056A	10/15/2018 23:17	BGN9034
Sulfate	**< 0.1**	mg/L		0.1	1	EPA 9056A	10/15/2018 23:17	BGN9034
MERCURY (COLD VAPOR) IN WATER - Q18100646								
Mercury (Hg)	**< 0.05**	ug/L		0.05	1	EPA 7470A	10/24/2018 12:56	DMFRANC
TOTAL RECOVERABLE METALS BY ICP - Q18100370								
Barium (Ba)	**< 0.005**	mg/L		0.005	1	SW 6010D	10/15/2018 13:18	MHALL3
Boron (B)	**< 0.05**	mg/L		0.05	1	SW 6010D	10/15/2018 13:18	MHALL3
Calcium (Ca)	**< 0.01**	mg/L		0.01	1	SW 6010D	10/15/2018 13:18	MHALL3
Lithium (Li)	**< 0.005**	mg/L		0.005	1	SW 6010D	10/15/2018 13:18	MHALL3
Magnesium (Mg)	**< 0.005**	mg/L		0.005	1	SW 6010D	10/15/2018 13:18	MHALL3
Potassium (K)	**< 0.1**	mg/L		0.1	1	SW 6010D	10/15/2018 13:18	MHALL3
Sodium (Na)	**< 0.05**	mg/L		0.05	1	SW 6010D	10/15/2018 13:18	MHALL3
TOTAL RECOVERABLE METALS BY ICP-MS - Q18100371								
Antimony (Sb)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:52	CWSPEN3
Arsenic (As)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:52	CWSPEN3
Beryllium (Be)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:52	CWSPEN3
Cadmium (Cd)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:52	CWSPEN3
Chromium (Cr)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:52	CWSPEN3
Cobalt (Co)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:52	CWSPEN3
Lead (Pb)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:52	CWSPEN3
Molybdenum (Mo)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:52	CWSPEN3
Selenium (Se)	**< 1**	ug/L		1	1	SW 6020B	10/15/2018 17:52	CWSPEN3
Thallium (Tl) Low Level	**< 0.2**	ug/L		0.2	1	SW 6020B	10/15/2018 17:52	CWSPEN3

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Level II QC Summary

Q18100417 Dionex INORGANIC IONS BY IC

Blank # 1

Parameter	Measured	Final	Units:	Dil	RDL	Relative Concentration	Qualifier
Chloride	0.0211	0.0211	mg/L	1	0.1	< 1/2 RDL	-
Fluoride	0	0	mg/L	1	0.1	< 1/2 RDL	-
Sulfate	0	0	mg/L	1	0.1	< 1/2 RDL	-

LCS # 1

Parameter	Measured	Final	Units:	Dil	Spike	% Recovery	LCL	UCL	Qualifier
Chloride	4.95	4.95	mg/L	1	5	98.9	90	110	-
Fluoride	5.05	5.05	mg/L	1	5	101	90	110	-
Sulfate	5.01	5.01	mg/L	1	5	100	90	110	-

MS # 1

Parent Sample: J18100132 -- 2018031471

Parameter	Measured	Final	Units:	Dil	Spike	% Recovery	LCL	UCL	Qualifier
Chloride	3	15	mg/L	5	10	98.6	80	120	-
Fluoride	2.14	2.14	mg/L	1	2	93.2	80	120	-
Sulfate	9.83	49.1	mg/L	5	10	100	80	120	-

MSD # 1

Parent Sample: J18100132 -- 2018031471

Parameter	Measured	Final	Units:	Dil	Spike	% Recovery	LCL	UCL	RPD	Qualifier
Chloride	3.01	15	mg/L	5	10	98.9	80	120	0.273	-
Fluoride	2.15	2.15	mg/L	1	2	93.5	80	120	0.332	-
Sulfate	9.82	49.1	mg/L	5	10	99.8	80	120	0.225	-

Level II QC Summary

Q18100425 HG 7470 MERCURY (COLD VAPOR) IN WATER

Blank # 1

Parameter	Measured	Final	Units:	Dil	RDL	Relative Concentration	Qualifier
Mercury (Hg)	0.021	0.021	ug/L	1	0.05	< 1/2 RDL	-

Blank # 2

Parameter	Measured	Final	Units:	Dil	RDL	Relative Concentration	Qualifier
Mercury (Hg)	0.005	0.005	ug/L	1	0.05	< 1/2 RDL	-

Blank # 3

Parameter	Measured	Final	Units:	Dil	RDL	Relative Concentration	Qualifier
Mercury (Hg)	0.004	0.004	ug/L	1	0.05	< 1/2 RDL	-

Blank # 4

Parameter	Measured	Final	Units:	Dil	RDL	Relative Concentration	Qualifier
Mercury (Hg)	0.006	0.006	ug/L	1	0.05	< 1/2 RDL	-

LCS # 1

Parameter	Measured	Final	Units:	Dil	Spike	% Recovery	LCL	UCL	Qualifier
Mercury (Hg)	2.02	2.02	ug/L	1	2	101	85	115	-

LCS # 2

Parameter	Measured	Final	Units:	Dil	Spike	% Recovery	LCL	UCL	Qualifier
Mercury (Hg)	1.99	1.99	ug/L	1	2	99.6	85	115	-

MS # 1

Parent Sample: J18100057 -- 2018031135

Parameter	Measured	Final	Units:	Dil	Spike	% Recovery	LCL	UCL	Qualifier
Mercury (Hg)	0.632	0.632	ug/L	1	1	63.4	75	125	M2

MSD # 1

Parent Sample: J18100057 -- 2018031135

Parameter	Measured	Final	Units:	Dil	Spike	% Recovery	LCL	UCL	RPD	Qualifier
Mercury (Hg)	0.624	0.624	ug/L	1	1	62.6	75	125	1.27	M2

Qualifiers:

M2 Matrix Spike and/or Matrix Spike Duplicate recovery was Low: the associated Laboratory Control Spike (LCS) was acceptable.

Level II QC Summary

Q18100646 HG 7470 MERCURY (COLD VAPOR) IN WATER

Blank # 1

Parameter	Measured	Final	Units:	Dil	RDL	Relative Concentration	Qualifier
Mercury (Hg)	0.016	0.016	ug/L	1	0.05	< 1/2 RDL	-

Blank # 2

Parameter	Measured	Final	Units:	Dil	RDL	Relative Concentration	Qualifier
Mercury (Hg)	0.018	0.018	ug/L	1	0.05	< 1/2 RDL	-

Blank # 3

Parameter	Measured	Final	Units:	Dil	RDL	Relative Concentration	Qualifier
Mercury (Hg)	0.02	0.02	ug/L	1	0.05	< 1/2 RDL	-

Blank # 4

Parameter	Measured	Final	Units:	Dil	RDL	Relative Concentration	Qualifier
Mercury (Hg)	0.022	0.022	ug/L	1	0.05	< 1/2 RDL	-

LCS # 1

Parameter	Measured	Final	Units:	Dil	Spike	% Recovery	LCL	UCL	Qualifier
Mercury (Hg)	2	2	ug/L	1	2	100	85	115	-

LCS # 2

Parameter	Measured	Final	Units:	Dil	Spike	% Recovery	LCL	UCL	Qualifier
Mercury (Hg)	1.96	1.96	ug/L	1	2	98.2	85	115	-

MS # 1

Parent Sample: J18090577 -- 2018030169

Parameter	Measured	Final	Units:	Dil	Spike	% Recovery	LCL	UCL	Qualifier
Mercury (Hg)	1.03	1.03	ug/L	1	1	102	75	125	-

MSD # 1

Parent Sample: J18090577 -- 2018030169

Parameter	Measured	Final	Units:	Dil	Spike	% Recovery	LCL	UCL	RPD	Qualifier
Mercury (Hg)	1.06	1.06	ug/L	1	1	104	75	125	2.43	-

MS # 2

Parent Sample: J18100179 -- 2018031610

Parameter	Measured	Final	Units:	Dil	Spike	% Recovery	LCL	UCL	Qualifier
Mercury (Hg)	1.02	1.02	ug/L	1	1	99.9	75	125	-

MSD # 2

Parent Sample: J18100179 -- 2018031610

Parameter	Measured	Final	Units:	Dil	Spike	% Recovery	LCL	UCL	RPD	Qualifier
Mercury (Hg)	1.02	1.02	ug/L	1	1	101	75	125	0.599	-

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Order # J18100179

Level II QC Summary

Q18100370 ICP_TRM TOTAL RECOVERABLE METALS BY ICP

Blank # 1

Parameter	Measured	Final	Units:	Dil	RDL	Relative Concentration	Qualifier
Barium (Ba)	-0.000047	-0.000047	mg/L	1	0.005	< 1/2 RDL	-
Boron (B)	-0.000654	-0.000654	mg/L	1	0.05	< 1/2 RDL	-
Calcium (Ca)	0.00342	0.00342	mg/L	1	0.01	< 1/2 RDL	-
Lithium (Li)	-0.000403	-0.000403	mg/L	1	0.005	< 1/2 RDL	-
Magnesium (Mg)	0.000049	0.000049	mg/L	1	0.005	< 1/2 RDL	-
Potassium (K)	-0.004	-0.004	mg/L	1	0.1	< 1/2 RDL	-
Sodium (Na)	0.00314	0.00314	mg/L	1	0.05	< 1/2 RDL	-

LCS # 1

Parameter	Measured	Final	Units:	Dil	Spike	% Recovery	LCL	UCL	Qualifier
Barium (Ba)	5.04	5.04	mg/L	1	5	101	80	120	-
Boron (B)	4.83	4.83	mg/L	1	5	96.6	80	120	-
Calcium (Ca)	4.8	4.8	mg/L	1	5	96.1	80	120	-
Lithium (Li)	4.75	4.75	mg/L	1	5	95.1	80	120	-
Magnesium (Mg)	5.11	5.11	mg/L	1	5	102	80	120	-
Potassium (K)	4.95	4.95	mg/L	1	5	99.1	80	120	-
Sodium (Na)	4.93	4.93	mg/L	1	5	98.6	80	120	-

MS # 1

Parent Sample: J18100132 -- 2018031471

Parameter	Measured	Final	Units:	Dil	Spike	% Recovery	LCL	UCL	Qualifier
Barium (Ba)	5.13	5.13	mg/L	1	5	102	75	125	-
Boron (B)	5.03	5.03	mg/L	1	5	100	75	125	-
Calcium (Ca)	54	54	mg/L	1	5	93.8	75	125	-
Lithium (Li)	4.83	4.83	mg/L	1	5	96.5	75	125	-
Magnesium (Mg)	15.6	15.6	mg/L	1	5	91.2	75	125	-
Potassium (K)	7.63	7.63	mg/L	1	5	100	75	125	-
Sodium (Na)	15.2	15.2	mg/L	1	5	102	75	125	-

MSD # 1

Parent Sample: J18100132 -- 2018031471

Parameter	Measured	Final	Units:	Dil	Spike	% Recovery	LCL	UCL	RPD	Qualifier
Barium (Ba)	5.13	5.13	mg/L	1	5	102	75	125	0.078	-
Boron (B)	5	5	mg/L	1	5	99.8	75	125	0.479	-
Calcium (Ca)	53.6	53.6	mg/L	1	5	84.7	75	125	0.844	-
Lithium (Li)	4.84	4.84	mg/L	1	5	96.8	75	125	0.248	-
Magnesium (Mg)	15.6	15.6	mg/L	1	5	90.8	75	125	0.141	-
Potassium (K)	7.62	7.62	mg/L	1	5	99.8	75	125	0.157	-
Sodium (Na)	15.1	15.1	mg/L	1	5	99.5	75	125	0.692	-

Level II QC Summary

Q18100371 IMS_TRM TOTAL RECOVERABLE METALS BY ICP-MS

Blank # 1

Parameter	Measured	Final	Units:	Dil	RDL	Relative Concentration	Qualifier
Antimony (Sb)	0.017	0.017	ug/L	1	1	< 1/2 RDL	-
Arsenic (As)	0.012	0.012	ug/L	1	1	< 1/2 RDL	-
Beryllium (Be)	-0.046	-0.046	ug/L	1	1	< 1/2 RDL	-
Cadmium (Cd)	0.001	0.001	ug/L	1	1	< 1/2 RDL	-
Chromium (Cr)	0.056	0.056	ug/L	1	1	< 1/2 RDL	-
Cobalt (Co)	0	0	ug/L	1	1	< 1/2 RDL	-
Lead (Pb)	-0.004	-0.004	ug/L	1	1	< 1/2 RDL	-
Molybdenum (Mo)	0.022	0.022	ug/L	1	1	< 1/2 RDL	-
Selenium (Se)	-0.003	-0.003	ug/L	1	1	< 1/2 RDL	-
Thallium (Tl) Low Level	-0.01	-0.01	ug/L	1	0.2	< 1/2 RDL	-

LCS # 1

Parameter	Measured	Final	Units:	Dil	Spike	% Recovery	LCL	UCL	Qualifier
Antimony (Sb)	48.1	48.1	ug/L	1	50	96.3	80	120	-
Arsenic (As)	49.2	49.2	ug/L	1	50	98.4	80	120	-
Beryllium (Be)	48.1	48.1	ug/L	1	50	96.1	80	120	-
Cadmium (Cd)	49.6	49.6	ug/L	1	50	99.2	80	120	-
Chromium (Cr)	49.1	49.1	ug/L	1	50	98.2	80	120	-
Cobalt (Co)	49.3	49.3	ug/L	1	50	98.5	80	120	-
Lead (Pb)	49.7	49.7	ug/L	1	50	99.5	80	120	-
Molybdenum (Mo)	48.7	48.7	ug/L	1	50	97.5	80	120	-
Selenium (Se)	48.3	48.3	ug/L	1	50	96.6	80	120	-
Thallium (Tl) Low Level	48.8	48.8	ug/L	1	50	97.7	80	120	-

MS # 1

Parent Sample: J18100132 -- 2018031473

Parameter	Measured	Final	Units:	Dil	Spike	% Recovery	LCL	UCL	Qualifier
Antimony (Sb)	50.7	50.7	ug/L	1	50	101	75	125	-
Arsenic (As)	51	51	ug/L	1	50	101	75	125	-
Beryllium (Be)	52.3	52.3	ug/L	1	50	105	75	125	-
Cadmium (Cd)	50.6	50.6	ug/L	1	50	101	75	125	-
Chromium (Cr)	50.5	50.5	ug/L	1	50	100	75	125	-
Cobalt (Co)	50.1	50.1	ug/L	1	50	100	75	125	-
Lead (Pb)	51	51	ug/L	1	50	102	75	125	-
Molybdenum (Mo)	51	51	ug/L	1	50	101	75	125	-
Selenium (Se)	49.7	49.7	ug/L	1	50	99.4	75	125	-
Thallium (Tl) Low Level	50.3	50.3	ug/L	1	50	100	75	125	-

MSD # 1

Parent Sample: J18100132 -- 2018031473

Parameter	Measured	Final	Units:	Dil	Spike	% Recovery	LCL	UCL	RPD	Qualifier
Antimony (Sb)	51	51	ug/L	1	50	102	75	125	0.583	-

Level II QC Summary

Q18100371 IMS_TRM TOTAL RECOVERABLE METALS BY ICP-MS

MSD # 1

Parent Sample: J18100132 -- 2018031473

Parameter	Measured	Final	Units:	Dil	Spike	% Recovery	LCL	UCL	RPD	Qualifier
Arsenic (As)	51.3	51.3	ug/L	1	50	102	75	125	0.604	-
Beryllium (Be)	50.3	50.3	ug/L	1	50	101	75	125	3.88	-
Cadmium (Cd)	51	51	ug/L	1	50	102	75	125	0.748	-
Chromium (Cr)	50.3	50.3	ug/L	1	50	99.9	75	125	0.557	-
Cobalt (Co)	50.1	50.1	ug/L	1	50	100	75	125	0.038	-
Lead (Pb)	51.3	51.3	ug/L	1	50	103	75	125	0.666	-
Molybdenum (Mo)	51.3	51.3	ug/L	1	50	102	75	125	0.515	-
Selenium (Se)	49.8	49.8	ug/L	1	50	99.5	75	125	0.0945	-
Thallium (Tl) Low Level	50.2	50.2	ug/L	1	50	100	75	125	0.0936	-

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Order # J18100179

Level II QC Summary

Q18100228 TDS TOTAL DISSOLVED SOLIDS

Blank # 1

Parameter	Measured	Final	Units:	Dil	RDL	Relative Concentration	Qualifier
TDS	0	0	mg/L	1	25	< 1/2 RDL	-

Blank # 2

Parameter	Measured	Final	Units:	Dil	RDL	Relative Concentration	Qualifier
TDS	0	0	mg/L	1	25	< 1/2 RDL	-

Duplicate # 1

Parent Sample: J18100179 -- 2018031599

Parameter	Measured	Final	Units:	Dil	RPD	Qualifier
TDS	3120	3120	mg/L	1	1.94	-

Duplicate # 2

Parent Sample: J18100179 -- 2018031600

Parameter	Measured	Final	Units:	Dil	RPD	Qualifier
TDS	2160	2160	mg/L	1	0.922	-

Duplicate # 3

Parent Sample: J18100179 -- 2018031601

Parameter	Measured	Final	Units:	Dil	RPD	Qualifier
TDS	501	501	mg/L	1	0.4	-

LCS # 1

Parameter	Measured	Final	Units:	Dil	Spike	% Recovery	LCL	UCL	Qualifier
TDS	103	103	mg/L	1	100	103	90	110	-

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

October 10, 2018

Program Manager
Duke Energy
13339 Hagers Ferry Road
Bldg. 7405 MG30A2
Huntersville, NC 28078

RE: Project: J18100179
Pace Project No.: 92402167

Dear Program Manager:

Enclosed are the analytical results for sample(s) received by the laboratory on October 04, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kevin Herring
kevin.herring@pacelabs.com
1(704)875-9092
HORIZON Database Administrator

Enclosures

cc: Program Manager, Duke Energy

CERTIFICATIONS

Project:	J18100179
Pace Project No.:	92402167

Asheville Certification IDs

2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
Virginia/VELAP Certification #: 460222

SAMPLE SUMMARY

Project: J18100179
Pace Project No.: 92402167

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92402167001	**2018031599**	Water	10/03/18 09:10	10/04/18 14:00
92402167002	**2018031600**	Water	10/03/18 09:12	10/04/18 14:00
92402167003	**2018031601**	Water	10/03/18 09:58	10/04/18 14:00
92402167004	**2018031602**	Water	10/03/18 10:10	10/04/18 14:00
92402167005	**2018031603**	Water	10/03/18 10:56	10/04/18 14:00
92402167006	**2018031604**	Water	10/03/18 10:56	10/04/18 14:00
92402167007	**2018031605**	Water	10/03/18 11:04	10/04/18 14:00
92402167008	**2018031606**	Water	10/03/18 11:34	10/04/18 14:00
92402167009	**2018031607**	Water	10/03/18 11:45	10/04/18 14:00
92402167010	**2018031608**	Water	10/03/18 11:55	10/04/18 14:00
92402167011	**2018031609**	Water	10/03/18 12:02	10/04/18 14:00
92402167012	**2018031610**	Water	10/03/18 12:50	10/04/18 14:00
92402167013	**2018031611**	Water	10/03/18 12:02	10/04/18 14:00
92402167014	**2018031612**	Water	10/03/18 11:58	10/04/18 14:00

SAMPLE ANALYTE COUNT

Project: J18100179
Pace Project No.: 92402167

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92402167001	**2018031599**	SM 2320B-2011	ECH	1	PASI-A
92402167002	**2018031600**	SM 2320B-2011	ECH	1	PASI-A
92402167003	**2018031601**	SM 2320B-2011	ECH	1	PASI-A
92402167004	**2018031602**	SM 2320B-2011	ECH	1	PASI-A
92402167005	**2018031603**	SM 2320B-2011	ECH	1	PASI-A
92402167006	**2018031604**	SM 2320B-2011	ECH	1	PASI-A
92402167007	**2018031605**	SM 2320B-2011	ECH	1	PASI-A
92402167008	**2018031606**	SM 2320B-2011	ECH	1	PASI-A
92402167009	**2018031607**	SM 2320B-2011	ECH	1	PASI-A
92402167010	**2018031608**	SM 2320B-2011	ECH	1	PASI-A
92402167011	**2018031609**	SM 2320B-2011	ECH	1	PASI-A
92402167012	**2018031610**	SM 2320B-2011	ECH	1	PASI-A
92402167013	**2018031611**	SM 2320B-2011	ECH	1	PASI-A
92402167014	**2018031612**	SM 2320B-2011	ECH	1	PASI-A

SUMMARY OF DETECTION

Project: J18100179
Pace Project No.: 92402167

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92402167001	**2018031599**					
SM 2320B-2011	Alkalinity, Total as CaCO3	202	mg/L	5.0	10/06/18 01:31	
92402167002	**2018031600**					
SM 2320B-2011	Alkalinity, Total as CaCO3	29.6	mg/L	5.0	10/08/18 15:43	
92402167003	**2018031601**					
SM 2320B-2011	Alkalinity, Total as CaCO3	259	mg/L	5.0	10/09/18 02:27	
92402167004	**2018031602**					
SM 2320B-2011	Alkalinity, Total as CaCO3	254	mg/L	5.0	10/09/18 02:35	
92402167005	**2018031603**					
SM 2320B-2011	Alkalinity, Total as CaCO3	274	mg/L	5.0	10/09/18 02:44	
92402167006	**2018031604**					
SM 2320B-2011	Alkalinity, Total as CaCO3	327	mg/L	5.0	10/09/18 02:52	
92402167007	**2018031605**					
SM 2320B-2011	Alkalinity, Total as CaCO3	246	mg/L	5.0	10/09/18 03:03	
92402167008	**2018031606**					
SM 2320B-2011	Alkalinity, Total as CaCO3	139	mg/L	5.0	10/08/18 16:59	
92402167009	**2018031607**					
SM 2320B-2011	Alkalinity, Total as CaCO3	149	mg/L	5.0	10/08/18 17:15	
92402167010	**2018031608**					
SM 2320B-2011	Alkalinity, Total as CaCO3	148	mg/L	5.0	10/08/18 17:32	
92402167011	**2018031609**					
SM 2320B-2011	Alkalinity, Total as CaCO3	260	mg/L	5.0	10/09/18 13:13	
92402167012	**2018031610**					
SM 2320B-2011	Alkalinity, Total as CaCO3	275	mg/L	5.0	10/09/18 13:25	
92402167014	**2018031612**					
SM 2320B-2011	Alkalinity, Total as CaCO3	256	mg/L	5.0	10/09/18 13:34	

PROJECT NARRATIVE

Project: J18100179
Pace Project No.: 92402167

Method: **SM 2320B-2011**
Description: 2320B Alkalinity
Client: Duke Energy
Date: October 10, 2018

General Information:
14 samples were analyzed for SM 2320B-2011. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 434646

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 92401210003,92401919002

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 2394686)
  - Alkalinity, Total as $CaCO_3$
- MS (Lab ID: 2394688)
  - Alkalinity, Total as $CaCO_3$
- MSD (Lab ID: 2394687)
  - Alkalinity, Total as $CaCO_3$
- MSD (Lab ID: 2394689)
  - Alkalinity, Total as $CaCO_3$

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

ANALYTICAL RESULTS

Project:	J18100179
Pace Project No.:	92402167

Sample: 2018031599 **Lab ID: 92402167001** Collected: 10/03/18 09:10 Received: 10/04/18 14:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
2320B Alkalinity	Analytical Method: SM 2320B-2011							
Alkalinity, Total as CaCO3	**202**	mg/L	5.0	1		10/06/18 01:31		

ANALYTICAL RESULTS

Project: J18100179
Pace Project No.: 92402167

Sample: 2018031600 **Lab ID: 92402167002** Collected: 10/03/18 09:12 Received: 10/04/18 14:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
2320B Alkalinity	Analytical Method: SM 2320B-2011							
Alkalinity, Total as CaCO3	**29.6**	mg/L	5.0	1		10/08/18 15:43		

ANALYTICAL RESULTS

Project: J18100179
Pace Project No.: 92402167

Sample: 2018031601 **Lab ID: 92402167003** Collected: 10/03/18 09:58 Received: 10/04/18 14:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
2320B Alkalinity	Analytical Method: SM 2320B-2011							
Alkalinity, Total as CaCO3	**259**	mg/L	5.0	1		10/09/18 02:27		

ANALYTICAL RESULTS

Project: J18100179
Pace Project No.: 92402167

Sample: 2018031602 **Lab ID: 92402167004** Collected: 10/03/18 10:10 Received: 10/04/18 14:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
2320B Alkalinity	Analytical Method: SM 2320B-2011							
Alkalinity, Total as CaCO3	**254**	mg/L	5.0	1		10/09/18 02:35		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: J18100179
Pace Project No.: 92402167

Sample: 2018031603 **Lab ID: 92402167005** Collected: 10/03/18 10:56 Received: 10/04/18 14:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
2320B Alkalinity	Analytical Method: SM 2320B-2011							
Alkalinity, Total as CaCO3	**274**	mg/L	5.0	1		10/09/18 02:44		

ANALYTICAL RESULTS

Project: J18100179
Pace Project No.: 92402167

Sample: 2018031604 **Lab ID: 92402167006** Collected: 10/03/18 10:56 Received: 10/04/18 14:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
2320B Alkalinity	Analytical Method: SM 2320B-2011							
Alkalinity, Total as CaCO3	**327**	mg/L	5.0	1		10/09/18 02:52		

ANALYTICAL RESULTS

Project: J18100179
Pace Project No.: 92402167

Sample: 2018031605 **Lab ID: 92402167007** Collected: 10/03/18 11:04 Received: 10/04/18 14:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
2320B Alkalinity	Analytical Method: SM 2320B-2011							
Alkalinity, Total as CaCO3	**246**	mg/L	5.0	1		10/09/18 03:03		

ANALYTICAL RESULTS

Project:	J18100179
Pace Project No.:	92402167

Sample: 2018031606 **Lab ID: 92402167008** Collected: 10/03/18 11:34 Received: 10/04/18 14:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
2320B Alkalinity	Analytical Method: SM 2320B-2011							
Alkalinity, Total as CaCO3	**139**	mg/L	5.0	1		10/08/18 16:59		

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ANALYTICAL RESULTS

Project: J18100179
Pace Project No.: 92402167

Sample: 2018031607 **Lab ID: 92402167009** Collected: 10/03/18 11:45 Received: 10/04/18 14:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
2320B Alkalinity	Analytical Method: SM 2320B-2011							
Alkalinity, Total as CaCO3	**149**	mg/L	5.0	1		10/08/18 17:15		

ANALYTICAL RESULTS

Project: J18100179
Pace Project No.: 92402167

Sample: 2018031608 **Lab ID: 92402167010** Collected: 10/03/18 11:55 Received: 10/04/18 14:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
2320B Alkalinity	Analytical Method: SM 2320B-2011							
Alkalinity, Total as CaCO3	**148**	mg/L	5.0	1		10/08/18 17:32		

ANALYTICAL RESULTS

Project: J18100179
Pace Project No.: 92402167

Sample: 2018031609 **Lab ID: 92402167011** Collected: 10/03/18 12:02 Received: 10/04/18 14:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
2320B Alkalinity	Analytical Method: SM 2320B-2011							
Alkalinity, Total as CaCO3	**260**	mg/L	5.0	1		10/09/18 13:13		

ANALYTICAL RESULTS

Project: J18100179
Pace Project No.: 92402167

Sample: 2018031610 **Lab ID: 92402167012** Collected: 10/03/18 12:50 Received: 10/04/18 14:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
2320B Alkalinity	Analytical Method: SM 2320B-2011							
Alkalinity, Total as CaCO3	**275**	mg/L	5.0	1		10/09/18 13:25		

ANALYTICAL RESULTS

Project: J18100179
Pace Project No.: 92402167

Sample: 2018031611 **Lab ID: 92402167013** Collected: 10/03/18 12:02 Received: 10/04/18 14:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
2320B Alkalinity	Analytical Method: SM 2320B-2011							
Alkalinity, Total as CaCO3	ND	mg/L	5.0	1		10/08/18 19:13		

ANALYTICAL RESULTS

Project: J18100179
Pace Project No.: 92402167

Sample: 2018031612 **Lab ID: 92402167014** Collected: 10/03/18 11:58 Received: 10/04/18 14:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
2320B Alkalinity	Analytical Method: SM 2320B-2011							
Alkalinity, Total as CaCO3	**256**	mg/L	5.0	1		10/09/18 13:34		

REPORT OF LABORATORY ANALYSIS

QUALITY CONTROL DATA

Project: J18100179
Pace Project No.: 92402167

QC Batch: 434644
QC Batch Method: SM 2320B-2011
Analysis Method: SM 2320B-2011
Analysis Description: 2320B Alkalinity
Associated Lab Samples: 92402167001

METHOD BLANK: 2393320
Matrix: Water
Associated Lab Samples: 92402167001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	ND	5.0	10/05/18 20:09	

LABORATORY CONTROL SAMPLE: 2393321

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	50	50.1	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2393324 2393325

Parameter	Units	92402206002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	82.9	50	50	131	128	95	90	80-120	2	25	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2393327 2393328

Parameter	Units	92402203001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	ND	50	50	52.8	53.4	98	99	80-120	1	25	

QUALITY CONTROL DATA

Project: J18100179
Pace Project No.: 92402167

QC Batch:	434646	Analysis Method:	SM 2320B-2011
QC Batch Method:	SM 2320B-2011	Analysis Description:	2320B Alkalinity

Associated Lab Samples: 92402167002, 92402167003, 92402167004, 92402167005, 92402167006, 92402167007, 92402167008, 92402167009, 92402167010, 92402167011, 92402167012, 92402167013, 92402167014

METHOD BLANK: 2393329 Matrix: Water

Associated Lab Samples: 92402167002, 92402167003, 92402167004, 92402167005, 92402167006, 92402167007, 92402167008, 92402167009, 92402167010, 92402167011, 92402167012, 92402167013, 92402167014

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	ND	5.0	10/08/18 13:24	

LABORATORY CONTROL SAMPLE: 2393330

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	50	52.2	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2394686 2394687

Parameter	Units	92401210003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	390	50	50	423	429	66	78	80-120	1	25	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2394688 2394689

Parameter	Units	92401919002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	311	50	50	380	382	139	143	80-120	1	25	M1

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

QUALIFIERS

Project: J18100179
Pace Project No.: 92402167

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville

ANALYTE QUALIFIERS

M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: J18100179
Pace Project No.: 92402167

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92402167001	**2018031599**	SM 2320B-2011	434644		
92402167002	**2018031600**	SM 2320B-2011	434646		
92402167003	**2018031601**	SM 2320B-2011	434646		
92402167004	**2018031602**	SM 2320B-2011	434646		
92402167005	**2018031603**	SM 2320B-2011	434646		
92402167006	**2018031604**	SM 2320B-2011	434646		
92402167007	**2018031605**	SM 2320B-2011	434646		
92402167008	**2018031606**	SM 2320B-2011	434646		
92402167009	**2018031607**	SM 2320B-2011	434646		
92402167010	**2018031608**	SM 2320B-2011	434646		
92402167011	**2018031609**	SM 2320B-2011	434646		
92402167012	**2018031610**	SM 2320B-2011	434646		
92402167013	**2018031611**	SM 2320B-2011	434646		
92402167014	**2018031612**	SM 2320B-2011	434646		

Pace Analytical	Document Name: **Sample Condition Upon Receipt(SCUR)**	Document Revised: February 7, 2018 Page 1 of 2
	Document No.: **F-CAR-CS-033-Rev.06**	Issuing Authority: Pace Carolinas Quality Office

Laboratory receiving samples:
Asheville ☐ **Eden** ☐ **Greenwood** ☐ **Huntersville** ☑ **Raleigh** ☐ **Mechanicsville** ☐

Sample Condition Upon Receipt

Client Name: Duke

Project #:

WO# : 92402167
92402167

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☑ Pace ☐ Other:____

Custody Seal Present? ☐ Yes ☑ No **Seals Intact?** ☐ Yes ☑ No

Date/Initials Person Examining Contents: EH 10-4-18

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None ☐ Other

Biological Tissue Frozen? ☐ Yes ☐ No ☑ N/A

Thermometer:
☑ IR Gun ID: 92T045

Type of Ice: ☑ Wet ☐ Blue ☐ None

Cooler Temp (°C): 2.6 **Correction Factor:** Add/Subtract (°C) -0.1

Cooler Temp Corrected (°C): 2.5

Temp should be above freezing to 6°C
☐ Samples out of temp criteria. Samples on ice, cooling process has begun

USDA Regulated Soil (☑ N/A, water sample)

Did samples originate in a quarantine zone within the United States: CA, NY, or SC (check maps)?
☐ Yes ☑ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☑ No

				Comments/Discrepancy:
Chain of Custody Present?	☑ Yes	☐ No	☐ N/A	1.
Samples Arrived within Hold Time?	☑ Yes	☐ No	☐ N/A	2.
Short Hold Time Analysis (<72 hr.)?	☐ Yes	☑ No	☐ N/A	3.
Rush Turn Around Time Requested?	☐ Yes	☑ No	☐ N/A	4.
Sufficient Volume?	☑ Yes	☐ No	☐ N/A	5.
Correct Containers Used?	☑ Yes	☐ No	☐ N/A	6.
-Pace Containers Used?	☐ Yes	☑ No	☐ N/A	
Containers Intact?	☑ Yes	☐ No	☐ N/A	7.
Dissolved analysis: Samples Field Filtered?	☐ Yes	☐ No	☑ N/A	8.
Sample Labels Match COC?	☑ Yes	☐ No	☐ N/A	9.
-Includes Date/Time/ID/Analysis Matrix: WT				
Headspace in VOA Vials (>5-6mm)?	☐ Yes	☐ No	☑ N/A	10.
Trip Blank Present?	☐ Yes	☐ No	☑ N/A	11.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☑ N/A	

COMMENTS/SAMPLE DISCREPANCY

Field Data Required? ☐ Yes ☐ No

Lot ID of split containers:

CLIENT NOTIFICATION/RESOLUTION

Person contacted: ____________ Date/Time: ____________

Project Manager SCURF Review: ____________ **Date:** ____________

Project Manager SRF Review: ____________ **Date:** ____________

Pace Analytical™	Document Name: **Sample Condition Upon Receipt(SCUR)**	Document Revised: February 7, 2018 Page 1 of 2
	Document No.: **F-CAR-CS-033-Rev.06**	Issuing Authority: Pace Carolinas Quality Office

***Check mark top half of box if pH and/or dechlorination is verified and within the acceptance range for preservation samples.**

Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC, LLHg

****Bottom half of box is to list number of bottle**

Project #

WO#:92402167
PM: KLH1 Due Date: 10/11/18
CLIENT: 92-Duke Ener

Pg 1

Item#	**BP4U**-125 mL Plastic Unpreserved (N/A) (Cl-)	**BP3U**-250 mL Plastic Unpreserved (N/A)	**BP2U**-500 mL Plastic Unpreserved (N/A)	**BP1U**-1 liter Plastic Unpreserved (N/A)	**BP4S**-125 mL Plastic H_2SO_4 (pH < 2) (Cl-)	**BP3N**-250 mL plastic HNO_3 (pH < 2)	**BP4Z**-125 mL Plastic ZN Acetate & NaOH (>9)	**BP4C**-125 mL Plastic NaOH (pH > 12) (Cl-)	**WGFU**-Wide-mouthed Glass jar Unpreserved	**AG1U**-1 liter Amber Unpreserved (N/A) (Cl-)	**AG1H**-1 liter Amber HCl (pH < 2)	**AG3U**-250 mL Amber Unpreserved (N/A) (Cl-)	**AG1S**-1 liter Amber H_2SO_4 (pH < 2)	**AG3S**-250 mL Amber H_2SO_4 (pH < 2)	**AG3A(DG3A)**-250 mL Amber NH_4Cl (N/A)(Cl-)	**DG9H**-40 mL VOA HCl (N/A)	**VG9T**-40 mL VOA $Na_2S_2O_3$ (N/A)	**VG9U**-40 mL VOA Unp (N/A)	**DG9P**-40 mL VOA H_3PO_4 (N/A)	**VOAK (6 vials per kit)**-5035 kit (N/A)	**V/GK (3 vials per kit)**-VPH/Gas kit (N/A)	**SP5T**-125 mL Sterile Plastic (N/A – lab)	**SP2T**-250 mL Sterile Plastic (N/A – lab)		**BP3A**-250 mL Plastic $(NH_2)_2SO_4$ (9.3-9.7)	**AG0U**-100 mL Amber Unpreserved vials (N/A)	**VSGU**-20 mL Scintillation vials (N/A)	**DG9U**-40 mL Amber Unpreserved vials (N/A)
1		1																										
2		1																										
3		1																										
4		1																										
5		1																										
6		1																										
7		1																										
8		1																										
9		1																										
10		1																										
11		1																										
12		1																										

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preservative	pH upon receipt	Date preservation adjusted	Time preservation adjusted	Amount of Preservative added	Lot #

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. Out of hold, incorrect preservative, out of temp, incorrect containers.

Pace Analytical	Document Name: **Sample Condition Upon Receipt(SCUR)**	Document Revised: February 7, 2018 Page 1 of 2
	Document No.: **F-CAR-CS-033-Rev.06**	Issuing Authority: Pace Carolinas Quality Office

***Check mark top half of box if pH and/or dechlorination is verified and within the acceptance range for preservation samples.**

Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC, LLHg

****Bottom half of box is to list number of bottle**

Project #

WO#:92402167

PM: KLH1 Due Date: 10/11/18

CLIENT: 92-Duke Ener

Pg 2

Item#	BP4U-125 mL Plastic Unpreserved (N/A) (Cl-)	BP3U-250 mL Plastic Unpreserved (N/A)	BP2U-500 mL Plastic Unpreserved (N/A)	BP1U-1 liter Plastic Unpreserved (N/A)	BP4S-125 mL Plastic H2SO4 (pH < 2) (Cl-)	BP3N-250 mL plastic HNO3 (pH < 2)	BP4Z-125 mL Plastic ZN Acetate & NaOH (>9)	BP4C-125 mL Plastic NaOH (pH > 12) (Cl-)	WGFU-Wide-mouthed Glass jar Unpreserved	AG1U-1 liter Amber Unpreserved (N/A) (Cl-)	AG1H-1 liter Amber HCl (pH < 2)	AG3U-250 mL Amber Unpreserved (N/A) (Cl-)	AG1S-1 liter Amber H2SO4 (pH < 2)	AG3S-250 mL Amber H2SO4 (pH < 2)	AG3A(DG3A)-250 mL Amber NH4Cl (N/A)(Cl-)	DG9H-40 mL VOA HCl (N/A)	VG9T-40 mL VOA Na2S2O3 (N/A)	VG9U-40 mL VOA Unp (N/A)	DG9P-40 mL VOA H3PO4 (N/A)	VOAK (6 vials per kit)-5035 kit (N/A)	V/GK (3 vials per kit)-VPH/Gas kit (N/A)	SP5T-125 mL Sterile Plastic (N/A – lab)	SP2T-250 mL Sterile Plastic (N/A – lab)		BP3A-250 mL Plastic (NH2)2SO4 (9.3-9.7)	AG0U-100 mL Amber Unpreserved vials (N/A)	VSGU-20 mL Scintillation vials (N/A)	DG9U-40 mL Amber Unpreserved vials (N/A)
1		1																										
2		1																										
3																												
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12																												

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preservative	pH upon receipt	Date preservation adjusted	Time preservation adjusted	Amount of Preservative added	Lot #

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. Out of hold, incorrect preservative, out of temp, incorrect containers.

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

Duke Energy Analytical Laboratory Chain of Custody & Sample Log

Duke Energy Analytical Laboratory
Mail Code MGO3A2 (Building 7405)
13339 Hagers Ferry Rd
Huntersville, N. C. 28078
(704) 875-5245
Fax: (704) 875-5038

Analytical Laboratory Use Only

Order # J18100179
Matrix GW_RCRA
Samples Originating From NC_X_ SC___
Logged By Q
Date & Time 10/4/18 1038
2.1 Cooler Temp (C)

SAMPLE PROGRAM
Ground Water _X_ NPDES ___
Drinking Water ___ UST ___
RCRA Waste ___

Page _1_ of _1_
DISTRIBUTION
ORIGINAL to LAB, COPY to CLIENT

COC REV DATE 2/13/2018

PACE
PO 5666396

GEL
PO 5616867

Project Name CCR Assessment Wells- WATER
Phone
Client CCR DEP
Fax No
Business Unit:
Process:
Resp.
Project ID:
Activity ID:
Mail Code:
Waterbody:
Station Mayo Monit

Customer to complete all appropriate non-shaded areas.

92402167

							tration (0.45 um)	⇩	Unfiltered							⇩						
							eservative	Ice	Ice	HNO3	HNO3											
							lume (mL)	1000	500	500	4L											
							iner Type	PET	PET	HDPE	HDPE											
	Sample Description or ID	Sample Location	Collection Information Date	Time	Signature	Comp.	Grab	TDS	F, Cl, Sulfate, Alkalinity	Metals (see below)	Total Radium (228 and 226) V_GEL										Total # Containers	
2018031599		CCR-209BR	10-3-18	0910			x	1	1	1	1										4	001
1600		CCR-210D		0912			X	1	1	1	1										4	002
1601		CCR-210BR		0958			X	1	1	1	1										4	003
1602		CCR-208BR		1010			X	1	1	1	1										4	004
1603		CCR-203BR		1056			X	1	1	1	1										4	005
1604		LMW-4		1056			X	1	1	1	1										4	006
1605		LMW-3		1104			X	1	1	1	1										4	007
1606		CCR-206D		1134			X	1	1	1	1										4	008
1607		CCR-204BR		1145			X	1	1	1	1										4	009
1608		CCR-206BR		1155			X	1	1	1	1										4	010
1609		CCR-205D		1202			X	1	1	1	1										4	011
1610		CCR-205BR		1250			X	1	1	1	1										4	012
																					0	
																					0	
																					0	
																					0	
1611	CCR-205D	Duplicate		1202			X	1	1	1	1										4	013
1612		Field Blank		1158			X		1	1											2	014
					TOTAL			2	3	3	2	0	0	0	0	0	0	0	0	0	10	

Customer to sign & date below

Relinquished By Matt Craig	Date/Time 10/3/18	Accepted By: J.Watts	Date/Time 10/3/18 / 1832
Relinquished By ShipTeam	Date/Time	Accepted By:	Date/Time 10/4/18 720
Relinquished By	Date/Time 10/4/18 1420	Accepted By:	Date/Time 10/4. 1400
Seal/Locked By	Date/Time 10/4 1425	Sealed/Lock Opened By	Date/Time

Comments

ELEMENTS by ICP_MS (TRM): As, Be, Cd, Cr, Co, Mo, Pb, Se, Sb, Tl(LL)
ELEMENTS by ICP (TRM): Ba, Ca, B, Li, Na, K, Mg Hg by 7470

Customer, important: please indicate desired turnaround

Requested Turnaround
14 Days 10/17/18
*7 Days ___
* 48 Hr ___
*Other ___
* Add. Cost Will Apply

Total ~~10~~ 54

Erick Hanna/Pace 10-4-18 1425

GEL Laboratories LLC
a member of **The GEL Group** INC

PO Box 30712 Charleston, SC 29417
2040 Savage Road Charleston, SC 29407
P 843.556.8171
F 843.766.1178

gel.com

October 22, 2018

Peggy Kendall
Duke Energy Central Lab
13339 Hagers Ferry Road
Huntersville, North Carolina 28078

Re: CCR Assessment Wells
Work Order: 461113
SDG: J18100179

Dear Peggy Kendall:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on October 05, 2018. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4705.

Sincerely,

Katherine Cates
Project Manager

Purchase Order: 5616867
Enclosures

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 − (843) 556−8171 − www.gel.com

Certificate of Analysis Report
for

DUPO006 Duke Energy Carolinas, LLC (PO 5616867)

Client SDG: J18100179 GEL Work Order: 461113

The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a Tracer compound
- ** Analyte is a surrogate compound
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the limit as defined in the 'U' qualifier above.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC
standard operating procedures. Please direct any questions to your Project Manager, Katherine Cates.

Reviewed by Katherine Cates ______________________________

Certificate of Analysis

Report Date: October 22, 2018

Company :	Duke Energy Central Lab
Address :	13339 Hagers Ferry Road Huntersville, North Carolina 28078
Contact:	Peggy Kendall
Project:	CCR Assessment Wells

Client Sample ID:	2018031599	Project:	DUKE00601
Sample ID:	461113001	Client ID:	DUPO006
Matrix:	Water		
Collect Date:	03-OCT-18 09:10		
Receive Date:	05-OCT-18		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Rad Gas Flow Proportional Counting													
GFPC, Ra228, Liquid "As Received"													
Radium-228		2.12	+/-0.512	0.597	1.00	pCi/L			JXC9	10/16/18	0953	1810346	1
Rad Radium-226													
Lucas Cell, Ra226, liquid "As Received"													
Radium-226		1.81	+/-0.454	0.327	1.00	pCi/L			PCW	10/15/18	0940	1809846	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 904.0/SW846 9320 Modified	
2	EPA 903.1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Barium-133 Tracer	GFPC, Ra228, Liquid "As Received"			83	(15%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration

Lc/LC: Critical Level
PF: Prep Factor
RL: Reporting Limit
SQL: Sample Quantitation Limit

Certificate of Analysis

Report Date: October 22, 2018

Company :	Duke Energy Central Lab
Address :	13339 Hagers Ferry Road Huntersville, North Carolina 28078
Contact:	Peggy Kendall
Project:	CCR Assessment Wells

Client Sample ID:	2018031600	Project:	DUKE00601
Sample ID:	461113002	Client ID:	DUPO006
Matrix:	Water		
Collect Date:	03-OCT-18 09:12		
Receive Date:	05-OCT-18		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Rad Gas Flow Proportional Counting													
GFPC, Ra228, Liquid "As Received"													
Radium-228		0.799	+/-0.390	0.559	1.00	pCi/L			JXC9	10/16/18	0953	1810346	1
Rad Radium-226													
Lucas Cell, Ra226, liquid "As Received"													
Radium-226		1.39	+/-0.446	0.388	1.00	pCi/L			PCW	10/15/18	0940	1809846	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 904.0/SW846 9320 Modified	
2	EPA 903.1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Barium-133 Tracer	GFPC, Ra228, Liquid "As Received"			79.8	(15%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Lc/LC: Critical Level
PF: Prep Factor
RL: Reporting Limit
SQL: Sample Quantitation Limit

Certificate of Analysis

Report Date: October 22, 2018

Company :	Duke Energy Central Lab
Address :	13339 Hagers Ferry Road Huntersville, North Carolina 28078
Contact:	Peggy Kendall
Project:	CCR Assessment Wells

Client Sample ID:	2018031601	Project:	DUKE00601
Sample ID:	461113003	Client ID:	DUPO006
Matrix:	Water		
Collect Date:	03-OCT-18 09:58		
Receive Date:	05-OCT-18		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Rad Gas Flow Proportional Counting													
GFPC, Ra228, Liquid "As Received"													
Radium-228		2.43	+/-0.508	0.505	1.00	pCi/L			JXC9	10/16/18	0953	1810346	1
Rad Radium-226													
Lucas Cell, Ra226, liquid "As Received"													
Radium-226		1.87	+/-0.452	0.354	1.00	pCi/L			PCW	10/15/18	1015	1809846	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 904.0/SW846 9320 Modified	
2	EPA 903.1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Barium-133 Tracer	GFPC, Ra228, Liquid "As Received"			83.4	(15%-125%)

Notes:
Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

Certificate of Analysis

Report Date: October 22, 2018

Company :	Duke Energy Central Lab
Address :	13339 Hagers Ferry Road Huntersville, North Carolina 28078
Contact:	Peggy Kendall
Project:	CCR Assessment Wells

Client Sample ID:	2018031602	Project:	DUKE00601
Sample ID:	461113004	Client ID:	DUPO006
Matrix:	Water		
Collect Date:	03-OCT-18 10:10		
Receive Date:	05-OCT-18		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Rad Gas Flow Proportional Counting													
GFPC, Ra228, Liquid "As Received"													
Radium-228		0.439	+/-0.267	0.397	1.00	pCi/L			JXC9	10/16/18	0954	1810346	1
Rad Radium-226													
Lucas Cell, Ra226, liquid "As Received"													
Radium-226	U	0.229	+/-0.192	0.250	1.00	pCi/L			PCW	10/10/18	0900	1809846	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 904.0/SW846 9320 Modified	
2	EPA 903.1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Barium-133 Tracer	GFPC, Ra228, Liquid "As Received"			92	(15%-125%)

Notes:
Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:
DF: Dilution Factor
DL: Detection Limit
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Lc/LC: Critical Level
PF: Prep Factor
RL: Reporting Limit
SQL: Sample Quantitation Limit

Certificate of Analysis

Report Date: October 22, 2018

Company :	Duke Energy Central Lab
Address :	13339 Hagers Ferry Road Huntersville, North Carolina 28078
Contact:	Peggy Kendall
Project:	CCR Assessment Wells

Client Sample ID:	2018031603	Project:	DUKE00601
Sample ID:	461113005	Client ID:	DUPO006
Matrix:	Water		
Collect Date:	03-OCT-18 10:56		
Receive Date:	05-OCT-18		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Rad Gas Flow Proportional Counting													
GFPC, Ra228, Liquid "As Received"													
Radium-228	U	-0.0428	+/-0.380	0.696	1.00	pCi/L			JXC9	10/16/18	0954	1810346	1
Rad Radium-226													
Lucas Cell, Ra226, liquid "As Received"													
Radium-226	U	0.127	+/-0.152	0.242	1.00	pCi/L			PCW	10/10/18	0900	1809846	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 904.0/SW846 9320 Modified	
2	EPA 903.1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Barium-133 Tracer	GFPC, Ra228, Liquid "As Received"			91.2	(15%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

Certificate of Analysis

Report Date: October 22, 2018

Company :	Duke Energy Central Lab
Address :	13339 Hagers Ferry Road Huntersville, North Carolina 28078
Contact:	Peggy Kendall
Project:	CCR Assessment Wells

Client Sample ID:	2018031604	Project:	DUKE00601
Sample ID:	461113006	Client ID:	DUPO006
Matrix:	Water		
Collect Date:	03-OCT-18 10:56		
Receive Date:	05-OCT-18		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Rad Gas Flow Proportional Counting													
GFPC, Ra228, Liquid "As Received"													
Radium-228	U	-0.0746	+/-0.302	0.579	1.00	pCi/L			JXC9	10/16/18	1002	1810346	1
Rad Radium-226													
Lucas Cell, Ra226, liquid "As Received"													
Radium-226		0.456	+/-0.286	0.360	1.00	pCi/L			PCW	10/10/18	0900	1809846	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 904.0/SW846 9320 Modified	
2	EPA 903.1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Barium-133 Tracer	GFPC, Ra228, Liquid "As Received"			88.2	(15%-125%)

Notes:
Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

Certificate of Analysis

Report Date: October 22, 2018

Company :	Duke Energy Central Lab
Address :	13339 Hagers Ferry Road Huntersville, North Carolina 28078
Contact:	Peggy Kendall
Project:	CCR Assessment Wells

Client Sample ID:	2018031605	Project:	DUKE00601
Sample ID:	461113007	Client ID:	DUPO006
Matrix:	Water		
Collect Date:	03-OCT-18 11:04		
Receive Date:	05-OCT-18		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Rad Gas Flow Proportional Counting													
GFPC, Ra228, Liquid "As Received"													
Radium-228	U	0.229	+/-0.298	0.508	1.00	pCi/L			JXC9	10/16/18	1003	1810346	1
Rad Radium-226													
Lucas Cell, Ra226, liquid "As Received"													
Radium-226		0.540	+/-0.336	0.398	1.00	pCi/L			PCW	10/10/18	0935	1809846	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 904.0/SW846 9320 Modified	
2	EPA 903.1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Barium-133 Tracer	GFPC, Ra228, Liquid "As Received"			89.1	(15%-125%)

Notes:
Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

Certificate of Analysis

Report Date: October 22, 2018

Company :	Duke Energy Central Lab
Address :	13339 Hagers Ferry Road Huntersville, North Carolina 28078
Contact:	Peggy Kendall
Project:	CCR Assessment Wells

Client Sample ID:	2018031606	Project:	DUKE00601
Sample ID:	461113008	Client ID:	DUPO006
Matrix:	Water		
Collect Date:	03-OCT-18 11:34		
Receive Date:	05-OCT-18		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Rad Gas Flow Proportional Counting													
GFPC, Ra228, Liquid "As Received"													
Radium-228	U	-0.0359	+/-0.228	0.447	1.00	pCi/L			JXC9	10/16/18	1003	1810346	1
Rad Radium-226													
Lucas Cell, Ra226, liquid "As Received"													
Radium-226		1.19	+/-0.413	0.355	1.00	pCi/L			PCW	10/10/18	0935	1809846	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 904.0/SW846 9320 Modified	
2	EPA 903.1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Barium-133 Tracer	GFPC, Ra228, Liquid "As Received"			89.4	(15%-125%)

Notes:
Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration

Lc/LC: Critical Level
PF: Prep Factor
RL: Reporting Limit
SQL: Sample Quantitation Limit

Certificate of Analysis

Report Date: October 22, 2018

Company :	Duke Energy Central Lab
Address :	13339 Hagers Ferry Road Huntersville, North Carolina 28078
Contact:	Peggy Kendall
Project:	CCR Assessment Wells

Client Sample ID:	2018031607	Project:	DUKE00601
Sample ID:	461113009	Client ID:	DUPO006
Matrix:	Water		
Collect Date:	03-OCT-18 11:45		
Receive Date:	05-OCT-18		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Rad Gas Flow Proportional Counting													
GFPC, Ra228, Liquid "As Received"													
Radium-228	U	0.0886	+/-0.199	0.361	1.00	pCi/L			JXC9	10/16/18	1003	1810346	1
Rad Radium-226													
Lucas Cell, Ra226, liquid "As Received"													
Radium-226		1.35	+/-0.549	0.641	1.00	pCi/L			PCW	10/10/18	0935	1809846	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 904.0/SW846 9320 Modified	
2	EPA 903.1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Barium-133 Tracer	GFPC, Ra228, Liquid "As Received"			87.5	(15%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

Certificate of Analysis

Report Date: October 22, 2018

Company : Duke Energy Central Lab
Address : 13339 Hagers Ferry Road

Huntersville, North Carolina 28078
Contact: Peggy Kendall
Project: CCR Assessment Wells

Client Sample ID: 2018031608
Sample ID: 461113010
Matrix: Water
Collect Date: 03-OCT-18 11:55
Receive Date: 05-OCT-18
Collector: Client

Project: DUKE00601
Client ID: DUPO006

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Rad Gas Flow Proportional Counting													
GFPC, Ra228, Liquid "As Received"													
Radium-228	U	0.0712	+/-0.205	0.379	1.00	pCi/L			JXC9	10/16/18	1003	1810346	1
Rad Radium-226													
Lucas Cell, Ra226, liquid "As Received"													
Radium-226		0.322	+/-0.236	0.308	1.00	pCi/L			PCW	10/10/18	0935	1809846	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 904.0/SW846 9320 Modified	
2	EPA 903.1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Barium-133 Tracer	GFPC, Ra228, Liquid "As Received"			84.6	(15%-125%)

Notes:
Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

Certificate of Analysis

Report Date: October 22, 2018

Company :	Duke Energy Central Lab
Address :	13339 Hagers Ferry Road Huntersville, North Carolina 28078
Contact:	Peggy Kendall
Project:	CCR Assessment Wells

Client Sample ID:	2018031609	Project:	DUKE00601
Sample ID:	461113011	Client ID:	DUPO006
Matrix:	Water		
Collect Date:	03-OCT-18 12:02		
Receive Date:	05-OCT-18		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Rad Gas Flow Proportional Counting													
GFPC, Ra228, Liquid "As Received"													
Radium-228	U	0.212	+/-0.252	0.424	1.00	pCi/L			JXC9	10/16/18	1003	1810346	1
Rad Radium-226													
Lucas Cell, Ra226, liquid "As Received"													
Radium-226		0.468	+/-0.323	0.408	1.00	pCi/L			PCW	10/10/18	0935	1809846	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 904.0/SW846 9320 Modified	
2	EPA 903.1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Barium-133 Tracer	GFPC, Ra228, Liquid "As Received"			87.4	(15%-125%)

Notes:
Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

Certificate of Analysis

Report Date: October 22, 2018

Company :	Duke Energy Central Lab
Address :	13339 Hagers Ferry Road Huntersville, North Carolina 28078
Contact:	Peggy Kendall
Project:	CCR Assessment Wells

Client Sample ID:	2018031610	Project:	DUKE00601
Sample ID:	461113012	Client ID:	DUPO006
Matrix:	Water		
Collect Date:	03-OCT-18 12:50		
Receive Date:	05-OCT-18		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Rad Gas Flow Proportional Counting													
GFPC, Ra228, Liquid "As Received"													
Radium-228	U	0.153	+/-0.224	0.388	1.00	pCi/L			JXC9	10/16/18	1003	1810346	1
Rad Radium-226													
Lucas Cell, Ra226, liquid "As Received"													
Radium-226	U	0.191	+/-0.176	0.243	1.00	pCi/L			PCW	10/10/18	0935	1809846	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 904.0/SW846 9320 Modified	
2	EPA 903.1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Barium-133 Tracer	GFPC, Ra228, Liquid "As Received"			92.5	(15%-125%)

Notes:
Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

Certificate of Analysis

Report Date: October 22, 2018

Company :	Duke Energy Central Lab
Address :	13339 Hagers Ferry Road Huntersville, North Carolina 28078
Contact:	Peggy Kendall
Project:	CCR Assessment Wells

Client Sample ID:	2018031611	Project:	DUKE00601
Sample ID:	461113013	Client ID:	DUPO006
Matrix:	Water		
Collect Date:	03-OCT-18 12:02		
Receive Date:	05-OCT-18		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Rad Gas Flow Proportional Counting													
GFPC, Ra228, Liquid "As Received"													
Radium-228	U	0.100	+/-0.216	0.387	1.00	pCi/L			JXC9	10/16/18	1003	1810346	1
Rad Radium-226													
Lucas Cell, Ra226, liquid "As Received"													
Radium-226	U	0.269	+/-0.295	0.485	1.00	pCi/L			PCW	10/10/18	0935	1809846	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 904.0/SW846 9320 Modified	
2	EPA 903.1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Barium-133 Tracer	GFPC, Ra228, Liquid "As Received"			90.1	(15%-125%)

Notes:
Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: October 22, 2018

Duke Energy Central Lab
13339 Hagers Ferry Road
Huntersville, North Carolina

Contact: **Peggy Kendall**

Workorder: **461113**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gas Flow										
Batch 1810346										
QC1204131248 461113008 DUP										
Radium-228	U	-0.0359	U	0.277	pCi/L	N/A		N/A	JXC9	10/16/18 10:03
	Uncertainty	+/-0.228		+/-0.255						
QC1204131249 LCS										
Radium-228	5.74			5.63	pCi/L		98.2	(75%-125%)		10/16/18 10:04
	Uncertainty			+/-0.660						
QC1204131247 MB										
Radium-228			U	0.019	pCi/L					10/16/18 10:03
	Uncertainty			+/-0.221						
Rad Ra-226										
Batch 1809846										
QC1204130114 461113001 DUP										
Radium-226		1.81		1.27	pCi/L	35*		(0%-20%)	PCW	10/15/18 10:15
	Uncertainty	+/-0.454		+/-0.362						
QC1204130116 LCS										
Radium-226	26.0			20.6	pCi/L		79.1	(75%-125%)		10/15/18 10:15
	Uncertainty			+/-1.50						
QC1204130113 MB										
Radium-226			U	0.00	pCi/L					10/15/18 10:15
	Uncertainty			+/-0.225						
QC1204130115 461113001 MS										
Radium-226	130	1.81		118	pCi/L		89.4	(75%-125%)		10/10/18 10:10
	Uncertainty	+/-0.454		+/-8.40						

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

The Qualifiers in this report are defined as follows:

**	Analyte is a Tracer compound
<	Result is less than value reported
>	Result is greater than value reported
BD	Results are either below the MDC or tracer recovery is low
FA	Failed analysis.
H	Analytical holding time was exceeded

QC Summary

Workorder: **461113**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time

J	Value is estimated
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
M	M if above MDC and less than LLD
M	REMP Result > MDC/CL and < RDL
N/A	RPD or %Recovery limits do not apply.
N1	See case narrative
ND	Analyte concentration is not detected above the detection limit
NJ	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Q	One or more quality control criteria have not been met. Refer to the applicable narrative or DER.
R	Sample results are rejected
U	Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
UI	Gamma Spectroscopy--Uncertain identification
UJ	Gamma Spectroscopy--Uncertain identification
UL	Not considered detected. The associated number is the reported concentration, which may be inaccurate due to a low bias.
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Y	Other specific qualifiers were required to properly define the results. Consult case narrative.
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.
h	Preparation or preservation holding time was exceeded

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
* Indicates that a Quality Control parameter was not within specifications.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

461113

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

Duke Energy
Analytical Laboratory
Chain of Custody & Sample Log

Duke Energy Analytical Laboratory
Mail Code MGO3A2 (Building 7405)
13339 Hagers Ferry Rd
Huntersville, N. C. 28078
(704) 875-5245
Fax: (704) 875-5038

Analytical Laboratory Use Only

Order # J18100179
Matrix GW_RCRA
Logged By Q
Date & Time 10/4/18 1038
Cooler Temp (C) 2.1
Samples Originating From NC_X_ SC___

SAMPLE PROGRAM
Ground Water _X_ NPDES ___
Drinking Water ___ UST ___
RCRA Waste ___

Page _1_ of _1_
DISTRIBUTION
ORIGINAL to LAB, COPY to CLIENT

COC REV DATE 2/13/2018

PACE
PO 5666396

GEL
PO 5616867

Customer Must Complete

Project Name CCR Assessment Wells- WATER
Phone
Client CCR DEP
Fax No
Business Unit:
Process:
Resp.
Project ID:
Activity ID:
Mail Code:
Waterbody:
Station: Mayo Monit

Customer to complete all appropriate non-shaded areas.

Filtration (0.45 um)	Unfiltered				
Preservative	Ice	Ice	HNO3	HNO3	
Volume (mL)	1000	500	500	4L	
Container Type	PET	PET	HDPE	HDPE	

	Sample Description or ID	Sample Location	Date	Time	Signature	Comp.	Grab	TDS	F, Cl, Sulfate, Alkalinity	Metals (see below)	Total Radium (228 and 226) V_GEL										Total # Containers
218031599		CCR-209BR	10-3-18	0910			x	1	1	1	1										4
1600		CCR-210D		0912			X	1	1	1	1										4
1601		CCR-210BR		0958			X	1	1	1	1										4
1602		CCR-208BR		1010			X	1	1	1	1										4
1603		CCR-203BR		1056			X	1	1	1	1										4
1604		LMW-4		1056			X	1	1	1	1										4
1605		LMW-3		1104			X	1	1	1	1										4
1606		CCR-206D		1134			X	1	1	1	1										4
1607		CCR-204BR		1145			X	1	1	1	1										4
1608		CCR-206BR		1155			X	1	1	1	1										4
1609		CCR-205D		1202			X	1	1	1	1										4
1610		CCR-205BR		1250			X	1	1	1	1										4
																					0
																					0
																					0
																					0
1611	CCR-205D	Duplicate		1202			X	1	1	1	1										4
1612		Field Blank		1158			X		1	1											2
					TOTAL			2	3	3	2	0	0	0	0	0	0	0	0	0	10

Total 54

Customer to sign & date below

Relinquished By Matt Craig	Date/Time 10/3/18	Accepted By: J Watts	Date/Time 10/3/18 / 1832
Relinquished By ShipTeam	Date/Time	Accepted By:	Date/Time 10/4/18 720
Relinquished By	Date/Time 10/4/18	Accepted By:	Date/Time 10/4 1400
Seal/Locked By	Date/Time 10/4/18	Sealed/Lock Opened By	Date/Time 10/5/18 1335

Comments
ELEMENTS by ICP_MS (TRM): As, Be, Cd, Cr, Co, Mo, Pb, Se, Sb, Tl(LL)
ELEMENTS by ICP (TRM): Ba, Ca, B, Li, Na, K, Mg Hg by 7470

Customer, important: please indicate desired turnaround

Requested Turnaround
14 Days 15BD
*7 Days ____
* 48 Hr ____
*Other ____
* Add. Cost Will Apply

GEL Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: DUKE	**SDG/AR/COC/Work Order:** 461113 / 461114
Received By: ZKW	**Date Received:** 10-5-18
Carrier and Tracking Number	Circle Applicable: FedEx Express FedEx Ground UPS Field Services [✓ Courier] Other

Suspected Hazard Information	**Yes**	**No**	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
Shipped as a DOT Hazardous?		✓	Hazard Class Shipped: UN#:
COC/Samples marked or classified as radioactive?		✓	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0 [✓ CPM] mR/Hr **Classified as: Rad 1 Rad 2 Rad 3**
Is package, COC, and/or Samples marked HAZ?		✓	If yes, select Hazards below, and contact the GEL Safety Group. PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other:

	Sample Receipt Criteria	**Yes**	**NA**	**No**	**Comments/Qualifiers (Required for Non-Conforming Items)**
1	Shipping containers received intact and sealed?	✓			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Chain of custody documents included with shipment?	✓			
3	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*		✓		Preservation Method: Wet Ice Ice Packs Dry ice [✓ None] Other: *all temperatures are recorded in Celsius **TEMP:** 2°
4	Daily check performed and passed on IR temperature gun?	✓			**Temperature Device Serial #:** IR3-18 Secondary Temperature Device Serial # (If Applicable):
5	Sample containers intact and sealed?	✓			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6	Samples requiring chemical preservation at proper pH?	✓			Sample ID's and Containers Affected: If Preservation added, Lot#:
7	Do any samples require Volatile Analysis?			✓	If Yes, Are Encores or Soil Kits present? Yes___ No___ (If yes, take to VOA Freezer) Do VOA vials contain acid preservation? Yes___ No___ N/A___ (If unknown, select No) VOA vials free of headspace? Yes___ No___ N/A___ Sample ID's and containers affected:
8	Samples received within holding time?	✓			ID's and tests affected:
9	Sample ID's on COC match ID's on bottles?	✓			Sample ID's and containers affected:
10	Date & time on COC match date & time on bottles?	✓			Sample ID's affected:
11	Number of containers received match number indicated on COC?			✓	Sample ID's affected: Received CCR-205D Dup.
12	Are sample containers identifiable as GEL provided?			✓	
13	COC form is properly signed in relinquished/received sections?	✓			

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials AM Date 10/8/18 Page 1 of 1

GL-CHL-SR-001 Rev 5

List of current GEL Certifications as of 22 October 2018

State	Certification
Alaska	17−018
Arkansas	88−0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH−0169
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330−15−00283, P330−15−00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C−SC−01
Kansas NELAP	E−10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA180011
Maryland	270
Massachusetts	M−SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE−OS−26−13
Nevada	SC000122018−1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R−158
Oklahoma	9904
Pennsylvania NELAP	68−00485
Puerto Rico	SC00012
S. Carolina Radiochem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235−18−13
Utah NELAP	SC000122018−27
Vermont	VT87156
Virginia NELAP	460202
Washington	C780

Radiochemistry
Technical Case Narrative
Duke Energy Carolinas, LLC (DUPC)
SDG #: J18100179
Work Order #: 461113

Product: GFPC, Ra228, Liquid
Analytical Method: EPA 904.0/SW846 9320 Modified
Analytical Procedure: GL-RAD-A-063 REV# 2
Analytical Batch: 1810346

The following samples were analyzed using the above methods and analytical procedure(s).

GEL Sample ID#	Client Sample Identification
461113001	2018031599
461113002	2018031600
461113003	2018031601
461113004	2018031602
461113005	2018031603
461113006	2018031604
461113007	2018031605
461113008	2018031606
461113009	2018031607
461113010	2018031608
461113011	2018031609
461113012	2018031610
461113013	2018031611
1204131247	Method Blank (MB)
1204131248	461113008(2018031606) Sample Duplicate (DUP)
1204131249	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on an "as received" basis.

Data Summary:

There are no exceptions, anomalies or deviations from the specified methods. All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable.

Product: Lucas Cell, Ra226, liquid
Analytical Method: EPA 903.1 Modified
Analytical Procedure: GL-RAD-A-008 REV# 15
Analytical Batch: 1809846

The following samples were analyzed using the above methods and analytical procedure(s).

GEL Sample ID#	Client Sample Identification
461113001	2018031599
461113002	2018031600

461113003	2018031601
461113004	2018031602
461113005	2018031603
461113006	2018031604
461113007	2018031605
461113008	2018031606
461113009	2018031607
461113010	2018031608
461113011	2018031609
461113012	2018031610
461113013	2018031611
1204130113	Method Blank (MB)
1204130114	461113001(2018031599) Sample Duplicate (DUP)
1204130115	461113001(2018031599) Matrix Spike (MS)
1204130116	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on an "as received" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Quality Control (QC) Information

Duplication Criteria between QC Sample and Duplicate Sample

The Sample and the Duplicate, (See Below), did not meet the relative percent difference requirement; however, they do meet the relative error ratio requirement with the value listed below.

Sample	Analyte	Value
1204130114 (2018031599DUP)	Radium-226	RPD 35* (0.00%-20.00%) RER 1.56 (0-3)

Technical Information

Recounts

Samples 1204130113 (MB), 1204130114 (2018031599DUP), 1204130116 (LCS), 461113001 (2018031599), 461113002 (2018031600) and 461113003 (2018031601) were recounted to verify sample results. Recounts are reported.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

Duke Energy Analytical Laboratory
Chain of Custody & Sample Log

Duke Energy Analytical Laboratory
Mail Code MGO3A2 (Building 7405)
13339 Hagers Ferry Rd
Huntersville, N. C. 28078
(704) 875-5245
Fax: (704) 875-5038

Analytical Laboratory Use Only
Order # J18100179
Matrix GW_RCRA
Samples Originating From NC_X_ SC___
Logged By Q
Date & Time 10/4/18 1038
Cooler Temp (C) 2.1

SAMPLE PROGRAM
Ground Water _X_
Drinking Water ___
RCRA Waste ___
NPDES ___
UST ___

Page _1_ of _1_
Page 75 of 75
DISTRIBUTION
ORIGINAL to LAB, COPY to CLIENT

COC REV DATE 2/13/2018

PACE
PO 5666396

GEL
PO 5616867

Customer Must Complete

Project Name: CCR Assessment Wells- WATER
Phone
Client: CCR DEP
Fax No
Business Unit:
Process:
Resp.
Project ID:
Activity ID:
Mail Code:
Waterbody:
Station: Mayo Monit

Customer to complete all appropriate non-shaded areas.

						tration (0.45 um)	⇩		Unfiltered					⇩							
						eservative	Ice	Ice	HNO₃	HNO₃											#########
						lume (mL)	1000	500	500	4L											
						iner Type	PET	PET	HDPE	HDPE											
	Sample Description or ID Sample Location	Collection Information Date	Time	Signature	Comp.	Grab	TDS	F, Cl, Sulfate, Alkalinity	Metals (see below)	Total Radium (228 and 226) V_GEL											Total # Containers
2018031599	CCR-209BR	10-3-18	0910			x	1	1	1	1											4
1600	CCR-210D		0912			X	1	1	1	1											4
1601	CCR-210BR		0958			X	1	1	1	1											4
1602	CCR-208BR		1010			X	1	1	1	1											4
1603	CCR-203BR		1056			X	1	1	1	1											4
1604	LMW-4		1056			X	1	1	1	1											4
1605	LMW-3		1104			X	1	1	1	1											4
1606	CCR-206D		1134			X	1	1	1	1											4
1607	CCR-204BR		1145			X	1	1	1	1											4
1608	CCR-206BR		1155			X	1	1	1	1											4
1609	CCR-205D		1202			X	1	1	1	1											4
1610	CCR-205BR		1250			X	1	1	1	1											4
																					0
																					0
																					0
																					0
1611	CCR-205D Duplicate		1202			X	1	1	1	1											4
1612	Field Blank		1158			X		1	1												2
				TOTAL			2	3	3	2	0	0	0	0	0	0	0	0	0	10	

Customer to sign & date below

Relinquished By: Matt Craig	Date/Time: 10/3/18 /	Accepted By: J Watts	Date/Time: 10/3/18 / 1832
Relinquished By: ShipTeam	Date/Time:	Accepted By:	Date/Time: 10/4/18 720
Relinquished By:	Date/Time: 10/4/18 1420	Accepted By: Chad Fox PAR	Date/Time: 10/4 1400
Seal/Locked By:	Date/Time: 10/4/18	Sealed/Lock Opened By	Date/Time:

Comments
ELEMENTS by ICP_MS (TRM): As, Be, Cd, Cr, Co, Mo, Pb, Se, Sb, Tl(LL)
ELEMENTS by ICP (TRM): Ba, Ca, B, Li, Na, K, Mg
Hg by 7470

Customer, important: please indicate desired turnaround

Requested Turnaround
14 Days 15BD
*7 Days ____
* 48 Hr ____
*Other ____
* Add. Cost Will Apply

Total ~~10~~ 54

I/A

Hart Exhibit 55
Docket No. E-2, Sub 1219

ADVANCED GeoServices
Engineering for the Environment. Planning for People.™
1055 Andrew Drive, Suite A
West Chester, PA 19380-4293
tel 610.840.9100 fax 610.840.9199
www.advancedgeoservices.com

ENVIRONMENTAL AUDIT IN SUPPORT OF THE COURT APPOINTED MONITOR

H.B. Robinson Facility
Hartsville, South Carolina

March 2019

Final Report Issued To:

Duke Energy and the Court Appointed Monitor

Prepared By:

Advanced GeoServices Corp.
and
The Elm Consulting Group International LLC

TABLE OF CONTENTS

1.0 INTRODUCTION

Advanced GeoServices Corp. (AGC) and The Elm Consulting Group International LLC (Elm) (collectively, the Audit Team) are conducting environmental compliance audits (the Audits) of certain coal combustion residuals (CCR) management locations owned or operated by Duke Energy Business Services LLC, Duke Energy Carolinas, LLC, and Duke Energy Progress, Inc. (collectively, Duke Energy). The Audits are being conducted under the direction of Mr. Benjamin Wilson, the Court Appointed Monitor (CAM), pursuant to an order issued by the U.S. District Court, Eastern District of North Carolina, in case numbers 5:15-CR-62-H, 5:15-CR-67-H, and 5:15-CR-68-H.

The scope of the Audits is set forth in the plea agreements entered into by Duke Energy and the United States in the above-referenced cases, the court's judgments in these cases, and a written Audit scoping document agreed to by Duke Energy and the United States.

1.1 BACKGROUND INFORMATION FOR THE H.B. ROBINSON AUDIT

The subject of this report is the Audit completed at Duke Energy's H.B. Robinson Facility located in Hartsville, Darlington County, South Carolina (Robinson Facility). The on-site portion of the Audit was conducted on January 16-17, 2019 for a total of two days on-site. The on-site Audit Team consisted of two senior auditors, who were supported by a third team member assisting from off-site:

• Mr. Christopher Reitman, AGC	Project Director, Audit Team Leader, Sr. Subject Matter Expert (on-site)
• Mr. Joseph Cotier, CPEA, ELM	Sr. Environmental Auditor (on-site)
• Mr. Bernie Beegle, AGC	Sr. Subject Matter Expert (off-site)

During the on-site audit, the facility was represented by:

- Mr. Dan Zakary, CCP System Owner
- Mr. Tim Hill, General Manager, Carolinas West Region, CCP Operations and Maintenance
- Mr. Kevin Kirkley, CCP Project Management
- Mr. Scott Saunders, CCP Engineering & Closure Engineering
- Ms. Tina Woodward, EHS CCP Permitting and Compliance
- Ms. Bryson Sheetz, EHS CCP Waste & Groundwater
- Ms. Tammy Jett, EHS CCP Waste & Groundwater (by phone)
- Mr. Randy Hart, Regulatory Affairs
- Mr. Michael Phillips, Manager, Environmental Rover, EHS CCP Compliance
- Ms. Danelle Watson, EHS CCP Environmental Field Support
- Mr. William Hamilton, Station Environmental Field Support
- Mr. Ken Bazilio, EHS CCP H&S Field Support
- Mr. Keith Higgins, EHS CCP Compliance

1.2 FACILITY OVERVIEW

The Duke Energy Robinson Facility is located at 3581 West Entrance Road, Hartsville, South Carolina. The Robinson Facility is located along the west side of Lake Robinson and first began power generation in 1960. One coal-fired power plant (Unit 1) was operated from 1960 to 2012 and was demolished in 2016.

According to the Robinson Facility Operations and Maintenance Manual and Duke Energy personnel, coal combustion has not occurred since Unit 1 was shut down in October 2012. Since there is no coal combustion, there was no ash generation while the Audit Team was on-site.

Current power generation at the Robinson Facility is provided by a nuclear reactor. Operations and activities associated with these operations were not reviewed as part of the Audit.

1.2.1 Ash Management Activities

The Robinson Facility Operations and Maintenance Manual and Duke Energy personnel indicated that ash generated by coal combustion was placed in only the following two discrete areas on-site:

- **Ash Basin (approx. 72.0 acres) –** An estimated 2,400,000 cubic yards of ash currently exists within the Ash Basin (HDR, July 15, 2016). Ash is not currently being placed into the Ash Basin and Duke Energy personnel indicated that there are no plans to place additional ash in the Ash Basin. The Ash Basin does intermittently receive water discharged from the adjacent Darlington County combustion turbine facility's oil/water separator. Any combustion turbine water discharged into the Ash Basin would be discharged to Lake Robinson via Outfall 005. However, according to Duke Energy personnel, over the last four years all of the discharged water has infiltrated into the ground and no water has been discharged from the Ash Basin to Outfall 005. The Ash Basin includes an Ash Stack which exists within the basin limits. Duke Energy received South Carolina Department of Health and Environmental Control (DHEC) approval of a Closure Plan for the Ash Basin on May 30, 2017.

- **1960 Fill Area, also referred to as LOLA (25.0 acres) –** The 1960 Fill Area has been inactive for at least 40 years and contains an estimated 276,000 cubic yards of material overlain by 19,600 cubic yards of cover (AMEC, August 21, 2014). Removal and restoration of the 1960 Fill Area is complicated by the presence of overhead electric transmission lines and an underground sewer pipe.

Duke Energy entered a Consent Agreement (15-23-HW) with DHEC dated July 15, 2015 which requires consolidation of materials in the 1960 Fill Area and placement of the materials in the proposed on-site Class 3 Landfill which was under construction at the time of the Audit. Excavation and transport of the ash will commence upon receipt of the Cell 1 certification from DHEC which Duke Energy anticipates receiving during the first quarter of 2020.

Duke Energy also plans on addressing the Ash Basin closure by excavating the ash and disposing it in the proposed on-site Class 3 Landfill. The landfill, to be located to the northwest of the Ash Basin, was under construction at the time of the Audit. Duke Energy received a Class 3 Landfill permit on October 6, 2017 and submitted a Permit Modification Package in December 2018 to reduce the landfill footprint size. Duke Energy stated after the audit that the updated permit was received on February 1, 2019. Duke Energy is anticipating the construction certification for Cell 1 in the first quarter of 2020, at which time Duke will be able to begin placing ash and CCR materials in Cell 1.

1.2.2 Environmental Permits and Programs

The Robinson Facility operates under the following environmental permits and programs:

- **National Pollutant Discharge Elimination System (NPDES) Wastewater Permitting** – DHEC issued NPDES Permit No. SC0002925 on March 8, 2007, with an effective date of May 1, 2007 and an expiration date of April 30, 2011. A timely NPDES permit renewal application was submitted to DHEC on October 28, 2010 and received by DHEC on November 1, 2010. Per the DHEC letter acknowledging the permit renewal application, authorization to discharge under Permit No. SC0002925 continues pursuant to Section 122.6 of SC Regulation 61-9.

As it relates to ash and ash management activities, the permit covers Outfall 001. This is the main outfall from the Robinson Facility discharge canal that leads to Lake Robinson. Several internal discharges flow to Outfall 001, including:

- Outfall 005 - Ash transport waters (this is the outfall from the Robinson Facility ash basin).

A modification to the NPDES permit renewal application was submitted to DHEC on January 11, 2017 requesting permit coverage for seeps S-1, S-2, S-3, and S-4, all of which discharge via Outfall 005. Note that Outfall 005 and S-1 are located in close proximity and the flows are comingled before flowing through Outfall 005 and eventually into Robinson Lake via Outfall 001. Duke Energy received email confirmation from DHEC on January 13, 2017 that all flows east of the Main Dam that drain to the catch basin and Outfall 005 are covered under NPDES Permit. No. SC0002925. This approval covers all four seeps. Duke Energy has not identified any additional seeps since completion of the Audit in January 2018.

On October 3, 2018, DHEC contacted the Robinson Facility to inquire about the Discharge Monitoring Report (DMR) for discharges at the Robinson Facility during June 2018; the June DMR had not been received by DHEC. Duke Energy submitted an email copy to DHEC by email on October 3, 2018 with a hardcopy submitted on October 4, 2018. On November 2, 2018, DHEC issued a Notice of Violation (NOV) to Duke Energy for failing to submit the June 2018 DMR. In Duke Energy's reply to DHEC, dated November 13, 2018, it was explained that Robinson Facility staff had inadvertently filed the DMR and not sent it to DHEC. According to Duke Energy, there has been no follow-up by DHEC since the submittal of Duke Energy's response.

The adjacent Darlington County combustion turbine facility operates an oil/water separator which discharges treated water to a drain connected to the Robinson Facility Ash Basin, which ultimately discharges via Outfall 005. However, as previously noted, according to Duke Energy personnel, over the last four years all of the discharged water has infiltrated into the ground and no water has been discharged from the Ash Basin to Outfall 005. A December 16, 2015 email from DHEC to Duke Energy approved the Robinson Facility's request to connect the oil/water separator drain line to the Ash Basin.

The NPDES permit also requires groundwater monitoring for seven compliance wells. Four wells, MW-1, MW-2, MW-3 and MW-4, were included with the issuance of the permit in 2007. In 2014, MW-1, MW-2, MW-3 and MW-4 were replaced and re-established in a deeper monitoring zone due to the lack of water in the original wells. The new deeper wells were renamed MW-1R, MW-2R, MW-3R and MW-4R. An additional three groundwater monitoring wells (MW-5, MW-6 and MW-7) are being monitored in accordance with the permit at the request of DHEC. The water from these wells is analyzed for a select list of field parameters and metals identified in the NPDES permit, as well as sulfate, on a semi-annual basis.

- **NPDES Stormwater Construction Permitting** – DHEC issues coverage for stormwater discharges associated with construction activity under the State Stormwater General Permit for Construction Activities, No. SCR100000. There is no local authority (i.e., County) permit required to be issued for stormwater construction activities in Darlington County. The Robinson Facility has one active stormwater construction permit associated with CCR management. The CCR related project is described below:

  - DHEC Permit No. SCR10BQ32 for Closure Project activities was issued on June 12, 2017 and covers activities related to development of an on-site landfill and excavation and closure of the 1960 Fill Area on 135 acres. The Permit was modified on December 4, 2018 to add 4.9 acres, bringing the total area under control to 139.9 acres. The Audit Team observed that tree removal, ground disturbance activities and excavation and grading associated with landfill construction had commenced and were ongoing during the 2019 Audit.

- **Spill Prevention, Control and Countermeasure (SPCC) Plan** – The SPCC Plan Amendment No. 24 was implemented by Duke Energy in December 2018. The SPCC Plan covers oil storage across the entire Robinson Facility. Based on documentation reviewed and activities observed by the Audit Team, it appeared that the SPCC regulations were not specifically applicable to Ash Basin management activities at the time of the Audit.

- **Title V Permitting** – DHEC issued Title V Permit No. TV-0820-0002 with an effective date of July 1, 2015 and an expiration date of June 30, 2020. Ash Basin management is addressed under the requirement to control emissions of fugitive dust in Section M.4.

- **Tier II Reporting** – Hazardous chemicals inventory reporting on Tier II for 2017 was completed and submitted on February 16, 2018.

- **CCR Rule –** The Ash Basin is subject to the CCR Rule because the Robinson Facility currently produces electricity via a nuclear reactor. A summary of CCR submittals completed by Duke Energy is provided on Table 1.

A CCR groundwater monitoring well network of 14 wells plus nine (9) characterization wells installed during 2018 has been established at the Ash Basin. On February 6, 2018, Duke Energy posted on its public website the CCR Annual Groundwater Monitoring and Corrective Action Report, dated January 10, 2018, for the Ash Basin.

On March 14, 2018, Duke Energy provided notice on Duke Energy's public website that the Ash Basin is now in the CCR assessment monitoring program due to statistically significant increases over the background values of the Appendix III parameters. On December 14, 2018, Duke Energy provided notice on Duke Energy's public website that the following CCR Rule Appendix IV constituents were detected at levels above the applicable Groundwater Protection Standard (GWPS).

- Arsenic
- Lithium
- Radium 226 and 228 combined

Duke Energy was continuing to implement the groundwater assessment process prescribed by the CCR Rule at the time of the Audit.

On November 7, 2018, Duke Energy provided notice on Duke Energy's public website that the Ash Basin did not meet specific location restrictions under the CCR Rule. The Ash Basin did not meet the restrictions for placement above the uppermost aquifer. Failure to meet this restriction requires the Ash Basin Operator to cease placement of CCR in the basin by October 31, 2020. The CCR regulations also require waste flows to be terminated. The final closure plan for the Ash Basin calls for excavation and disposal of the ash in a proposed Class 3 Landfill which is being constructed on Robinson Facility property to the northwest of the Ash Basin.

There are no coal ash regulations covering the management of the 1960 Fill Area and it is not covered by the CCR Rule since it is not an active landfill, ash basin, or CCR pile. However, as previously noted, Duke Energy entered a Consent Agreement (15-23-HW) with DHEC dated July 15, 2015, which requires consolidation of materials in the 1960 Fill Area and placement of the materials in a proposed on-site Class 3 landfill.

1.2.3 Dam Background Information and Other Structural Permits and Approvals

The 72-acre Ash Basin is comprised of a 49-acre basin which contains a 23-acre dry ash storage area near the upstream (western) side of the Ash Basin. The Ash Basin was reportedly formed via the construction of a dam across an unnamed tributary to the nearby Black Creek. The Ash Basin began receiving ash in the mid-1970s and continued to receive ash until coal power generation activities were terminated in October 2012. Based upon available data, ash thickness within the basin ranges from 11 feet along the northern side of the basin to 53 feet in the middle portion of the basin. The calculated ash volume reported in the most recent annual report is 1,500 acre-feet (about 2,400,000 cubic yards), including the dry ash stack on the upslope western side of the basin. During the Audit, no water was observed in the basin and Duke Energy personnel reported that there is generally no water in the basin except for minor temporary ponding during storm events. The State ID for the dam is D3514. The most recent annual inspection of the dam was completed on May 2, 2018 by Duke Energy Coal Combustion Products (CCP) Engineering and an inspection report was issued on July 31, 2018. The report notes that “[n]o conditions were observed during the field inspection nor identified by existing engineering analysis that represent an unsafe structural stability concern requiring immediate action.”

The state completed an inspection of the Ash Basin dam on October 31, 2017 and issued their inspection report on January 23, 2018. The report noted the Ash Basin was in fair condition and the status would be updated to satisfactory if seismic studies regarding the Ash Basin conditions were provided to the state. Seismic studies have been completed and Duke Energy noted to the Audit Team they were forwarded to the state and the conclusions of the studies were posted on their public website. However, as of the date of the Audit, the state has not issued a written change in the dam condition.

1.2.4 Audit Update and 2018 Observations

As noted in the 2018 Audit Report, Duke Energy received a Class 3 Landfill Permit on October 6, 2017 from DHEC. Duke Energy started tree clearing for the landfill on October 25, 2017 with completion on December 15, 2017.

Over the last year the landfill construction and ash excavation bid event were completed. Construction of the Cell 1 and the sedimentation ponds associated with landfill construction had commenced and were ongoing during the 2019 Audit. The landfill construction activities are expected to be completed in the fourth quarter of 2019 or first quarter of 2020. Cell 2 construction is planned immediately following completion of Cell 1. It may also be noted that Duke Energy submitted plans to DHEC in December 2018 for modifications to the Landfill Permit associated with reducing the Landfill Permit and capacity. Ash from both the Ash Basin and 1960 Fill Area will be deposited in the landfill.

Excavation of ash in the 1960 Ash Fill Area had also been started at the time of the Audit. The phased approach is being completed to allow coordination with landfill completion activities, construction of a sewer re-route, Duke Energy Transmission requirements, Plant Outages, and Customer power demands between 2019 and 2022. The initial phase includes excavation of a small section of ash on the southeast side of the 1960 Fill Area and stockpiling on the eastern side, until the landfill is prepared and permitted to accept the excavated ash. This initial excavation phase was observed by the Audit Team. A small volume of additional material still required excavation and confirmation sampling in the observed area.

2.0 AUDIT SCOPE AND SUBJECT MATTER

The Audit was completed in accordance with the court documents and the Audit scoping document agreed to by Duke Energy and the United States. A description of the scope is provided as Attachment A. The Audit included a review of ash management activities including aspects of generation that affect the nature of the waste streams from the point of generation into surface impoundments or ash management basins, landfills, and/or storage piles. The Audit focused on the activities at the facility since the date of the last Audit, which was January 17-18, 2018.

3.0 AUDIT FINDINGS

The Audit Finding for the Robinson Facility is described below.

3.1 EXCEEDANCE OF STATE GROUNDWATER STANDARDS

Requirement – The Robinson Facility's NPDES permit requires Duke Energy to monitor seven (7) groundwater monitoring wells and report sampling results to DHEC. The groundwater beneath the Robinson Facility is designated as Class GB (underground source of drinking water) under South Carolina's Water Classification Standards, Regulation 61-68. Regulation 61-68 further provides that "all ground waters of the State shall be protected to a quality consistent with the use associated with the classes described herein. Further, the Department may require the owner or operator of a contaminated site to restore the ground water quality to a level that maintains and supports the existing and classified uses…" The applicable water quality standards for Class GB Ground Waters for inorganic chemicals are the maximum contaminant levels (MCLs) as set forth in Regulation 61-58.5, the State Primary Drinking Water Regulations. The MCL for arsenic is 10 micrograms/liter (µg/L) and the MCL for combined radium 226/228 is 5 picocuries per Liter (pCi/L).

Finding – In September 2014, DHEC issued a Notice of Violation (NOV) to Duke Energy alleging a violation of the state groundwater Class GB standards. The NOV stated that monitoring data from groundwater under the Robinson Facility's Ash Basin detected arsenic in groundwater that is designated as an underground source of drinking water at concentrations above the Class GB groundwater standard of 10 micrograms per liter (µg/L). DHEC determined that the presence of arsenic above the Class GB standard violated the requirement to protect the quality of groundwater to a quality consistent with Class GB groundwater. The NOV stated that DHEC was requiring Duke Energy to investigate and remediate, as appropriate, the groundwater at the facility that exceeds the Class GB standard.

The Audit Team observed that Duke Energy appears to be in substantial compliance with the remedial requirements as stated in the 2014 NOV. In response to the 2014 NOV that Duke Energy received from DHEC, Duke Energy submitted: (1) a Work Plan for groundwater assessment activities in October 2014, (2) an Assessment Report that characterized the extent of groundwater contamination in February 2015, and (3) the Closure Plan, submitted on November 13, 2015 and approved by DHEC on May 30, 2017, which provides Duke Energy's plan to permanently close the Robinson Ash Basin as a remedial action measure. In early February 2018, DHEC approved Duke Energy's Assessment Report and proposed corrective action to close the Robinson Ash Basin.

However, based on the Audit Team's review of the facility's 2018 NPDES groundwater sampling data, water beneath and near the Ash Basin continues to exceed the South Carolina Class GB Water Classification Standard for arsenic. Recent sampling in well MW-7 identified arsenic concentrations of 84.6 µg/L during the January 2018 sampling event and 95.6 µg/L of arsenic during the July 2018 sampling event. These concentrations are above the arsenic MCL of 10 µg/L. The arsenic MCL was also exceeded in CCR wells CCR-02S, CCR-02D, CCR-03S, and CCR-04S based on groundwater data from May 2018 at the Ash Basin. Note that the Audit Team included a similar finding in the 2016 and the 2017 Audit Reports related to exceedances of the South Carolina groundwater standard for arsenic based on the 2016 and the 2017 groundwater data that the Audit Team reviewed.

Sampling results also indicate that there is a combined radium exceedance of the groundwater protection standard in the wells identified as part of the CCR Rule monitoring program. The MCL for combined radium 226/228 of 5 pCi/L was exceeded during the May 2018 event in CCR wells CCR-03S (6.36 pCi/L), CCR-04D (7.86 pCi/L), CCR-05D (7.66 pCi/L), and CCR-06D (15.1 pCi/L) at the Ash Basin. The locations of the NPDES monitoring wells and CCR monitoring wells referenced above are provided on figures in Attachment B, along with the groundwater monitoring data. The statistical analysis of groundwater samples completed by Duke Energy under the CCR Rule, and the lack of radium 226/228 in background wells, indicates that the Ash Basin is the source of the identified radium. Duke Energy stated that they intend to continue CCR groundwater sampling and assessment activities to characterize the nature, extent, and source of the combined radium groundwater plume.

As determined by DHEC, the presence of arsenic and combined radium 226/228 above the Class GB standard violates the requirement to protect the quality of groundwater to a quality consistent with Class GB groundwater; therefore, the Audit Team has included these issues as a Finding.

The Audit Team further notes that per a July 2015 Consent Agreement between Duke Energy and DHEC, Duke Energy is required to "assess and address any release or threat of release of Coal Combustion Residuals or other pollutants from the [Robinson Facility] to the environment." The assessments required by the agreement include an assessment of any groundwater contamination at the facility and an evaluation of the need for groundwater remediation. If remedial actions are necessary, then upon DHEC's approval of a Remedial Plan, Duke Energy must fully implement and complete the remedy. Once the remedy is completed, as confirmed by DHEC, the Department will provide Duke Energy a written approval of completion that includes a covenant not to sue for the remedial actions covered by and completed in accordance with the Consent Agreement.

The CAM has advised the Audit Team that the Audit Scope does not include an evaluation of compliance with the July 2015 Consent Agreement with DHEC.

4.0 OPEN LINES OF INQUIRY

Open Lines of Inquiry are items identified by the Audit Team while on-site that, due to limited available information or the need for additional research, could not be determined as being in compliance or out of compliance. There were no Open Lines of Inquiry for the Robinson Facility Audit.

5.0 AUDIT APPROACH

5.1 ON-SITE ACTIVITIES

During its time on-site, the Audit Team conducted an opening conference with facility personnel to discuss the scope of work and the plan for accomplishing necessary tasks while at the Robinson Facility. A site tour of the coal ash management and program support areas was subsequently completed. Following the tour, the Audit Team conducted a review of pertinent files, interviews with facility representatives, and verification of facility activities related to the Environmental Compliance Plans (ECPs), written programs, and permits. A debrief was conducted each Audit day to advise the facility representatives of Audit progress, Open Lines of Inquiry, possible Audit Findings, and needs for the next day. At the completion of the Audit, the Audit Team led a verbal discussion of draft Audit findings with facility representatives.

5.2 STANDARDS OF PRACTICE

The fieldwork portion of the Audit was conducted on January 16-17, 2019, with compliance reporting commencing May 14, 2015, the date of the court's judgments. The Audit focused on the activities at the facility since the date of the last Audit, which was January 17-18, 2018. The Audit was based on:

- Physical inspections of the facility;
- Examination of selected administrative and operating records made available by facility staff at the Audit Team's request;
- Interviews and discussions with key facility management and staff; and

- Verification procedures designed to assess the facility's application of, and adherence to, terms of the probation, environmental laws and regulations, and site policies and procedures. In addition, the Audit Team reviewed the facility's adherence to good management practices.

The Audit followed established audit protocols and procedures. It should be understood that the Audit consisted of evaluating a sample of practices and was conducted over a short period of time. Efforts were made toward sampling major facets of environmental performance during the period under review. This method is intended to uncover major system deficiencies and the Audit may not have identified all potential problems.

To support the overall independence of the Audit process, the Audit included an auditing professional certified by the Board of Environmental, Health and Safety Auditor Certifications (BEAC). BEAC is an accredited professional certification board that issues the Certified Professional Environmental Auditor (CPEA) designation to qualified auditors. Under BEAC, auditor independence is a key criterion for the implementation of an effective third-party audit program. The Audit was implemented in accordance with the standards related to auditor independence.

The process by which the Audit was conducted was consistent with the general state of the art of environment auditing and the best professional judgment of the Audit Team. To conduct the Audit, the team implemented a formal approach, drawing on process guidance from both BEAC and the Auditing Roundtable (AR) guidance documents. Guidance documents included:

- *Standards for the Professional Practice of Environmental, Health and Safety Auditing*. Prepared by the Board of Environmental, Health and Safety Auditor Certifications, 2008.

- ISO 19011:2002 – Guidelines for Quality and/or Environmental Management Systems Auditing. Prepared by the International Organization for Standardization, 2002.

- Standard for the Design and Implementation of an Environmental, Health and Safety Audit Program. Prepared by The Auditing Roundtable, Inc., 1995.

- Minimum Criteria for the Conduct of Environmental, Health and Safety Audits. Prepared by The Auditing Roundtable, Inc.

5.3 REPRESENTATIVE SAMPLING

When confronted with a large population of data to review or equipment to inspect, the Audit Team employed representative sampling techniques to evaluate records over the Audit period requested, and as necessary, for physical inspection of some types of common equipment. The sample size for record reviews or equipment inspections required professional judgment.

The Audit Team's judgement considered the following:

- The outcome of the evaluation of the records sampled. If problems are found in the representative sample, more records may need to be examined to evaluate compliance status.
- Potential for or severity of non-compliance.
- The general appearance and observed practices of certain operating areas.
- Information obtained during an interview that indicates a potential problem.
- Other specific information or guidance from the CAM.
- Time available during the Audit.

The Audit Team also employed the following types of sampling techniques, depending upon the characteristics of a specific population:

- Random sampling – every item has an equal chance of being selected.
- Interval sampling – select every n^{th} item, (e.g., every third manifest in chronological order as contained in facility files).
- Block sampling – auditor uses his/her judgment to select a specific block of items, (e.g., petroleum storage tank inspections from April to October).
- Stratified sampling – population is divided into groups, which are then sampled through random or judgmental techniques.

TABLE

TABLE 1
Ash Basin - Plans and Reports Posted by Duke Energy Under the CCR Rule

Document Name	Category	Release Date
Notice of Groundwater Protection Standard Exceedance 2018	Groundwater Monitoring and Corrective Action	12/14/2018
Annual Fugitive Dust Control Report 2018	Operating Criteria	12/05/2018
Wetlands	Location Restriction	11/07/2018
Unstable Areas	Location Restriction	11/07/2018
Seismic Impact Zones	Location Restriction	11/07/2018
Fault Areas	Location Restriction	11/07/2018
Placement Above Uppermost Aquifer	Location Restriction	11/07/2018
Emergency Action Plan Robinson Ash Pond	Design Criteria	10/01/2018
CCR Annual Surface Impoundment Inspection Report 2018	Operating Criteria	08/16/2018
Annual Meeting with Local Emergency Responders 2018	Design Criteria	05/23/2018
Notice of Establishment of an Assessment Monitoring Program - Robinson Ash Pond	Groundwater Monitoring and Corrective Action	03/14/2018
CCR Annual Groundwater Monitoring and Corrective Action Report	Groundwater Monitoring and Corrective Action	02/06/2018
Robinson Inundation Maps	Design Criteria	01/25/2018
2017 Annual CCR Fugitive Dust Control Report-Robinson	Operating Criteria	11/29/2017
Groundwater Sampling and Analysis Program Selection of Statistical Method Certification-Robinson Ash Basin	Groundwater Monitoring and Corrective Action	11/06/2017
Groundwater Monitoring System Certification	Groundwater Monitoring and Corrective Action	10/25/2017
CCR Annual Surface Impoundment Inspection Report 2017 Revision 1	Operating Criteria	10/19/2017
CCR Annual Surface Impoundment Inspection Report 2017	Operating Criteria	08/17/2017
Annual Meeting with Local Emergency Responders 2017	Design Criteria	05/24/2017
Annual Fugitive Dust Control Report 2016	Operating Criteria	12/05/2016

TABLE 1
(Continued)

Initial Structural Stability Assessment	Design Criteria	11/16/2016
Initial Factor of Safety Assessment	Design Criteria	11/15/2016
Closure Plan for Impoundments	Closure and Post Closure Care	11/11/2016
Inflow Design Flood Control System	Operating Criteria	11/03/2016
History of Construction	Design Criteria	10/25/2016
Initial Hazard Classification Assessment Certification	Design Criteria	10/12/2016
Existing Liner Design Criteria	Design Criteria	10/11/2016
Annual Surface Impoundment Report 2016	Operating Criteria	08/11/2016
Coal Combustion Residual Fugitive Dust Control Plan	Operating Criteria	11/12/2015
Annual Surface Impoundment Report (Initial)	Operating Criteria	02/12/2016

*This summary of reports was downloaded on January 17, 2019

ATTACHMENT A

ATTACHMENT A
AUDIT SCOPE

A-1 GENERAL AUDIT SCOPE ITEMS

The general Audit scope items included:

- Review and evaluation of documentation for maintenance and repair of structures and equipment used for coal ash disposal.
- Review and evaluation of documentation of modifications, failures, leaks, damage, disrepair and other problems at the coal ash management units.
- Review and evaluation of documentation of efforts to correct failures, leaks, damage, disrepair and other problems where they determine that employee/contractor actions were likely a primary or contributing cause to a compliance finding.
- Review and evaluation of documentation of communication of the items above within the organization.
- Review and evaluation of documentation associated with the specific environmental compliance items described below and laws, regulations, and policies associated these items.
- Review of compliance with administrative aspects and regulatory submissions related to coal ash management-specific regulations, including the Coal Combustion Residuals Rule found in 40 CFR Part 257, Subpart D.

More specific items which were addressed in the audits to comply with the general Audit scope are described below.

A-2 SPECIFIC COMPLIANCE WITH OTHER PROVISIONS OF THE PLEA AGREEMENTS

The following items related to specific items in the plea agreements were reviewed as part of the Audit:

1. Determine whether Defendants have opened, expanded, or reopened any coal ash or coal ash wastewater impoundment and, if so, verify that they are lined and do not allow unpermitted discharges of coal ash or coal ash wastewater to waters of the United States.

2. Review citations/notices of violation/notices of deficiency related to violations of federal, state, or local law to assure that they have been properly relayed to the court and, as appropriate under the plea agreements, determine their materiality.

3. Note any observations made during the audit that cause concern regarding the assets and/or security available to the Defendants to meet the obligations imposed by the court’s judgment.

A-3 GENERAL ENVIRONMENTAL COMPLIANCE SUBJECT AREAS

The following items related to general environmental compliance were reviewed as part of the Audit:

1. Assess all waste streams from Duke Energy facilities with coal ash impoundments. Review Duke Energy's processes, procedures, and practices, as well as compliance with those processes, procedures, and practices, for:
   a. identifying waste streams (especially, but not limited to, waste streams with discharge points into bodies of water);
   b. identifying and communicating any modifications or changes, or potential modifications or changes, to waste streams;
   c. ensuring proper handling/disposal of waste streams;
   d. identifying, preventing, and mitigating any risks or hazards that could affect waste streams and/or the disposal of waste streams; and,
   e. ensuring proper permitting for waste streams.

For Item 1.d., the Audit Team evaluated such risk/hazard issues where there were compliance findings associated with waste streams.

2. Review and evaluate documentation of:
   a. maintenance and repair of structures and equipment related to coal ash disposal;
   b. modification of the coal ash impoundments and related pollution prevention equipment and structures;
   c. failures, leaks, damage, disrepair, and other problems;
   d. communication of the information described in a-c within the organization; and,
   e. efforts to correct failures, leaks, damage, disrepair, and other problems.

3. Assess the employees responsible for inspection, maintenance, and repair of coal ash basins and related structures and equipment. The assessment included an assessment of the workloads of such employees to assure that Duke Energy's facilities are adequately staffed. These assessments were made where the Audit Team determined that employee/contractor actions were likely a primary or contributing cause to a compliance finding.

4. Review the results and recommendations of any other audits (internal or external/state-mandated) and assess Duke Energy's implementation of those recommendations.

5. Review and assess Duke Energy's processes, procedures, and practices for identifying, communicating, and addressing problems and potential problems at its coal ash basins (leaks, unpermitted discharges, etc.).

6. Review and assess Duke Energy's policies, procedures, practices, and equipment for handling emergency releases from its coal ash basins and evaluate the personnel with duties in such situations.

7. Verify that Duke Energy is complying with its NPDES wastewater and stormwater permits, as well as other relevant environmental permits. This would include verifying Duke Energy's timely submission of permit applications, permit renewal applications, and responses to requests for additional information from the relevant regulatory authority.

8. Review and assess any actions or measures Duke Energy has undertaken to assure accountability and prevent recurrences when problems and/or failures occur (e.g., disciplinary actions, re-training, revision to policies and procedures, etc.). This review was conducted where the Audit Team determined that employee/contractor actions were likely a primary or contributing cause to a compliance finding.

9. Review and assess compliance with the following environmental regulations, as applicable to the management of coal ash:

a.	Wastewater Discharges	40 CFR 122; R61-9.122
b.	Stormwater Discharges	40 CFR 122.26; R61-9.122.26
c.	Groundwater Quality Standards	SC R. 61-58, 61-68, 61-69
d.	Hazardous Waste Management	R61-79.260, R61-79.261
e.	Oil Pollution Prevention	40 CFR Part 112
f.	Dam Safety	Dam & Reservoir Safety 72-1 to72-9
g.	Air Pollution (Title V)	R. 61-62.70
h.	Hazardous Chemical Reporting (Tier II)	40 CFR Part 370.

Reviews also included an analysis of overall compliance and the status and security of the asset. Subsequent reviews of individual facilities will evaluate the movement towards compliance. The Audit did not include an evaluation of compliance with the July 2015 Consent Agreement with DHEC.

A-4 LIST OF PERMITS AND PROGRAMS DEEMED TO BE EITHER DIRECTLY OR INDIRECTLY IN SUPPORT OF ASH MANAGEMENT

During the Audit, the Audit Team reviewed a variety of written programs developed and implemented by Duke Energy and facility staff. State-issued permits and supporting documentation relative to environmental programs and geotechnical aspects of ash basin management were also requested and reviewed.

Requested documents, pertinent to management of ash in basins, landfills, ponds, etc., were outlined in the pre-Audit questionnaire for the facility and included, but were not limited to:

1. The Compliance Register developed for eTRAC for the facility.

2. The Duke Energy Operations Manual for the facility.

3. A site plan, site map, or aerial photo which shows the entire facility and key features of the facility, including NPDES outfalls associated environmental monitoring locations, storage tanks, etc.

4. Most recent two (2) years of maintenance, monitoring, and inspection records for each coal ash/CCR basin (just the physical inspections, not the groundwater records).

5. A “Phase 1 and Phase 2” summary of ash basin conditions prepared by an outside consultant.

6. Duke Energy’s permitting plans for addressing ash impoundments and landfills at the facility.

7. Applicable pages from the Duke Energy basin-by-basin coal ash/CCR project tracking document for the facility.

8. Original basin/landfill/coal ash management unit construction records.

9. Documentation of changes to these units.

10. Coal ash unit construction permit application and approval.

11. State-issued permits and application materials for permits associated with coal ash/CCR management (including, e.g., dam permits).

12. Any currently effective state order, consent order, or similar state directive that addresses coal ash/CCR management at the facility.

13. Records required to be maintained in the facility's operating record under the federal CCR regulation and/or any state CCR regulatory program.

14. Records of off-site ash shipments from May 2015 forward.

15. Stormwater permit application and approval for all outfalls.

16. Industrial wastewater (NPDES/POTW) permit application and approval for all outfalls/discharges.

17. Industrial stormwater permit, sampling and monitoring records, and any corrective action plans (last two (2) years).

18. Stormwater Pollution Prevention Plan(s).

19. Landfill operating permit(s) with maintenance and monitoring requirements.

20. Landfill leak detection and groundwater monitoring records from the last two (2) years along with any workplans that describe the rationale for the monitoring system at the facility.

21. Air permits and applications for coal ash units and ancillary operations.

22. Testing and monitoring records completed to comply with air permits.

23. Any notices of violation associated with the coal ash/CCR management activities received over the last two (2) years.

24. Spill Prevention Control and Countermeasure Plan.

25. Community Right-to-Know:
    a. Lists of hazardous chemicals and/or MSDSs submitted;
    b. Tier I or II reports; and
    c. Form R (toxic release inventory) reports.

26. Copies of communications with employees and the public regarding availability of toll-free hotline and electronic mail inbox for reporting suspected environmental violations.

27. Management Systems:
    a. List of responsible party(ies) for each environmental activity.
    b. All environmental-related training records.
    c. All environmental policies and procedures.
    d. Organization chart.
    e. Site diagram identifying storage areas, tanks, etc.

ATTACHMENT B-1

NPDES MONITORING WELL LOCATIONS AND MONITORING RESULTS

Robinson Groundwater Programs

<u>Ash Basin Groundwater Monitoring</u>

- NPDES Network
  - 7 Wells (1 background, 5 down gradient, 1 near nuclear plant)
  - Sampled and reported semi-annually (January and July)
  - Sampling since at least 1995
- Parameters:
  - MCLs - Arsenic, Cadmium & Chromium
  - SMCLs - Copper, Sulfate, Zinc, TDS, pH
- 2018 Results (summary of SC R. 61-68 standards exceedances)
  - **pH** (low pH; all wells except MW-6 and MW-7, including background)
  - **Sulfate** (MW-4R)
  - **Arsenic** (MW-7)
    - MW-5: 6.74 ug/L (07/18)
    - MW-7: 84.6 ug/L (01/18), 95.6 ug/L (07/18)
- Arsenic NOV Assessment Report approval received February 2018

WELL ID	NORTHING	EASTING	TOP OF CASING ELEVATION
MW-1R	939582.35	2249216.74	267.99
MW-2R	941299.50	2252877.87	256.62
MW-3R	939418.88	2252615.48	280.25
MW-4R	935207.61	2254495.38	227.92
MW-5	939998.24	2252712.41	265.99
MW-6	940407.92	2252768.03	257.72
MW-7	940805.40	2252844.88	245.61

7015 1660 0000 4945 2710

Serial #: 18-0005 **Distribution #:** DHEC

Outgoing Correspondence Checklist

Activity	Initials
Prior to Mailing	
Check the headers on additional pages and attachments for consistent letter number and number of pages.	CC
Check the listed attachments against actual attachment titles.	CC
Verify that the Original Letter Date Stamped and Signed?	CC
Check the quality of original. Are the pages clean, numbered, dates and numbers not rolled to next line, attachments in order, and no hand written notes left on the pages.	CC
Check the distribution requirements	CC
Is the original copied? Verify that the copies have the correct page count.	CC
Check the quality of the copies (Two sided if required).	CC
Verify that the outgoing envelopes correctly labeled.	CC
Verify that the outgoing envelopes have correct postage.	CC
After Mailing	
Make the electronic copy.	CC
Send the electronic copy, if applicable.	CC
Post the electronic copy to file (N: Drive).	CC
Send copy to QA vault.	CC
Update the Letter Log	CC
Enter commitments into Action Tracking, if applicable. Note AT # on Signature Traveler.	NA
Place the validation file in the file cabinet.	CC
Create source file folder for submittal in 'Letters' folder.	CC

bc: John Krakuszeski
John Williamson
Greg Hartzer
Gary Sain
William Hamilton
Wellie Gilbert
John Gainey
John Toepfer – Duke Corp Environmental
W. Reid Garrett – Duke Environmental Water Resources
Nathan Craig – Duke Environmental Services
Tina Woodward – Duke Energy NPDES Compliance
State directory
Vault

DUKE ENERGY

John A. Krakuszeski
H. B. Robinson Steam
Electric Plant Unit 2
Plant Manager

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John.Krakuszeski@duke-energy.com

FEB 21 2018

Serial: RNP-RA/18-0005

R61-9.122

South Carolina Department of Health and Environmental Control (SCDHEC)
Bureau of Water/Water Monitoring, Assessment, and Protection Division
Groundwater Quality Section
2600 Bull Street
Columbia, South Carolina 29201

H. B. ROBINSON STEAM ELECTRIC PLANT, SITE ID #16-00568
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
PERMIT NUMBER SC0002925

FIRST SEMIANNUAL GROUNDWATER MONITORING REPORT FOR 2018

Ladies and Gentlemen:

In accordance with Part II, Paragraph L.4.a.(2) of NPDES Permit No. SC0002925, effective May 1, 2007, Duke Energy Progress, LLC hereby submits the First Semiannual Groundwater Monitoring Report of 2018 for H. B. Robinson Steam Electric Plant (HBRSEP). The attachment provides this report.

The current SC0002925 NPDES permit for HBRSEP expired on April 30, 2011. On October 28, 2010, Progress Energy Carolinas, Inc. submitted its renewal application for this permit. By letter dated March 2, 2011, SCDHEC acknowledged receipt of this application. This letter authorized continued discharge of effluent to surface waters, pursuant to Section 122.6 of South Carolina Regulation 61-9, and stated this permit will remain fully effective and enforceable pending issuance of a new permit. Please contact William Hamilton, Senior EHS Professional, at (843) 951-1231 with any questions.

Certification

I certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Sincerely,

John A. Krakuszeski

John A. Krakuszeski
Plant Manager
H. B. Robinson Steam Electric Plant, Unit 2

JAK/cac

Attachment

c: South Carolina Department of Health and Environmental Control

South Carolina Department of Health and Environmental Control
Attachment to Serial: RNP-RA/18-0005
28 Pages (including this cover page)

H. B. ROBINSON STEAM ELECTRIC PLANT

FIRST SEMIANNUAL GROUNDWATER MONITORING REPORT FOR 2018

DHEC
PROMOTE PROTECT PROSPER

Groundwater Monitoring Report

SC0002925
Permit Number

Facility: H. B. Robinson Steam Electric Plant
Address: 3581 West Entrance Road
City: Hartsville State: South Carolina
County: Darlington Zipcode: 29550
Site I.D. #: 16-00568

Date Sampled			Date Analyzed		
01	03	2018	01	03	2018
Month	Day	Year	Month	Day	Year

Lab Name: Duke Energy Analytical
SC Lab Certification No.: 99005 / 99005001

PARAMETERS		WELL NUMBERS						
Name	Units	1R	2R	3R	4R	5	6	7
Depth to Water	FT.	26.71	30.25	50.82	19.69	36.94	29.91	18.94
Water Elevation	FT.	241.28	226.37	229.43	208.23	229.05	227.81	226.67
Water Temperature	C	12.5	16.4	15.1	14.4	11.1	16.8	19.0
Specific Conductivity	uS/cm	24.0	31.0	234.0	519.8	171.2	139.6	121.3
pH	S.U.	4.7	5.6	6.3	3.0	6.4	6.7	6.9
Sulfate - IC	mg/L							
Arsenic, Total	ug/L							
Cadmium, Total - PQL	ug/L							
Chromium, Total	ug/L							
Copper, Total	ug/L							
Zinc, Total	ug/L							
Total Dissolved Solids	mg/L							
Turbidity	NTU	5.3	7.7	9.9	6.7	0.6	4.2	6.0

(Type or Print)
Telephone: (843) 951-1201
Authorized Release By: John A. Krakuszeski - H.B. Robinson Plant Manager Date: John A. Krakuszeski

DHEC 2110 (05/1999)

D H E C
PROMOTE PROTECT PROSPER

Groundwater Monitoring Report

SC0002925
Permit Number

Facility: H. B. Robinson Steam Electric Plant
Address: 3581 West Entrance Road
City: Hartsville State: South Carolina
County: Darlington Zipcode: 29550
Site I.D. #: 16-00568

Date Sampled			Date Analyzed		
01	03	2018	01	04	2018
Month	Day	Year	Month	Day	Year

Lab Name: Duke Energy Analytical
SC Lab Certification No.: 99005 / 99005001

PARAMETERS		WELL NUMBERS						
Name	Units	1R	2R	3R	4R	5	6	7
Depth to Water	FT.							
Water Elevation	FT.							
Water Temperature	C							
Specific Conductivity	uS/cm							
pH	S.U.							
Sulfate - IC	mg/L	5.3	8.2	94	690	27	45	15
Arsenic, Total	ug/L							
Cadmium, Total - PQL	ug/L							
Chromium, Total	ug/L							
Copper, Total	ug/L							
Zinc, Total	ug/L							
Total Dissolved Solids	mg/L	<25	<25	200	360	150	130	110
Turbidity	NTU							

(Type or Print)

Telephone: (843) 951-1201

Authorized Release By: John A. Krakuszeski - H.B. Robinson Plant Manager Date: John A. Krakuszeski

DHEC 2110 (05/1999)

D H E C
PROMOTE PROTECT PROSPER

Groundwater Monitoring Report

SC0002925
Permit Number

Facility: H. B. Robinson Steam Electric Plant
Address: 3581 West Entrance Road
City: Hartsville State: South Carolina
County: Darlington Zipcode: 29550
Site I.D. #: 16-00568

Date Sampled			Date Analyzed		
01	03	2018	01	10	2018
Month	Day	Year	Month	Day	Year

Lab Name: Duke Energy Analytical
SC Lab Certification No.: 99005 / 99005001

PARAMETERS		WELL NUMBERS						
Name	Units	1R	2R	3R	4R	5	6	7
Depth to Water	FT.							
Water Elevation	FT.							
Water Temperature	C							
Specific Conductivity	uS/cm							
pH	S.U.							
Sulfate - IC	mg/L							
Arsenic, Total	ug/L	<1	3.43	<1	2.11	4.97	1.28	84.6
Cadmium, Total - PQL	ug/L	<1	<1	<1	<1	<1	<1	<1
Chromium, Total	ug/L	<1	<1	<1	7.63	<1	<1	<1
Copper, Total	ug/L	<1	<1	<1	102	<1	<1	<1
Zinc, Total	ug/L	<5	<5	<5	197	<5	<5	<5
Total Dissolved Solids	mg/L							
Turbidity	NTU							

(Type or Print)

Telephone: (843) 951-1201

Authorized Release By: John A. Krakuszeski - H.B. Robinson Plant Manager Date: John A. Krakuszeski

Analytical Laboratory

13339 Hagers Ferry Road
Huntersville, NC 28078-7929
McGuire Nuclear Complex - MG03A2
Phone: 980-875-5245 Fax: 980-875-4349

Order Summary Report

Order Number:	**J17120441**
Project Name:	ROBINSON - GW ASH BASIN
Customer Name(s):	j. Toepfer, B Moeller, C Campbell, J Gainey, W Ham
Customer Address:	

Lab Contact: Peggy Kendall Phone: 980-875-5848

Report Authorized By: (Signature) Peggy J Kendall **Date:** 1/19/2018

Peggy Kendall

Program Comments:

Please contact the Program Manager (Peggy Kendall) with any questions regarding this report.

Data Flags & Calculations:

Any analytical tests or individual analytes within a test flagged with a Qualifier indicate a deviation from the method quality system or quality control requirement. The qualifier description is found at the end of the Certificate of Analysis (sample results) under the qualifiers heading. All results are reported on a dry weight basis unless otherwise noted. Subcontracted data included on the Duke Certificate of Analysis is to be used as information only. Certified vendor results can be found in the subcontracted lab final report. Duke Energy Analytical Laboratory subcontracts analyses to other vendor laboratories that have been qualified by Duke Energy to perform these analyses except where noted.

Data Package:

This data package includes analytical results that are applicable only to the samples described in this narrative. An estimation of the uncertainty of measurement for the results in the report is available upon request. This report shall not be reproduced, except in full, without the written consent of the Analytical Laboratory. Please contact the Analytical laboratory with any questions. The order of individual sections within this report is as follows:

Job Summary Report, Sample Identification, Technical Validation of Data Package, Analytical Laboratory Certificate of Analysis, Analytical Laboratory QC Reports, Sub-contracted Laboratory Results, Customer Specific Data Sheets, Reports & Documentation, Customer Database Entries, Test Case Narratives, Chain of Custody (COC)

Certification:

The Analytical Laboratory holds the following State Certifications : North Carolina (DENR) Certificate #248, South Carolina (DHEC) Laboratory ID # 99005. Contact the Analytical Laboratory for definitive information about the certification status of specific methods.

Sample ID's & Descriptions:

Sample ID	Plant/Station	Collection Date and Time	Collected By	Sample Description
2017042155	ROBINSON	03-Jan-18 12:35 PM	Pace	MW-1R NPDES (ASH)
2017042156	ROBINSON	03-Jan-18 1:30 PM	Pace	MW-2R NPDES (ASH)
2017042157	ROBINSON	03-Jan-18 5:00 PM	Pace	MW-3R NPDES (ASH)
2017042158	ROBINSON	03-Jan-18 10:55 AM	Pace	MW-4R NPDES (ASH)
2017042159	ROBINSON	03-Jan-18 3:30 PM	Pace	MW-5 NPDES (ASH)
2017042160	ROBINSON	03-Jan-18 2:40 PM	Pace	MW-6 NPDES (ASH)
2017042161	ROBINSON	03-Jan-18 2:05 PM	Pace	MW-7 NPDES (ASH)
2017042162	ROBINSON	03-Jan-18 11:10 AM	Pace	FIELD BLANK

8 Total Samples

Technical Validation Review

Checklist:

COC and .pdf report are in agreement with sample totals and analyses (compliance programs and procedures). ☑ Yes ☐ No

All Results are less than the laboratory reporting limits. ☐ Yes ☑ No

All laboratory QA/QC requirements are acceptable. ☑ Yes ☐ No

Report Sections Included:

☑ Job Summary Report

☑ Sample Identification

☑ Technical Validation of Data Package

☑ Analytical Laboratory Certificate of Analysis

☐ Analytical Laboratory QC Report

☐ Sub-contracted Laboratory Results

☐ Customer Specific Data Sheets, Reports, & Documentation

☐ Customer Database Entries

☑ Chain of Custody

☑ Electronic Data Deliverable (EDD) Sent Separatel

Reviewed By: Peggy Kendall

Date: 1/19/2018

Certificate of Laboratory Analysis

This report shall not be reproduced, except in full.

Order # J17120441

Site: MW-1R NPDES (ASH)

Collection Date: 01/03/2018 12:35 PM

Sample #: 2017042155

Matrix: GW_WW

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
INORGANIC IONS BY IC								
Sulfate	5.3	mg/L	M2	0.5	5	EPA 300.0	01/04/2018 10:25	BGN9034
TOTAL RECOVERABLE METALS BY ICP-MS								
Arsenic (As)	< 1	ug/L		1	1	EPA 200.8	01/10/2018 20:04	CWSPEN3
Cadmium (Cd)	< 1	ug/L		1	1	EPA 200.8	01/10/2018 20:04	CWSPEN3
Chromium (Cr)	< 1	ug/L		1	1	EPA 200.8	01/10/2018 20:04	CWSPEN3
Copper (Cu)	< 1	ug/L		1	1	EPA 200.8	01/10/2018 20:04	CWSPEN3
Zinc (Zn)	< 5	ug/L		5	1	EPA 200.8	01/10/2018 20:04	CWSPEN3
TOTAL DISSOLVED SOLIDS								
TDS	< 25	mg/L		25	1	SM2540C	01/04/2018 14:00	Mgigant

Certificate of Laboratory Analysis

This report shall not be reproduced, except in full.

Order # J17120441

Site: MW-2R NPDES (ASH)
Collection Date: 01/03/2018 01:30 PM

Sample #: 2017042156
Matrix: GW_WW

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
INORGANIC IONS BY IC								
Sulfate	8.2	mg/L		0.5	5	EPA 300.0	01/04/2018 11:15	BGN9034
TOTAL RECOVERABLE METALS BY ICP-MS								
Arsenic (As)	3.43	ug/L		1	1	EPA 200.8	01/10/2018 20:29	CWSPEN3
Cadmium (Cd)	< 1	ug/L		1	1	EPA 200.8	01/10/2018 20:29	CWSPEN3
Chromium (Cr)	< 1	ug/L		1	1	EPA 200.8	01/10/2018 20:29	CWSPEN3
Copper (Cu)	< 1	ug/L		1	1	EPA 200.8	01/10/2018 20:29	CWSPEN3
Zinc (Zn)	< 5	ug/L		5	1	EPA 200.8	01/10/2018 20:29	CWSPEN3
TOTAL DISSOLVED SOLIDS								
TDS	< 25	mg/L		25	1	SM2540C	01/04/2018 14:00	Mgigant

Certificate of Laboratory Analysis

This report shall not be reproduced, except in full.

Order # J17120441

Site: MW-3R NPDES (ASH)

Collection Date: 01/03/2018 05:00 PM

Sample #: 2017042157

Matrix: GW_WW

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
INORGANIC IONS BY IC								
Sulfate	94	mg/L		1	10	EPA 300.0	01/04/2018 11:32	BGN9034
TOTAL RECOVERABLE METALS BY ICP-MS								
Arsenic (As)	< 1	ug/L		1	1	EPA 200.8	01/10/2018 20:38	CWSPEN3
Cadmium (Cd)	< 1	ug/L		1	1	EPA 200.8	01/10/2018 20:38	CWSPEN3
Chromium (Cr)	< 1	ug/L		1	1	EPA 200.8	01/10/2018 20:38	CWSPEN3
Copper (Cu)	< 1	ug/L		1	1	EPA 200.8	01/10/2018 20:38	CWSPEN3
Zinc (Zn)	< 5	ug/L		5	1	EPA 200.8	01/10/2018 20:38	CWSPEN3
TOTAL DISSOLVED SOLIDS								
TDS	200	mg/L		25	1	SM2540C	01/04/2018 14:00	Mgigant

Certificate of Laboratory Analysis

This report shall not be reproduced, except in full.

Order # J17120441

Site: MW-4R NPDES (ASH)
Collection Date: 01/03/2018 10:55 AM

Sample #: 2017042158
Matrix: GW_WW

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
INORGANIC IONS BY IC								
Sulfate	690	mg/L		10	100	EPA 300.0	01/04/2018 11:49	BGN9034
TOTAL RECOVERABLE METALS BY ICP-MS								
Arsenic (As)	2.11	ug/L		1	1	EPA 200.8	01/10/2018 20:46	CWSPEN3
Cadmium (Cd)	< 1	ug/L		1	1	EPA 200.8	01/10/2018 20:46	CWSPEN3
Chromium (Cr)	7.63	ug/L		1	1	EPA 200.8	01/10/2018 20:46	CWSPEN3
Copper (Cu)	102	ug/L		1	1	EPA 200.8	01/10/2018 20:46	CWSPEN3
Zinc (Zn)	197	ug/L		5	1	EPA 200.8	01/10/2018 20:46	CWSPEN3
TOTAL DISSOLVED SOLIDS								
TDS	360	mg/L		25	1	SM2540C	01/04/2018 14:00	Mgigant

Certificate of Laboratory Analysis

This report shall not be reproduced, except in full.

Order # J17120441

Site: MW-5 NPDES (ASH)
Collection Date: 01/03/2018 03:30 PM

Sample #: 2017042159
Matrix: GW_WW

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
INORGANIC IONS BY IC								
Sulfate	**27**	mg/L		0.5	5	EPA 300.0	01/04/2018 12:06	BGN9034
TOTAL RECOVERABLE METALS BY ICP-MS								
Arsenic (As)	**4.97**	ug/L		1	1	EPA 200.8	01/10/2018 21:02	CWSPEN3
Cadmium (Cd)	< 1	ug/L		1	1	EPA 200.8	01/10/2018 21:02	CWSPEN3
Chromium (Cr)	< 1	ug/L		1	1	EPA 200.8	01/10/2018 21:02	CWSPEN3
Copper (Cu)	< 1	ug/L		1	1	EPA 200.8	01/10/2018 21:02	CWSPEN3
Zinc (Zn)	< 5	ug/L		5	1	EPA 200.8	01/10/2018 21:02	CWSPEN3
TOTAL DISSOLVED SOLIDS								
TDS	**150**	mg/L		25	1	SM2540C	01/04/2018 14:00	Mgigant

Certificate of Laboratory Analysis

This report shall not be reproduced, except in full.

Order # J17120441

Site: MW-6 NPDES (ASH)
Collection Date: 01/03/2018 02:40 PM

Sample #: **2017042160**
Matrix: GW_WW

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
INORGANIC IONS BY IC								
Sulfate	45	mg/L		1	10	EPA 300.0	01/04/2018 12:22	BGN9034
TOTAL RECOVERABLE METALS BY ICP-MS								
Arsenic (As)	1.28	ug/L		1	1	EPA 200.8	01/10/2018 21:11	CWSPEN3
Cadmium (Cd)	< 1	ug/L		1	1	EPA 200.8	01/10/2018 21:11	CWSPEN3
Chromium (Cr)	< 1	ug/L		1	1	EPA 200.8	01/10/2018 21:11	CWSPEN3
Copper (Cu)	< 1	ug/L		1	1	EPA 200.8	01/10/2018 21:11	CWSPEN3
Zinc (Zn)	< 5	ug/L		5	1	EPA 200.8	01/10/2018 21:11	CWSPEN3
TOTAL DISSOLVED SOLIDS								
TDS	130	mg/L		25	1	SM2540C	01/04/2018 14:00	Mgigant

Certificate of Laboratory Analysis

This report shall not be reproduced, except in full.

Order # J17120441

Site: MW-7 NPDES (ASH)
Collection Date: 01/03/2018 02:05 PM

Sample #: 2017042161
Matrix: GW_WW

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
INORGANIC IONS BY IC								
Sulfate	15	mg/L		0.5	5	EPA 300.0	01/04/2018 12:39	BGN9034
TOTAL RECOVERABLE METALS BY ICP-MS								
Arsenic (As)	84.6	ug/L		1	1	EPA 200.8	01/10/2018 21:19	CWSPEN3
Cadmium (Cd)	< 1	ug/L		1	1	EPA 200.8	01/10/2018 21:19	CWSPEN3
Chromium (Cr)	< 1	ug/L		1	1	EPA 200.8	01/10/2018 21:19	CWSPEN3
Copper (Cu)	< 1	ug/L		1	1	EPA 200.8	01/10/2018 21:19	CWSPEN3
Zinc (Zn)	< 5	ug/L		5	1	EPA 200.8	01/10/2018 21:19	CWSPEN3
TOTAL DISSOLVED SOLIDS								
TDS	110	mg/L		25	1	SM2540C	01/04/2018 14:00	Mgigant

Certificate of Laboratory Analysis

This report shall not be reproduced, except in full.

Order # J17120441

Site: FIELD BLANK

Collection Date: 01/03/2018 11:10 AM

Sample #: 2017042162

Matrix: GW_WW

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
INORGANIC IONS BY IC								
Sulfate	< 0.1	mg/L		0.1	1	EPA 300.0	01/04/2018 12:56	BGN9034
TOTAL RECOVERABLE METALS BY ICP-MS								
Arsenic (As)	< 1	ug/L		1	1	EPA 200.8	01/10/2018 21:52	CWSPEN3
Cadmium (Cd)	< 1	ug/L		1	1	EPA 200.8	01/10/2018 21:52	CWSPEN3
Chromium (Cr)	< 1	ug/L		1	1	EPA 200.8	01/10/2018 21:52	CWSPEN3
Copper (Cu)	< 1	ug/L		1	1	EPA 200.8	01/10/2018 21:52	CWSPEN3
Zinc (Zn)	< 5	ug/L		5	1	EPA 200.8	01/10/2018 21:52	CWSPEN3

Qualifiers:

M2 Matrix Spike and/or Matrix Spike Duplicate recovery was Low; the associated Laboratory Control Spike (LCS) was acceptable.

Level II QC Summary

Q18010086 Dionex INORGANIC IONS BY IC

Blank # 1

Parameter	Measured	Final	Units:	Dil	RDL	Relative Concentration	Qualifier
Sulfate	-0.0144	-0.0144	mg/L	1	0.1	< 1/2 RDL	-

LCS # 1

Parameter	Measured	Final	Units:	Dil	Spike	% Recovery	LCL	UCL	Qualifier
Sulfate	4.96	4.96	mg/L	1	5	99.3	90	110	-

MS # 1

Parent Sample: J17120441 -- 2017042155

Parameter	Measured	Final	Units:	Dil	Spike	% Recovery	LCL	UCL	Qualifier
Sulfate	3.24	16.2	mg/L	5	15	72.4	80	120	M2

MSD # 1

Parent Sample: J17120441 -- 2017042155

Parameter	Measured	Final	Units:	Dil	Spike	% Recovery	LCL	UCL	RPD	Qualifier
Sulfate	3.21	16.1	mg/L	5	15	71.4	80	120	1.37	M2

Qualifiers:

M2 Matrix Spike and/or Matrix Spike Duplicate recovery was Low; the associated Laboratory Control Spike (LCS) was acceptable.

Level II QC Summary

Q18010225 IMS_TRM TOTAL RECOVERABLE METALS BY ICP-MS

Blank # 1

Parameter	Measured	Final	Units:	Dil	RDL	Relative Concentration	Qualifier
Arsenic (As)	0.011	0.011	ug/L	1	1	< 1/2 RDL	-
Cadmium (Cd)	-0.001	-0.001	ug/L	1	1	< 1/2 RDL	-
Chromium (Cr)	0.103	0.103	ug/L	1	1	< 1/2 RDL	-
Copper (Cu)	0	0	ug/L	1	1	< 1/2 RDL	-
Zinc (Zn)	-0.014	-0.014	ug/L	1	5	< 1/2 RDL	-

LCS # 1

Parameter	Measured	Final	Units:	Dil	Spike	% Recovery	LCL	UCL	Qualifier
Arsenic (As)	47.3	47.3	ug/L	1	50	94.7	85	115	-
Cadmium (Cd)	48.7	48.7	ug/L	1	50	97.5	85	115	-
Chromium (Cr)	49.1	49.1	ug/L	1	50	98.3	85	115	-
Copper (Cu)	47.6	47.6	ug/L	1	50	95.3	85	115	-
Zinc (Zn)	47.4	47.4	ug/L	1	50	94.7	85	115	-

MS # 1

Parent Sample: J17120441 -- 2017042155

Parameter	Measured	Final	Units:	Dil	Spike	% Recovery	LCL	UCL	Qualifier
Arsenic (As)	45.2	45.2	ug/L	1	50	90.1	70	130	-
Cadmium (Cd)	47.1	47.1	ug/L	1	50	94	70	130	-
Chromium (Cr)	47.3	47.3	ug/L	1	50	93.9	70	130	-
Copper (Cu)	45.9	45.9	ug/L	1	50	90.9	70	130	-
Zinc (Zn)	46.3	46.3	ug/L	1	50	90.5	70	130	-

MSD # 1

Parent Sample: J17120441 -- 2017042155

Parameter	Measured	Final	Units:	Dil	Spike	% Recovery	LCL	UCL	RPD	Qualifier
Arsenic (As)	45.3	45.3	ug/L	1	50	90.4	70	130	0.41	-
Cadmium (Cd)	46.8	46.8	ug/L	1	50	93.4	70	130	0.653	-
Chromium (Cr)	47	47	ug/L	1	50	93.4	70	130	0.476	-
Copper (Cu)	45.7	45.7	ug/L	1	50	90.6	70	130	0.333	-
Zinc (Zn)	46.3	46.3	ug/L	1	50	90.4	70	130	0.102	-

Level II QC Summary

Q18010090 TDS TOTAL DISSOLVED SOLIDS

Blank # 1

Parameter	Measured	Final	Units:	Dil	RDL	Relative Concentration	Qualifier
TDS	0	0	mg/L	1	25	< 1/2 RDL	-

Duplicate # 1

Parent Sample: J17120441 -- 2017042155

Parameter	Measured	Final	Units:	Dil	RPD	Qualifier
TDS	3	3	mg/L	1	0	-

Duplicate # 2

Parent Sample: J17120441 -- 2017042156

Parameter	Measured	Final	Units:	Dil	RPD	Qualifier
TDS	17	17	mg/L	1	0	-

LCS # 1

Parameter	Measured	Final	Units:	Dil	Spike	% Recovery	LCL	UCL	Qualifier
TDS	103	103	mg/L	1	100	103	90	110	-

DUKE ENERGY.

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

Duke Energy Analytical Laboratories
Mail Code MG03A2 (Building 7405)
13339 Hagers Ferry Rd
Huntersville, N. C. 28078
(980) 875-6371
Fax: (980) 875-5559

Analytical Laboratory Use Only

LIMS # J17120441

Sample Class: GROUNDWATER

Samples Originating From: NC ___ SC ✓

Logged By: TDC

Date & Time: 1/4/18 0750

Vendor:

Cooler Temp (C): 0.6

SAMPLE PROGRAM
Ground Water ___
NPDES X
Drinking Water ___
UST ___
RCRA Waste ___

[10]Page 1 of 1
DISTRIBUTION
ORIGINAL to LAB,
COPY to CLIENT

Revised 12/8/2017

Customer must Complete

1)Project Name: Robinson NPDES Groundwater Monitoring Program NPDES #SC0002925

2)Phone No: 980-875-5257

3)Client: John Toepfer, Bryan Moeller, Chuck Campbell, John Gainey, Will Hamilton, Dee O'Brian

4)Fax No:

5)Business Unit: 50125

6)Process: BENVWT

7)Resp. To: RS01

8)Task ID:

9)Activity ID:

10)Mail Code: MG03A3

PO #

MR #

[15]Preserv.:1=HCL 2=H_2SO_4 3=HNO_3 4=Ice 5=None

Customer to complete all appropriate NON-SHADED areas.

							Preserv.	3	4	4	
							Volume	500 ML	500 ML	500 ML	
LAB USE ONLY [11]Lab ID	[13]Sample Description or ID	[14]Collection Information Date	Time	Signature	TESTS	[18]Analyses Required [19]Grab		Metals IMS/TRM (EPA 200.8) As, Cd, Cr, Cu, Zn	SULFATES	TDS	[20]Total # of Containers
2017042155	MW-1R - NPDES (ASH)	1/3/18	1235			X		1	1	1	3
2017042156	MW-2R - NPDES (ASH)	1/3/18	1330			X		1	1	1	3
2017042157	MW-3R - NPDES (ASH)	1/3/18	1700			X		1	1	1	3
2017042158	MW-4R - NPDES (ASH)	1/3/18	1055			X		1	1	1	3
2017042159	MW-5 - NPDES (ASH)	1/3/18	1530			X		1	1	1	3
2017042160	MW-6 - NPDES (ASH)	1/3/18	1440			X		1	1	1	3
2017042161	MW-7 - NPDES (ASH)	1/3/18	~~1145~~ 1455			X		1	1	1	3
2017042162	FIELD BLANK	1/3/18	1110			X		1	1		2

Customer to complete appropriate columns to right

Customer to sign & date below

21)Relinquished By: /Pace	Date/Time: 1/3/18 1920	Accepted By:	Date/Time: 1/4/18 0800
21)Relinquished By:	Date/Time:	Accepted By:	Date/Time:
21)Relinquished By:	Date/Time:	Accepted By:	Date/Time:
23)Seal/Locked By:	Date/Time:	Sealed/Lock Opened By:	Date/Time:

24)Comments:

Customer, important please indicate desired turnaround

[22]Requested Turnaround
14 Days X
*7 Days ___
*48 Hr ___
*Other ___
*Add. Cost Will Apply

DUKE ENERGY

GROUNDWATER MONITORING DATA SHEET

SAMPLING PROCEDURE NO. 3175.4

FOR LOW FLOW SAMPLING

SITE NAME	ROBINSON STEAM STATION	PERMIT #	SC0002925	SITE ID	16-00568
PROJECT NAME	ASH BASIN GROUNDWATER MONITORING PROGRAM	FIELD CREW	PACE		
SAMPLING DATE(s)	☑ 3-Jan-2018 ☐ ☐ ☐	WELL/LOCATION NAME	MW-1R-(ASH)		

MONITORING WELL INFORMATION

WELL DIAMETER (in)	2.00	TOC ELEV (ft msl)	267.99	MIDDLE OF WETTED SCREEN (ft toc)		33.60
WELL DEPTH (ft TOC)	38.60	GS ELEV (ft msl)	265.32	PUMP INTAKE DEPTH (ft TOC)		38.00
SCREEN LENGTH (ft)	10	ELEV REF	0	SCREEN INTERVAL (ft TOC)	28.60 TO	38.60

EQUIPMENT INFORMATION

LEVEL METER SERIAL#	?	SAMPLING EQUIPMENT	QED T1250	TUBING DIAMETER (in)	3/8 OD

PUMP CONTROLLER SETTINGS

PRESSURE	25 (psi)	RECHARGE	9 (sec)	DISCHARGE	6 (sec)

WELL/SAMPLING INFORMATION

WELL TYPE	WELL INFORMATION	WELL USE	PURGE METHOD
STICK UP WELL	MONITORING WELL	ASH BASIN NPDES	Low Flow

SAMPLING INFORMATION

INITIAL DEPTH TO WATER (ft TOC)	26.71	WATER COLUMN (ft)		11.89
WATER ELEVATION (ft msl)	241.28	WELL VOLUME	(gal)	1.94
DETECTED ODOR	None			
ODOR STRENGTH	None			
APPEARANCE	Normal			

TIME (hh:mm)	WATER LEVEL (ft)	FLOWRATE (ml/min)	☑ TEMP (deg C)	☑ SPECIFIC COND. (umho/cm)	☑ pH (SU)	☑ TURBIDITY (NTU)	☑ ORP (mV-NHE)	☑ DISSOLVED OXYGEN (mg/L)	☐ (gal) WELL VOL (recalculates on current water level)
12:35	26.77	200	12.5	24.0	4.7	5.3	227.3	7.1	N/A

DRAW-DOWN	0.06	(ft)				
INITIAL PURGE VOLUME	0.26	(gal)	SAMPLE COLLECTED BY	DATE	TIME	CHLORINE (mg/l)
TOTAL PURGE VOLUME	1.05	(gal)	PACE	1/3/2018	@ 1235	N/A

QC By:

Sample preservation verified to pH (units): N/A

SAMPLE LIST CHECK IF SAMPLES WERE COLLECTED

☐ GAMMA ☐ H3 ☐ BORON ☐ SR 89/90 ☐ GROSS ALPH/BETA ☐ Fe 55 ☐ Ni 63 ☐ IODINE 131 ☐ SO4,CL ☐ ALPHA SPEC

☐ METALS ☐ F_ALK ☐ CO2 ☐ RSK 175 ☐ VOC's ☐ TPH-DRO

☐ METALS ☐ NO3-N, CL, F, SO4, F_ALK ☐ TDS

☐ METALS ☐ NO3-N, CL, SO4 ☐ F_ALK ☐ TDS/TSS ☐ RADIUM 226/228

WELL CONDITION

WELL PAD	Good Condition
WELL CAPS	Well cap in good conditon
WELL CASING	Good Condition
ACCESS TO WELLS	Access cleared into well
PROTECTIVE CASING	Casing in good condition
FLUSH MOUNT WELLS	Vault in good condition
WELL TAG	Well tag in good condition
ACCESS AROUND WELL	Access cleared around well
WELL SECURITY	Well found locked
WELL LOCK CONDITION	Lock in good condition

ADDITIONAL WELL CONDITION NOTES

Well Impacted By Silting:	NO

SAMPLING NOTES

0

DUKE ENERGY
GROUNDWATER MONITORING DATA SHEET
SAMPLING PROCEDURE NO. 3175.4
FOR LOW FLOW SAMPLING

SITE NAME	ROBINSON STEAM STATION	PERMIT #	SC0002925	SITE ID	16-00568
PROJECT NAME	ASH BASIN GROUNDWATER MONITORING PROGRAM	FIELD CREW	PACE		
SAMPLING DATE(s)	☑ 3-Jan-2018 ☐ ☐ ☐	WELL/LOCATION NAME	MW-2R-(ASH)		

MONITORING WELL INFORMATION

WELL DIAMETER (in)	2.00	TOC ELEV (ft msl)	256.62	MIDDLE OF WETTED SCREEN (ft toc)	40.52
WELL DEPTH (ft TOC)	45.52	GS ELEV (ft msl)	254.62	PUMP INTAKE DEPTH (ft TOC)	44.92
SCREEN LENGTH (ft)	10	ELEV REF	0	SCREEN INTERVAL (ft TOC)	35.52 TO 45.52

EQUIPMENT INFORMATION

LEVEL METER SERIAL#	?	SAMPLING EQUIPMENT	QED T1250	TUBING DIAMETER (in)	3/8 OD

PUMP CONTROLLER SETTINGS

PRESSURE	20 (psi)	RECHARGE	10 (sec)	DISCHARGE	5 (sec)

WELL/SAMPLING INFORMATION

WELL TYPE	WELL INFORMATION	WELL USE	PURGE METHOD
STICK UP WELL	MONITORING WELL	ASH BASIN NPDES	Low Flow

SAMPLING INFORMATION

INITIAL DEPTH TO WATER (ft TOC)	30.25	WATER COLUMN (ft)	15.27
WATER ELEVATION (ft msl)	226.37	WELL VOLUME (gal)	2.49
DETECTED ODOR	None		
ODOR STRENGTH	None		
APPEARANCE	Normal		

TIME (hh:mm)	WATER LEVEL (ft)	FLOWRATE (ml/min)	☑ TEMP (deg C)	☑ SPECIFIC COND. (umho/cm)	☑ pH (SU)	☑ TURBIDITY (NTU)	☑ ORP (mV-NHE)	☑ DISSOLVED OXYGEN (mg/L)	☐ (gal) WELL VOL (recalculates on current water level)
13:30	30.25	200	16.4	31.0	5.6	7.7	168.4	6.0	N/A

DRAW-DOWN	0.00	(ft)			CHLORINE (mg/l)
INITIAL PURGE VOLUME	0.26	(gal)	SAMPLE COLLECTED BY	DATE @ TIME	
TOTAL PURGE VOLUME	1.32	(gal)	PACE	1/3/2018 @ 1330	N/A

QC By:

Sample preservation verified to pH (units): N/A

SAMPLE LIST CHECK IF SAMPLES WERE COLLECTED

☐ GAMMA ☐ H3 ☐ BORON ☐ SR 89/90 ☐ GROSS ALPH/BETA ☐ Fe 55 ☐ Ni 63 ☐ IODINE 131 ☐ SO4,CL ☐ ALPHA SPEC
☐ METALS ☐ F_ALK ☐ CO2 ☐ RSK 175 ☐ VOC's ☐ TPH-DRO
☐ METALS ☐ NO3-N, CL, F, SO4, F_ALK ☐ TDS
☐ METALS ☐ NO3-N, CL, SO4 ☐ F_ALK ☐ TDS/TSS ☐ RADIUM 226/228

WELL CONDITION		ADDITIONAL WELL CONDITION NOTES	
WELL PAD	Good Condition	Well Impacted By Silting:	NO
WELL CAPS	Well cap in good conditon		
WELL CASING	Good Condition		
ACCESS TO WELLS	Access cleared into well		
PROTECTIVE CASING	Casing in good condition		
FLUSH MOUNT WELLS	Vault in good condition		
WELL TAG	Well tag in good condition		
ACCESS AROUND WELL	Access cleared around well		
WELL SECURITY	Well found locked		
WELL LOCK CONDITION	Lock in good condition		

SAMPLING NOTES

0

DUKE ENERGY
GROUNDWATER MONITORING DATA SHEET
SAMPLING PROCEDURE NO. 3175.4
FOR LOW FLOW SAMPLING

SITE NAME	ROBINSON STEAM STATION	PERMIT #	SC0002925	SITE ID	16-00568
PROJECT NAME	ASH BASIN GROUNDWATER MONITORING PROGRAM	FIELD CREW	PACE		
SAMPLING DATE(s)	☑ 3-Jan-2018 ☐ ☐ ☐	WELL/LOCATION NAME	MW-3R-(ASH)		

MONITORING WELL INFORMATION

WELL DIAMETER (in)	2.00	TOC ELEV (ft msl)	280.25	MIDDLE OF WETTED SCREEN (ft toc)	67.88
WELL DEPTH (ft TOC)	72.88	GS ELEV (ft msl)	277.27	PUMP INTAKE DEPTH (ft TOC)	72.28
SCREEN LENGTH (ft)	10	ELEV REF	0	SCREEN INTERVAL (ft TOC)	62.88 TO 72.88

EQUIPMENT INFORMATION

LEVEL METER SERIAL# ?

SAMPLING EQUIPMENT	QED T1250	TUBING DIAMETER (in)	3/8 OD

PUMP CONTROLLER SETTINGS

PRESSURE	35 (psi)	RECHARGE	5 (sec)	DISCHARGE	10 (sec)		

WELL/SAMPLING INFORMATION

WELL TYPE	WELL INFORMATION	WELL USE	PURGE METHOD
STICK UP WELL	MONITORING WELL	ASH BASIN NPDES	Low Flow

SAMPLING INFORMATION

INITIAL DEPTH TO WATER (ft TOC)	50.82	WATER COLUMN (ft)	22.06
WATER ELEVATION (ft msl)	229.43	WELL VOLUME (gal)	3.60
DETECTED ODOR	None		
ODOR STRENGTH	None		
APPEARANCE	Normal		

TIME (hh:mm)	WATER LEVEL (ft)	FLOWRATE (ml/min)	☑ TEMP (deg C)	☑ SPECIFIC COND. (umho/cm)	☑ pH (SU)	☑ TURBIDITY (NTU)	☑ ORP (mV-NHE)	☑ DISSOLVED OXYGEN (mg/L)	☐ (gal) WELL VOL (recalculates on current water level)
17:00	50.96	200	15.1	234.0	6.3	9.9	29.4	0.3	N/A

DRAW-DOWN	0.14	(ft)				CHLORINE (mg/l)
INITIAL PURGE VOLUME	0.26	(gal)	SAMPLE COLLECTED BY	DATE	TIME	
TOTAL PURGE VOLUME	3.17	(gal)	PACE	1/3/2018 @	1700	N/A

QC By:

Sample preservation verified to pH (units) N/A

SAMPLE LIST CHECK IF SAMPLES WERE COLLECTED

☐ GAMMA ☐ H3 ☐ BORON ☐ SR 89/90 ☐ GROSS ALPH/BETA ☐ Fe 55 ☐ Ni 63 ☐ IODINE 131 ☐ SO4,CL ☐ ALPHA SPEC

☐ METALS ☐ F_ALK ☐ CO2 ☐ RSK 175 ☐ VOC's ☐ TPH DRO

☐ METALS ☐ NO3-N, CL, F, SO4, F_ALK ☐ TDS

☐ METALS ☐ NO3-N, CL, SO4 ☐ F_ALK ☐ TDS/TSS ☐ RADIUM 226/228

WELL CONDITION

WELL PAD	Good Condition	
WELL CAPS	Well cap in good conditon	
WELL CASING	Good Condition	
ACCESS TO WELLS	Access cleared into well	
PROTECTIVE CASING	Casing in good condition	
FLUSH MOUNT WELLS	Vault in good condition	
WELL TAG	Well tag in good condition	
ACCESS AROUND WELL	Access cleared around well	
WELL SECURITY	Well found locked	
WELL LOCK CONDITION	Lock in good condition	

ADDITIONAL WELL CONDITION NOTES

Well Impacted By Silting:	NO

SAMPLING NOTES

0

DUKE ENERGY

GROUNDWATER MONITORING DATA SHEET

SAMPLING PROCEDURE NO. 3175.4

FOR LOW FLOW SAMPLING

SITE NAME	ROBINSON STEAM STATION	PERMIT #	SC0002925	SITE ID	16-00568
PROJECT NAME	ASH BASIN GROUNDWATER MONITORING PROGRAM	FIELD CREW	PACE		
SAMPLING DATE(s)	☑ 3-Jan-2018 ☐ ☐ ☐	WELL/LOCATION NAME	MW-4R-(ASH)		

MONITORING WELL INFORMATION

WELL DIAMETER (in)	2.00	TOC ELEV (ft msl)	227.92	MIDDLE OF WETTED SCREEN (ft toc)	25.79		
WELL DEPTH (ft TOC)	30.79	GS ELEV (ft msl)	225.29	PUMP INTAKE DEPTH (ft TOC)	30.79		
SCREEN LENGTH (ft)	10	ELEV REF	0	SCREEN INTERVAL (ft TOC)	20.79	TO	30.79

EQUIPMENT INFORMATION

LEVEL METER SERIAL#	?	SAMPLING EQUIPMENT	QED T1250	TUBING DIAMETER (in)	3/8 OD			
		PUMP CONTROLLER SETTINGS						
		PRESSURE	20 (psi)	RECHARGE	10 (sec)	DISCHARGE	5 (sec)	

WELL/SAMPLING INFORMATION

WELL TYPE	WELL INFORMATION	WELL USE	PURGE METHOD
STICK UP WELL	MONITORING WELL	ASH BASIN NPDES	Low Flow

SAMPLING INFORMATION

INITIAL DEPTH TO WATER (ft TOC)	19.69	WATER COLUMN (ft)		11.10
WATER ELEVATION (ft msl)	208.23	WELL VOLUME	(gal)	1.81
DETECTED ODOR	None			
ODOR STRENGTH	None			
APPEARANCE	Normal			

TIME (hh:mm)	WATER LEVEL (ft)	FLOWRATE (ml/min)	☑ TEMP (deg C)	☑ SPECIFIC COND. (umho/cm)	☑ pH (SU)	☑ TURBIDITY (NTU)	☑ ORP (mV-NHE)	☑ DISSOLVED OXYGEN (mg/L)	☐ (gal) WELL VOL (recalculates on current water level)
16:55	19.68	100	14.4	519.8	3.0	6.7	367.3	2.8	N/A

DRAW-DOWN	0.00	(ft)				CHLORINE (mg/l)
INITIAL PURGE VOLUME	0.13	(gal)	SAMPLE COLLECTED BY	DATE	TIME	
TOTAL PURGE VOLUME	1.32	(gal)	PACE	1/3/2018	@ 1655	N/A

QC By:

Sample preservation verified to pH (units): N/A

SAMPLE LIST CHECK IF SAMPLES WERE COLLECTED

☐ GAMMA ☐ H3 ☐ BORON ☐ SR 89/90 ☐ GROSS ALPH/BETA ☐ Fe 55 ☐ Ni 63 ☐ IODINE 131 ☐ SO4,CL ☐ ALPHA SPEC
☐ METALS ☐ F_ALK ☐ CO2 ☐ RSK 175 ☐ VOC's ☐ TPH-DRO
☐ METALS ☐ NO3-N, CL, F, SO4, F_ALK ☐ TDS
☐ METALS ☐ NO3-N, CL, SO4 ☐ F_ALK ☐ TDS/TSS ☐ RADIUM 226/228

WELL CONDITION

WELL PAD	Good Condition	
WELL CAPS	Well cap in good conditon	
WELL CASING	Good Condition	
ACCESS TO WELLS	Access cleared into well	
PROTECTIVE CASING	Casing in good condition	
FLUSH MOUNT WELLS	Vault in good condition	
WELL TAG	Well tag in good condition	
ACCESS AROUND WELL	Access cleared around well	
WELL SECURITY	Well found locked	
WELL LOCK CONDITION	Lock in good condition	

ADDITIONAL WELL CONDITION NOTES

Well Impacted By Silting:	NO

SAMPLING NOTES

0

DUKE ENERGY
GROUNDWATER MONITORING DATA SHEET
SAMPLING PROCEDURE NO. 3175.4
FOR LOW FLOW SAMPLING

SITE NAME	ROBINSON STEAM STATION	PERMIT #	SC0002925	SITE ID	16-00568
PROJECT NAME	ASH BASIN GROUNDWATER MONITORING PROGRAM	FIELD CREW	PACE		
SAMPLING DATE(s)	☑ 3-Jan-2018 ☐ ☐ ☐	WELL/LOCATION NAME	MW-5-(ASH)		

MONITORING WELL INFORMATION

WELL DIAMETER (in)	2.00	TOC ELEV (ft msl)	265.99	MIDDLE OF WETTED SCREEN (ft toc)	39.78
WELL DEPTH (ft TOC)	42.61	GS ELEV (ft msl)	262.81	PUMP INTAKE DEPTH (ft TOC)	42.01
SCREEN LENGTH (ft)	10	ELEV REF	0	SCREEN INTERVAL (ft TOC)	32.61 TO 42.61

EQUIPMENT INFORMATION

LEVEL METER SERIAL#	?	SAMPLING EQUIPMENT	QED T1250	TUBING DIAMETER (in)	3/8 OD		
		PUMP CONTROLLER SETTINGS					
		PRESSURE	20 (psi)	RECHARGE	5 (sec)	DISCHARGE	10 (sec)

WELL/SAMPLING INFORMATION

WELL TYPE	WELL INFORMATION	WELL USE	PURGE METHOD
STICK UP WELL	MONITORING WELL	ASH BASIN NPDES	Low Flow

SAMPLING INFORMATION

INITIAL DEPTH TO WATER (ft TOC)	36.94	WATER COLUMN (ft)	5.67
WATER ELEVATION (ft msl)	229.05	WELL VOLUME (gal)	0.92
DETECTED ODOR	None		
ODOR STRENGTH	None		
APPEARANCE	Normal		

TIME (hh:mm)	WATER LEVEL (ft)	FLOWRATE (ml/min)	☑ TEMP (deg C)	☑ SPECIFIC COND. (umho/cm)	☑ pH (SU)	☑ TURBIDITY (NTU)	☑ ORP (mV-NHE)	☑ DISSOLVED OXYGEN (mg/L)	☐ (gal) WELL VOL (recalculates on current water level)
15:30	36.95	120	11.1	171.2	6.4	0.6	24.9	0.6	N/A

DRAW-DOWN	0.01	(ft)				
INITIAL PURGE VOLUME	0.15	(gal)	SAMPLE COLLECTED BY	DATE	TIME	CHLORINE (mg/l)
TOTAL PURGE VOLUME	0.79	(gal)	PACE	1/3/2018 @	1530	N/A

QC By:

Sample preservation verified to pH (units): N/A

SAMPLE LIST CHECK IF SAMPLES WERE COLLECTED

☐ GAMMA ☐ H3 ☐ BORON ☐ SR 89/90 ☐ GROSS ALPH/BETA ☐ Fe 55 ☐ Ni 63 ☐ IODINE 131 ☐ SO4,CL ☐ ALPHA SPEC
☐ METALS ☐ F_ALK ☐ CO2 ☐ RSK 175 ☐ VOC's ☐ TPH-DRO
☐ METALS ☐ NO3-N, CL, F, SO4, F_ALK ☐ TDS
☐ METALS ☐ NO3-N, CL, SO4 ☐ F_ALK ☐ TDS/TSS ☐ RADIUM 226/228

WELL CONDITION

WELL PAD	Good Condition
WELL CAPS	Well cap in good conditon
WELL CASING	Good Condition
ACCESS TO WELLS	Access cleared into well
PROTECTIVE CASING	Casing in good condition
FLUSH MOUNT WELLS	Vault in good condition
WELL TAG	Well tag in good condition
ACCESS AROUND WELL	Access cleared around well
WELL SECURITY	Well found locked
WELL LOCK CONDITION	Lock in good condition

ADDITIONAL WELL CONDITION NOTES

Well Impacted By Silting:	NO

SAMPLING NOTES

0

DUKE ENERGY
GROUNDWATER MONITORING DATA SHEET
SAMPLING PROCEDURE NO. 3175.4
FOR LOW FLOW SAMPLING

SITE NAME	ROBINSON STEAM STATION	PERMIT #	SC0002925	SITE ID	16-00568
PROJECT NAME	ASH BASIN GROUNDWATER MONITORING PROGRAM	FIELD CREW	PACE		
SAMPLING DATE(s)	☑ 3-Jan-2018 ☐ ☐ ☐	WELL/LOCATION NAME	MW-6-(ASH)		

MONITORING WELL INFORMATION

WELL DIAMETER (in)	2.00	TOC ELEV (ft msl)	257.72	MIDDLE OF WETTED SCREEN (ft toc)	47.97
WELL DEPTH (ft TOC)	52.97	GS ELEV (ft msl)	254.73	PUMP INTAKE DEPTH (ft TOC)	52.37
SCREEN LENGTH (ft)	10	ELEV REF	0	SCREEN INTERVAL (ft TOC)	42.97 TO 52.97

EQUIPMENT INFORMATION

LEVEL METER SERIAL#	?	SAMPLING EQUIPMENT	QED T1250	TUBING DIAMETER (in)	3/8 OD

PUMP CONTROLLER SETTINGS

PRESSURE	28 (psi)	RECHARGE	5 (sec)	DISCHARGE	10 (sec)

WELL/SAMPLING INFORMATION

WELL TYPE	WELL INFORMATION	WELL USE	PURGE METHOD
STICK UP WELL	MONITORING WELL	ASH BASIN NPDES	Low Flow

SAMPLING INFORMATION

INITIAL DEPTH TO WATER (ft TOC)	29.91	WATER COLUMN (ft)	23.06
WATER ELEVATION (ft msl)	227.81	WELL VOLUME (gal)	3.76
DETECTED ODOR	None		
ODOR STRENGTH	None		
APPEARANCE	Normal		

TIME (hh:mm)	WATER LEVEL (ft)	FLOWRATE (ml/min)	☑ TEMP (deg C)	☑ SPECIFIC COND. (umho/cm)	☑ pH (SU)	☑ TURBIDITY (NTU)	☑ ORP (mV-NHE)	☑ DISSOLVED OXYGEN (mg/L)	☐ (gal) WELL VOL (recalculates on current water level)
14:40	29.95	100	16.8	139.6	6.7	4.2	2.3	0.2	N/A

DRAW-DOWN	0.04	(ft)				
INITIAL PURGE VOLUME	0.13	(gal)	SAMPLE COLLECTED BY	DATE	TIME	CHLORINE (mg/l)
TOTAL PURGE VOLUME	0.39	(gal)	PACE	1/3/2018 @	1440	N/A

QC By:

Sample preservation verified to pH (units): N/A

SAMPLE LIST CHECK IF SAMPLES WERE COLLECTED

☐ GAMMA ☐ H3 ☐ BORON ☐ SR 89/90 ☐ GROSS ALPH/BETA ☐ Fe 55 ☐ Ni 63 ☐ IODINE 131 ☐ SO4,CL ☐ ALPHA SPEC
☐ METALS ☐ F_ALK ☐ CO2 ☐ RSK 175 ☐ VOC's ☐ TPH-DRO
☐ METALS ☐ NO3-N, CL, F, SO4, F_ALK ☐ TDS
☐ METALS ☐ NO3-N, CL, SO4 ☐ F_ALK ☐ TDS/TSS ☐ RADIUM 226/228

WELL CONDITION

WELL PAD	Good Condition
WELL CAPS	Well cap in good conditon
WELL CASING	Good Condition
ACCESS TO WELLS	Access cleared into well
PROTECTIVE CASING	Casing in good condition
FLUSH MOUNT WELLS	Vault in good condition
WELL TAG	Well tag in good condition
ACCESS AROUND WELL	Access cleared around well
WELL SECURITY	Well found locked
WELL LOCK CONDITION	Lock in good condition

ADDITIONAL WELL CONDITION NOTES

Well Impacted By Silting: NO

SAMPLING NOTES

0

DUKE ENERGY
GROUNDWATER MONITORING DATA SHEET
SAMPLING PROCEDURE NO. 3175.4
FOR LOW FLOW SAMPLING

SITE NAME	ROBINSON STEAM STATION	PERMIT #	SC0002925	SITE ID	16-00568
PROJECT NAME	ASH BASIN GROUNDWATER MONITORING PROGRAM	FIELD CREW	PACE		
SAMPLING DATE(s)	☑ 3-Jan-2018 ☐ ☐ ☐	WELL/LOCATION NAME	MW-7-(ASH)		

MONITORING WELL INFORMATION

WELL DIAMETER (in)	2.00	TOC ELEV (ft msl)	245.61	MIDDLE OF WETTED SCREEN (ft toc)	31.88
WELL DEPTH (ft TOC)	36.88	GS ELEV (ft msl)	243.18	PUMP INTAKE DEPTH (ft TOC)	36.28
SCREEN LENGTH (ft)	10	ELEV REF	0	SCREEN INTERVAL (ft TOC)	26.88 TO 36.88

EQUIPMENT INFORMATION

LEVEL METER SERIAL# ?

SAMPLING EQUIPMENT	QED T1250	TUBING DIAMETER (in)	3/8 OD

PUMP CONTROLLER SETTINGS

PRESSURE	30	(psi)	RECHARGE	10	(sec)	DISCHARGE	5 (sec)

WELL/SAMPLING INFORMATION

WELL TYPE	WELL INFORMATION	WELL USE	PURGE METHOD
STICK UP WELL	MONITORING WELL	ASH BASIN NPDES	Low Flow

SAMPLING INFORMATION

INITIAL DEPTH TO WATER (ft TOC)	18.94
WATER ELEVATION (ft msl)	226.67
DETECTED ODOR	None
ODOR STRENGTH	None
APPEARANCE	Normal

WATER COLUMN (ft)		17.94
WELL VOLUME	(gal)	2.93

TIME (hh:mm)	WATER LEVEL (ft)	FLOWRATE (ml/min)	☑ TEMP (deg C)	☑ SPECIFIC COND. (umho/cm)	☑ pH (SU)	☑ TURBIDITY (NTU)	☑ ORP (mV-NHE)	☑ DISSOLVED OXYGEN (mg/L)	☐ (gal) WELL VOL (recalculates on current water level)
14:05	18.94	200	19.0	121.3	6.9	6.0	-45.1	0.3	N/A

DRAW-DOWN	0.00	(ft)
INITIAL PURGE VOLUME	0.26	(gal)
TOTAL PURGE VOLUME	1.05	(gal)

SAMPLE COLLECTED BY	DATE		TIME	CHLORINE (mg/l)
PACE	1/3/2018	@	1405	N/A

QC By:

Sample preservation verified to pH (units) N/A

SAMPLE LIST CHECK IF SAMPLES WERE COLLECTED

☐ GAMMA ☐ H3 ☐ BORON ☐ SR 89/90 ☐ GROSS ALPH/BETA ☐ Fe 55 ☐ Ni 63 ☐ IODINE 131 ☐ SO4,CL ☐ ALPHA SPEC

☐ METALS ☐ F_ALK ☐ CO2 ☐ RSK 175 ☐ VOC's ☐ TPH-DRO

☐ METALS ☐ NO3-N, CL, F, SO4, F_ALK ☐ TDS

☐ METALS ☐ NO3-N, CL, SO4 ☐ F_ALK ☐ TDS/TSS ☐ RADIUM 226/228

WELL CONDITION

WELL PAD	Good Condition	
WELL CAPS	Well cap in good conditon	
WELL CASING	Good Condition	
ACCESS TO WELLS	Access cleared into well	
PROTECTIVE CASING	Casing in good condition	
FLUSH MOUNT WELLS	Vault in good condition	
WELL TAG	Well tag in good condition	
ACCESS AROUND WELL	Access cleared around well	
WELL SECURITY	Well found locked	
WELL LOCK CONDITION	Lock in good condition	

ADDITIONAL WELL CONDITION NOTES

Well Impacted By Silting:	NO

SAMPLING NOTES

0

SOUTH CAROLINA GROUNDWATER SAMPLING SITE CHECKLIST

SITE: ROBINSON STEAM STATION
PROJECT: ASH BASIN GROUNDWATER MONITORING PROGRAM
SITE CONTACT John Toepfer, Welke Gilbert, John Gainey
WEATHER 1/3/2018 Cloudy, 34 deg F, wind 5 to 10 mph

SAMPLE DATE January 3, 2018
FIELD CREW PACE

PAGE 1 OF 1

	MW-1R ASH	MW-2R ASH	MW-3R ASH	MW-4R ASH	MW-5 ASH	MW-6 ASH	MW-7 ASH
ACCESS TO WELLS							
Access cleared into well	YES	YES	YES	YES	YES	YES	YES
Access cleared around well	YES	YES	YES	YES	YES	YES	YES
Tall grass or weeds - needs mowing							
Road washing out / muddy / needs grading							
Fallen tree blocking access							
WELL DEPTH							
Well impacted by silting	NO	NO	NO	NO	NO	NO	NO
WELL SECURITY							
Well found locked	YES	YES	YES	YES	YES	YES	YES
Well found unlocked							
WELL LOCK CONDITION							
Lock in good condition	YES	YES	YES	YES	YES	YES	YES
Lock rusted, difficult to open / needs replacing							
Replaced damaged lock							
WELL CASINGS							
Casing in good condition	YES	YES	YES	YES	YES	YES	YES
Damaged casing / still functional							
Damaged casing / repair required							
CONCRETE PADS							
Pad in good condition	YES	YES	YES	YES	YES	YES	YES
Minor cracks							
Major cracks / broken / repair required							
Undermined / washing out							
Fire ants around concrete pad							
WELL PROTECTIVE CASINGS							
Casing in good condition	YES	YES	YES	YES	YES	YES	YES
Damaged casing / still functional							
Damaged casing / repair required							
Broken hinge on protective lid							
Wasp nest inside protective casing							
Ants inside protective casing							
WELL CAPS							
Well cap in good conditon	YES	YES	YES	YES	YES	YES	YES
Damaged / needs replacement							
Replaced damaged well cap							
FLUSH MOUNT WELLS							
Vault in good condition	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Water inside vault							
Vault bolt holes broken or stripped							
Bolts stripped							
Vault lid cracked or broken							
WELL ID TAGS							
Well tag in good condition	YES	YES	YES	YES	YES	YES	YES
Well tag missing							
Well tag damaged / illegible							
Lacks required information - Driller Reg #							
Lacks required information - Completion date							
Lacks required information - Total well depth							
Lacks required information - Depth to screen							
Lacks required info - Casing depth / diam.							
Lacks required information - Screen interval							
Lacks required information - Static WL / date							
Lacks required information - Non potable tag							

NOTE:

ROBINSON STEAM STATION
ASH BASIN GROUNDWATER MONITORING PROGRAM
GROUNDWATER MONITORING FIELD DATA
PERMIT # SC0002925

Purge Methods

LF = Low Flow	C = Connventional	EOP = Equip. Only Purge	LO = Level Only	NP = No Purge	LF(M) = Low Flow (Mod.)	* = Applicable to LF & LF(M) Purging Only

DATE	WELL NO	WELL DEPTH (ft - TOC)	DEPTH TO WATER (ft - TOC)	WATER ELEV. (ft)	APPEARANCE	ODOR	PURGE METHOD	PUMP RATE (ml/min)	WELL VOL. (gal)	EVAC VOL. (gal)	EVAC (YES/NO)	TEMP. (deg. C)	SPECIFIC CONDUCTANCE (umho/cm)	pH (units)	TURBIDITY (NTU's)	ORP (mV-NHE)	DO (mg/L)
1/3/2018	MW-1R-(ASH)	38.60	26.71	241.28	Normal	None	LF	200.00	1.94	1.05	N/A	12.5	24.0	4.7	5.3	227.3	7.1
1/3/2018	MW-2R-(ASH)	45.52	30.25	226.37	Normal	None	LF	200.00	2.49	1.32	N/A	16.4	31.0	5.6	7.7	168.4	6.0
1/3/2018	MW-3R-(ASH)	72.88	50.82	229.43	Normal	None	LF	200.00	3.60	3.17	N/A	15.1	234.0	6.3	9.9	29.4	0.3
1/3/2018	MW-4R-(ASH)	30.79	19.69	208.23	Normal	None	LF	100.00	1.81	1.32	N/A	14.4	519.8	3.0	6.7	367.3	2.8
1/3/2018	MW-5-(ASH)	42.61	36.94	229.05	Normal	None	LF	120.00	0.92	0.79	N/A	11.1	171.2	6.4	0.6	24.9	0.6
1/3/2018	MW-6-(ASH)	52.97	29.91	227.81	Normal	None	LF	100.00	3.76	0.39	N/A	16.8	139.6	6.7	4.2	2.3	0.2
1/3/2018	MW-7-(ASH)	36.88	18.94	226.67	Normal	None	LF	200.00	2.93	1.05	N/A	19.0	121.3	6.9	6.0	-45.1	0.3

DUKE ENERGY

John A. Krakuszeski
H. B. Robinson Steam
Electric Plant Unit 2
Plant Manager

Duke Energy
3581 West Entrance Road
Hartsville, SC 29550

O: 843 857 1201
F: 843 857 1319
John.Krakuszeski@duke-energy.com

Serial: RNP-RA/18-0051

R61-9.122

AUG 06 2018

South Carolina Department of Health and Environmental Control (SCDHEC)
Bureau of Water/Water Monitoring, Assessment, and Protection Division
Groundwater Quality Section
2600 Bull Street
Columbia, South Carolina 29201

H. B. ROBINSON STEAM ELECTRIC PLANT, SITE ID #16-00568
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
PERMIT NUMBER SC0002925

SECOND SEMIANNUAL GROUNDWATER MONITORING REPORT FOR 2018

Ladies and Gentlemen:

In accordance with Part II, Paragraph L.4.a.(2) of NPDES Permit No. SC0002925, effective May 1, 2007, Duke Energy Progress, LLC hereby submits the Second Semiannual Groundwater Monitoring Report of 2018 for H. B. Robinson Steam Electric Plant (HBRSEP). The attachment provides this report.

The current SC0002925 NPDES permit for HBRSEP expired on April 30, 2011. On October 28, 2010, Progress Energy Carolinas, Inc. submitted its renewal application for this permit. By letter dated March 2, 2011, SCDHEC acknowledged receipt of this application. This letter authorized continued discharge of effluent to surface waters, pursuant to Section 122.6 of South Carolina Regulation 61-9, and stated this permit will remain fully effective and enforceable pending issuance of a new permit. Please contact William Hamilton, Senior EHS Professional, at (843) 951-1231 with any questions.

Certification

I certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Sincerely,

John A. Krakuszeski

John A. Krakuszeski
Plant Manager
H. B. Robinson Steam Electric Plant, Unit 2

JAK/cac

Attachment

c: South Carolina Department of Health and Environmental Control

South Carolina Department of Health and Environmental Control
Attachment to Serial: RNP-RA/18-0051
28 Pages (including this cover page)

H. B. ROBINSON STEAM ELECTRIC PLANT

SECOND SEMIANNUAL GROUNDWATER MONITORING REPORT FOR 2018

D H E C
PROMOTE PROTECT PROSPER

Groundwater Monitoring Report

SC0002925	
Permit Number	

Facility: H. B. Robinson Steam Electric Plant
Address: 3581 West Entrance Road
City: Hartsville State: South Carolina
County: Darlington Zipcode: 29550
Site I.D. #: 16-00568

Date Sampled			Date Analyzed		
07	11	2018	07	11	2018
Month	Day	Year	Month	Day	Year

Lab Name: Duke Energy Analytical
SC Lab Certification No.: 99005 / 99005001

PARAMETERS		WELL NUMBERS						
Name	Units	1R	2R	3R	4R	5	6	7
Depth to Water	FT.	27.80	30.57	51.87	19.70	37.78	30.48	19.36
Water Elevation	FT.	240.19	226.05	228.38	208.22	228.21	227.24	226.25
Water Temperature	C	20.0	21.0	23.0	29.0	24.0	22.0	23.0
Specific Conductivity	uS/cm	42.0	42.0	357.0	625.0	247.0	202.0	179.0
pH	S.U.	5.08	5.35	6.05	3.10	6.14	6.50	6.67
Sulfate - IC	mg/L							
Arsenic, Total	ug/L							
Cadmium, Total - PQL	ug/L							
Chromium, Total	ug/L							
Copper, Total	ug/L							
Zinc, Total	ug/L							
Total Dissolved Solids	mg/L							
Turbidity	NTU	5.72	8.30	8.94	9.30	0.9	6.34	6.6

(Type or Print) John A. Krakuszeski
Telephone: (843) 951-1201
Authorized Release By: John A. Krakuszeski - H.B. Robinson Plant Manager Date: 8-6-18

DHEC 2110 (05/1999)

DHEC
PROMOTE PROTECT PROSPER

Groundwater Monitoring Report

SC0002925	
Permit Number	

Facility: H. B. Robinson Steam Electric Plant
Address: 3581 West Entrance Road
City: Hartsville State: South Carolina
County: Darlington Zipcode: 29550
Site I.D. #: 16-00568

Date Sampled			Date Analyzed		
07	11	2018	07	12	2018
Month	Day	Year	Month	Day	Year

Lab Name: Duke Energy Analytical
SC Lab Certification No.: 99005 / 99005001

PARAMETERS		WELL NUMBERS						
Name	Units	1R	2R	3R	4R	5	6	7
Depth to Water	FT.							
Water Elevation	FT.							
Water Temperature	C							
Specific Conductivity	uS/cm							
pH	S.U.							
Sulfate - IC	mg/L	3.1		87	490	23	38	14
Arsenic, Total	ug/L							
Cadmium, Total - PQL	ug/L							
Chromium, Total	ug/L							
Copper, Total	ug/L							
Zinc, Total	ug/L							
Total Dissolved Solids	mg/L	<25	<25	210	300	150	120	110
Turbidity	NTU							

(Type or Print) John A. Krakuszeski Telephone: (843) 951-1201

Authorized Release By: John A. Krakuszeski - H.B. Robinson Plant Manager Date: 8-6-18

DHEC 2110 (05/1999)

D H E C
PROMOTE PROTECT PROSPER

Groundwater Monitoring Report

SC0002925
Permit Number

Facility: H. B. Robinson Steam Electric Plant
Address: 3581 West Entrance Road
City: Hartsville State: South Carolina
County: Darlington Zipcode: 29550
Site I.D. #: 16-00568

Date Sampled			Date Analyzed		
07	11	2018	07	13	2018
Month	Day	Year	Month	Day	Year

Lab Name: Duke Energy Analytical
SC Lab Certification No.: 99005 / 99005001

PARAMETERS		WELL NUMBERS						
Name	Units	1R	2R	3R	4R	5	6	7
Depth to Water	FT.							
Water Elevation	FT.							
Water Temperature	C							
Specific Conductivity	uS/cm							
pH	S.U.							
Sulfate - IC	mg/L							
Arsenic, Total	ug/L	<1	3.30	<1	1.22	6.74	2.72	95.6
Cadmium, Total - PQL	ug/L	<1	<1	<1	<1	<1	<1	<1
Chromium, Total	ug/L	<1	<1	<1	4.50	<1	<1	<1
Copper, Total	ug/L	<1	<1	<1	110	<1	<1	<1
Zinc, Total	ug/L	<5	<5	<5	140	<5	<5	<5
Total Dissolved Solids	mg/L							
Turbidity	NTU							

(Type or Print) John A. Krakuszeski
Telephone: (843) 951-1201

Authorized Release By: John A. Krakuszeski - H.B. Robinson Plant Manager
Date: 8-6-18

DHEC 2110 (05/1999)

DHEC

PROMOTE PROTECT PROSPER

Groundwater Monitoring Report

SC0002925	
Permit Number	

Facility: H. B. Robinson Steam Electric Plant
Address: 3581 West Entrance Road
City: Hartsville State: South Carolina
County: Darlington Zipcode: 29550
Site I.D. #: 16-00568

Date Sampled				Date Analyzed		
07	11	2018		07	16	2018
Month	Day	Year		Month	Day	Year

Lab Name: Duke Energy Analytical
SC Lab Certification No.: 99005 / 99005001

PARAMETERS		WELL NUMBERS						
Name	Units	1R	2R	3R	4R	5	6	7
Depth to Water	FT.							
Water Elevation	FT.							
Water Temperature	C							
Specific Conductivity	uS/cm							
pH	S.U.							
Sulfate - IC	mg/L		6.7					
Arsenic, Total	ug/L							
Cadmium, Total - PQL	ug/L							
Chromium, Total	ug/L							
Copper, Total	ug/L							
Zinc, Total	ug/L							
Total Dissolved Solids	mg/L							
Turbidity	NTU							

(Type or Print) John A. Krakuszeski Telephone: (843) 951-1201

Authorized Release By: John A. Krakuszeski - H.B. Robinson Plant Manager Date: 8-6-18

DHEC 2110 (05/1999)

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

DUKE ENERGY.

Duke Energy Analytical Laboratories
Mail Code MG03A2 (Building 7405)
13339 Hagers Ferry Rd
Huntersville, N.C. 28078
(980) 875-5371
Fax: (980) 875-5559

Analytical Laboratory Use Only

LIMS # J18070011	Sample Class: GROUNDWATER	Samples Originating From	NC SC ✓
Logged By	Date & Time	SAMPLE PROGRAM Ground Water ___ NPDES _X_ Drinking Water ___ UST ___ RCRA Waste ___	
Vendor	Cooler Temp (C)		
PO #	¹⁵Preserv.: 1=HCL 2=H₂SO₄ 3=HNO₃ 4=Ice 5=None		
MR #	Volume		

¹⁹Page _1_ of _1_
DISTRIBUTION
ORIGINAL to LAB,
COPY to CLIENT

Customer must Complete

1)Project Name: Robinson NPDES Groundwater Monitoring Program NPDES #SC0002925		2)Phone No: 980-875-5257
3)Client John Toepfer, Bryan Moeller, Chuck Campbell, John Gainey, Will Hamilton, Dee O'Brien		4)Fax No:
5)Business Unit: 50125	6)Process: BENVWT	7)Resp. To: RS01
8)Task ID:	9)Activity ID:	10)Mail Code: MG03A3

Customer to complete all appropriate NON-SHADED areas.

LAB USE ONLY ¹¹Lab ID	¹³Sample Description or ID	¹⁴Collection Information Date	Time	Signature	TESTS	¹⁶Grab	¹⁶Analyses Required Metals IMS/TRM (EPA 200.8) As, Cd, Cr, Cu, Zn 500 ML 3	SULFATES 500 ML 4	TDS 500 ML 4	
2018020252	MW-1R - NPDES (ASH)	7/11/18	1035	EHS		X	1	1	1	3
2018020253	MW-2R - NPDES (ASH)	7/11/18	1110	EHS		X	[illegible]	1	1	3
2018020254	MW-3R - NPDES (ASH)	7/11/18	1158	EHS		X	1	1	1	3
2018020255	MW-4R - NPDES (ASH)	7/11/18	1045	EHS		X	1	1	1	3
2018020256	MW-5 - NPDES (ASH)	7/11/18	1256	EHS		X	1	1	1	3
2018020257	MW-6 - NPDES (ASH)	7/11/18	1245	EHS		X	1	1	1	3
2018020258	MW-7 - NPDES (ASH)	7/11/18	1150	EHS		X	1	1	1	3
2018020259	FIELD BLANK	7/11/18	1215	EHS		X	1	1		2

Customer to complete appropriate columns to right

COPY

Customer to sign & date below

21)Relinquished By	Date/Time 7/12/18 0725	Accepted By:	Date/Time 7/12/18 725
21)Relinquished By	Date/Time	Accepted By:	Date/Time
21)Relinquished By	Date/Time	Accepted By:	Date/Time
23)Seal/Locked By	Date/Time	Sealed/Lock Opened By	Date/Time
24)Comments:			

Customer, important please indicate desired turnaround

²²Requested Turnaround
14 Days ___✓___
*7 Days ______
*48 Hr ______
*Other ______
*Add. Cost Will Apply

☐ CAMA ☐ CCR ☐ Landfill ☑ NPDES ☐ SPECIAL STUDY ______________ - GROUNDWATER MONITORING

LOW FLOW SAMPLING LOG

Site: Robinson

DUKE ENERGY

WEATHER: ☑ SUNNY ☐ PARTLY CLOUDY ☐ OVERCAST ☐ RAIN ☐ SNOW

FIELD PERSONNEL: EHS/HPB
TEMPERATURE (APPROX): 90 °F
INSITU SMARTROLL SERIAL #: 563632
2100Q SERIAL #: 3328

STABLIZATION CRITERIA:

pH	± 0.1 standard unit
Specific Conductance	± 5% in µS/cm
DO	± 0.2 mg/L or 10% saturation
Turbidity	less than 10 NTUs

WELL ID: MW-1R
WELL DIAMETER: 2 (IN)
WELL DEPTH: 38.60 (FT) EHS 7/11/18
DEPTH TO WATER: ~~20.85~~ (FT) 27.80
HEIGHT OF WC: ~~9.80~~ (FT) 10.8 EHS 7/11/18

PUMP/TUBING INTAKE DEPTH: 33.60 (FT)
MULT FACTOR *: 0.163 [*(radius/12)2*3.14*7.48]
CASING VOLUME: 1.76 (GAL)
INITIAL PURGE VOLUME: 1.00 (GAL)
TOTAL VOLUME PURGED: 2.40 (GAL)

START PURGE TIME: 1010
END PURGE TIME: 1038
FINAL READING TIME: 1029
SAMPLE DATE: 7/11/18
COLLECTION TIME: 1035

TYPE OF PUMP:	Bladder			Peristaltic	12 Volt	Grundfos	Other ( )
PURGE METHOD:	✓						
SAMPLING METHOD:	✓						
PUMP SETTING:	25 P	9 R	6 D				
	(psi)	(sec)	(sec)				

TIME	WATER LEVEL (FT) (x.xx)	FLOW RATE (mL/min) (x)	VOLUME REMOVED (gallons/ mL) (x.xx)	TEMPERATURE (°C) (x)	DO (mg/L) (x.xx)	SPECIFIC CONDUCTANCE (µS/cm) (x)	pH (su) (x.xx)	ORP (mv) (x)	TURBIDITY (NTU) (x.x)
1017	27.96	380	1.00	20	8.27	45	5.19	359	33.4
1020	27.96	380	1.25	20	8.31	44	5.15	353	17.5
1023	27.96	380	1.60	20	8.32	44	5.11	350	11.7
1026	27.96	380	1.90	20	8.30	42	5.07	350	783
1029	27.96	380	2.20	20	8.31	42	5.08	349	5.72

COMMENTS:

PLEASE REFER TO THE BACK OF THIS SHEET IF THE CHART ABOVE IS FULL

IF TURBIDITY >10 NTUS, REDEVELOPMENT NEEDED ☐ YES ☑ NO   ALL SAMPLES ON ICE WITHIN 15 MINUTES ☑ YES ☐ NO

FINAL SAMPLE OBSERVATIONS (COLOR/CLARITY/ODOR): Clear/no odor

ADDITIONAL NOTES:

FIELD VEHICLE ACCESSIBLE ☑ YES ☐ NO

WELL TAG			PROTECTIVE CASING			LOCK			CAP			CONCRETE PAD		
GOOD	BAD	NONE	GOOD	BAD	NONE	GOOD	BAD	NONE	GOOD	BAD	NONE	GOOD	BAD	NONE
✓			✓			✓			✓			✓		

☐ CAMA ☐ CCR ☐ Landfill ☑ NPDES ☐ SPECIAL STUDY ____________ - GROUNDWATER MONITORING

DUKE ENERGY

LOW FLOW SAMPLING LOG

Site: Robinson

WEATHER: ☑ SUNNY ☐ PARTLY CLOUDY ☐ OVERCAST ☐ RAIN ☐ SNOW

FIELD PERSONNEL: EHS, HPB
TEMPERATURE (APPROX): 90 F
INSITU SMARTROLL SERIAL #: 563632
2100Q SERIAL #: 3328

STABLIZATION CRITERIA:

pH	± 0.1 standard unit
Specific Conductance	± 5% in µS/cm
DO	± 0.2 mg/L or 10% saturation
Turbidity	less than 10 NTUs

WELL ID: MW-2R
WELL DIAMETER: 2 (IN)
WELL DEPTH: 45.52 (FT)
DEPTH TO WATER: 30.57 (FT)
HEIGHT OF WC: 14.95 (FT)

PUMP/TUBING INTAKE DEPTH: 40.52 (FT)
MULT FACTOR *: 0.163 [*(radius/12)^2*3.14*7.48]
CASING VOLUME: 2.44 (GAL)
INITIAL PURGE VOLUME: 0.50 (GAL)
TOTAL VOLUME PURGED: 1.50 (GAL)

START PURGE TIME: 1050
END PURGE TIME: 1115
FINAL READING TIME: 1109
SAMPLE DATE: 7/11/18
COLLECTION TIME: 1110

TYPE OF PUMP:	Bladder			Peristaltic	12 Volt	Grundfos	Other ( )
PURGE METHOD:	✓						
SAMPLING METHOD:	✓						
PUMP SETTING:	30 P (psi)	10 R (sec)	5 D (sec)				

TIME	WATER LEVEL (FT) (x.xx)	FLOW RATE (mL/min) (x)	VOLUME REMOVED (gallons/ mL) (x.xx)	TEMPERATURE (°C) (x)	DO (mg/L) (x.xx)	SPECIFIC CONDUCTANCE (µS/cm) (x)	pH (su) (x.xx)	ORP (mv) (x)	TURBIDITY (NTU) (x.x)
1057	30.69	440	0.50	21	7.18	43	5.40	344	55.2
1100	30.69	440	0.70	21	7.24	43	5.35	337	40.8
1103	30.69	440	0.90	21	7.30	43	5.34	334	23.4
1106	30.69	440	1.10	21	7.30	43	5.35	332	15.8
1109	30.69	440	1.30	21	7.35	42	5.35	333	8.30

COMMENTS: **PLEASE REFER TO THE BACK OF THIS SHEET IF THE CHART ABOVE IS FULL**

IF TURBIDITY >10 NTUS, REDEVELOPMENT NEEDED ☐ YES ☑ NO ALL SAMPLES ON ICE WITHIN 15 MINUTES ☑ YES ☐ NO

FINAL SAMPLE OBSERVATIONS (COLOR/CLARITY/ODOR): Clear/no odor

ADDITIONAL NOTES:

FIELD VEHICLE ACCESSIBLE ☑ YES ☐ NO

WELL TAG			PROTECTIVE CASING			LOCK			CAP			CONCRETE PAD		
GOOD	BAD	NONE	GOOD	BAD	NONE	GOOD	BAD	NONE	GOOD	BAD	NONE	GOOD	BAD	NONE
✓			✓			✓			✓			✓		

☐ CAMA ☐ CCR ☐ Landfill ☒ NPDES ☐ SPECIAL STUDY________________ - GROUNDWATER MONITORING

LOW FLOW SAMPLING LOG

Site: Robinson

DUKE ENERGY

FIELD PERSONNEL: RDP HJS

WEATHER: ☒ SUNNY ☐ PARTLY CLOUDY ☐ OVERCAST ☐ RAIN ☐ SNOW

TEMPERATURE (APPROX): 86°F

INSITU SMARTROLL SERIAL #: 563024

2100Q SERIAL #: 3326

STABLIZATION CRITERIA:

pH	± 0.1 standard unit
Specific Conductance	± 5% in µS/cm
DO	± 0.2 mg/L or 10% saturation
Turbidity	less than 10 NTUs

WELL ID: MW-3BR

WELL DIAMETER: 2 (IN)

WELL DEPTH: 72.88 (FT)

DEPTH TO WATER: 51.87 (FT)

HEIGHT OF WC: 21.01 (FT)

PUMP/TUBING INTAKE DEPTH: 67.00 (FT)

MULT FACTOR *: 0.163 [*(radius/12)2*3.14*7.48]

CASING VOLUME: 3.42 (GAL)

INITIAL PURGE VOLUME: 0.02 (GAL)

TOTAL VOLUME PURGED: 1.06 (GAL)

START PURGE TIME: 1139

END PURGE TIME: 1158

FINAL READING TIME: 1158

SAMPLE DATE: ~~1158~~ 7-11-18 HJ

COLLECTION TIME: 1158

	Bladder			Peristaltic	12 Volt	Grundfos	Other ( )
TYPE OF PUMP:							
PURGE METHOD:	✓						
SAMPLING METHOD:	✓						
PUMP SETTING:	35 P	10.5 R	4.5 D				
	(psi)	(sec)	(sec)				

TIME	WATER LEVEL (FT) (x.xx)	FLOW RATE (mL/min) (x)	VOLUME REMOVED (gallons/ mL) (x.xx)	TEMPERATURE (°C) (x)	DO (mg/L) (x.xx)	SPECIFIC CONDUCTANCE (µS/cm) (x)	pH (su) (x.xx)	ORP (mv) (x)	TURBIDITY (NTU) (x.x)
1140	51.90	200	0.02	27	2.59	357	6.10	346	9.25
1143	51.95	200	0.17	25	0.66	358	6.05	345	21.1
1148	51.90	200	0.42	25	0.37	356	6.06	339	11.9
1153	51.90	200	0.67	24	0.35	359	6.04	332	10.4
1158	51.90	200	0.92	23	0.30	357	6.05	318	8.94

PLEASE REFER TO THE BACK OF THIS SHEET IF THE CHART ABOVE IS FULL

COMMENTS:

IF TURBIDITY >10 NTUS, REDEVELOPMENT NEEDED ☐ YES ☒ NO   ALL SAMPLES ON ICE WITHIN 15 MINUTES ☒ YES ☐ NO

FINAL SAMPLE OBSERVATIONS (COLOR/CLARITY/ODOR):

ADDITIONAL NOTES:

Clear/no odor

FIELD VEHICLE ACCESSIBLE ☒ YES ☐ NO

WELL TAG			PROTECTIVE CASING			LOCK			CAP			CONCRETE PAD		
GOOD	BAD	NONE	GOOD	BAD	NONE	GOOD	BAD	NONE	GOOD	BAD	NONE	GOOD	BAD	NONE
X			X			X			X			X		

☐ CAMA ☐ CCR ☐ Landfill ☒ NPDES ☐ SPECIAL STUDY__________ - GROUNDWATER MONITORING

LOW FLOW SAMPLING LOG

Site: Robinson

DUKE ENERGY

FIELD PERSONNEL: RDP HJS

WEATHER: ☒ SUNNY ☐ PARTLY CLOUDY ☐ OVERCAST ☐ RAIN ☐ SNOW

TEMPERATURE (APPROX): 83 °F

INSITU SMARTROLL SERIAL #: 563024

2100Q SERIAL #: 3326

STABLIZATION CRITERIA:

pH	± 0.1 standard unit
Specific Conductance	± 5% in µS/cm
DO	± 0.2 mg/L or 10% saturation
Turbidity	less than 10 NTUs

WELL ID: MW-4R

WELL DIAMETER: 2 (IN)

WELL DEPTH: 30.79 (FT)

DEPTH TO WATER: 19.70 (FT)

HEIGHT OF WC: 11.09 (FT)

PUMP/TUBING INTAKE DEPTH: 25.00 (FT)

MULT FACTOR *: 0.163 [*(radius/12)2*3.14*7.48]

CASING VOLUME: 1.81 (GAL)

INITIAL PURGE VOLUME: 0.01 (GAL)

TOTAL VOLUME PURGED: 2.26 (GAL)

START PURGE TIME: 0929

END PURGE TIME: 1045

FINAL READING TIME: 1045

SAMPLE DATE: 7/11/18

COLLECTION TIME: 1045

TYPE OF PUMP:	Bladder			Peristaltic	12 Volt	Grundfos	Other ( )
PURGE METHOD:	✓						
SAMPLING METHOD:	✓						
PUMP SETTING:	20	13.5 18	15 5				
	(psi)	(sec)	(sec)				

TIME	WATER LEVEL (FT) (x.xx)	FLOW RATE (mL/min) (x)	VOLUME REMOVED (gallons/ mL) (x.xx)	TEMPERATURE (°C) (x)	DO (mg/L) (x.xx)	SPECIFIC CONDUCTANCE (µS/cm) (x)	pH (su) (x.xx)	ORP (mv) (x)	TURBIDITY (NTU) (x.x)
0930	19.70	100	0.01	27	5.05	656	3.06	740	46.1
0935	19.70	100	0.16	27	3.79	643	3.07	735	118.0
0945	19.70	100	0.46	27	3.57	641	3.08	741	73.1
0955	19.70	100	0.76	27	3.51	639	3.08	742	54.0
1005	19.70	100	1.06	28	3.49	638	3.09	736	33.0
1015	19.70	100	1.36	28	3.55	633	3.10	733	20.2
1025	19.70	100	1.66	29	3.59	631	3.10	738	16.6
1035	19.70	100	1.96	29	3.53	628	3.10	736	12.7
1040	19.70	100	2.11	29	3.51	629	3.10	734	11.0
1045	19.70	100	2.26	29	3.53	625	3.10	738	~~9.2~~ 9.3 RDP 7/11

PLEASE REFER TO THE BACK OF THIS SHEET IF THE CHART ABOVE IS FULL

COMMENTS:

IF TURBIDITY >10 NTUS, REDEVELOPMENT NEEDED ☐ YES ☒ NO ALL SAMPLES ON ICE WITHIN 15 MINUTES ☒ YES ☐ NO

FINAL SAMPLE OBSERVATIONS (COLOR/CLARITY/ODOR): clear/no odor

ADDITIONAL NOTES:

Field blank taken @ 1215
7-11-18

FIELD VEHICLE ACCESSIBLE ☒ YES ☐ NO

WELL TAG			PROTECTIVE CASING			LOCK			CAP			CONCRETE PAD		
GOOD	BAD	NONE	GOOD	BAD	NONE	GOOD	BAD	NONE	GOOD	BAD	NONE	GOOD	BAD	NONE
X			X			X			X			X		

☐ CAMA ☐ CCR ☐ Landfill ☒ NPDES ☐ SPECIAL STUDY ______________ - GROUNDWATER MONITORING

LOW FLOW SAMPLING LOG

Site: Robinson

DUKE ENERGY

FIELD PERSONNEL: HJS RDP

WEATHER: ☐ SUNNY ☒ PARTLY CLOUDY ☐ OVERCAST ☐ RAIN ☐ SNOW

TEMPERATURE (APPROX): 85 °F

INSITU SMARTROLL SERIAL #: 563024

2100Q SERIAL #: 3326

STABLIZATION CRITERIA:

• pH	± 0.1 standard unit
• Specific Conductance	± 5% in µS/cm
• DO	± 0.2 mg/L or 10% saturation
• Turbidity	less than 10 NTUs

WELL ID: MW-5
WELL DIAMETER: 2 (IN)
WELL DEPTH: 42.61 (FT)
DEPTH TO WATER: 37.78 (FT)
HEIGHT OF WC: 4.83 (FT)

PUMP/TUBING INTAKE DEPTH: 42.01 (FT)
MULT FACTOR *: 0.163 [*(radius/12)2*3.14*7.48]
CASING VOLUME: 0.79 (GAL)
INITIAL PURGE VOLUME: 0.01 (GAL)
TOTAL VOLUME PURGED: 0.64 (GAL)

START PURGE TIME: 1234
END PURGE TIME: 1256
FINAL READING TIME: 1256
SAMPLE DATE: 7/11/18
COLLECTION TIME: 1256

TYPE OF PUMP:	Bladder			Peristaltic	12 Volt	Grundfos	Other ( )
PURGE METHOD:	✓						
SAMPLING METHOD:	✓						
PUMP SETTING:	25	11	4				
	(psi)	(sec)	(sec)				

TIME	WATER LEVEL (FT) (x.xx)	FLOW RATE (mL/min) (x)	VOLUME REMOVED (gallons/ mL) (x.xx)	TEMPERATURE (°C) (x)	DO (mg/L) (x.xx)	SPECIFIC CONDUCTANCE (µS/cm) (x)	pH (su) (x.xx)	ORP (mv) (x)	TURBIDITY (NTU) (x.x)
1235	37.90	120	0.01	25	3.52	244	6.13	395	8.9
1238	37.90	120	0.10	24	2.52	248	6.08	384	6.6
1241	37.90	170	0.19	24	1.81	247	6.09	369	3.1
1244	37.90	120	0.28	24	1.50	246	6.10	361	1.9
1247	37.90	120	0.37	24	1.30	246	6.11	355	1.5
1250	37.90	120	0.46	24	1.14	246	6.12	349	1.6
1253	37.90	120	0.55	24	1.06	246	6.13	345	1.1
1256	37.90	120	0.64	24	1.01	247	6.14	343	0.9

PLEASE REFER TO THE BACK OF THIS SHEET IF THE CHART ABOVE IS FULL

COMMENTS:
IF TURBIDITY >10 NTUS, REDEVELOPMENT NEEDED ☐ YES ☒ NO ALL SAMPLES ON ICE WITHIN 15 MINUTES ☒ YES ☐ NO
FINAL SAMPLE OBSERVATIONS (COLOR/CLARITY/ODOR):
ADDITIONAL NOTES:

Clear, no odor

FIELD VEHICLE ACCESSIBLE ☒ YES ☐ NO

WELL TAG			PROTECTIVE CASING			LOCK			CAP			CONCRETE PAD		
GOOD	BAD	NONE	GOOD	BAD	NONE	GOOD	BAD	NONE	GOOD	BAD	NONE	GOOD	BAD	NONE
X			X			X			X			X		

☐ CAMA ☐ CCR ☐ Landfill ☑ NPDES ☐ SPECIAL STUDY ______________ - GROUNDWATER MONITORING

LOW FLOW SAMPLING LOG

Site: Robinson

DUKE ENERGY

WEATHER: ☑ SUNNY ☐ PARTLY CLOUDY ☐ OVERCAST ☐ RAIN ☐ SNOW

FIELD PERSONNEL: EHS
TEMPERATURE (APPROX): 90 °F
INSITU SMARTROLL SERIAL #: 563632
2100Q SERIAL #: 3328

STABLIZATION CRITERIA:

pH	± 0.1 standard unit
Specific Conductance	± 5% in µS/cm
DO	± 0.2 mg/L or 10% saturation
Turbidity	less than 10 NTUs

WELL ID: MW-6
WELL DIAMETER: 2 (IN)
WELL DEPTH: 52.97 (FT)
DEPTH TO WATER: 30.48 (FT)
HEIGHT OF WC: 22.49 (FT)

PUMP/TUBING INTAKE DEPTH: 47.97 (FT)
MULT FACTOR *: 0.163 (*(radius/12)2*3.14*7.48)
CASING VOLUME: [illegible] 3.67 (GAL)
INITIAL PURGE VOLUME: 2.80 (GAL)
TOTAL VOLUME PURGED: 3.60 (GAL)

START PURGE TIME: 1208
END PURGE TIME: 1250
FINAL READING TIME: 1239
SAMPLE DATE: 7/11/18
COLLECTION TIME: 1245

	Bladder	Peristaltic	12 Volt	Grundfos	Other ( )
TYPE OF PUMP:					
PURGE METHOD:	✓				
SAMPLING METHOD:	✓				
PUMP SETTING:	28 (psi) 5 (sec) 10 (sec)				

TIME	WATER LEVEL (FT) (x.xx)	FLOW RATE (mL/min) (x)	VOLUME REMOVED (gallons/ mL) (x.xx)	TEMPERATURE (°C) (x)	DO (mg/L) (x.xx)	SPECIFIC CONDUCTANCE (µS/cm) (x)	pH (su) (x.xx)	ORP (mv) (x)	TURBIDITY (NTU) (x.x)
1233	30.62	440	2.80	22	0.10	201	6.50	201	25.9
1236	30.62	440	3.10	22	0.09	201	6.50	200	10.2
1239	30.62	440	3.40	22	0.09	202	6.50	199	6.34

COMMENTS: **PLEASE REFER TO THE BACK OF THIS SHEET IF THE CHART ABOVE IS FULL**

IF TURBIDITY >10 NTUS, REDEVELOPMENT NEEDED ☐ YES ☐ NO ALL SAMPLES ON ICE WITHIN 15 MINUTES ☑ YES ☐ NO

FINAL SAMPLE OBSERVATIONS (COLOR/CLARITY/ODOR):

ADDITIONAL NOTES: Started out very turbid, orange particulates and orange chunks
Final reading: Clear/no odor

FIELD VEHICLE ACCESSIBLE ☑ YES ☐ NO

WELL TAG			PROTECTIVE CASING			LOCK			CAP			CONCRETE PAD		
GOOD	BAD	NONE	GOOD	BAD	NONE	GOOD	BAD	NONE	GOOD	BAD	NONE	GOOD	BAD	NONE
✓			✓			✓			✓			✓		

☐ CAMA ☐ CCR ☐ Landfill ☑ NPDES ☐ SPECIAL STUDY ____________ - GROUNDWATER MONITORING

LOW FLOW SAMPLING LOG

Site: Robinson

DUKE ENERGY

WEATHER: ☑ SUNNY ☐ PARTLY CLOUDY ☐ OVERCAST ☐ RAIN ☐ SNOW

FIELD PERSONNEL: EHS, HPB
TEMPERATURE (APPROX): 90 °F
INSITU SMARTROLL SERIAL #: 563632
2100Q SERIAL #: 3328

STABLIZATION CRITERIA:

pH	± 0.1 standard unit
Specific Conductance	± 5% in µS/cm
DO	± 0.2 mg/L or 10% saturation
Turbidity	less than 10 NTUs

WELL ID: MW-7
WELL DIAMETER: 2 (IN)
WELL DEPTH: 36.88 (FT)
DEPTH TO WATER: 19.36 (FT)
HEIGHT OF WC: 17.52 (FT)

PUMP/TUBING INTAKE DEPTH: 31.88 (FT)
MULT FACTOR *: 0.163 [*(radius/12)2*3.14*7.48]
CASING VOLUME: 2.86 (GAL)
INITIAL PURGE VOLUME: 1.00 (GAL)
TOTAL VOLUME PURGED: 2.80 (GAL)

START PURGE TIME: 1125
END PURGE TIME: 1155
FINAL READING TIME: 1147
SAMPLE DATE: 7-11-18
COLLECTION TIME: 1150

TYPE OF PUMP:	Bladder			Peristaltic	12 Volt	Grundfos	Other ( )
PURGE METHOD:	✓						
SAMPLING METHOD:	✓						
PUMP SETTING:	30 P (psi)	10 R (sec)	5 D (sec)				

TIME	WATER LEVEL (FT) (x.xx)	FLOW RATE (mL/min) (x)	VOLUME REMOVED (gallons/ mL) (x.xx)	TEMPERATURE (°C) (x)	DO (mg/L) (x.xx)	SPECIFIC CONDUCTANCE (µS/cm) (x)	pH (su) (x.xx)	ORP (mv) (x)	TURBIDITY (NTU) (x.x)
1135	19.49	460	1.00	22	0.10	180	6.53	86	86.2
1138	19.49	460	1.51	22	1.11	179	6.57	91	59.1
1141	19.49	460	1.82	23	0.09	179	6.63	97	38.8
1144	19.49	460	2.25	23	0.09	179	6.65	101	14.0
1147	19.49	460	2.67	23	0.08	179	6.67	102	6.6

COMMENTS:

PLEASE REFER TO THE BACK OF THIS SHEET IF THE CHART ABOVE IS FULL

IF TURBIDITY >10 NTUS, REDEVELOPMENT NEEDED ☐ YES ☑ NO   ALL SAMPLES ON ICE WITHIN 15 MINUTES ☑ YES ☐ NO

FINAL SAMPLE OBSERVATIONS (COLOR/CLARITY/ODOR):

ADDITIONAL NOTES:

Clear / no odor

FIELD VEHICLE ACCESSIBLE ☑ YES ☐ NO

WELL TAG			PROTECTIVE CASING			LOCK			CAP			CONCRETE PAD		
GOOD	BAD	NONE	GOOD	BAD	NONE	GOOD	BAD	NONE	GOOD	BAD	NONE	GOOD	BAD	NONE
✓			✓			✓			✓			✓		

Analytical Laboratory

13339 Hagers Ferry Road
Huntersville, NC 28078-7929
McGuire Nuclear Complex - MG03A2
Phone: 980-875-5245 Fax: 980-875-4349

Order Summary Report

Order Number:	**J18070011**
Project Name:	ROBINSON - GW ASH BASIN
Customer Name(s):	Toepfer, Moeller, Campbell, Gainey, Hamilton,
Customer Address:	

Lab Contact: Peggy Kendall Phone: 980-875-5848

Report Authorized By:
(Signature)
Peggy F Kendall
Peggy Kendall
Date: 7/25/2018

Program Comments:

Please contact the Program Manager (Peggy Kendall) with any questions regarding this report.

Data Flags & Calculations:

Any analytical tests or individual analytes within a test flagged with a Qualifier indicate a deviation from the method quality system or quality control requirement. The qualifier description is found at the end of the Certificate of Analysis (sample results) under the qualifiers heading. All results are reported on a dry weight basis unless otherwise noted. Subcontracted data included on the Duke Certificate of Analysis is to be used as information only. Certified vendor results can be found in the subcontracted lab final report. Duke Energy Analytical Laboratory subcontracts analyses to other vendor laboratories that have been qualified by Duke Energy to perform these analyses except where noted.

Data Package:

This data package includes analytical results that are applicable only to the samples described in this narrative. An estimation of the uncertainty of measurement for the results in the report is available upon request. This report shall not be reproduced, except in full, without the written consent of the Analytical Laboratory. Please contact the Analytical laboratory with any questions. The order of individual sections within this report is as follows:

Job Summary Report, Sample Identification, Technical Validation of Data Package, Analytical Laboratory Certificate of Analysis, Analytical Laboratory QC Reports, Sub-contracted Laboratory Results, Customer Specific Data Sheets, Reports & Documentation, Customer Database Entries, Test Case Narratives, Chain of Custody (COC)

Certification:

The Analytical Laboratory holds the following State Certifications : North Carolina (DENR) Certificate #248, South Carolina (DHEC) Laboratory ID # 99005. Contact the Analytical Laboratory for definitive information about the certification status of specific methods.

Sample ID's & Descriptions:

Sample ID	Plant/Station	Collection Date and Time	Collected By	Sample Description
2018020252	ROBINSON	11-Jul-18 10:35 AM	EHS	MW-1R NPDES (ASH)
2018020253	ROBINSON	11-Jul-18 11:10 AM	EHS	MW-2R NPDES (ASH)
2018020254	ROBINSON	11-Jul-18 11:58 AM	EHS	MW-3R NPDES (ASH)
2018020255	ROBINSON	11-Jul-18 10:45 AM	EHS	MW-4R NPDES (ASH)
2018020256	ROBINSON	11-Jul-18 12:56 PM	EHS	MW-5 NPDES (ASH)
2018020257	ROBINSON	11-Jul-18 12:45 PM	EHS	MW-6 NPDES (ASH)
2018020258	ROBINSON	11-Jul-18 11:50 AM	EHS	MW-7 NPDES (ASH)
2018020259	ROBINSON	11-Jul-18 12:15 PM	EHS	FIELD BLANK

8 Total Samples

Technical Validation Review

Checklist:

COC and .pdf report are in agreement with sample totals and analyses (compliance programs and procedures).	☑ Yes	☐ No
All Results are less than the laboratory reporting limits.	☐ Yes	☑ No
All laboratory QA/QC requirements are acceptable.	☑ Yes	☐ No

Report Sections Included:

☑ Job Summary Report

☑ Sample Identification

☑ Technical Validation of Data Package

☑ Analytical Laboratory Certificate of Analysis

☐ Analytical Laboratory QC Report

☐ Sub-contracted Laboratory Results

☐ Customer Specific Data Sheets, Reports, & Documentation

☐ Customer Database Entries

☑ Chain of Custody

☑ Electronic Data Deliverable (EDD) Sent Separatel

Reviewed By: Peggy Kendall

Date: 7/25/2018

Certificate of Laboratory Analysis

This report shall not be reproduced, except in full.

Order # J18070011

Site: MW-1R NPDES (ASH)
Collection Date: 07/11/2018 10:35 AM

Sample #: 2018020252
Matrix: GW_WW

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
INORGANIC IONS BY IC - Q18070271								
Sulfate	3.1	mg/L		0.5	5	EPA 300.0	07/12/2018 17:49	BGN9034
TOTAL RECOVERABLE METALS BY ICP-MS - Q18070297								
Arsenic (As)	< 1	ug/L		1	1	EPA 200.8	07/13/2018 21:08	CWSPEN3
Cadmium (Cd)	< 1	ug/L		1	1	EPA 200.8	07/13/2018 21:08	CWSPEN3
Chromium (Cr)	< 1	ug/L		1	1	EPA 200.8	07/13/2018 21:08	CWSPEN3
Copper (Cu)	< 1	ug/L		1	1	EPA 200.8	07/13/2018 21:08	CWSPEN3
Zinc (Zn)	< 5	ug/L		5	1	EPA 200.8	07/13/2018 21:08	CWSPEN3
TOTAL DISSOLVED SOLIDS - Q18070258								
TDS	< 25	mg/L		25	1	SM2540C	07/12/2018 14:00	Mgigant

Certificate of Laboratory Analysis

This report shall not be reproduced, except in full.

Order # J18070011

Site: MW-2R NPDES (ASH)

Collection Date: 07/11/2018 11:10 AM

Sample #: **2018020253**

Matrix: GW_WW

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
INORGANIC IONS BY IC - Q18070271								
Sulfate	**6.7**	mg/L		0.1	1	EPA 300.0	07/16/2018 10:28	BGN9034
TOTAL RECOVERABLE METALS BY ICP-MS - Q18070297								
Arsenic (As)	**3.30**	ug/L		1	1	EPA 200.8	07/13/2018 21:41	CWSPEN3
Cadmium (Cd)	**< 1**	ug/L		1	1	EPA 200.8	07/13/2018 21:41	CWSPEN3
Chromium (Cr)	**< 1**	ug/L		1	1	EPA 200.8	07/13/2018 21:41	CWSPEN3
Copper (Cu)	**< 1**	ug/L		1	1	EPA 200.8	07/13/2018 21:41	CWSPEN3
Zinc (Zn)	**< 5**	ug/L		5	1	EPA 200.8	07/13/2018 21:41	CWSPEN3
TOTAL DISSOLVED SOLIDS - Q18070258								
TDS	**< 25**	mg/L		25	1	SM2540C	07/12/2018 14:00	Mgigant

Certificate of Laboratory Analysis

This report shall not be reproduced, except in full.

Order # J18070011

Site: MW-3R NPDES (ASH)
Collection Date: 07/11/2018 11:58 AM

Sample #: **2018020254**
Matrix: GW_WW

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
INORGANIC IONS BY IC - Q18070271								
Sulfate	87	mg/L		1	10	EPA 300.0	07/12/2018 19:03	BGN9034
TOTAL RECOVERABLE METALS BY ICP-MS - Q18070297								
Arsenic (As)	< 1	ug/L		1	1	EPA 200.8	07/13/2018 21:49	CWSPEN3
Cadmium (Cd)	< 1	ug/L		1	1	EPA 200.8	07/13/2018 21:49	CWSPEN3
Chromium (Cr)	< 1	ug/L		1	1	EPA 200.8	07/13/2018 21:49	CWSPEN3
Copper (Cu)	< 1	ug/L		1	1	EPA 200.8	07/13/2018 21:49	CWSPEN3
Zinc (Zn)	< 5	ug/L		5	1	EPA 200.8	07/13/2018 21:49	CWSPEN3
TOTAL DISSOLVED SOLIDS - Q18070258								
TDS	**210**	mg/L		25	1	SM2540C	07/12/2018 14:00	Mgigant

Certificate of Laboratory Analysis

This report shall not be reproduced, except in full.

Order # J18070011

Site: MW-4R NPDES (ASH)
Collection Date: 07/11/2018 10:45 AM

Sample #: **2018020255**
Matrix: GW_WW

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
INORGANIC IONS BY IC - Q18070271								
Sulfate	**490**	mg/L		10	100	EPA 300.0	07/12/2018 19:21	BGN9034
TOTAL RECOVERABLE METALS BY ICP-MS - Q18070297								
Arsenic (As)	**1.22**	ug/L		1	1	EPA 200.8	07/13/2018 21:58	CWSPEN3
Cadmium (Cd)	**< 1**	ug/L		1	1	EPA 200.8	07/13/2018 21:58	CWSPEN3
Chromium (Cr)	**4.50**	ug/L		1	1	EPA 200.8	07/13/2018 21:58	CWSPEN3
Copper (Cu)	**110**	ug/L		1	1	EPA 200.8	07/13/2018 21:58	CWSPEN3
Zinc (Zn)	**140**	ug/L		5	1	EPA 200.8	07/13/2018 21:58	CWSPEN3
TOTAL DISSOLVED SOLIDS - Q18070258								
TDS	**300**	mg/L		25	1	SM2540C	07/12/2018 14:00	Mgigant

Certificate of Laboratory Analysis

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Order # J18070011

Site: MW-5 NPDES (ASH)

Collection Date: 07/11/2018 12:56 PM

Sample #: **2018020256**

Matrix: GW_WW

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
INORGANIC IONS BY IC - Q18070271								
Sulfate	**23**	mg/L		0.5	5	EPA 300.0	07/12/2018 19:40	BGN9034
TOTAL RECOVERABLE METALS BY ICP-MS - Q18070297								
Arsenic (As)	**6.74**	ug/L		1	1	EPA 200.8	07/13/2018 22:06	CWSPEN3
Cadmium (Cd)	**< 1**	ug/L		1	1	EPA 200.8	07/13/2018 22:06	CWSPEN3
Chromium (Cr)	**< 1**	ug/L		1	1	EPA 200.8	07/13/2018 22:06	CWSPEN3
Copper (Cu)	**< 1**	ug/L		1	1	EPA 200.8	07/13/2018 22:06	CWSPEN3
Zinc (Zn)	**< 5**	ug/L		5	1	EPA 200.8	07/13/2018 22:06	CWSPEN3
TOTAL DISSOLVED SOLIDS - Q18070258								
TDS	**150**	mg/L		25	1	SM2540C	07/12/2018 14:00	Mgigant

Certificate of Laboratory Analysis

This report shall not be reproduced, except in full.

Order # J18070011

Site: MW-6 NPDES (ASH)

Collection Date: 07/11/2018 12:45 PM

Sample #: 2018020257

Matrix: GW_WW

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
INORGANIC IONS BY IC - Q18070271								
Sulfate	**38**	mg/L		1	10	EPA 300.0	07/12/2018 19:58	BGN9034
TOTAL RECOVERABLE METALS BY ICP-MS - Q18070297								
Arsenic (As)	**2.72**	ug/L		1	1	EPA 200.8	07/13/2018 22:14	CWSPEN3
Cadmium (Cd)	**< 1**	ug/L		1	1	EPA 200.8	07/13/2018 22:14	CWSPEN3
Chromium (Cr)	**< 1**	ug/L		1	1	EPA 200.8	07/13/2018 22:14	CWSPEN3
Copper (Cu)	**< 1**	ug/L		1	1	EPA 200.8	07/13/2018 22:14	CWSPEN3
Zinc (Zn)	**< 5**	ug/L		5	1	EPA 200.8	07/13/2018 22:14	CWSPEN3
TOTAL DISSOLVED SOLIDS - Q18070258								
TDS	**120**	mg/L		25	1	SM2540C	07/12/2018 14:00	Mgigant

Certificate of Laboratory Analysis

This report shall not be reproduced, except in full.

Order # J18070011

Site: MW-7 NPDES (ASH)

Collection Date: 07/11/2018 11:50 AM

Sample #: **2018020258**

Matrix: GW_WW

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
INORGANIC IONS BY IC - Q18070271								
Sulfate	**14**	mg/L		0.5	5	EPA 300.0	07/12/2018 20:16	BGN9034
TOTAL RECOVERABLE METALS BY ICP-MS - Q18070297								
Arsenic (As)	**95.6**	ug/L		1	1	EPA 200.8	07/13/2018 22:22	CWSPEN3
Cadmium (Cd)	**< 1**	ug/L		1	1	EPA 200.8	07/13/2018 22:22	CWSPEN3
Chromium (Cr)	**< 1**	ug/L		1	1	EPA 200.8	07/13/2018 22:22	CWSPEN3
Copper (Cu)	**< 1**	ug/L		1	1	EPA 200.8	07/13/2018 22:22	CWSPEN3
Zinc (Zn)	**< 5**	ug/L		5	1	EPA 200.8	07/13/2018 22:22	CWSPEN3
TOTAL DISSOLVED SOLIDS - Q18070258								
TDS	**110**	mg/L		25	1	SM2540C	07/12/2018 14:00	Mgigant

Certificate of Laboratory Analysis

This report shall not be reproduced, except in full.

Order # J18070011

Site: FIELD BLANK

Collection Date: 07/11/2018 12:15 PM

Sample #: **2018020259**

Matrix: GW_WW

Analyte	Result	Units	Qualifiers	RDL	DF	Method	Analysis Date/Time	Analyst
INORGANIC IONS BY IC - Q18070271								
Sulfate	< 0.1	mg/L		0.1	1	EPA 300.0	07/12/2018 20:35	BGN9034
TOTAL RECOVERABLE METALS BY ICP-MS - Q18070297								
Arsenic (As)	< 1	ug/L		1	1	EPA 200.8	07/13/2018 22:31	CWSPEN3
Cadmium (Cd)	< 1	ug/L		1	1	EPA 200.8	07/13/2018 22:31	CWSPEN3
Chromium (Cr)	< 1	ug/L		1	1	EPA 200.8	07/13/2018 22:31	CWSPEN3
Copper (Cu)	< 1	ug/L		1	1	EPA 200.8	07/13/2018 22:31	CWSPEN3
Zinc (Zn)	< 5	ug/L		5	1	EPA 200.8	07/13/2018 22:31	CWSPEN3

Certificate of Laboratory Analysis

This report shall not be reproduced, except in full.

Order # J18070011

Level II QC Summary

Q18070271 Dionex INORGANIC IONS BY IC

Blank #1

Parameter	Measured	Final	Units:	Dil	RDL	Relative Concentration	Qualifier
Sulfate	0	0	mg/L	1	0.1	< 1/2 RDL	-

LCS #1

Parameter	Measured	Final	Units:	Dil	Spike	% Recovery	LCL	UCL	Qualifier
Sulfate	4.91	4.91	mg/L	1	5	98.3	90	110	-

MS #1

Parent Sample: J18070011 -- 2018020252

Parameter	Measured	Final	Units:	Dil	Spike	% Recovery	LCL	UCL	Qualifier
Sulfate	2.49	12.4	mg/L	5	10	93.7	80	120	-

MSD #1

Parent Sample: J18070011 -- 2018020252

Parameter	Measured	Final	Units:	Dil	Spike	% Recovery	LCL	UCL	RPD	Qualifier
Sulfate	2.49	12.4	mg/L	5	10	93.6	80	120	0.0694	-

Level II QC Summary

Q18070297 IMS_TRM TOTAL RECOVERABLE METALS BY ICP-MS

Blank #1

Parameter	Measured	Final	Units:	Dil	RDL	Relative Concentration	Qualifier
Arsenic (As)	0.002	0.002	ug/L	1	1	< 1/2 RDL	-
Cadmium (Cd)	0.001	0.001	ug/L	1	1	< 1/2 RDL	-
Chromium (Cr)	0.01	0.01	ug/L	1	1	< 1/2 RDL	-
Copper (Cu)	-0.109	-0.109	ug/L	1	1	< 1/2 RDL	-
Zinc (Zn)	-0.067	-0.067	ug/L	1	5	< 1/2 RDL	-

LCS #1

Parameter	Measured	Final	Units:	Dil	Spike	% Recovery	LCL	UCL	Qualifier
Arsenic (As)	49	49	ug/L	1	50	98	85	115	-
Cadmium (Cd)	48.3	48.3	ug/L	1	50	96.5	85	115	-
Chromium (Cr)	47.5	47.5	ug/L	1	50	94.9	85	115	-
Copper (Cu)	48.7	48.7	ug/L	1	50	97.5	85	115	-
Zinc (Zn)	48.6	48.6	ug/L	1	50	97.2	85	115	-

MS #1

Parent Sample: J18070011 -- 2018020252

Parameter	Measured	Final	Units:	Dil	Spike	% Recovery	LCL	UCL	Qualifier
Arsenic (As)	50	50	ug/L	1	50	99.9	70	130	-
Cadmium (Cd)	49.5	49.5	ug/L	1	50	99	70	130	-
Chromium (Cr)	48.9	48.9	ug/L	1	50	97.4	70	130	-
Copper (Cu)	50.5	50.5	ug/L	1	50	100	70	130	-
Zinc (Zn)	50.8	50.8	ug/L	1	50	93.1	70	130	-

MSD #1

Parent Sample: J18070011 -- 2018020252

Parameter	Measured	Final	Units:	Dil	Spike	% Recovery	LCL	UCL	RPD	Qualifier
Arsenic (As)	49.4	49.4	ug/L	1	50	98.7	70	130	1.25	-
Cadmium (Cd)	49.4	49.4	ug/L	1	50	98.6	70	130	0.336	-
Chromium (Cr)	49.2	49.2	ug/L	1	50	97.9	70	130	0.506	-
Copper (Cu)	50.4	50.4	ug/L	1	50	100	70	130	0.307	-
Zinc (Zn)	50	50	ug/L	1	50	91.4	70	130	1.91	-

Certificate of Laboratory Analysis

This report shall not be reproduced, except in full.

Order # J18070011

Level II QC Summary

Q18070258 TDS TOTAL DISSOLVED SOLIDS

Blank # 1

Parameter	Measured	Final	Units:	Dil	RDL	Relative Concentration	Qualifier
TDS	0	0	mg/L	1	25	< 1/2 RDL	-

Duplicate # 1

Parent Sample: J18060179 -- 2018016794

Parameter	Measured	Final	Units:	Dil	RPD	Qualifier
TDS	157	157	mg/L	1	1.93	-

Duplicate # 2

Parent Sample: J18070011 -- 2018020252

Parameter	Measured	Final	Units:	Dil	RPD	Qualifier
TDS	11	11	mg/L	1	9.52	-

LCS # 1

Parameter	Measured	Final	Units:	Dil	Spike	% Recovery	LCL	UCL	Qualifier
TDS	104	104	mg/L	1	100	104	90	110	-

DUKE ENERGY.

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

Duke Energy Analytical Laboratories
Mail Code MG03A2 (Building 7405)
13339 Hagers Ferry Rd
Huntersville, N. C. 28078
(980) 875-5371
Fax: (980) 875-5559

Analytical Laboratory Use Only

LIMS # J18070011
Sample Class: GROUNDWATER
Samples Originating From: NC__ SC_√_
Logged By: Q
Date & Time: 7/12/18 708
Vendor:
Cooler Temp (C): 3.8
SAMPLE PROGRAM
Ground Water ___
NPDES __X__
Drinking Water ___
UST ___
RCRA Waste ___
PO #
MR #

19Page _1_ of _1_
DISTRIBUTION
ORIGINAL to LAB,
COPY to CLIENT

Revised 12/8/2017

Customer must Complete

1)Project Name: Robinson NPDES Groundwater Monitoring Program
NPDES #SC0002925
2)Phone No: 980-875-5257
3)Client: John Toepfer, Bryan Moeller, Chuck Campbell, John Gainey, Will Hamilton, Dee O'Brien
4)Fax No:
5)Business Unit: 50125
6)Process: BENVWT
7)Resp. To: RS01
8)Task ID:
9)Activity ID:
10)Mail Code: MG03A3

Customer to complete all appropriate NON-SHADED areas.

16Preserv.: 1=HCL 2=H_2SO_4 3=HNO_3 4=Ice 5=None

							Metals IMS/TRM (EPA 200.8) As, Cd, Cr, Cu, Zn	SULFATES	TDS	
						Preserv.	3	4	4	
						Volume	500 ML	500 ML	500 ML	
LAB USE ONLY		14Collection Information			15Analyses Required					
11Lab ID	13Sample Description or ID	Date	Time	Signature	TESTS	18Grab				20Total # of Containers
2018020252	MW-1R - NPDES (ASH)	7/11/18	1035	EHS		X	1	1	1	3
2018020253	MW-2R - NPDES (ASH)	7/11/18	1110	EHS		X	1	1	1	3
2018020254	MW-3R - NPDES (ASH)	7/11/18	1158	EHS		X	1	1	1	3
2018020255	MW-4R - NPDES (ASH)	7/11/18	1045	EHS		X	1	1	1	3
2018020256	MW-5 - NPDES (ASH)	7/11/18	1256	EHS		X	1	1	1	3
2018020257	MW-6 - NPDES (ASH)	7/11/18	1245	EHS		X	1	1	1	3
2018020258	MW-7 - NPDES (ASH)	7/11/18	1150	EHS		X	1	1	1	3
2018020259	FIELD BLANK	7/11/18	1215	EHS		X	1	1		2

Customer to complete appropriate columns to right

Customer to sign & date below

21)Relinquished By: Ella Sid	Date/Time: 7/12/18 0725	Accepted By:	Date/Time: 7/12/18 725
21)Relinquished By	Date/Time	Accepted By:	Date/Time
21)Relinquished By	Date/Time	Accepted By:	Date/Time
23)Seal/Locked By	Date/Time	Sealed/Lock Opened By	Date/Time

24)Comments:

Customer, important please indicate desired turnaround

22Requested Turnaround
14 Days __√__
*7 Days ____
*48 Hr ____
*Other ____
*Add. Cost Will Apply

ATTACHMENT B-2

CCR COMPLIANCE WELL LOCATIONS AND MONITORING RESULTS

Robinson Groundwater Programs

Ash Basin Groundwater Monitoring

- CCR Network
  - 14 wells plus 9 Characterization wells (installed 2018)
    - 1 Background cluster
    - 6 Downgradient clusters
    - 3 Downgradient characterization clusters
  - 3 Rounds of Assessment Monitoring (including characterization sampling)

TABLE 7A
COMPARISON OF GROUNDWATER PROTECTION STANDARDS
ASH BASIN - SHALLOW FLOW ZONE
H.B. ROBINSON STEAM ELECTRIC PLANT
DUKE ENERGY PROGRESS, LLC, HARTSVILLE, SC

		Appendix III Parameters CCR Rule 257.95 (d)(1)							**Appendix IV Parameters CCR Rule 257.95 (d)(1)**														
	Analytical Parameter	**Boron**	**Calcium**	**Chloride**	**Fluoride**	**pH**	**Sulfate**	**Total Dissolved Solids**	**Antimony**	**Arsenic**	**Barium**	**Beryllium**	**Cadmium**	**Chromium**	**Cobalt**	**Fluoride**	**Lead**	**Lithium**	**Mercury**	**Molybdenum**	**Selenium**	**Thallium**	**Total Radium**
	Reporting Units	**ug/L**	**mg/L**	**mg/L**	**mg/L**	**S.U.**	**mg/L**	**mg/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**mg/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**pCi/L**
	Comparison Criteria	**49***	**7.3***	**4.1***	**0.1***	**3.8 - 6.2***	**10.8***	**55***	**6^{+}**	**10^{+}**	**2000^{+}**	**4^{+}**	**5^{+}**	**100^{+}**	**6^{+}**	**4^{+}**	**15^{+}**	**40^{+}**	**2^{+}**	**100^{+}**	**50^{+}**	**2^{+}**	**5^{+}**
Sample ID	**Sample Collection Date**	**Analytical Results**							**Analytical Results**														
CCR-01SA	05/24/2018	30.3	3.78	1.3	<0.1	5.4	5.8	35	<0.5	0.13	12.1	<0.1	0.073 j	2.3	0.36	<0.1	0.19	9	<0.2	0.11 j	0.44 j	0.23	1.14 U
CCR-02S	05/24/2018	**473**	**33.5**	2.3	**0.15**	**6.6**	**18.7**	**154**	<0.5	**49**	121	<0.1	<0.08	0.7 B	0.03 j	0.15	<0.1	**48**	<0.2	4.7	<0.5	<0.1	2.22
CCR-03S	05/24/2018	**511**	**49.9**	2.5	**0.37**	**6.5**	**50.1**	**210**	<0.5	**20.7**	111	<0.1	<0.08	0.24 j,B	0.54	0.37	<0.1	**81**	<0.2	54.7	<0.5	<0.1	**6.36**
CCR-04S	05/24/2018	**607**	**41.8**	2.7 M1	**0.25 M1**	**6.7**	**28.7 M1**	**184**	<0.5	**120**	111	<0.1	<0.08	<0.5	0.42	0.25 M1	<0.1	**50**	<0.2	26.7	3.8	0.051 j	3.49
CCR-06S	05/24/2018	**350**	**22.6**	2.1	0.072 j	5.0	**38.2**	**111 D6**	<0.5	0.068 j	30.3	<0.1	<0.08	1.3 B	0.12	0.072 j	<0.1	6	<0.2	0.16 j	8.4	0.38	4.51

Prepared by: HHS Checked by: VTV

Notes:

175 - Bold, blue highlighted value indicates concentration detected at a statistically significant level greater than the comparison criteria for Appendix III constituents.

302 - Bold, orange highlighted value indicates concentration detected at a statistically significant level greater than the comparison criteria for Appendix IV constituents.

^ - Comparison criteria represents values noted in USEPA'S Amendments to the National Minimum Criteria (Phase One, Part One), Disposal of Coal Combustion Residuals from Electric Utilities; effective August 29, 2018.

- Comparison criteria represents background concentration developed in July 2018.

* - Comparison criteria represents background concentration value developed in January 2018.

+ - Comparison criteria represents the USEPA Maximum Contaminant Level (MCL).

< - Concentration not detected at or above the adjusted reporting limit.

B - Target analyte detected in method blank at or above the reporting limit. Target analyte concentration in sample is less than 10X the concentration in the method blank. Analyte concentration in sample could be due to blank contamination.

Background wells include: CCR-BG-1S

CCR-05S was not sampled due to insufficient water in the well.

D6 - The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.

j - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

M1 - Matrix spike recovery was high: the associated Laboratory Control Spike (LCS) was acceptable.

mg/L - milligrams per liter

pCi/L - picocuries per liter

Radium (Total) = the sum of radium-226 + radium-228

S.U. - Standard Unit

U – Analyte was analyzed for, but not detected above the MDC.

ug/L - micrograms per liter

TABLE 7B
COMPARISON OF GROUNDWATER PROTECTION STANDARDS
ASH BASIN - DEEP FLOW ZONE
HB ROBINSON STEAM ELECTRIC PLANT
DUKE ENERGY PROGRESS, LLC, HARTSVILLE, SC

		Appendix III Parameters CCR Rule 257.95 (d)(1)							Appendix IV Parameters CCR Rule 257.95 (d)(1)														
	Analytical Parameter	**Boron**	**Calcium**	**Chloride**	**Fluoride**	**pH**	**Sulfate**	**Total Dissolved Solids**	**Antimony**	**Arsenic**	**Barium**	**Beryllium**	**Cadmium**	**Chromium**	**Cobalt**	**Fluoride**	**Lead**	**Lithium**	**Mercury**	**Molybdenum**	**Selenium**	**Thallium**	**Total Radium**
	Reporting Units	**ug/L**	**mg/L**	**mg/L**	**mg/L**	**S.U.**	**mg/L**	**mg/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**mg/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**pCi/L**
	Comparison Criteria	**16***	**4.4***	**1.8***	**0.1***	**3.9 - 7.1***	**1***	**31***	**6^{+}**	**10^{+}**	**2000^{+}**	**4^{+}**	**5^{+}**	**100^{+}**	**6^{+}**	**4^{+}**	**15^{+}**	**40^{+}**	**2^{+}**	**100^{+}**	**50^{+}**	**2^{+}**	**5^{+}**
Sample ID	**Sample Collection Date**	**Analytical Results**							**Analytical Results**														
CCR-01D	05/24/2018	**91**	**17**	0.86 j	**0.14**	6.3	**8.9**	**87**	<0.5	0.64	135	<0.1	<0.08	0.62 B	0.13	0.14	<0.1	20	<0.2	4.1	1.3	0.08 j	0.847 U
CCR-02D	05/24/2018	**207**	**12**	**1.9**	**0.14**	6.7	**24.2**	**87**	<0.5	**51.2**	79.9	<0.1	<0.08	0.22 j,B	0.2	0.14	<0.1	31	<0.2	9.1	0.99	<0.1	1.94
CCR-03D	05/24/2018	**262**	**10.9**	**1.9**	0.064 j	6.5	**27.3**	**77**	<0.5	0.56	15.8	<0.1	<0.08	2.7	0.77	0.064 j	<0.1	30	<0.2	<0.5	<0.5	0.021 j	4.44
CCR-04D	05/24/2018	**593**	**39.6**	**2.4**	**0.33**	6.7	**40.7**	**173**	0.12 j	1.8	93.8	<0.1	<0.08	0.34 j,B	0.13	0.33	<0.1	**61**	<0.2	1.2	<0.5	<0.1	**7.86**
CCR-05D	05/24/2018	**1070**	**54.6**	**3.2**	<0.1	6.2	**94.3**	**253**	<0.5	0.13	45.2	<0.1	<0.08	<0.5	0.025 j	<0.1	<0.1	**45**	<0.2	<0.5	<0.5	2	**7.66**
CCR-06D	05/24/2018	**1000**	**39**	**3.2**	<0.1	5.6	**104**	**209**	<0.5	0.37	38.5	<0.1	<0.08	0.32 j,B	0.045 j	<0.1	<0.1	21	<0.2	<0.5	<0.5	0.29	**15.1**

Prepared by: HHS Checked by:VTV

Notes:

175 - Bold, blue highlighted value indicates concentration detected at a statistically significant level greater than the comparison criteria for Appendix III constituents.

302 - Bold, orange highlighed value indicates concentration detected at a statistically significant level greater than the comparison criteria for Appendix IV constituents.

^ - Comparison criteria represents values noted in USEPA'S Amendments to the National Minimum Criteria (Phase One, Part One), Disposal of Coal Combustion Residuals from Electric Utilities; effective August 29, 2018.

+ - Comparison criteria represents the USEPA Maximum Contaminant Level (MCL).

* - Comparison criteria represents background concentration value developed in January 2018.

< - Concentration not detected at or above the adjusted reporting limit.

B - Target analyte detected in method blank at or above the reporting limit. Target analyte concentration in sample is less than 10X the concentration in the method blank. Analyte concentration in sample could be due to blank contamination.

Background wells include: MW-101D

j - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

mg/L - milligrams per liter

pCi/L - picocuries per liter

Radium (Total) = the sum of radium-226 + radium-228

S.U. - Standard Unit

U – Analyte was analyzed for, but not detected above the MDC.

ug/L - micrograms per liter

I/A

Hart Exhibit 56
Docket No. E-2, Sub 1219

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Apr 13 2020

ADVANCED GeoServices
Engineering for the Environment. Planning for People.™
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THE ELM CONSULTING GROUP INTERNATIONAL LLC

ENVIRONMENTAL AUDIT IN SUPPORT OF THE COURT APPOINTED MONITOR

Roxboro Steam Plant
Semora, North Carolina
USA

October 2019

Final Report Issued To:

Duke Energy and the Court Appointed Monitor

Prepared By:

Advanced GeoServices Corp.
and
The Elm Consulting Group International LLC

TABLE OF CONTENTS

1.0 INTRODUCTION

Advanced GeoServices Corp. (AGC) and The Elm Consulting Group International LLC (Elm) (collectively, the Audit Team) are conducting environmental compliance audits (the Audits) of certain coal combustion residuals (CCR) management locations owned or operated by Duke Energy Business Services LLC, Duke Energy Carolinas, LLC, and Duke Energy Progress, Inc. (collectively, Duke Energy). The Audits are being conducted under the direction of Mr. Benjamin Wilson, the Court Appointed Monitor (CAM), pursuant to an Order issued by the U.S. District Court, Eastern District of North Carolina, in case numbers 5:15-CR-62-H, 5:15-CR-67-H, and 5:15-CR-68-H.

The scope of the Audits is set forth in the plea agreements entered into by Duke Energy and the United States in the above cases, the Court's judgments in these cases, and a written Audit scoping document agreed to by Duke Energy and the United States.

1.1 BACKGROUND INFORMATION

The subject of this report is the Audit completed at Duke Energy's Roxboro Steam Electric Plant located in Semora, North Carolina. The Audit was conducted on July 22-23, 2019, for a total of two days on-site. The Audit Team members were:

• Mr. Christopher Reitman, P.E. AGC	Project Director, Audit Team Leader, Sr. Subject Matter Expert (on-site)
• Mr. Joseph Cotier, CPEA, Elm	Sr. Environmental Auditor (on-site)
• Mr. Bernie Beegle, P.G., AGC	Sr. Subject Matter Expert (off-site)

The facility was represented by:

- Mr. Tom Copolo, Station General Manager
- Mr. Jake Muessen, CCP System Owner

- Mr. Tim Hill, General Manager, Regional CCP Operations and Maintenance
- Ms. Gretchen Schroeder, CCP Engineering & Closure Engineering
- Mr. Bobby Barnes, Manager, Engineering & Closure Engineering
- Ms. Lori Tollie, EHS CCP Permitting and Compliance
- Ms. Kim Witt, EHS CCP Waste & Groundwater
- Ms. Tammy Jett, EHS CCP Waste & Groundwater (by phone)
- Mr. Randy Hart, Regulatory Affairs
- Ms. Keeley McCormick, Environmental Rover, EHS CCP Compliance
- Mr. Michael Phillips, Manager, EHS CCP Compliance
- Mr. Brian Fowler, EHS CCP Environmental Field Support
- Mr. Robert Howard, Station Environmental Field Support
- Mr. James Hailey, EHS CCP Health & Safety Field Support
- Mr. Keith Higgins, EHS CCP Compliance

1.2 FACILITY OVERVIEW

The Roxboro Steam Electric Plant (the Roxboro Facility) is located at 1700 Dunnaway Road in Semora, Person County, North Carolina. According to Duke Energy personnel, the Roxboro Facility has four coal-fired units, and the plant has a total electric generating capacity of 2,419 Megawatts (MWs) of power. All four coal burning units were operating while the Audit Team was on-site.

1.2.1 Ash Management Activities

The following information regarding the on-site CCR management facilities was provided during the pre-audit conference call or was found in the Operations and Maintenance Manual for the Roxboro Facility. The CCR management facilities include: two ash basins; one active landfill; three flue gas desulfurization (FGD) ponds; one gypsum storage area; and five fly ash silos.

These features are described below:

- West Ash Basin – The West Ash Basin has an area of approximately 240 acres and is made up of the following five dams/dikes: Main Dam (PERSO-038 by the North Carolina Department of Environmental Quality (NCDEQ)); Rock Filter Dam (PERSO-039 by NCDEQ); and three non-jurisdictional saddle dikes. According to the 2019 Annual Surface Impoundment Inspection Report, the West Ash Basin impounds approximately 12,970,000 tons of CCR and 120.8 million gallons of water as of March 12, 2019. The West Ash Basin historically received sluiced bottom ash, boiler slag, pyrites, stormwater, and flows from the East Ash Basin (stormwater and leachate). Duke Energy reported on their publicly available CCR website site that they ceased placing CCR and non-CCR waste in the West Ash Basin on April 10, 2019.

- East Ash Basin – The East Ash Basin was formed through the construction of the East Ash Basin Dam and was historically used as the ash treatment and storage basin for the Roxboro Facility. According to the 2019 Annual Surface Impoundment Inspection Report, this East Ash Basin has an area of approximately 126 acres and contains approximately 7,070,000 tons of CCR and no water (dry) as of March 12, 2019. An east finger of the East Ash Basin was identified by NCDEQ as a separate impoundment in its draft proposed ash basin classification document. Duke Energy subsequently clarified with NCDEQ that the "east finger" was not a separate impoundment but merely a portion of the East Ash Basin that was cut off as a result of construction of the landfill. This area is identified in Roxboro Facility correspondence as the Eastern Extension Impoundment.

  Ash flows to the East Ash Basin were discontinued in 1986; however, East Ash Basin stormwater and leachate from the CCP Landfill, which is located primarily within the East Ash Basin and is discussed below, historically discharged through a culvert system to the West Ash Basin. Duke Energy reported on their CCR publicly available website that they ceased placing CCR and non-CCR waste in the East Ash Basin on April 10, 2019.

- CCP Landfill – In 1988, the construction of the CCP Landfill (identified as the Industrial Landfill on CCR correspondence) was permitted. A significant portion of the CCP Landfill is located within the boundary of the East Ash Basin. The total permitted landfill area is approximately 280 acres, and development is permitted in six phases. Phases 1 through 5 were permitted and constructed with a single liner with leachate collection; Phase 6 has a double liner system with leachate collection and leak detection. Phases 1 through 5 have a temporary cover while Phase 6 is active with ongoing placement of waste. The waste being landfilled includes fly ash, bottom ash, boiler slag, mill rejects, FGD residuals, and gypsum.

- FGD Ponds – There are three FGD Ponds at the Roxboro Facility that are formed by three dams that share abutment features. The total length of the exterior dam is 5,100 feet. These three ponds are the West FGD Settling Pond (identified as PERSO-039 by NCDEQ), the East FGD Settling Pond (identified as PERSO-041 by NCDEQ), and the FGD Forward Flush (FF) Pond (identified as PERSO-042 by NCDEQ). The West and East FGD Settling Ponds receive FGD blowdown. The FGD FF Pond receives inflow from the back-flush of the bioreactor. The inflow is treated and released from the West and East FGD Settling Ponds at NPDES Internal Outfall 010. According to the 2019 Annual Surface Impoundment Inspection Report, the three FGD Ponds at the Roxboro Facility have a total area of approximately 29.5 acres and contain approximately 203,300 tons of CCR as of March 12, 2019. Impounded water in the FGD Ponds varies based upon bioreactor operations.

- Gypsum Storage Area – The Gypsum Storage Area is located north of the East Ash Basin. The Gypsum Storage Area stores gypsum material from the FGD process of the Roxboro Facility and Duke Energy's Mayo Facility. A conveyor at the Roxboro Facility is used to transfer the gypsum to the Gypsum Storage Area. The gypsum is moved from the Gypsum Storage Area to an off-site wallboard manufacturer on the other (far) side of the Intake Canal with another conveyor system. Off-spec gypsum is disposed in the on-site CCP Landfill.

- Fly Ash Silos – The Roxboro Facility contains five dry fly ash silos. Fly ash is transferred pneumatically into the ash silos. At the silos, the fly ash is treated for on-site disposal in the CCP Landfill or separated for beneficial use.

In addition to the above described ash management activities, three legacy ash structural fills exist at the facility. These legacy structural fills are located: 1) under the coal pile; 2) under the gypsum pad; and 3) under the CCP landfill.

1.2.2 Environmental Permits and Programs

The Roxboro Facility operates under a number of current environmental permits and programs, including:

- **National Pollutant Discharge Elimination System (NPDES) Wastewater Permitting and Special Order by Consent Discharges –** NCDEQ issued NPDES Permit No. NC00003425 with an effective date of May 1, 2007 and an expiration date of March 31, 2012. A timely permit renewal application package was submitted to NCDEQ on September 27, 2011. Permit renewal updates were submitted to NCDEQ on July 5, 2016 (inclusion of Areas of Wetness S-18 and S-19) and November 6, 2018 (direct coal pile runoff to the new Lined Retention Basin; include the new Lined Retention Basin discharge as internal outfall 012B;

include Outfall 012B as a discharge to existing Outfall 003 via the Heated Water Discharge Canal; and eliminate Outfall 006). A new permit has not yet been issued by NCDEQ. As it relates to CCR management activities, the currently effective permit covers the following Outfalls:

- Internal Outfall 002 – Ash Basin treatment system waters flow to a discharge canal, then the Heated Water Discharge Canal, and then discharge to Hyco Lake via Outfall 003;
- Outfall 003 – The Heated Water Discharge Canal collects various waters from the plant and discharges to Hyco Lake through this outfall;
- Internal Outfall 005 – Cooling tower blowdown water from Unit 4 discharges to the ash basin system through this outfall;
- Outfall 006 – Coal pile runoff, limestone and gypsum pile runoff, and wheel wash water all flow to a retention pond for neutralization, sedimentation, and equalization and then discharge to Hyco Lake through this outfall;
- Internal Outfall 008 – Domestic wastewater discharges to the ash basin system through this outfall;
- Internal Outfall 009 – Chemical metal wash water discharges to the ash basin system through this outfall; and
- Internal Outfall 010 – FGD treatment system waters flow to the west basin canal, then the Heated Water Discharge Canal, and then discharge to Hyco Lake via Outfall 003.

On March 14, 2019, Duke Energy submitted a letter to NCDEQ advising of the commissioning of the new Lined Retention Basin, which would receive all Roxboro Facility waters. These waters were previously directed to the Ash Basin. NCDEQ approved these changes in its March 26, 2019 letter response to Duke Energy. Wastewater discharges to the Ash Basin were discontinued and redirected to the Lined Retention Basin on April 10, 2019. Discharge from the Lined Retention Basin via Outfall 012B commenced on April 22, 2019. As noted above, Outfall

012B discharges to the Heated Water Discharge Canal and then to Outfall 003, and was included in the Roxboro Facility's NPDES permit renewal updates. However, NCDEQ has not yet issued a new permit.

The Roxboro Facility currently operates a network of eight compliance wells sampled three times per year for determining compliance with groundwater limits pursuant to 15A NCAC 02L.0200.

On August 15, 2018, the North Carolina Environmental Management Commission Special Order by Consent No. EMC SOC WQ S18-005 (SOC) issued to Duke Energy became effective. The SOC has an expiration date of "no later than June 30, 2022." The SOC covers discharges from the following seeps: S-01, S-02, S-03, S-04, S-05, S-06, S-07, S-08, S-09, S-10, S-11, S-12, S-13, S-14, S-18, S-19, S-20, S-21, S-22 and S-23, all considered non-constructed seeps. Non-constructed seeps are not on or within a dam structure and do not convey wastewater via a pipe or constructed channel directly to a receiving stream.

Seeps S-10, S-11, and S-12 have been dispositioned due to lack of flow. These seeps do not carry monitoring requirements. For monitoring purposes, the following seeps are represented by other seeps or monitoring programs: S-01, S-02, S-03, S-04, S-05, S-06, S-07, S-08, S-13, S-14, S-19, S-21, S-22, and S-23. Monitoring is required at S-13, S-18, and S-20. S-18 and S-20 include interim action levels for total hardness, total dissolved solids, and sulfates. Seep S-13 is represented by instream monitoring covering the 2B standards in an unnamed tributary to Hyco Lake. Quarterly monitoring is required for parameters specified in the SOC. At the time of the Audit, four rounds of sampling had been conducted. No exceedances of Interim Action Levels were noted.

Additional requirements of the SOC included:

- Payment of an upfront civil penalty within 30 days of SOC issuance. This penalty was paid September 13, 2018.
- Completion of the dry bottom ash system (submerged flight conveyor or SFC) by May 31, 2019. In a March 21, 2019 letter to NCDEQ, Duke Energy reported commencement of the dry bottom ash handling system.
- Initiation of decanting of the Ash Basin by June 30, 2019. In its first quarterly decanting report to NCDEQ dated July 12, 2019, Duke Energy reported commencement of decanting had taken place on April 10, 2019.
- Annual completion of a comprehensive survey of existing and potentially new seeps. New non-constructed seeps identified and reported to NCDEQ in the Annual Seep Report are deemed covered by the SOC. The Annual Seep Survey was conducted on October 25, 2018 with a subsequent report submitted to NCDEQ on April 24, 2019. The SOC requires the Annual Seep Survey to be submitted by April 30 each year. No new seeps were identified during the 2018 annual seep survey.
- Posting of a copy of the Roxboro Facility NPDES Permit, SOC, and related reports on Duke Energy's external website. All required documents have been posted.

- **NPDES Industrial Stormwater Permitting** – NCDEQ issued Individual Stormwater Permit No. NCS000581 with an effective date of January 27, 2017 and an expiration date of December 31, 2021. The permit was modified on June 22, 2017 and includes one stormwater outfall, SW-A, which drains an area north of the generation powerhouse and discharges to Hyco Lake. A Stormwater Pollution Prevention Plan (SWPPP) dated June 2017 has been developed and implemented.

- **NPDES Construction Stormwater Permitting** – NCDEQ has issued ten stormwater construction permits to Duke Energy for activities related to the facility's CCR management. These permits were issued by NCDEQ under its Stormwater General Permit for Construction Activities, No. NCG010000.
  - PERSO-2017-004 was issued November 7, 2016 for the Water Redirection Program (submerged flight conveyor);
  - PERSO-2017-011 was issued April 24, 2017 for wastewater treatment, bottom ash, and the retention basin;
  - PERSO-2018-014 was issued April 30, 2018 for the Leachate Transfer Line;
  - PERSO-2018-010 was issued March 16, 2018 for the Lined Retention Basin (LRB) Emergency Spillway;
  - PERSO-2018-005 was issued November 17, 2017 for the Process Water Redirect-Final Phase;
  - PERSO-2018-010 was issued May 11, 2018 for Water Redirection Project-Final Phase;
  - PERSO-2018-003 was issued October 11, 2017 for the Phase 6 Landfill-East Divider berm;
  - PERSO-2014-001 was issued August 16, 2013 for the Monofill Borrow Area;
  - PERSO-2014-004 was issued September 5, 2013 for the Lined Ash Monofill-Phase 6; and
  - PERSO-2017-005 was issued January 13, 2017 for Monofill Berm Vegetation Removal.

At the time of the Audit, erosion and sedimentation control plans were in place for these projects.

- **Title V Permitting** – Title V Permit No. 01001T56, effective November 27, 2018 and with an expiration date of September 30, 2023, has been issued to the Roxboro Facility for all facility activities, including gypsum storage and transfer operations, ash transfer operations, ash silos, and ash basin management. Ash management activities listed as sources included: fly and bottom ash handling; the CCP landfill; the gypsum handling; and the truck transport of ash and gypsum. Fugitive dust control was included in Section 3.MM of the permit.

- **Spill Prevention, Control, and Countermeasure (SPCC) Plan** – A Tier I Qualified Plan was prepared by Charah, Inc., a contractor to Duke Energy, for ash excavation and gypsum management activities. The SPCC Plan was dated July 30, 2018.

- **Tier II Reporting** – Hazardous chemicals inventory reporting on Tier II for 2018 has been completed and was submitted on February 25, 2019.

- **CCP Landfill** – The CCP Landfill began operating under NCDEQ Solid Waste Permit No. 7302 in 1988. The permit requires semi-annual groundwater monitoring, semi-annual sampling of untreated leachate, an annual dam safety progress reporting, a record of the amount of waste received (compiled on a monthly basis), and submission of an annual report. The CCP Landfill groundwater monitoring network consists of five (5) detection wells and one (1) background well, which are sampled semi-annually.

- **Waste Unit Compliance Boundaries** – NCDEQ issued a letter dated August 25, 2017 to Duke Energy regarding compliance boundaries for North Carolina coal ash facilities. On February 15, 2018, Duke Energy submitted to NCDEQ an updated compliance boundary map for the Roxboro Facility Ash Basins that eliminated the Gypsum Storage Area. On June 26, 2018, Duke Energy submitted to NCDEQ a future compliance boundary for the Roxboro Facility that will eliminate the compliance boundary associated with the Eastern Extension Impoundment located on the northwest the East Ash Basin. Duke Energy plans on removing the CCR within this impoundment as part of closure activities.

- **North Carolina Coal Ash Management Act of 2014 (CAMA)** – CAMA requires identification of drinking water supply wells within one-half mile of the facility, submission of Groundwater Assessment Plans, installation and multiple rounds of sampling from Assessment Wells, submission of Groundwater Assessment Reports summarizing groundwater investigations, submission of an Annual Groundwater Protection and Restoration Report, submission of Discharge Assessment Plans to characterize seeps, submission of a Groundwater Corrective Action Plan, and ash basin closure/removal. These activities have been completed in accordance with the schedule required under CAMA.

  NCDEQ initially assigned both the East and West Ash Basins at the Roxboro Facility an "intermediate risk" classification under CAMA. An intermediate risk classification requires excavation, removal, and safe storage of the impounded coal ash by December 31, 2024. Duke Energy completed dam improvements and local installation of an alternative potable drinking water, and as a result, NCDEQ assigned the Roxboro Facility a "low risk" ranking on November 13, 2018. The low risk classification allows in-place closure activities at the East and West Ash Basins and provides an extension of the closure deadline to June 2030. However, on April 1, 2019, NCDEQ issued a closure determination directing Duke Energy to excavate all of the CAMA-related coal ash from the Roxboro Facility and properly dispose of it. On April 26, 2019, Duke Energy filed an administrative petition challenging NCDEQ's determination.

The current Interim Monitoring Plan (IMP) for groundwater monitoring at the Roxboro Facility includes sampling 25 wells quarterly and 75 wells semi-annually. Duke Energy submitted the 2018 CAMA Interim Monitoring Report dated April 30, 2019 to NCDEQ.

Duke Energy submitted to NCDEQ the Roxboro Facility’s 2018 Groundwater Protection and Restoration Annual Report on January 25, 2019 and its 2018 Surface Water Protection and Restoration Annual Report on January 21, 2019.

- **Federal Coal Combustion Residuals Rule (CCR Rule)** – The CCR Rule (40 CFR, part 257, Subpart D) identifies standards for the disposal of CCR in landfills and surface impoundments. The West Ash Basin, the East Ash Basin, the CCP Landfill, the West FGD Settling Pond, the East FGD Settling Pond, and the FGD Forward Flush Pond are subject to the CCR Rule because the Roxboro Facility continues to use coal for power generation. Tables 1a through 1f summarize the reports and plans posted by Duke Energy to its publicly available website in accordance with the CCR Rule.

  The East Ash Basin and the CCP Landfill’s CCR multi-unit monitoring well network (CCR Multi-unit 1) consists of 25 CCR monitoring wells. The West Basin, the West FGD Settling Pond, the East FGD Settling Pond, and the FGD Forward Flush Pond utilize a separate CCR multi-unit monitoring well network (CCR Multi-unit 2) consisting of 34 CCR monitoring wells

  On February 27, 2018, Duke Energy provided notice on Duke Energy’s public website that the West Ash Basin, the East Ash Basin, the CCP Landfill, the West FGD Settling Pond, the East FGD Settling Pond, and the FGD Forward Flush Pond are now in the CCR assessment monitoring program due to statistically significant increases over the background values of the Appendix III parameters.

On November 7, 2018, Duke Energy posted on Duke Energy's public website the required location restrictions for the Roxboro Facility impoundments, which stated the East Ash Basin and West Ash Basin did not meet the surface impoundment standard for placement above the uppermost aquifer (40 CFR § 257.60(a)). The West Ash Basin did not meet the surface impoundment standard for wetlands (40 CFR § 257.61(a)). Failure to meet the wetlands restriction requires Duke Energy to cease placing CCR and non-CCR waste streams into the West Ash Basin by April 12, 2019 and begin closure.

On December 14, 2018, Duke Energy provided notice on Duke Energy's public website that the following CCR Rule Appendix IV constituents were detected at levels above the applicable Groundwater Protection Standard (GWPS).

East Ash Basin and Industrial Landfill

- Cobalt
- Lithium
- Molybdenum
- Selenium

West Ash Basin, East and West FGD Settling Ponds, and the FGD Forward Flush Pond

- Arsenic
- Cobalt
- Molybdenum

On February 19, 2019, Duke Energy provided notice on Duke Energy's public website that an assessment of corrective measures was initiated for the East Ash

Basin, the Industrial Landfill, the West FGD Settling Pond, the East FGD Settling Pond, and the FGD Forward Flush Pond in accordance with 40 CFR § 257.96(a).

On March 1, 2019, Duke Energy posted on its public website the CCR Annual Groundwater Monitoring and Corrective Action Reports, dated January 18, 2019, for the West Ash Basin, the East Ash Basin, the CCP Landfill, the West FGD Settling Pond, the East FGD Settling Pond, and the FGD Forward Flush Pond.

On May 7, 2019, Duke Energy provided notice on Duke Energy's public website of CCR Assessment of Corrective Measures Reports for the East Ash Basin, the Industrial Landfill, the West FGD Settling Pond, the East FGD Settling Pond, and the FGD Forward Flush Pond.

On May 20, 2019, Duke Energy posted on its public website the Notice of Intent to Close the East Ash Basin and the West Ash Basin and noted that flows to these Basins were ceased on April 10, 2019.

1.2.3 Dam and Other Structural Permits and Approvals

The Main Dam (PERSO-038) and the Rock Filter Dam (PERSO-039) of the West Ash Basin, the East Ash Basin Dam (PERSO-033), the West FGD Pond (PERSO-040), the East FGD Pond (PERSO-041), and FGD FF Pond (PERSO-042) at the Roxboro Facility are associated with the ash management operations. These dams were grandfathered under North Carolina's Session Law 2009-390 (Senate Bill 1004, effective January 1, 2010). Under this grandfathering, the original design of the dams is not subject to the current design standards for new construction, although modifications after the effective date may be subject to these standards. All five (5) dams referenced above have a high hazard classification under the North Carolina Dam Safety system.

Over the last year Duke Energy modified the lower bench of the East Ash Basin Dam to facilitate installation of the Dry Fly Ash Silo Pipeline and repaired two culverts which go under a road in the area of the landfill. Duke Energy has also submitted plans to remove (breach) the West FGD Settling Pond Dam, the East FGD Settling Pond Dam, and the Forward Flush Pond Dam.

A new Lined Retention Basin dam and a new Holding Basin Dam were also constructed and Engineer of Record Certifications were submitted for each on February 13, 2019.

On February 1, 2019, Chapter 15A section 02K.0224 of the North Carolina Administrative Code (15A NCAC 02K.0224) was published in the North Carolina Register. These regulations created new standards for CCR impoundment during flood events. Duke Energy met with NCDEQ to discuss these regulations on March 13, 2019 and completed analysis of the spillways at their facilities on July 10, 2019. The analysis showed the Roxboro East Ash Basin will require modification to meet the new requirements. Duke Energy is scheduled to meet with NCDEQ on August 21, 2019 to discuss their approach and the timing for meeting these new CCR basin standards.

1.2.4 Audit Notes and Observations and an Update of Facility Activities

During the 2019 Audit, the redirection of water flow activities were substantially complete. This project included construction of a new wastewater treatment system that includes the Lined Retention Basin and the Holding Basin and construction of a submerged flight conveyor, which allows dry handling of the bottom ash that historically was sluiced to the West Ash Basin and came on line in December 2018. These new facilities are on the western side of the Roxboro Facility property. The new Lined Retention Basin required construction of a high hazard dam based on its size and the amount of wastewater it may hold.

Significant projects completed or underway on the West Ash Basin included: cleaning a pipe under Dunnaway Road; developing plans for decommissioning of the FGD Basins; and construction of a dewatering pad near the Western Ash Basin Dam.

Significant projects completed or under construction on the East Ash Basin included: installation of an ash pipeline to convey dry fly ash silo discharge and water from the East Ash Basin to the new Lined Retention Basin; repair of two culverts; and closure of a small section of the CCP Landfill which sits above a newly installed landfill leachate collection system.

Final closure plans are being revised and permit level drawings are planned for submission by December 31, 2019 for both the East and the West Ash Basins. Duke Energy anticipates having design approaches for both a cap-in-place closure approach and a CAMA ash-excavation approach available for the December 31, 2019 submission.

2.0 AUDIT SCOPE AND SUBJECT MATTER

The Audit was completed in accordance with the court documents and the Audit scoping document agreed to by Duke Energy and the United States. A description of the scope is provided in Attachment A. The Audit included ash management activities, including aspects of generation that affect the nature of the waste streams from the point of generation into surface impoundments or ash management basins, landfills, and/or storage piles. The Audit focused on the activities at the facility since the date of the last Audit, which was July 23-24, 2018.

3.0 AUDIT FINDINGS

The following Findings at the Roxboro Facility were identified by the Audit Team.

3.1 EXCEEDANCES OF THE STATE GROUNDWATER QUALITY STANDARDS

Requirement – The State groundwater rules establish maximum contaminant levels for groundwater at or beyond the compliance boundaries for the East and West Ash Basins. *See* 15A NCAC 02L.0202. 15A NCAC 02L.0103(d) provides that "[n]o person shall conduct or cause to be conducted, any activity which causes the concentration of any substance to exceed that specified" under the Class GA standards or the interim maximum acceptable concentrations (IMACs) established for groundwater quality pursuant to 15A NCAC 02L.0202. Further, under N.C.G.S.A. § 143-215.1(i), "[a]ny person … who is required to obtain an individual permit … for a disposal system under the authority of N.C.G.S.A. § 143-215.1 [water pollution control] … shall have a compliance boundary … beyond which groundwater quality standards may not be exceeded." *See also* 15A NCAC 02L.0102(3) (defining "compliance boundary" as "a boundary around a disposal system at and beyond which groundwater quality standards may not be exceeded").

In addition, under N.C.G.S.A. § 143-215.6A(a)(1), civil penalties may be assessed against any person who violates any standard established by NCDEQ under the authority of N.C.G.S.A. § 143-214.1, which covers groundwater standards.

Finding – Constituents exceeding the standards for Class GA waters, established in 15A NCAC 02L.0202, were documented in monitoring wells located at or beyond the compliance boundary for the East and/or West Ash Basins. Based on the review of the 2018 and 2019 CAMA groundwater monitoring analyses and the NPDES groundwater monitoring analyses, pH, boron, cobalt, iron, manganese, sulfate, vanadium, and TDS were observed to exceed the 02L or IMAC groundwater standards, or NCDEQ-approved PBTVs if the PBTV was greater than the 02L or IMAC groundwater standards, one or more times at or beyond the compliance boundaries of the East and/or West Ash Basins. The 2018 and 2019 groundwater data summary and a well location map are located in Attachment B to this report. Attachment C provides the 2018 and 2019 NPDES Ash Basin Groundwater Results.

Duke Energy is addressing the groundwater exceedances as required by the state under CAMA, as well as under the CCR rule. Duke Energy has stated its opinion that, pursuant to a September 2015 Settlement Agreement with NCDEQ, “Duke Energy is not subject to any further financial penalties for exceedances of groundwater standards” and “Duke Energy is not subject to any further enforcement action based on exceedances of groundwater standards as long as it remains in substantial compliance with CAMA groundwater requirements.”

The CAM has advised the Audit Team that the Audit scope does not include an evaluation of compliance with the September 2015 Settlement Agreement, and therefore the Audit Team does not take a position on Duke Energy’s opinion.

4.0 OPEN LINES OF INQUIRY

Open Lines of Inquiry are items identified by the Audit Team while on-site that, due to limited available information or the need for additional research, could not be determined as being in compliance or out of compliance. There were no Open Lines of Inquiry identified during the Audit.

5.0 AUDIT APPROACH

5.1 ON-SITE ACTIVITIES

During its time on-site, the Audit Team conducted an opening conference with facility personnel to discuss the scope of work and the plan for accomplishing necessary tasks while at the facility. A site tour of the coal ash management and program support areas was subsequently completed. Following the tour, the Audit Team conducted a review of pertinent files, interviews with facility representatives, and verification of facility activities related to the ECPs, written programs, and permits. A debrief was conducted each Audit day to advise the facility representatives of Audit progress, open lines of inquiry, possible Audit findings, and needs for the next day. At the completion of the Audit, the Audit Team led a verbal discussion of draft Audit findings with facility representatives.

5.2 STANDARDS OF PRACTICE

The fieldwork portion of the Audit was conducted on July 22-23, 2019, with compliance reporting commencing May 14, 2015, the date of the Court's judgments. The Audit focused on the activities at the facility since the date of the last Audit, which was July 23-24, 2018 and was based on:

- Physical inspections of the facility;
- Examination of selected administrative and operating records made available by facility staff at the Audit Team's request;
- Interviews and discussions with key facility management and staff; and
- Verification procedures designed to assess the facility's application of, and adherence to, terms of the Probation, environment laws and regulations, and site policies and procedures. In addition, the Audit Team reviewed the facility's adherence to good management practices.

The Audit followed established audit protocols and procedures. It should be understood that the Audit consisted of evaluating a sample of practices and was conducted over a short period of time.

Efforts were made to sample major facets of environmental performance during the period under review. This method is intended to uncover major system deficiencies, and the Audit may not have identified all potential problems.

To support the overall independence of the Audit process, the Audit included an auditing professional certified by the Board of Environmental, Health and Safety Auditor Certifications (BEAC). BEAC is an accredited professional certification board that issues the Certified Professional Environmental Auditor (CPEA) designation to qualified auditors. Under BEAC, auditor independence is a key criterion for the implementation of an effective third-party audit program. The Audit was implemented in accordance with the standards related to auditor independence.

The process by which the Audit was conducted was consistent with the general state of the art of environment auditing and the best professional judgment of the Audit Team. To conduct the Audit, the team implemented a formal approach, drawing on process guidance from both BEAC and the Auditing Roundtable (AR) guidance documents. Guidance documents included:

- *Standards for the Professional Practice of Environmental, Health and Safety Auditing*. Prepared by the Board of Environmental, Health and Safety Auditor Certifications, 2008.

- ISO 19011:2002 – *Guidelines for Quality and/or Environmental Management Systems Auditing*. Prepared by the International Organization for Standardization, 2002.

- *Standard for the Design and Implementation of an Environmental, Health and Safety Audit Program*. Prepared by The Auditing Roundtable, Inc., 1995.

- *Minimum Criteria for the Conduct of Environmental, Health and Safety Audits*. Prepared by The Auditing Roundtable, Inc.

5.3 REPRESENTATIVE SAMPLING

When confronted with a large population of data to review or equipment to inspect, the Audit Team employed representative sampling techniques to evaluate records over the Audit period requested, and as necessary, for physical inspection of some types of common equipment. The sample size for records reviews or equipment inspections required professional judgment.

The Audit Team's judgement considered the following:

- The outcome of the evaluation of the records sampled. If problems are found in the representative sample, more records may need to be examined to evaluate compliance status.
- Potential for or severity of non-compliance.
- The general appearance and observed practices of certain operating areas.
- Information obtained during an interview that indicates a potential problem.
- Other specific information or guidance from the CAM.
- Time available during the Audit.

The Audit Team also employed the following types of sampling techniques, depending upon the characteristics of a specific population:

- Random sampling – every item has an equal chance of being selected.
- Interval sampling – select every nth item, (e.g., every third manifest in chronological order as contained in facility files).
- Block sampling – auditor uses his/her judgment to select a specific block of items, (e.g., petroleum storage tank inspections from April to October).
- Stratified sampling – population is divided into groups, which are then sampled through random or judgmental techniques.

TABLES

TABLE 1A
East Ash Basin (East Ash Pond) - Plans and Reports Posted by Duke Energy under the CCR Rule

Document Name	Category	Release Date
Emergency Action Plan East Ash Pond, West Ash Pond, West Settling Pond East Settling Pond and FGD Forward Flush Pond	Design Criteria	08/28/2019
CCR Annual Surface Impoundment Inspection Report 2019	Operating Criteria	05/29/2019
Notice of Intent to Close	Closure and Post Closure Care	05/20/2019
CCR Assessment of Corrective Measures Report	Groundwater Monitoring and Corrective Action	05/07/2019
Annual Meeting with Local Emergency Responders 2019	Design Criteria	04/24/2019
CCR Annual Groundwater Monitoring and Corrective Action Report 2018	Groundwater Monitoring and Corrective Action	03/01/2019
Notice of Initiation of Assessment of Corrective Measures	Groundwater Monitoring and Corrective Action	02/19/2019
Notice of Groundwater Protection Standard Exceedance 2018	Groundwater Monitoring and Corrective Action	12/14/2018
EAP Activation Level 3, 10/31/2018: 6.5" Hole Discovered and Water Coming from Hole	Design Criteria	12/05/2018
Annual Fugitive Dust Control Report 2018	Operating Criteria	12/05/2018
Fugitive Dust Control Plan	Operating Criteria	11/19/2018
Wetlands	Location Restriction	11/07/2018
Unstable Areas	Location Restriction	11/07/2018
Seismic Impact Zones	Location Restriction	11/07/2018
Fault Areas	Location Restriction	11/07/2018
Placement Above Uppermost Aquifer	Location Restriction	11/07/2018

TABLE 1A
(Continued)

Document Name	Category	Release Date
Emergency Action Plan Roxboro East Ash Pond, West Ash Pond and Associated Structures	Design Criteria	10/01/2018
CCR Annual Surface Impoundment Inspection Report 2018	Operating Criteria	06/06/2018
Annual Meeting with Local Emergency Responders 2018	Design Criteria	05/01/2018
Inundation map	Design Criteria	04/09/2018
Notice of Establishment of an Assessment Monitoring Program Roxboro East Ash Pond	Groundwater Monitoring and Corrective Action	02/27/2018
CCR Annual Groundwater Monitoring and Corrective Action Report	Groundwater Monitoring and Corrective Action	02/06/2018
2017 Annual CCR Fugitive Dust Control Report-Roxboro	Operating Criteria	11/29/2017
Groundwater Monitoring System Certification-Roxboro East Ash Pond	Groundwater Monitoring and Corrective Action	11/06/2017
Groundwater Sampling and Analysis Program Selection of Statistical Method Certification-Roxboro East Ash Pond	Groundwater Monitoring and Corrective Action	10/25/2017
Roxboro Inundation Maps	Design Criteria	10/06/2017
Fugitive Dust Control Plan Revision 1	Operating Criteria	08/02/2017
CCR Annual Surface Impoundment Inspection Report 2017 - Roxboro	Operating Criteria	06/06/2017
Annual Meeting with Local Emergency Responders 2017	Design Criteria	05/24/2017
Annual Fugitive Dust Control Report 2016	Operating Criteria	12/05/2016
Initial Structural Stability Assessment	Design Criteria	11/16/2016
Initial Factor of Safety Assessment	Design Criteria	11/15/2016
Post Closure Plan for Impoundments	Closure and Post Closure Care	11/11/2016

TABLE 1A
(Continued)

Document Name	Category	Release Date
Closure Plan for Impoundments	Closure and Post Closure Care	11/11/2016
Inflow Design Flood Control System	Operating Criteria	11/03/2016
History of Construction	Design Criteria	10/25/2016
Initial Hazard Classification Assessment Certification	Design Criteria	10/12/2016
Existing Liner Design Criteria	Design Criteria	10/11/2016
Annual Surface Impoundment Inspection Report 2016	Operating Criteria	06/15/2016
Annual Surface Impoundment Report (Initial)	Operating Criteria	02/16/2016
Annual Surface Impoundment Report (Initial) Revision 1	Operating Criteria	02/19/2016

*This summary of reports was downloaded on October 10, 2019

TABLE 1B
West Ash Basin (West Ash Pond) - Plans and Reports Posted by Duke Energy under the CCR Rule

Document Name	Category	Release Date
Emergency Action Plan East Ash Pond, West Ash Pond, West Settling Pond East Settling Pond and FGD Forward Flush Pond	Design Criteria	08/28/2019
CCR Annual Surface Impoundment Inspection Report 2019	Operating Criteria	05/29/2019
Notice of Groundwater Protection Standard Exceedance 2019	Groundwater Monitoring and Corrective Action	05/20/2019
Notice of Intent to Close	Closure and Post Closure Care	05/20/2019
CCR Assessment of Corrective Measures Report	Groundwater Monitoring and Corrective Action	05/07/2019
Annual Meeting with Local Emergency Responders 2019	Design Criteria	04/24/2019
CCR Annual Groundwater Monitoring and Corrective Action Report 2018	Groundwater Monitoring and Corrective Action	03/01/2019
Notice of Initiation of Assessment of Corrective Measures	Groundwater Monitoring and Corrective Action	02/19/2019
Notice of Groundwater Protection Standard Exceedance 2018	Groundwater Monitoring and Corrective Action	12/14/2018
Annual Fugitive Dust Control Report 2018	Operating Criteria	12/05/2018
Fugitive Dust Control Plan	Operating Criteria	11/19/2018
Wetlands	Location Restriction	11/07/2018
Unstable Areas	Location Restriction	11/07/2018
Seismic Impact Zones	Location Restriction	11/07/2018
Fault Areas	Location Restriction	11/07/2018

TABLE 1B
(Continued)

Document Name	Category	Release Date
Placement Above Uppermost Aquifer	Location Restriction	11/07/2018
Emergency Action Plan Roxboro East Ash Pond, West Ash Pond and Associated Structures	Design Criteria	10/01/2018
CCR Annual Surface Impoundment Inspection Report 2018	Operating Criteria	06/06/2018
Annual Meeting with Local Emergency Responders 2018	Design Criteria	05/01/2018
Notice of Establishment of an Assessment Monitoring Program Roxboro West Ash Basin	Groundwater Monitoring and Corrective Action	02/27/2018
CCR Annual Groundwater Monitoring and Corrective Action Report	Groundwater Monitoring and Corrective Action	02/06/2018
2017 Annual CCR Fugitive Dust Control Report-Roxboro	Operating Criteria	11/29/2017
Groundwater Monitoring System Certification-Roxboro West Ash Basin	Groundwater Monitoring and Corrective Action	11/06/2017
Groundwater Sampling and Analysis Program Selection of Statistical Method Certification-Roxboro West Ash Basin	Groundwater Monitoring and Corrective Action	10/25/2017
Roxboro Inundation Maps	Design Criteria	10/06/2017
Fugitive Dust Control Plan Revision 1	Operating Criteria	08/02/2017
CCR Annual Surface Impoundment Inspection Report 2017 - Roxboro	Operating Criteria	06/06/2017
Annual Meeting with Local Emergency Responders 2017	Design Criteria	05/24/2017
Annual Fugitive Dust Control Report 2016	Operating Criteria	12/05/2016
Initial Structural Stability Assessment	Design Criteria	11/16/2016
Initial Factor of Safety Assessment	Design Criteria	11/15/2016
Post Closure Plan for Impoundments	Closure and Post Closure Care	11/11/2016

TABLE 1B
(Continued)

Document Name	Category	Release Date
Closure Plan for Impoundments	Closure and Post Closure Care	11/11/2016
Inflow Design Flood Control System	Operating Criteria	11/03/2016
History of Construction	Design Criteria	10/25/2016
Initial Hazard Classification Assessment Certification	Design Criteria	10/12/2016
Existing Liner Design Criteria	Design Criteria	10/11/2016
Annual Surface Impoundment Inspection Report 2016	Operating Criteria	06/15/2016
Annual Surface Impoundment Report (Initial)	Operating Criteria	02/16/2016
Annual Surface Impoundment Report (Initial) Revision 1	Operating Criteria	02/19/2016

*This summary of reports was downloaded on October 10, 2019

TABLE 1C
West FGD Settling Pond - Plans and Reports Posted by Duke Energy under the CCR Rule

Document Name	Category	Release Date
Emergency Action Plan East Ash Pond, West Ash Pond, West Settling Pond East Settling Pond and FGD Forward Flush Pond	Design Criteria	08/28/2019
CCR Annual Surface Impoundment Inspection Report 2019	Operating Criteria	05/29/2019
Notice of Groundwater Protection Standard Exceedance 2019	Groundwater Monitoring and Corrective Action	05/20/2019
CCR Assessment of Corrective Measures Report	Groundwater Monitoring and Corrective Action	05/07/2019
Annual Meeting with Local Emergency Responders 2019	Design Criteria	04/24/2019
CCR Annual Groundwater Monitoring and Corrective Action Report 2018	Groundwater Monitoring and Corrective Action	03/01/2019
Notice of Initiation of Assessment of Corrective Measures	Groundwater Monitoring and Corrective Action	02/19/2019
Notice of Groundwater Protection Standard Exceedance 2018	Groundwater Monitoring and Corrective Action	12/14/2018
Annual Fugitive Dust Control Report 2018	Operating Criteria	12/05/2018
Fugitive Dust Control Plan	Operating Criteria	11/19/2018
Wetlands	Location Restriction	11/07/2018
Unstable Areas	Location Restriction	11/07/2018
Seismic Impact Zones	Location Restriction	11/07/2018
Fault Areas	Location Restriction	11/07/2018
Placement Above Uppermost Aquifer	Location Restriction	11/07/2018
Emergency Action Plan Roxboro East Ash Pond, West Ash Pond and Associated Structures	Design Criteria	10/01/2018
CCR Annual Surface Impoundment Inspection Report 2018	Operating Criteria	06/06/2018

TABLE 1C
(Continued)

Document Name	Category	Release Date
Annual Meeting with Local Emergency Responders 2018	Design Criteria	05/01/2018
Notice of Establishment of an Assessment Monitoring Program Roxboro West FGD Settling Pond	Groundwater Monitoring and Corrective Action	02/27/2018
CCR Annual Groundwater Monitoring and Corrective Action Report	Groundwater Monitoring and Corrective Action	02/06/2018
2017 Annual CCR Fugitive Dust Control Report-Roxboro	Operating Criteria	11/29/2017
Groundwater Monitoring System Certification-Roxboro West FGD Settling Pond	Groundwater Monitoring and Corrective Action	11/06/2017
Groundwater Sampling and Analysis Program Selection of Statistical Method Certification-Roxboro West FGD Settling Pond	Groundwater Monitoring and Corrective Action	10/25/2017
Roxboro Inundation Maps	Design Criteria	10/06/2017
Fugitive Dust Control Plan Revision 1	Operating Criteria	08/02/2017
CCR Annual Surface Impoundment Inspection Report 2017 - Roxboro	Operating Criteria	06/06/2017
Annual Meeting with Local Emergency Responders 2017	Design Criteria	05/24/2017
Annual Fugitive Dust Control Report 2016	Operating Criteria	12/05/2016
Initial Structural Stability Assessment	Design Criteria	11/16/2016
Initial Factor of Safety Assessment	Design Criteria	11/15/2016
Post Closure Plan for Impoundments	Closure and Post Closure Care	11/11/2016
Inflow Design Flood Control System	Operating Criteria	11/03/2016
History of Construction	Design Criteria	10/25/2016
Initial Hazard Classification Assessment Certification	Design Criteria	10/12/2016

TABLE 1C
(Continued)

Document Name	Category	Release Date
Existing Liner Design Criteria	Design Criteria	10/11/2016
Annual Surface Impoundment Inspection Report 2016	Operating Criteria	06/15/2016
Annual Surface Impoundment Report (Initial)	Operating Criteria	02/16/2016
Annual Surface Impoundment Report (Initial) Revision 1	Operating Criteria	02/19/2016
Inflow Design Flood Control System	Operating Criteria	11/03/2016

*This summary of reports was downloaded on October 10, 2019

TABLE 1D
East FGD Settling Pond - Plans and Reports Posted by Duke Energy under the CCR Rule

Document Name	Category	Release Date
Emergency Action Plan East Ash Pond, West Ash Pond, West Settling Pond East Settling Pond and FGD Forward Flush Pond	Design Criteria	08/28/19
CCR Annual Surface Impoundment Inspection Report 2019	Operating Criteria	05/29/2019
Notice of Groundwater Protection Standard Exceedance 2019	Groundwater Monitoring and Corrective Action	05/20/2019
CCR Assessment of Corrective Measures Report	Groundwater Monitoring and Corrective Action	05/07/2019
Annual Meeting with Local Emergency Responders 2019	Design Criteria	04/24/2019
CCR Annual Groundwater Monitoring and Corrective Action Report 2018	Groundwater Monitoring and Corrective Action	03/01/2019
Notice of Initiation of Assessment of Corrective Measures	Groundwater Monitoring and Corrective Action	02/19/2019
Notice of Groundwater Protection Standard Exceedance 2018	Groundwater Monitoring and Corrective Action	12/14/2018
Annual Fugitive Dust Control Report 2018	Operating Criteria	12/05/2018
Fugitive Dust Control Plan	Operating Criteria	11/19/2018
Wetlands	Location Restriction	11/07/2018
Unstable Areas	Location Restriction	11/07/2018
Seismic Impact Zones	Location Restriction	11/07/2018
Fault Areas	Location Restriction	11/07/2018
Placement Above Uppermost Aquifer	Location Restriction	11/07/2018
Emergency Action Plan Roxboro East Ash Pond, West Ash Pond and Associated Structures	Design Criteria	10/01/2018
CCR Annual Surface Impoundment Inspection Report 2018	Operating Criteria	06/06/2018

TABLE 1D
(Continued)

Document Name	Category	Release Date
Annual Meeting with Local Emergency Responders 2018	Design Criteria	05/01/2018
Notice of Establishment of an Assessment Monitoring Program Roxboro East FGD Settling Pond	Groundwater Monitoring and Corrective Action	02/27/2018
CCR Annual Groundwater Monitoring and Corrective Action Report	Groundwater Monitoring and Corrective Action	02/06/2018
2017 Annual CCR Fugitive Dust Control Report-Roxboro	Operating Criteria	11/29/2017
Groundwater Monitoring System Certification-Roxboro East FGD Settling Pond	Groundwater Monitoring and Corrective Action	11/06/2017
Groundwater Sampling and Analysis Program Selection of Statistical Method Certification-Roxboro East FGD Settling Pond	Groundwater Monitoring and Corrective Action	10/25/2017
Roxboro Inundation Maps	Design Criteria	10/06/2017
Fugitive Dust Control Plan Revision 1	Operating Criteria	08/02/2017
CCR Annual Surface Impoundment Inspection Report 2017 - Roxboro	Operating Criteria	06/06/2017
Annual Meeting with Local Emergency Responders 2017	Design Criteria	05/24/2017
Annual Fugitive Dust Control Report 2016	Operating Criteria	12/05/2016
Initial Structural Stability Assessment	Design Criteria	11/16/2016
Initial Factor of Safety Assessment	Design Criteria	11/15/2016
Post Closure Plan for Impoundments	Closure and Post Closure Care	11/11/2016
Closure Plan for Impoundments	Closure and Post Closure Care	11/11/2016
Inflow Design Flood Control System	Operating Criteria	11/03/2016
History of Construction	Design Criteria	10/25/2016

TABLE 1D
(Continued)

Document Name	Category	Release Date
Initial Hazard Classification Assessment Certification	Design Criteria	10/12/2016
Existing Liner Design Criteria	Design Criteria	10/11/2016
Annual Surface Impoundment Inspection Report 2016	Operating Criteria	06/15/2016
Annual Surface Impoundment Report (Initial)	Operating Criteria	02/16/2016
Annual Surface Impoundment Report (Initial) Revision 1	Operating Criteria	02/19/2016

*This summary of reports was downloaded on October 10, 2019

TABLE 1E
FGD Forward Flush Pond - Plans and Reports Posted by Duke Energy under the CCR Rule

Document Name	Category	Release Date
Emergency Action Plan East Ash Pond, West Ash Pond, West Settling Pond East Settling Pond and FGD Forward Flush Pond	Design Criteria	08/28/2019
CCR Annual Surface Impoundment Inspection Report 2019	Operating Criteria	05/29/2019
Notice of Groundwater Protection Standard Exceedance 2019	Groundwater Monitoring and Corrective Action	05/20/2019
CCR Assessment of Corrective Measures Report	Groundwater Monitoring and Corrective Action	05/07/2019
Annual Meeting with Local Emergency Responders 2019	Design Criteria	04/24/2019
CCR Annual Groundwater Monitoring and Corrective Action Report 2018	Groundwater Monitoring and Corrective Action	03/01/2019
Notice of Initiation of Assessment of Corrective Measures	Groundwater Monitoring and Corrective Action	02/19/2019
Notice of Groundwater Protection Standard Exceedance 2018	Groundwater Monitoring and Corrective Action	12/14/2018
Annual Fugitive Dust Control Report 2018	Operating Criteria	12/05/2018
Fugitive Dust Control Plan	Operating Criteria	11/19/2018
Wetlands	Location Restriction	11/07/2018
Unstable Areas	Location Restriction	11/07/2018
Seismic Impact Zones	Location Restriction	11/07/2018
Fault Areas	Location Restriction	11/07/2018
Placement Above Uppermost Aquifer	Location Restriction	11/07/2018
Emergency Action Plan Roxboro East Ash Pond, West Ash Pond and Associated Structures	Design Criteria	10/01/2018

TABLE 1E
(Continued)

Document Name	Category	Release Date
CCR Annual Surface Impoundment Inspection Report 2018	Operating Criteria	06/06/2018
Annual Meeting with Local Emergency Responders 2018	Design Criteria	05/01/2018
Notice of Establishment of an Assessment Monitoring Program Roxboro FGD Forward Flush Pond	Groundwater Monitoring and Corrective Action	02/27/2018
CCR Annual Groundwater Monitoring and Corrective Action Report	Groundwater Monitoring and Corrective Action	02/06/2018
2017 Annual CCR Fugitive Dust Control Report-Roxboro	Operating Criteria	11/29/2017
Groundwater Monitoring System Certification-Roxboro FGD Forward Flush Pond	Groundwater Monitoring and Corrective Action	11/06/2017
Groundwater Sampling and Analysis Program Selection of Statistical Method Certification-Roxboro FGD Forward Flush Pond	Groundwater Monitoring and Corrective Action	10/25/2017
Roxboro Inundation Maps	Design Criteria	10/06/2017
Fugitive Dust Control Plan Revision 1	Operating Criteria	08/02/2017
CCR Annual Surface Impoundment Inspection Report 2017 - Roxboro	Operating Criteria	06/06/2017
Annual Meeting with Local Emergency Responders 2017	Design Criteria	05/24/2017
Annual Fugitive Dust Control Report 2016	Operating Criteria	12/05/2016
Initial Structural Stability Assessment	Design Criteria	11/16/2016
Initial Factor of Safety Assessment	Design Criteria	11/15/2016
Post Closure Plan for Impoundments	Closure and Post Closure Care	11/11/2016
Closure Plan for Impoundments	Closure and Post Closure Care	11/11/2016
Inflow Design Flood Control System	Operating Criteria	11/03/2016

TABLE 1E
(Continued)

Document Name	Category	Release Date
History of Construction	Design Criteria	10/25/2016
Initial Hazard Classification Assessment Certification	Design Criteria	10/12/2016
Existing Liner Design Criteria	Design Criteria	10/11/2016
Annual Surface Impoundment Inspection Report 2016	Operating Criteria	06/15/2016
Annual Surface Impoundment Report (Initial)	Operating Criteria	02/16/2016
Annual Surface Impoundment Report (Initial) Revision 1	Operating Criteria	02/19/2016

*This summary of reports was downloaded on October 10, 2019

TABLE 1F
Industrial Landfill - Plans and Reports Posted by Duke Energy under the CCR Rule

Document Name	Category	Release Date
CCR Assessment of Corrective Measures Report	Groundwater Monitoring and Corrective Action	05/07/2019
CCR Annual Groundwater Monitoring and Corrective Action Report 2018	Groundwater Monitoring and Corrective Action	03/01/2019
Notice of Initiation of Assessment of Corrective Measures	Groundwater Monitoring and Corrective Action	02/19/2019
Notice of Groundwater Protection Standard Exceedance 2018	Groundwater Monitoring and Corrective Action	12/14/2018
Annual Fugitive Dust Control Report 2018	Operating Criteria	12/05/2018
Fugitive Dust Control Plan	Operating Criteria	11/19/2018
CCR Annual Landfill Inspection Report 2018	Operating Criteria	11/19/2018
Unstable Areas	Location Restriction	11/07/2018
Notice of Establishment of an Assessment Monitoring Program Roxboro Industrial Landfill	Groundwater Monitoring and Corrective Action	02/27/2018
CCR Annual Groundwater Monitoring and Corrective Action Report	Groundwater Monitoring and Corrective Action	02/06/2018
2017 Annual CCR Fugitive Dust Control Report-Roxboro	Operating Criteria	11/29/2017
CCR Annual Landfill Report 2017-Roxboro Industrial Landfill	Operating Criteria	11/29/2017
Groundwater Monitoring System Certification-Roxboro Industrial Landfill	Groundwater Monitoring and Corrective Action	11/06/2017
Groundwater Sampling and Analysis Program Selection of Statistical Method Certification-Roxboro Industrial Landfill	Groundwater Monitoring and Corrective Action	10/25/2017
Fugitive Dust Control Plan Revision 1	Operating Criteria	08/02/2017

TABLE 1F
(Continued)

Document Name	Category	Release Date
Annual Fugitive Dust Control Report 2016	Operating Criteria	12/05/2016
CCR Annual Landfill Inspection Report 2016	Operating Criteria	11/22/2016
Post Closure Plan for Industrial Landfill	Closure and Post Closure Care	11/11/2016
Closure Plan for Industrial Landfill	Closure and Post Closure Care	11/11/2016
Run-on and Run-off Control System Plan	Operating Criteria	11/03/2016
Annual Landfill Report (Initial)	Operating Criteria	02/03/2016

*This summary of reports was downloaded on October 10, 2019

ATTACHMENT A

Audit Scope

ATTACHMENT A

AUDIT SCOPE

A-1 GENERAL AUDIT SCOPE ITEMS

The general Audit scope items included:

- Review and evaluation of documentation for maintenance and repair of structures and equipment used for coal ash disposal,

- Review and evaluation of documentation of modifications, failures, leaks, damage, disrepair and other problems at the coal ash management units,

- Review and evaluation of documentation of efforts to correct failures, leaks, damage, disrepair and other problems where they determine that employee/contractor actions were likely a primary or contributing cause to a compliance finding,

- Review and evaluation of documentation of communication of the items above within the organization,

- Review and evaluation of documentation associated with the specific environmental compliance items described below and laws, regulations, and policies associated these items and

- Review of compliance with administrative aspects and regulatory submissions related to coal ash management-specific regulations, including:

–	Coal Combustion Residuals	40 CFR Part 257 Subpart D
–	NC Coal Ash Management Act of 2014	NC General Statutes Chapter 130A, Article 9

More specific items which were addressed in the audits to comply with the General Audit Scope are described below.

A-2 SPECIFIC COMPLIANCE WITH THE ECP-NC

The following items related to specific ECP-NC compliance were reviewed as part of the audit:

1. Verify maintenance and sufficient funding of corporate compliance organizations (ABSAT, CCP organization, National Ash Management Advisory Board). Where a root cause of a compliance finding appears in an auditor's judgment to result from inadequate funding, the AGC/ELM Audit Team will identify this in the Audit finding.

2. Verify timely production of satisfactory Compliance Officer (CO) reports to the CAM relating to the development, implementation, and enforcement of the ECP-NC. No auditing work is associated with this work at this time.

3. Evaluate existence and efficacy of toll-free hotline/e-mail inbox for violation reporting, including the appropriateness of the follow-up investigation and disposition of each reported matter. This requirement will be evaluated for the first year of audits and then reassessed.

4. Evaluate completion and efficacy of periodic notices (via Internet, Intranet, email, notices in employee work areas, and publication in community outlets) to employees and the public of the availability of the toll-free hotline and electronic mail inbox.

5. Evaluate training materials and curricula utilized in the mandated training program, particularly those tailored to employee's specific job descriptions, to determine whether it advances the goal of "ensuring that every domestic employee of Duke Energy Corporation and its wholly-owned or operated affiliates understands applicable compliance policies and is able to integrate the compliance objectives in the performance of his/her job." Ensure that the subjects specifically named in the plea agreements are covered by the training (namely, notice and reporting requirements in the event of a release or discharge and the safe and proper handling of pollutants, hazardous substances and/or wastes.)

6. Evaluate whether Defendants are using "Best Efforts" to comply with the obligations under the ECP-NC. Where the Audit Team makes compliance findings, the Audit Team will, upon request, provide their opinion on whether this best efforts standard applies, and if so, whether best efforts have been used.

7. Verify compliance at each facility with the specific procedures and protocols set forth in the ECP-NC.

A-3 SPECIFIC COMPLIANCE WITH OTHER PROVISIONS OF THE PLEA AGREEMENT

The following items related to specific items in the Plea Agreement were reviewed as part of the Audit:

1. Determine whether Defendants have opened, expanded, or reopened any coal ash or coal ash wastewater impoundment and, if so, verify that they are lined and do not allow unpermitted discharges of coal ash or coal ash wastewater to waters of the United States.

2. Verify that Defendants have determined the volume of wastewater and coal ash in each wet-storage coal ash impoundment in North Carolina as described in the plea agreements and that written or electronic records of this information is maintained in a location available to facility staff and employees responsible for making environmental or emergency reports.

3. Review citations/notices of violation/notices of deficiency related to violations of federal, state, or local law to assure that they have been properly relayed to the Court and, as appropriate under the plea agreements, determine their materiality.

4. Evaluate Defendants' efforts to close coal ash impoundments at Dan River, Riverbend, Asheville, and Sutton for legal compliance.

5. Note any observations made during the Audit that cause concern regarding the assets and/or security available to the Defendants to meet the obligations imposed by the Judgment in this case.

A-4 GENERAL ENVIRONMENTAL COMPLIANCE SUBJECT AREAS

The following items related to General Environmental Compliance were reviewed as part of the Audit:

1. Assess all waste streams from Duke Energy facilities with coal ash impoundments. Review Duke Energy's processes, procedures, and practices, as well as compliance with those processes, procedures, and practices, for:

    a. identifying waste streams (especially, but not limited to, waste streams with discharge points into bodies of water),
    b. identifying and communicating any modifications or changes, or potential modifications or changes, to waste streams,
    c. ensuring proper handling/disposal of waste streams,
    d. identifying, preventing, and mitigating any risks or hazards that could affect waste streams and/or the disposal of waste streams, and
    e. ensuring proper permitting for waste streams.

For Item 1.d., the Audit Team evaluated such risk/hazard issues where there were compliance findings associated with waste streams.

2. Review and evaluate documentation of:

    a. Maintenance and repair of structures and equipment related to coal ash disposal,
    b. Modification of the coal ash impoundments and related pollution prevention equipment and structures,
    c. Failures, leaks, damage, disrepair, and other problems,
    d. Communication of the information described in a-c within the organization, and
    e. Efforts to correct failures, leaks, damage, disrepair, and other problems.

3. Assess the employees responsible for inspection, maintenance, and repair of coal ash basins and related structures and equipment. The assessment included an assessment of the workloads of such employees to assure that Duke Energy's facilities are adequately staffed. These assessments were made where the Audit Team determine that employee/contractor actions were likely a primary or contributing cause to a compliance finding.

4. Review the results and recommendations of any other audits (internal or external/state mandated) and assess Duke Energy's implementation of those recommendations.

5. Review and assess Duke Energy's processes, procedures, and practices for identifying, communicating, and addressing problems and potential problems at its coal ash basins (leaks, unpermitted discharges, etc.).

6. Review and assess Duke Energy's policies, procedures, practices, and equipment for handling emergency releases from its coal ash basins and evaluate the personnel with duties in such situations.

7. Verify that Duke Energy is complying with its NPDES wastewater and stormwater permits, as well as other relevant environmental permits. This should include verifying Duke Energy's timely submission of permit applications, permit renewal applications, and responses to requests for additional information from the relevant regulatory authority.

8. Review and assess any actions or measures Duke Energy has undertaken to assure accountability and prevent recurrences when problems and/or failures occur (i.e. disciplinary actions, re-training, revision to policies and procedures, etc.). This review will be completed where the Audit Team determines that employee/contractor actions were likely a primary or contributing cause to a compliance finding.

9. Review and assess compliance with the following environmental regulations, as applicable to the management of coal ash:

a. Wastewater Discharges	40 CFR 122; 15A NCAC 2H.0100 *et seq*
b. Stormwater Discharges	40 CFR 122.26; 15A NCAC 2H.1000 *et seq;* NC General Permit (Construction) No. NCG010000
c. NC Groundwater Standards	15A NCAC 02L.0202(h)
d. Hazardous Waste Management	15A NCAC 13A.0100 to 13A.0107
e. Oil Pollution Prevention	40 CFR Part 112
f. Air Pollution (Title V)	15A NCAC 2Q, and
g. Hazardous Chemicals (Tier II)	40 CFR Part 370.

Reviews also included an analysis of overall compliance and the status and security of the asset. Subsequent reviews of individual facilities will evaluate the movement towards compliance. The Audit did not include an evaluation of compliance with the September 2015 Settlement Agreement with NCDEQ.

A–5 LIST OF PERMITS AND PROGRAMS DEEMED TO BE EITHER DIRECTLY OR INDIRECTLY IN SUPPORT OF ASH MANAGEMENT

During the Audit, the Audit Team reviewed a variety of written programs developed and implemented by Duke Energy and facility staff. State-issued permits and supporting documentation relative to environmental programs and geotechnical aspects of ash basin management were also requested and reviewed.

Requested documents, pertinent to management of ash in basins, landfills, ponds, etc. were outlined in the pre-audit questionnaire for each facility and included, but were not limited to:

1. The Compliance Register developed for ETrac for the Site.

2. The Duke Energy Operations Manual for the facility.

3. A site plan, site map, or aerial photo which shows the entire facility and key features, of the facility including NPDES outfalls associated environmental monitoring locations, storage tanks, etc.

4. Most recent 2 years of maintenance, monitoring, and inspection records for each coal ash/CCR basin (just the physical inspections, not the groundwater records).
5. A "Phase 1 and Phase 2" summary of ash basin conditions prepared by an outside consultant.

6. Duke Energy's permitting plans for addressing ash impoundments and landfills at this facility.

7. Applicable pages from the Duke Energy basin-by-basin coal ash/CCR project tracking document for this facility.

8. Original basin/landfill/coal ash management unit construction records.

9. Documentation of changes to these units.

10. Coal ash unit construction permit application and approval.

11. State-issued permits and application materials for permits associated with coal ash/CCR management (including, e.g., dam permits).

12. Any currently effective state order, consent order, or similar state direction that addresses coal ash/CCR management at the site.

13. Records required to be maintained in the site's operating record under the federal CCR regulation and/or any state CCR regulatory program.
14. Records of off-site ash shipments from May 2015 forward.

15. Stormwater permit application and approval for all outfalls.

16. Industrial wastewater (NPDES/POTW) permit application and approval for all outfalls/discharges.

17. Industrial and stormwater sampling and monitoring records, and any corrective action plans (last 2 years).

18. Stormwater pollution prevention plan.

19. Landfill operating permit with maintenance and monitoring requirements.

20. Landfill leak detection and groundwater monitoring records from the last 2 years along with any workplans that describes the rationale for the monitoring system at the Site.

21. Landfill operating permit with maintenance and monitoring requirements.

22. Copies of any air permits and applications for coal ash units and ancillary operations.

23. Any testing and monitoring records completed to comply with the air permits.

24. Any notices of violation~~s~~ associated with the coal ash/CCR management activities received over the last 2 years.

25. Copy of SPCC Plan.

26. Community Right-to-Know

    a. Copies of lists of hazardous chemicals or MSDSs submitted;
    b. Copies of Tier I or II reports; and
    c. Copies of Form R (toxic release inventory) reports.

27. Copies of communications with employees and the public regarding availability of toll-free hotline and electronic mail inbox for reporting suspected environmental violations.

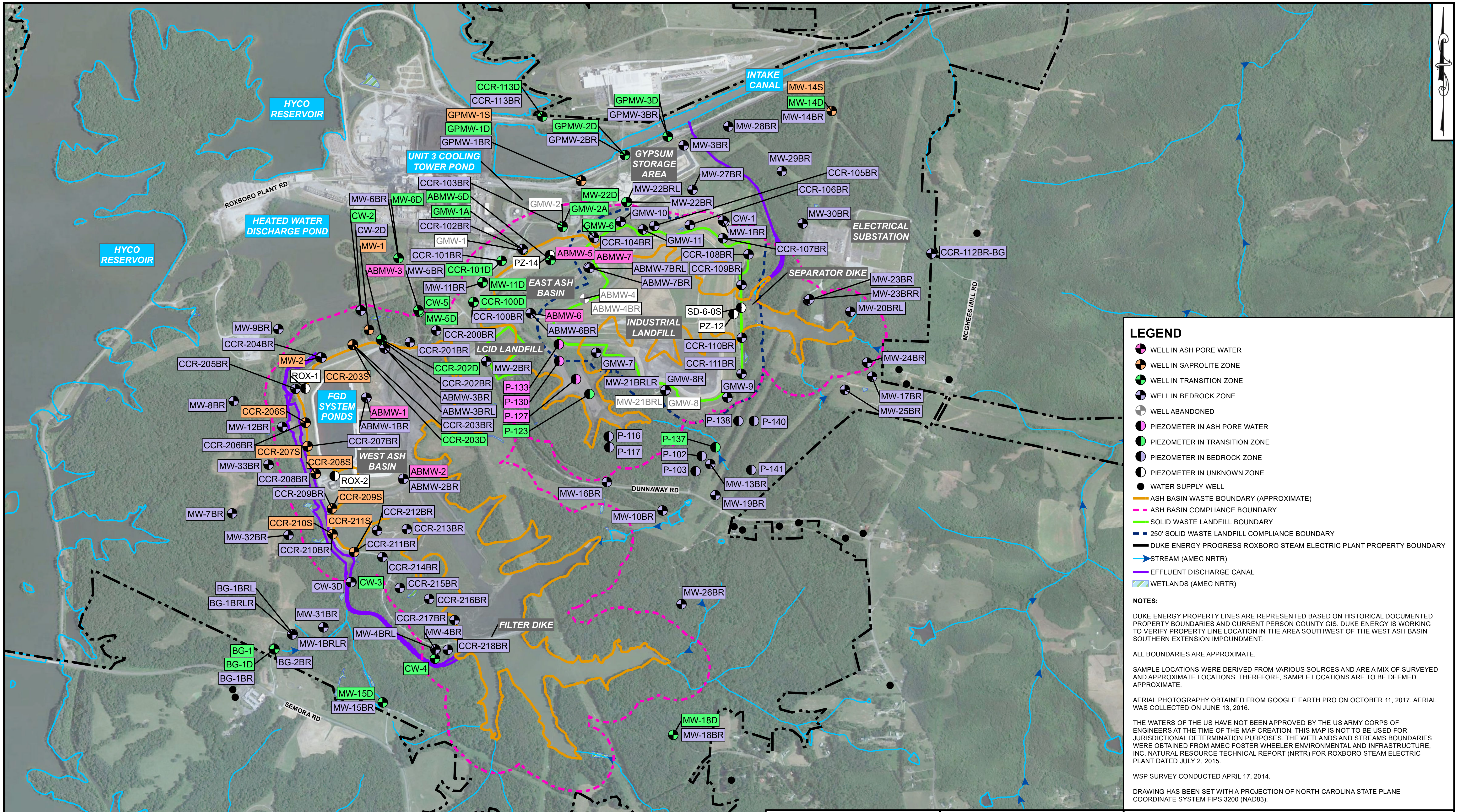
28. Management Systems:

    a. List of responsible party for each environmental activity.
    b. All environmental-related training records.
    c. All environmental policies and procedures.
    d. Organization chart.
    e. Site diagram identifying storage areas, tanks, etc.

29. Employee training records related to environmental programs and ash management policies.

ATTACHMENT B

2018 AND 2019 GROUNDWATER DATA SUMMARY AND WELL LOCATION MAP



LEGEND

- ◕ WELL IN ASH PORE WATER
- ◕ WELL IN SAPROLITE ZONE
- ◕ WELL IN TRANSITION ZONE
- ◕ WELL IN BEDROCK ZONE
- ◕ WELL ABANDONED
- ◐ PIEZOMETER IN ASH PORE WATER
- ◐ PIEZOMETER IN TRANSITION ZONE
- ◐ PIEZOMETER IN BEDROCK ZONE
- ◐ PIEZOMETER IN UNKNOWN ZONE
- ● WATER SUPPLY WELL
- ━ ASH BASIN WASTE BOUNDARY (APPROXIMATE)
- ╍ ASH BASIN COMPLIANCE BOUNDARY
- ━ SOLID WASTE LANDFILL BOUNDARY
- ╍ 250' SOLID WASTE LANDFILL COMPLIANCE BOUNDARY
- ━ DUKE ENERGY PROGRESS ROXBORO STEAM ELECTRIC PLANT PROPERTY BOUNDARY
- → STREAM (AMEC NRTR)
- ━ EFFLUENT DISCHARGE CANAL
- ▨ WETLANDS (AMEC NRTR)

NOTES:

DUKE ENERGY PROPERTY LINES ARE REPRESENTED BASED ON HISTORICAL DOCUMENTED PROPERTY BOUNDARIES AND CURRENT PERSON COUNTY GIS. DUKE ENERGY IS WORKING TO VERIFY PROPERTY LINE LOCATION IN THE AREA SOUTHWEST OF THE WEST ASH BASIN SOUTHERN EXTENSION IMPOUNDMENT.

ALL BOUNDARIES ARE APPROXIMATE.

SAMPLE LOCATIONS WERE DERIVED FROM VARIOUS SOURCES AND ARE A MIX OF SURVEYED AND APPROXIMATE LOCATIONS. THEREFORE, SAMPLE LOCATIONS ARE TO BE DEEMED APPROXIMATE.

AERIAL PHOTOGRAPHY OBTAINED FROM GOOGLE EARTH PRO ON OCTOBER 11, 2017. AERIAL WAS COLLECTED ON JUNE 13, 2016.

THE WATERS OF THE US HAVE NOT BEEN APPROVED BY THE US ARMY CORPS OF ENGINEERS AT THE TIME OF THE MAP CREATION. THIS MAP IS NOT TO BE USED FOR JURISDICTIONAL DETERMINATION PURPOSES. THE WETLANDS AND STREAMS BOUNDARIES WERE OBTAINED FROM AMEC FOSTER WHEELER ENVIRONMENTAL AND INFRASTRUCTURE, INC. NATURAL RESOURCE TECHNICAL REPORT (NRTR) FOR ROXBORO STEAM ELECTRIC PLANT DATED JULY 2, 2015.

WSP SURVEY CONDUCTED APRIL 17, 2014.

DRAWING HAS BEEN SET WITH A PROJECTION OF NORTH CAROLINA STATE PLANE COORDINATE SYSTEM FIPS 3200 (NAD83).

synTerra

DUKE ENERGY PROGRESS

700 350 0 700 1,400
GRAPHIC SCALE IN FEET

148 RIVER STREET, SUITE 220
GREENVILLE, SOUTH CAROLINA 29601
PHONE 864-421-9999
www.synterracorp.com

DRAWN BY: J. KIRTZ
PROJECT MANAGER: C. EADY
CHECKED BY: W. GERALD
DATE: 04/29/2019

FIGURE 1-2
SITE MAP WITH MONITORING WELL LOCATIONS
2018 CAMA ANNUAL INTERIM MONITORING REPORT
ROXBORO STEAM ELECTRIC PLANT
DUKE ENERGY PROGRESS, LLC
SEMORA, NORTH CAROLINA

FACILITY NAME: ROXBORO
DATE UPDATED: 06/24/2019
SHEET UPDATED BY: BRANDON RUSSO
SHEET CHECKED BY: CRAIG EADY

	D PARAME	TED 40CFR257 APPENDIX III CONSTITUENTS p				INORGANIC PARAMETERS (TOTAL CONCENTRATION)														RADIONUCLIDES		R PARAME
Reporting Units	S.U.	ug/L	mg/L	mg/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/mL	mg/L
15A NCAC 02L Standard	**6.5-8.5**	**700**	**250**	**250**	**500**	**1***	**10**	**700**	**4***	**10**	**10**	**1***	**300**	**50**	**100**	**20**	**0.2***	**0.3***	**1000**	**5^**	**0.03^**	**2**
Provisional Background Threshold Values (Transition Zone Unit)	6.3-7.6	50	150	37	540	1	1	91	1	16.1	24.1	1	1173	405	5.22	1.78	0.2	30.2	12	5.45	0.00516	NE
Provisional Background Threshold Values (Bedrock Unit)	6.8-8.3	50	120	73.5	530	1	1	185	1	0.19	3.61	6.4	4227	1198	2.11	1	0.2	2.49	7	5.21	0.00324	NE

					D PARAME	TED 40CFR257 APPENDIX III CONSTITUENTS p				INORGANIC PARAMETERS (TOTAL CONCENTRATION)														RADIONUCLIDES		R PARAME
Sample ID	Location Description	Associated Unit	Location With Respect to Groundwater Flow Direction	Sample Collection Date	pH	Boron	Chloride	Sulfate	Total Dissolved Solids	Antimony	Arsenic	Barium	Beryllium	Chromium (VI)	Chromium	Cobalt	Iron	Manganese	Nickel	Selenium	Thallium	Vanadium	Zinc	Total Radium	Total Uranium	Fluoride
ABMW-01	In WB	West Ash Basin	Downgradient	07/26/2018	**9.6**	**12200**	11	170	370	**3.66**	**608**	154	<1	0.16	<1	<1	24	3.7 j	2.71	5.5	<0.2	**2.1**	5	0.2315	<0.0002	0.52
ABMW-01	In WB	West Ash Basin	Downgradient	11/15/2018	**9.7**	**12800**	10	200	370	**3.58**	**585**	147	<1	0.28 M1,R1	<1	<1	6.032 j	3.382 j	2.59	5.66	<0.2	**1.37**	<5	0.936	<0.0002	0.285 j
ABMW-01	In WB	West Ash Basin	Downgradient	04/23/2019	**9.2**	**12400**	9.9	170	390	**6.82**	**537**	NA	NA	0.042 M1	<1	<1	3.841 j	3.752 j	NA	4.48	NA	**1.64**	NA	0.272	<0.0002	NA
ABMW-01BR	In WB	West Ash Basin	Downgradient	07/26/2018	7.3	549	16	20	320	<1	<1	31	<1	<0.025	<1	<1	**1560**	**1000**	<1	<1	<0.2	0.25 j	<5	1.6	<0.0002	0.12
ABMW-01BR	In WB	West Ash Basin	Downgradient	11/15/2018	7.1	558	15	19	320	<1	<1	30	<1	<0.025	<1	<1	**1570**	**1010**	<1	<1	<0.2	0.131 j	<5	1.2322	<0.0002	0.067 j
ABMW-01BR	In WB	West Ash Basin	Downgradient	04/23/2019	**6.5**	622	15	19	390	<1	<1	NA	NA	<0.025	<1	<1	**1660**	**1000**	NA	<1	NA	0.127 j	NA	1.511	<0.0002	NA
ABMW-02	In WB	West Ash Basin	Downgradient	07/25/2018	8.4	**6150**	7.6	76	240	0.365 j	**631**	380	<1	<0.025	<1	<1	**718**	**368**	1.08	1.52	<0.2	**1.19**	1.78 j	0.476	0.000465	1.2
ABMW-02	In WB	West Ash Basin	Downgradient	11/15/2018	7.3	**4870**	7.2	37	230	<1	**567**	515	<1	<0.025	0.426 j	0.423 j	**4710**	**1010**	<1	0.901 j	<0.2	**2.33**	3.141 j	1.243	0.00119	1.1
ABMW-02	In WB	West Ash Basin	Downgradient	04/23/2019	**6.4**	**1430**	8.1	3.8	220	<1	**144**	NA	NA	<0.025	1.01	**1.79**	**33800**	**1580**	NA	<1	NA	**2.54**	NA	0.736	<0.0002	NA
ABMW-02BR	In WB	West Ash Basin	Downgradient	07/25/2018	7.6	<50	26	75	410	<1	0.517 j	138	<1	0.052	<1	0.355 j	**666**	**1180**	<1	<1	0.159 j	**0.633**	<5	0.838	0.000489	0.21
ABMW-02BR	In WB	West Ash Basin	Downgradient	11/15/2018	7.7	<50	29	91	410	<1	0.348 j	162	<1	0.036	<1	<1	**630**	**1030**	<1	<1	0.107 j	0.294 j	<5	1.028	0.000825	0.18
ABMW-02BR	In WB	West Ash Basin	Downgradient	04/23/2019	7.0	<50	26	98	450	<1	0.4 j	NA	NA	<0.025	<1	<1	**666**	**1150**	NA	<1	NA	0.229 j	NA	1.514	0.000934	NA
ABMW-03	In WB	West Ash Basin	Downgradient	07/26/2018	**3.4**	223	4.54 j	**1700**	**1200**	<1	4.38	21	**27.9**	<0.025	3.88	**95.2**	**13400**	**6720**	**248**	1.24	**2.65**	**2.86**	496	NA	NA	**2.885 j**
ABMW-03	In WB	West Ash Basin	Downgradient	11/14/2018	**3.4**	289	5.7	**1500**	**1000**	<1	2.69	22	**16.1**	<0.025	4.98	**97**	**9320**	**5860**	**232**	0.617 j	**3.16**	**1.76**	406	NA	NA	<5
ABMW-03	In WB	West Ash Basin	Downgradient	04/30/2019	**3.7**	136	4.265 j	**510**	**720**	<1	1.95	NA	NA	<0.025	2.36	**44.9**	**5660**	**3230**	NA	0.349 j	NA	**1.3**	NA	NA	NA	NA
ABMW-03BR	In WB	West Ash Basin	Downgradient	07/26/2018	**5.6**	**3450**	17	**2500**	**4000**	<1	<1	19	3.91	<0.025 M1,R1	<1	**134**	**5790**	**17500**	**349**	<1	<0.2	**2.42**	127	NA	NA	**2.68 j**
ABMW-03BR	In WB	West Ash Basin	Downgradient	11/14/2018	**5.5**	**2770**	10	**2800**	**3400**	<1	0.341 j	20	**4.11**	<0.025 M1	0.347 j	**164**	**6980**	**18700**	**358**	<1	0.166 j	**2.4**	174	NA	NA	<5
ABMW-03BR	In WB	West Ash Basin	Downgradient	04/30/2019	**5.5**	**2820**	14	**2200**	**3300**	<1	0.374 j	NA	NA	<0.025	0.439 j	**141**	**6510**	**18300**	NA	<1	NA	**1.86**	NA	NA	NA	NA
ABMW-03BRL	In WB	West Ash Basin	Downgradient	07/26/2018	7.8	<50	10	**500**	**880**	<1	<1	29	<1	<0.025	<1	<1	271	19	0.345 j	<1	<0.2	0.267 j	<5	NA	NA	0.642 j
ABMW-03BRL	In WB	West Ash Basin	Downgradient	11/14/2018	7.3	19.744 j	10	**490**	**840**	<1	<1	28	<1	<0.025	0.616 j	<1	**649**	**163**	<1	<1	<0.2	0.278 j	10	NA	NA	0.497 j
ABMW-03BRL	In WB	West Ash Basin	Downgradient	04/30/2019	7.7	21.464 j	9.8	**460**	**800**	<1	<1	NA	NA	<0.025	0.413 j	<1	104	2.551 j	NA	<1	NA	<0.3	NA	NA	NA	NA
ABMW-04	In EB	East Ash Basin	Downgradient	07/26/2018	**5.6**	**45000**	90	**2200**	**3800**	<1	**951**	33	<1	<0.025	<1	**6.41**	**71500**	**12300**	4.98	<1	0.125 j	**1.63**	4.233 j	0.743	0.0241	<5
ABMW-04BR	In EB	East Ash Basin	Downgradient	07/26/2018	**6.2**	<50	9.9	20	230	<1	<1	95	<1	<0.025	0.711 j	<1	**3710**	**1570**	<1	<1	<0.2	**0.635**	3.985 j	0.2193	0.000117 j	0.17
ABMW-05	In EB	East Ash Basin	Downgradient	07/31/2018	7.2	**23500**	100	**1300**	**2200**	<1	**330**	46	<1	<0.025	<1	**1.71**	**3400**	**1550**	1.89	<1	<0.2	**0.753 B2**	<5	0.1865	0.00821	<5
ABMW-05	In EB	East Ash Basin	Downgradient	11/15/2018	7.4	**24800**	99	**1400**	**2300**	<1	**339**	46	<1	<0.025	<1	**1.19**	**4520**	**1570**	1.46	<1	<0.2	**0.677**	<5	0.3758	0.00665	<2
ABMW-05D	In EB	East Ash Basin	Downgradient	07/30/2018	6.8	**2880**	15	9.2	260	<1	2.86	165	<1	<0.025	<1	0.619 j	**34600**	**6380**	0.939 j	<1	<0.2	**1.14**	<5	1.12	<0.0002	0.29
ABMW-05D	In EB	East Ash Basin	Downgradient	11/15/2018	6.8	**2980**	15	16	240	<1	2.81	175	<1	<0.025	0.345 j	0.63 j	**32700**	**6630**	0.917 j	<1	<0.2	**0.726**	<5	0.558	<0.0002	0.29
ABMW-05D	In EB	East Ash Basin	Downgradient	04/29/2019	7.0	**2980**	16	26	290	<1	2.47	NA	NA	<0.025	<1	0.695 j	**31300**	**6430**	NA	<1	NA	**0.519**	NA	0.766	<0.0002	NA
ABMW-06	In EB	East Ash Basin	Downgradient	07/25/2018	7.1	**2880**	7.5	170	**740**	<1	**378**	**738**	<1	<0.025	<1	<1	**942**	**975**	0.595 j	0.526 j	<0.2	**1.46**	1.709 j	NA	NA	0.53
ABMW-06	In EB	East Ash Basin	Downgradient	11/15/2018	7.2	**2980**	7.2	140	**700**	<1	**269**	**725**	<1	0.052	<1	<1	**501**	**1060**	<1	0.473 j	<0.2	**1.56**	<5	NA	NA	0.55
ABMW-06	In EB	East Ash Basin	Downgradient	04/29/2019	7.0	**2310**	8.6	96	**670**	<1	**316**	NA	NA	<0.025	0.555 j	<1	**5810**	**1460**	NA	0.336 j	NA	**1.67**	NA	NA	NA	NA
ABMW-06BR	In EB	East Ash Basin	Downgradient	07/25/2018	**6.4**	<50	4.2	64	330	<1	3.57	35	<1	<0.025	<1	0.388 j	77	**717**	1.95	<1	<0.2	**0.419**	<5	NA	NA	0.17
ABMW-06BR	In EB	East Ash Basin	Downgradient	11/15/2018	6.8	<50	9.5	60	320	<1	<1	37	<1	<0.025	<1	0.425 j	86	**746**	2.11	<1	<0.2	**0.474**	2.537 j	NA	NA	0.12
ABMW-06BR	In EB	East Ash Basin	Downgradient	04/29/2019	6.7	<50	10	62	370	<1	<1	NA	NA	0.038	<1	<1	52	**590**	NA	<1	NA	**0.348**	NA	NA	NA	NA
ABMW-07BR	In EB	East Ash Basin	Downgradient	07/25/2018	6.8	**1550**	13	110	430	<1	<1	15	<1	<0.025	<1	**1.12**	168	**476**	0.507 j	<1	0.15 j	**0.455**	<5	NA	NA	0.1412 j
ABMW-07BR	In EB	East Ash Basin	Downgradient	11/14/2018	6.9	**1550**	14	110	420	<1	<1	16	<1	<0.025	<1	**1.65**	211 B2	**458**	<1	<1	<0.2	**0.352**	<5	NA	NA	0.1084 j
ABMW-07BR	In EB	East Ash Basin	Downgradient	04/29/2019	6.9	**2080**	14	120	450	0.903 j	<1	NA	NA	0.05	0.531 j	0.397 j	135	**564**	NA	<1	NA	**0.692**	NA	NA	NA	NA
ABMW-07BRL	In EB	East Ash Basin	Downgradient	07/25/2018	7.2	173	14	250	**560**	<1	0.729 j	14	<1	0.033	<1	<1	272	**66**	<1	<1	<0.2	0.235 j	<5	NA	NA	0.3025 j
ABMW-07BRL	In EB	East Ash Basin	Downgradient	11/14/2018	7.5	157	14	250	**530**	<1	0.888 j	15	<1	<0.025	<1	<1	244 B2	**67**	<1	<1	<0.2	0.19 j	<5	NA	NA	0.2605 j
ABMW-07BRL	In EB	East Ash Basin	Downgradient	04/29/2019	7.6	147	15	230	**530**	<1	0.885 j	NA	NA	<0.025	<1	<1	216	**62**	NA	<1	NA	0.154 j	NA	NA	NA	NA
ABMW-07BRLL	In EB	East Ash Basin	Downgradient	04/09/2019	7.8	137	15	90	400	<1	0.852 j	15	<1	<0.025	0.592 j	<1	**460**	**64**	<1	<1	<0.2	**0.497**	<5	0.97	0.00164	0.257 j
BG-01 IMP	Southwest of WB, outside CB	Background	Background	07/25/2018	**6.3**	<50	19	17	330	<1	<1	88	<1	2.3	2.4	<1	24	1.761 j	1.22	<1	<0.2	**16.7**	1.757 j	-0.1404	0.000585	0.15
BG-01	Southwest of WB, outside CB	Background	Background	07/25/2018	**6.3**	<50	18	17	340	<1	<1	87	<1	NA	<5	<1	26	<5	<5	<1	<0.2	**17.3**	<5	NA	NA	NA
BG-01 IMP	Southwest of WB, outside CB	Background	Background	11/14/2018	**6.5**	<50	19	18	330	<1	<1	89	<1	2.2	2.09 B2	<1	17 B2	<5	0.689 j	<1	0.177 j	**18.1**	<5	0.28	0.0006	0.13
BG-01	Southwest of WB, outside CB	Background	Background	11/14/2018	**6.5**	<50	18	18	310	<1	<1	92	<1	NA	<5	<1	19	<5	<5	<1	<0.2	**17.6**	<5	NA	NA	NA
BG-01 IMP	Southwest of WB, outside CB	Background	Background	04/24/2019	**6.0**	<50	20	16	340	<1	<1	NA	NA	2.2 M6	2.93	<1	55	<5	NA	<1	NA	**20.1**	NA	0.666	0.000488	NA
BG-01	Southwest of WB, outside CB	Background	Background	04/24/2019	**6.0**	<50	20	16	350	<1	<1	96	<1	NA	<5	<1	58	<5	<5	<1	<0.2	**20.4**	<5	NA	NA	NA
BG-01BR	Southwest of WB, outside CB	Background	Background	07/31/2018	6.8	<50	14	17	330	0.346 j	0.483 j	31	<1	0.12	<1	0.581 j	28	**263**	0.892 j	<1	<0.2	**2.26 B2**	3.138 j	0.123	0.000902	0.11
BG-01BR	Southwest of WB, outside CB	Background	Background	11/13/2018	7.0	<50	13	17	310	<1	0.461 j	31	<1	0.049	<1	0.485 j	40	**179**	0.86 j	<1	<0.2	**2.26**	9	0.775	0.000805	0.051 j
BG-01BR	Southwest of WB, outside CB	Background	Background	04/25/2019	6.8	<50	13	18	290	<1	0.342 j	NA	NA	0.14	0.411 j	<1	7.621 j	**111**	NA	<1	NA	**1.36**	NA	0.509	0.000651	NA
BG-01BRLR	Southwest of WB, background, outside of CB	Background	Background	07/30/2018	8.4	22.754 j	83	85	500	<1	4.5	48	<1	<0.025	<1	<1	122	**240**	0.504 j	<1	<0.2	**0.792**	3.759 j	3.81	0.0184	0.21
BG-01BRLR	Southwest of WB, background, outside of CB	Background	Background	11/14/2018	8.5	22.846 j	79	79	460	<1	6.02	58	<1	<0.025	0.469 j,B2	<1	59 B2	**167**	<1	<1	<0.2	**0.676**	<5	2.183	0.0176	0.1872 j
BG-01BRLR	Southwest of WB, background, outside of CB	Background	Background	04/25/2019	8.4	22.94 j	67	66	360	0.365 j	4.49	NA	NA	0.2	0.525 j	<1	25	**145**	NA	<1	NA	**0.665**	NA	1.452	0.015	NA
BG-02BR	Southwest of WB outside of CB	Background	Background	07/31/2018	8.3	<50	35	26	330	<1	2.16	14	<1	<0.025	<1	<1	182	**129**	<1	<1	<0.2	0.241 j,B2	<5	2.76	0.0042	0.17
BG-02BR	Southwest of WB outside of CB	Background	Background	11/13/2018	8.0	<50	28	36	310	<1	2.03	11	<1	0.045	<1	<1	12	<5	0.399 j	<1	<0.2	0.258 j	2.354 j	1.26	0.000587	0.18
BG-02BR	Southwest of WB outside of CB	Background	Background	04/30/2019	8.2	18.771 j	34	42	350	<1	2.14	NA	NA	0.056	0.439 j	<1	51	42	NA	<1	NA	0.243 j	NA	1.601	0.0016	NA
CCR-100BR	Edge of EB	East Ash Basin	Downgradient	10/08/2018	7.0	<50	4.9	27	430	<1	1.89	41	<1	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	NA	1.74	NA	0.21
CCR-100BR	Edge of EB	East Ash Basin	Downgradient	01/24/2019	7.1	<50	5	28	420	<1	1.74	40	<1	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	NA	2.209	NA	0.18
CCR-100D	Edge of EB	East Ash Basin	Downgradient	10/08/2018	6.9	<50	3.5	22	410	<1	<1	130	<1	NA	0.587 j	0.632 j	NA	NA	NA	<1	<0.2	NA	NA	0.671	NA	0.86
CCR-100D	Edge of EB	East Ash Basin	Downgradient	01/24/2019	7.0	18.936 j	3.1	22	430	<1	0.342 j	120	<1	NA	0.368 j	<1	NA	NA	NA	<1	<0.2	NA	NA	0.381	NA	0.83
CCR-101BR	Edge of EB	East Ash Basin	Downgradient	10/08/2018	7.0	<50	15	20	400	<1	0.808 j	13	<1	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	NA	0.374	NA	0.061 j

FACILITY NAME: ROXBORO
DATE UPDATED: 06/24/2019
SHEET UPDATED BY: BRANDON RUSSO
SHEET CHECKED BY: CRAIG EADY

	D PARAME	TED 40CFR257 APPENDIX III CONSTITUENTS p				INORGANIC PARAMETERS (TOTAL CONCENTRATION)														RADIONUCLIDES		ER PARAME
Reporting Units	S.U.	ug/L	mg/L	mg/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/mL	mg/L
15A NCAC 02L Standard	6.5-8.5	700	250	250	500	1*	10	700	4*	10	10	1*	300	50	100	20	0.2*	0.3*	1000	5^	0.03^	2
Provisional Background Threshold Values (Transition Zone Unit)	6.3-7.6	50	150	37	540	1	1	91	1	16.1	24.1	1	1173	405	5.22	1.78	0.2	30.2	12	5.45	0.00516	NE
Provisional Background Threshold Values (Bedrock Unit)	6.8-8.3	50	120	73.5	530	1	1	185	1	0.19	3.61	6.4	4227	1198	2.11	1	0.2	2.49	7	5.21	0.00324	NE

					D PARAME	TED 40CFR257 APPENDIX III CONSTITUENTS p				INORGANIC PARAMETERS (TOTAL CONCENTRATION)														RADIONUCLIDES		ER PARAME
Sample ID	**Location Description**	**Associated Unit**	**Location With Respect to Groundwater Flow Direction**	**Sample Collection Date**	**pH**	**Boron**	**Chloride**	**Sulfate**	**Total Dissolved Solids**	**Antimony**	**Arsenic**	**Barium**	**Beryllium**	**Chromium (VI)**	**Chromium**	**Cobalt**	**Iron**	**Manganese**	**Nickel**	**Selenium**	**Thallium**	**Vanadium**	**Zinc**	**Total Radium**	**Total Uranium**	**Fluoride**
CCR-101BR	Edge of EB	East Ash Basin	Downgradient	01/29/2019	7.2	<50	14	19	440	<1	0.883 j	12	<1	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	NA	0.808	NA	0.042 j
CCR-101D	Edge of EB	East Ash Basin	Downgradient	10/08/2018	6.6	<50	15	2.9	320	<1	1.46	**858**	<1	NA	0.396 j	**31**	NA	NA	NA	<1	<0.2	NA	NA	0.842	NA	0.18
CCR-101D	Edge of EB	East Ash Basin	Downgradient	01/29/2019	6.8	<50	16	2.3	350	<1	1.5	**822**	<1	NA	<1	**30**	NA	NA	NA	<1	<0.2	NA	NA	0.65	NA	0.16
CCR-102BR	Edge of EB	East Ash Basin	Downgradient	10/08/2018	**6.4**	<50	15	**390**	**800**	<1	<1	<5	<1	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	NA	1.6137	NA	0.085 j
CCR-102BR	Edge of EB	East Ash Basin	Downgradient	01/29/2019	**6.5**	<50	16	**390**	**830**	<1	<1	<5	<1	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	NA	1	NA	<0.5
CCR-103BR	Edge of EB	East Ash Basin	Downgradient	10/08/2018	7.0	**4090**	29	**680**	**1300**	<1	<1	28	<1	NA	<1	<1	NA	NA	NA	1.98	<0.2	NA	NA	0.669	NA	0.05 j
CCR-103BR	Edge of EB	East Ash Basin	Downgradient	01/30/2019	7.2	**3970**	29	**630**	**1200**	<1	<1	29	<1	NA	<1	<1	NA	NA	NA	0.663 j	<0.2	NA	NA	0.387	NA	<1
CCR-104BR	Edge of EB	East Ash Basin	Downgradient	10/08/2018	**6.4**	**6610**	41	**430**	**1900**	<1	0.604 j	48	<1	NA	1.56 S1	0.382 j	NA	NA	NA	**25.5**	<0.2	NA	NA	4.641	NA	<2
CCR-104BR	Edge of EB	East Ash Basin	Downgradient	01/30/2019	6.8	**7700**	41	**1100**	**1900**	<1	0.428 j	32	<1	NA	0.572 j	<1	NA	NA	NA	15.8	<0.2	NA	NA	0.1343	NA	<2
CCR-105BR	Edge of EB	East Ash Basin	Downgradient	10/08/2018	6.7	570	33	250	**590**	<1	<1	68	<1	NA	0.578 j	<1	NA	NA	NA	12.7	0.121 j	NA	NA	0.7076	NA	0.305 j
CCR-105BR	Edge of EB	East Ash Basin	Downgradient	01/30/2019	6.9	613	33	**290**	**620**	<1	<1	78	<1	NA	0.656 j	<1	NA	NA	NA	12.8	<0.2	NA	NA	0.0248	NA	0.194 j
CCR-106BR	Edge of EB	East Ash Basin	Downgradient	10/09/2018	6.6	**1450**	15	**400**	**930**	<1	<1	75	<1	NA	<1	0.756 j	NA	NA	NA	<1	<0.2	NA	NA	1.6295	NA	0.29 j
CCR-106BR	Edge of EB	East Ash Basin	Downgradient	01/29/2019	6.7	**1700**	15	**450**	**1000**	<1	<1	76	<1	NA	<1	0.804 j	NA	NA	NA	<1	<0.2	NA	NA	1.294	NA	0.181 j
CCR-107BR (Geochem M	Edge of EB	East Ash Basin	Downgradient	09/20/2018	**6.3**	**4140**	19	**340**	**690**	<1	<1	73	<1	0.057	<1	<1	3.656 j	3.717 j	1.17	<1	<0.2	**12.5**	1.728 j	0.3063	0.000121 j	0.239 j
CCR-107BR	Edge of EB	East Ash Basin	Downgradient	10/09/2018	**6.1**	**4090**	18	**350**	**680**	<1	<1	70	<1	NA	<1	<1	NA	NA	NA	0.39 j	<0.2	NA	NA	0.977	NA	0.105 j
CCR-107BR	Edge of EB	East Ash Basin	Downgradient	01/30/2019	**6.3**	**2750**	19	**270**	**520**	<1	<1	60	<1	NA	<1	<1	NA	NA	NA	0.46 j	<0.2	NA	NA	0.457	NA	<0.5
CCR-108BR (Geochem M	Edge of EB	East Ash Basin	Downgradient	09/20/2018	6.6	**11600**	25	**1200**	**2100**	<1	<1	33	<1	0.086	<1	0.563 j	<10	**74**	5.72	19.2	<0.2	**6.26**	3.1 j	0.46	0.0055	<2
CCR-108BR	Edge of EB	East Ash Basin	Downgradient	10/09/2018	6.5	**12400**	23	**520**	**2100**	<1	<1	32	<1	NA	<1	0.694 j	NA	NA	NA	16.9	<0.2	NA	NA	0.608	NA	0.1 j
CCR-108BR	Edge of EB	East Ash Basin	Downgradient	01/29/2019	6.6	**11000**	23	**1200**	**2000**	<1	<1	30	<1	NA	<1	<1	NA	NA	NA	**41.2**	<0.2	NA	NA	1.4455	NA	<2
CCR-109BR	Edge of EB	East Ash Basin	Downgradient	10/09/2018	6.5	**1470**	140	**490**	**1300**	<1	<1	66	<1	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	NA	0.639	NA	0.12 j
CCR-109BR	Edge of EB	East Ash Basin	Downgradient	01/29/2019	6.6	**1840**	170	**700**	**1300**	<1	<1	67	<1	NA	0.448 j	0.335 j	NA	NA	NA	0.459 j	<0.2	NA	NA	0.5552	NA	<1
CCR-110BR	Edge of EB	East Ash Basin	Downgradient	10/09/2018	**6.2**	**21900**	24	**1300**	**2100**	<1	<1	21	<1	NA	0.395 j	**11.6**	NA	NA	NA	**49.5**	0.084 j	NA	NA	0.845	NA	0.902 j
CCR-110BR	Edge of EB	East Ash Basin	Downgradient	01/29/2019	**6.3**	**16600**	19	**1100**	**1800**	0.49 j	<1	37	<1	NA	0.352 j	**20.5**	NA	NA	NA	**41.3**	0.127 j	NA	NA	0.804	NA	<2
CCR-110BR IMP	Edge of EB	East Ash Basin	Downgradient	05/07/2019	**6.3**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CCR-111BR	Edge of EB	East Ash Basin	Downgradient	10/09/2018	6.5	**4810**	120	**740**	**1600**	<1	<1	60	<1	NA	1.07	<1	NA	NA	NA	**195**	<0.2	NA	NA	1.144	NA	0.389 j
CCR-111BR	Edge of EB	East Ash Basin	Downgradient	01/29/2019	6.6	**6500**	120	**920**	**1800**	<1	<1	50	<1	NA	1.19	<1	NA	NA	NA	**299**	<0.2	NA	NA	0.3508	NA	<1
CCR-111BR IMP	Edge of EB	East Ash Basin	Downgradient	05/07/2019	6.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CCR-112BR-BG	East of EB, outside of CB	Background	Background	10/08/2018	**6.4**	<50	4.9	19	170	<1	<1	17	<1	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	NA	0.851	NA	0.068 j
CCR-112BR-BG	East of EB, outside of CB	Background	Background	01/29/2019	**6.3**	<50	4.8	19	200	<1	0.409 j	16	<1	NA	<1	<1	NA	NA	NA	<1	0.088 j	NA	NA	0.496	NA	0.039 j
CCR-113BR IMP	Downgradient of EB/Gypsum Storage Area	East Ash Basin	Downgradient	07/31/2018	7.0	<50	16	130	480	<1	0.719 j	15	<1	<0.025	<1	0.461 j	235	**69**	0.553 j	<1	<0.2	**1.5**	8	NA	NA	0.683 j
CCR-113BR	Downgradient of EB/Gypsum Storage Area	East Ash Basin	Downgradient	10/09/2018	6.6	<50	12	130	460	<1	1.14	19	<1	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	NA	3.991	NA	0.27
CCR-113BR IMP	Downgradient of EB/Gypsum Storage Area	East Ash Basin	Downgradient	11/15/2018	7.1	<50	12	140	450	<1	1.36	18	<1	<0.025	0.334 j	<1	**432**	44	0.49 j	<1	<0.2	**1.32**	3.805 j	NA	NA	0.166 j
CCR-113BR	Downgradient of EB/Gypsum Storage Area	East Ash Basin	Downgradient	01/30/2019	7.1	<50	11	150	470	<1	0.806 j	17	<1	NA	2.12	<1	NA	NA	NA	0.345 j	<0.2	NA	NA	0.651	NA	0.22
CCR-113BR IMP	Downgradient of EB/Gypsum Storage Area	East Ash Basin	Downgradient	01/30/2019	7.1	<50	12	140	480	<1	0.728 j	16	<1	<0.025	0.965 j	<1	277	25	<1	<1	<0.2	**1.56**	3.992 j	NA	NA	0.1976 j
CCR-113BR IMP	Downgradient of EB/Gypsum Storage Area	East Ash Basin	Downgradient	04/23/2019	7.2	<50	11	160 M4	**520**	<1	0.853 j	NA	NA	<0.025	1.75	<1	**328**	23	NA	<1	NA	**2.04**	NA	NA	NA	NA
CCR-113D IMP	Downgradient of EB/Gypsum Storage Area	East Ash Basin	Downgradient	07/31/2018	6.7	<50	9.7	110	440	<1	<1	32	<1	0.04	0.387 j	0.715 j	244	**97**	2	0.38 j	<0.2	**2.54**	4.074 j	NA	NA	0.7 j
CCR-113D	Downgradient of EB/Gypsum Storage Area	East Ash Basin	Downgradient	10/09/2018	**6.4**	<50	9.6	110	410	<1	<1	28	<1	NA	0.436 j	<1	NA	NA	NA	<1	<0.2	NA	NA	3.7353	NA	0.39
CCR-113D IMP	Downgradient of EB/Gypsum Storage Area	East Ash Basin	Downgradient	11/15/2018	6.7	<50	9.6	120	410	<1	<1	33	<1	0.095	0.364 j	<1	109	20	1.81	0.352 j	<0.2	**3.35**	8	NA	NA	0.29
CCR-113D	Downgradient of EB/Gypsum Storage Area	East Ash Basin	Downgradient	01/30/2019	6.7	<50	9.2	140	440	<1	<1	22	<1	NA	0.839 j	<1	NA	NA	NA	<1	<0.2	NA	NA	0.828	NA	0.32
CCR-113D IMP	Downgradient of EB/Gypsum Storage Area	East Ash Basin	Downgradient	01/30/2019	6.7	<50	9.5	130	440	<1	<1	22	<1	0.1	0.682 j	<1	285	13	0.744 j	<1	<0.2	**3.63**	2.823 j	NA	NA	0.29
CCR-113D IMP	Downgradient of EB/Gypsum Storage Area	East Ash Basin	Downgradient	04/23/2019	6.7	<50	8.5	140	470	<1	<1	NA	NA	0.17	0.862 j	<1	**310**	12	NA	<1	NA	**3.7**	NA	NA	NA	NA
CCR-200BR	Edge of WB	West Ash Basin	Downgradient	10/09/2018	6.8	<50	7.7	43	380	<1	<1	99	<1	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	NA	1.471	NA	0.28
CCR-200BR	Edge of WB	West Ash Basin	Downgradient	01/23/2019	6.9	<50	7.6	45	390	<1	<1	<5	<1	NA	0.444 j	<1	NA	NA	NA	0.346 j	<0.2	NA	NA	2.587	NA	0.25
CCR-201BR	Edge of WB	West Ash Basin	Downgradient	10/09/2018	**6.1**	24.845 j	18	**3700**	**5600**	<1	<1	26	<1	NA	0.586 j	**16.7**	NA	NA	NA	<1	<0.2	NA	NA	2.225	NA	0.1 j
CCR-201BR	Edge of WB	West Ash Basin	Downgradient	01/23/2019	**6.1**	20.841 j	19	**3500**	**5500**	<1	<1	26	<1	NA	<1	**18.1**	NA	NA	NA	<1	<0.2	NA	NA	0.738	NA	<5
CCR-202BR (Geochem M	Edge of WB	West Ash Basin	Downgradient	09/20/2018	**6.4**	**2880**	34	**1800**	**2800**	<1	<1	29	<1	<0.025	<1	<1	<10	**93**	12	0.419 j	<0.2	**4.12**	<5	0.6	0.00855	<5
CCR-202BR	Edge of WB	West Ash Basin	Downgradient	10/10/2018	**6.3**	**2750**	38	**4500**	**2800**	<1	<1	28	<1	NA	0.369 j	<1	NA	NA	NA	0.456 j	<0.2	NA	NA	0.975	NA	<5
CCR-202BR	Edge of WB	West Ash Basin	Downgradient	01/23/2019	**6.4**	**2270**	36	**1800**	**2700**	<1	<1	26	<1	NA	<1	0.405 j	NA	NA	NA	0.483 j	<0.2	NA	NA	0.732	NA	<5
CCR-202D (Geochem M	Edge of WB	West Ash Basin	Downgradient	09/20/2018	**6.3**	**2770**	29	**2100**	**3100**	<1	<1	23	<1	<0.025 M1	<1	<1	7.041 j	**634**	20.4	0.52 j	<0.2	**4.8**	3.271 j	0.59	0.00924	<5
CCR-202D	Edge of WB	West Ash Basin	Downgradient	10/10/2018	**6.2**	**2740**	32	**2100**	**3100**	<1	<1	22	<1	NA	<1	<1	NA	NA	NA	0.404 j	<0.2	NA	NA	1.379	NA	<5
CCR-202D	Edge of WB	West Ash Basin	Downgradient	01/23/2019	**6.3**	**2480**	28	**1900**	**3000**	<1	<1	21	<1	NA	<1	0.456 j	NA	NA	NA	0.551 j	<0.2	NA	NA	-0.004	NA	<5
CCR-203BR (Geochem M	Edge of WB	West Ash Basin	Downgradient	09/20/2018	6.6	**762**	30	**350**	**920**	<1	<1	71	<1	<0.025	<1	**8.61**	178	**355**	1.46	<1	<0.2	**3.44**	3.342 j	-0.0119	0.0067	<1
CCR-203BR	Edge of WB	West Ash Basin	Downgradient	10/09/2018	6.6	**713**	30	**340**	**910**	<1	<1	70	<1	NA	0.631 j	**9.01**	NA	NA	NA	<1	<0.2	NA	NA	2.28	NA	<1
CCR-203BR	Edge of WB	West Ash Basin	Downgradient	01/30/2019	6.6	**751**	29	**490**	**910**	<1	<1	69	<1	NA	0.761 j	**8.34**	NA	NA	NA	<1	0.092 j	NA	NA	0.999	NA	<1
CCR-203D (Geochem M	Edge of WB	West Ash Basin	Downgradient	09/20/2018	**6.3**	491	32	**300**	**800**	<1	<1	183	<1	<0.025	<1	**5.6**	**1440**	**460**	2.36	<1	<0.2	**1.81**	<5	0.2764	0.00142	0.234 j
CCR-203D	Edge of WB	West Ash Basin	Downgradient	10/09/2018	**6.3**	551	33	**300**	**800**	<1	<1	154	<1	NA	0.335 j	**6.66**	NA	NA	NA	<1	<0.2	NA	NA	1.635	NA	0.218 j
CCR-203D	Edge of WB	West Ash Basin	Downgradient	01/30/2019	**6.5**	505	31	**340**	**790**	<1	<1	174	<1	NA	<1	**4.9**	NA	NA	NA	<1	0.136 j	NA	NA	0.33	NA	<0.5
CCR-203S	Edge of WB	West Ash Basin	Downgradient	10/09/2018	**6.2**	<50	32	8.1	**730**	<1	0.611 j	338	<1	NA	<1	**37.3**	NA	NA	NA	<1	<0.2	NA	NA	1.04	NA	0.26
CCR-203S	Edge of WB	West Ash Basin	Downgradient	01/30/2019	**6.3**	<50	31	7.9	**660**	<1	0.361 j	355	<1	NA	0.335 j	**41.5**	NA	NA	NA	<1	<0.2	NA	NA	0.644	NA	0.04 j
CCR-204BR	Edge of WB	West Ash Basin	Downgradient	10/09/2018	6.8	**6710**	**1100**	**290**	**3200**	<1	<1	85	<1	NA	0.446 j	**1.38**	NA	NA	NA	<1	<0.2	NA	NA	3.258	NA	<2
CCR-204BR	Edge of WB	West Ash Basin	Downgradient	01/23/2019	6.8	**7630**	**1200**	**320**	**3000**	<1	<1	90	<1	NA	<1	**1.69**	NA	NA	NA	<1	<0.2	NA	NA	0.589	NA	<2
CCR-205BR	Edge of WB	West Ash Basin	Downgradient	10/10/2018	**6.2**	**6540**	**1200**	130	**3200**	<1	<1	278	<1	NA	1.2	<1	NA	NA	NA	1.63	<0.2	NA	NA	**5.03**	NA	<2
CCR-205BR	Edge of WB	West Ash Basin	Downgradient	01/24/2019	**6.1**	**7620**	**1200**	150	**2600**	<1	<1	342	<1	NA	0.803 j	<1	NA	NA	NA	2.16	0.115 j	NA	NA	4.28	NA	<2

FACILITY NAME: **ROXBORO**
DATE UPDATED: **06/24/2019**
SHEET UPDATED BY: **BRANDON RUSSO**
SHEET CHECKED BY: **CRAIG EADY**

	PARAME	TED 40CFR257 APPENDIX III CONSTITUENTS				INORGANIC PARAMETERS (TOTAL CONCENTRATION)														RADIONUCLIDES		R PARAME
Reporting Units	**S.U.**	**ug/L**	**mg/L**	**mg/L**	**mg/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**pCi/L**	**ug/mL**	**mg/L**
15A NCAC 02L Standard	**6.5-8.5**	**700**	**250**	**250**	**500**	**1***	**10**	**700**	**4***	**10**	**10**	**1***	**300**	**50**	**100**	**20**	**0.2***	**0.3***	**1000**	**5^**	**0.03^**	**2**
Provisional Background Threshold Values (Transition Zone Unit)	**6.3-7.6**	**50**	**150**	**37**	**540**	**1**	**1**	**91**	**1**	**16.1**	**24.1**	**1**	**1173**	**405**	**5.22**	**1.78**	**0.2**	**30.2**	**12**	**5.45**	**0.00516**	**NE**
Provisional Background Threshold Values (Bedrock Unit)	**6.8-8.3**	**50**	**120**	**73.5**	**530**	**1**	**1**	**185**	**1**	**0.19**	**3.61**	**6.4**	**4227**	**1198**	**2.11**	**1**	**0.2**	**2.49**	**7**	**5.21**	**0.00324**	**NE**

					PARAME	TED 40CFR257 APPENDIX III CONSTITUENTS				INORGANIC PARAMETERS (TOTAL CONCENTRATION)														RADIONUCLIDES		R PARAME
Sample ID	**Location Description**	**Associated Unit**	**Location With Respect to Groundwater Flow Direction**	**Sample Collection Date**	**pH**	**Boron**	**Chloride**	**Sulfate**	**Total Dissolved Solids**	**Antimony**	**Arsenic**	**Barium**	**Beryllium**	**Chromium (VI)**	**Chromium**	**Cobalt**	**Iron**	**Manganese**	**Nickel**	**Selenium**	**Thallium**	**Vanadium**	**Zinc**	**Total Radium**	**Total Uranium**	**Fluoride**
CCR-206BR	Edge of WB	West Ash Basin	Downgradient	10/10/2018	**6.0**	**11500**	**1600**	240	**4300**	<1	<1	240	<1	NA	2.08	**26.8**	NA	NA	NA	<1	0.083 j	NA	NA	1.923	NA	<2
CCR-206BR	Edge of WB	West Ash Basin	Downgradient	01/24/2019	**6.0**	**12100**	**1600**	230	**3200**	0.981 j	<1	233	<1	NA	4.65	**27.8**	NA	NA	NA	<1	<0.2	NA	NA	2.68	NA	<2
CCR-206S	Edge of WB	West Ash Basin	Downgradient	10/10/2018	6.6	**22000**	**470**	**290**	**1700**	<1	0.727 j	56	<1	NA	4.25	**4.95**	NA	NA	NA	<1	0.136 j	NA	NA	0.087	NA	0.045 j
CCR-206S	Edge of WB	West Ash Basin	Downgradient	01/24/2019	6.7	**19500**	**510**	**330**	**1300**	<1	0.779 j	54	<1	NA	0.395 j	**4.42**	NA	NA	NA	<1	<0.2	NA	NA	0.25458	NA	<1
CCR-207BR	Edge of WB	West Ash Basin	Downgradient	10/10/2018	**6.4**	**17700**	**2000**	**350**	**5000**	<1	<1	205	<1	NA	1.26	**24.3**	NA	NA	NA	<1	0.194 j	NA	NA	0.968	NA	<5
CCR-207BR	Edge of WB	West Ash Basin	Downgradient	01/24/2019	**6.3**	**22600**	**2100**	**480**	**4300**	<1	<1	178	<1	NA	0.599 j	**32.4**	NA	NA	NA	<1	<0.2	NA	NA	1.843	NA	<5
CCR-207S	Edge of WB	West Ash Basin	Downgradient	10/09/2018	**6.4**	**14100**	**770**	**280**	**2400**	<1	0.467 j	59	<1	NA	1.85	**1.09**	NA	NA	NA	<1	<0.2	NA	NA	0.505	NA	0.796 j
CCR-207S	Edge of WB	West Ash Basin	Downgradient	01/24/2019	6.8	**8830**	**320**	190	**1000**	<1	0.409 j	54	<1	NA	0.97 j	0.549 j	NA	NA	NA	<1	<0.2	NA	NA	0.336	NA	<2
CCR-208BR (Geochem M	Edge of WB	West Ash Basin	Downgradient	09/20/2018	**6.4**	**50800**	**3000**	**1000**	**7500**	<1	0.398 j	125	<1	0.2	0.41 j	**38.2**	5.589 j	**7770**	83.4	<1	<0.2	**11.4**	2.024 j	0.659	0.00859	0.922 j
CCR-208BR	Edge of WB	West Ash Basin	Downgradient	10/09/2018	**5.9**	**49000**	**2900**	**1000**	**8300**	<1	0.463 j	124	<1	NA	**19.1**	**37**	NA	NA	NA	<1	<0.2	NA	NA	1.186	NA	<5
CCR-208BR	Edge of WB	West Ash Basin	Downgradient	01/24/2019	**6.1**	**49800**	**2800**	**1100**	**6100**	<1	0.444 j	115	<1	NA	5.1	**39.3**	NA	NA	NA	<1	<0.2	NA	NA	1.321	NA	<5
CCR-208S	Edge of WB	West Ash Basin	Downgradient	10/09/2018	**5.9**	**34900**	**1400**	**930**	**5100**	<1	<1	77	<1	NA	0.799 j	**7.41**	NA	NA	NA	<1	<0.2	NA	NA	1.356	NA	<2
CCR-208S	Edge of WB	West Ash Basin	Downgradient	01/24/2019	**6.1**	**36200**	**1300**	**990**	**3800**	<1	<1	73	<1	NA	0.429 j	**7.43**	NA	NA	NA	<1	<0.2	NA	NA	0.63	NA	<2
CCR-209BR	Edge of WB	West Ash Basin	Downgradient	10/10/2018	6.5	**4420**	200	25	**770**	<1	<1	**743**	<1	NA	0.361 j	**14.9**	NA	NA	NA	<1	<0.2	NA	NA	3.246	NA	0.69
CCR-209BR	Edge of WB	West Ash Basin	Downgradient	01/24/2019	6.6	**4340**	220	27	**720**	<1	<1	**776**	<1	NA	0.375 j	**16.7**	NA	NA	NA	<1	<0.2	NA	NA	2.222	NA	0.56
CCR-209S	Edge of WB	West Ash Basin	Downgradient	10/10/2018	6.6	**3570**	**280**	25	**860**	<1	0.584 j	**836**	<1	NA	0.927 j	<1	NA	NA	NA	<1	<0.2	NA	NA	1.798	NA	0.52
CCR-209S	Edge of WB	West Ash Basin	Downgradient	01/24/2019	6.7	**3770**	**310**	29	**800**	<1	0.53 j	**939**	<1	NA	0.611 j	<1	NA	NA	NA	<1	<0.2	NA	NA	0.709	NA	0.51
CCR-210BR	Edge of WB	West Ash Basin	Downgradient	10/09/2018	**6.4**	**2510**	99	7.8	500	<1	<1	223	<1	NA	0.348 j	**3.68**	NA	NA	NA	<1	<0.2	NA	NA	3.427	NA	0.38
CCR-210BR	Edge of WB	West Ash Basin	Downgradient	01/24/2019	6.6	**2490**	98	6.4	410	<1	<1	199	<1	NA	<1	**3.59**	NA	NA	NA	<1	<0.2	NA	NA	2.788	NA	0.38
CCR-210S	Edge of WB	West Ash Basin	Downgradient	10/09/2018	6.6	**893**	26	12	420	<1	0.446 j	72	<1	NA	<1	**2.42**	NA	NA	NA	<1	<0.2	NA	NA	1.526	NA	0.41
CCR-210S	Edge of WB	West Ash Basin	Downgradient	01/24/2019	6.8	**909**	23	8.1	350	<1	0.52 j	63	<1	NA	<1	**2.79**	NA	NA	NA	<1	<0.2	NA	NA	0.731	NA	0.5
CCR-211BR	Edge of WB	West Ash Basin	Downgradient	10/09/2018	**6.2**	**1870**	46	42	360	<1	<1	116	<1	NA	<1	**1.16**	NA	NA	NA	<1	0.105 j	NA	NA	2.8458	NA	0.24
CCR-211BR	Edge of WB	West Ash Basin	Downgradient	01/24/2019	**6.4**	**1580**	38	40	320	<1	<1	106	<1	NA	<1	**1.14**	NA	NA	NA	<1	<0.2	NA	NA	2.3671	NA	0.21
CCR-211S	Edge of WB	West Ash Basin	Downgradient	10/09/2018	**6.4**	**3160**	57	49	500	<1	**23.1**	308	<1	NA	<1	**6.46**	NA	NA	NA	<1	<0.2	NA	NA	2.68	NA	0.44
CCR-211S	Edge of WB	West Ash Basin	Downgradient	01/24/2019	6.6	**2660**	46	44	410	<1	**25.6**	279	<1	NA	<1	**6.65**	NA	NA	NA	<1	<0.2	NA	NA	3.303	NA	0.38
CCR-212BR	Edge of WB	West Ash Basin	Downgradient	10/09/2018	**5.8**	<50	64	36	270	<1	<1	18	<1	NA	1.24	<1	NA	NA	NA	<1	<0.2	NA	NA	1.472	NA	0.078 j
CCR-212BR	Edge of WB	West Ash Basin	Downgradient	01/23/2019	**6.0**	<50	72	40	280	<1	<1	14	<1	NA	1.88	<1	NA	NA	NA	<1	<0.2	NA	NA	0.501	NA	0.056 j
CCR-213BR	Edge of WB	West Ash Basin	Downgradient	10/09/2018	**6.3**	<50	210	48	**780**	<1	<1	69	<1	NA	0.481 j	<1	NA	NA	NA	<1	<0.2	NA	NA	4.22	NA	0.1 j
CCR-213BR	Edge of WB	West Ash Basin	Downgradient	01/23/2019	6.6	<50	210	52	**720**	<1	<1	65	<1	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	NA	1.399	NA	<0.5
CCR-214BR	Edge of WB	West Ash Basin	Downgradient	10/09/2018	6.9	<50	36	50	430	<1	<1	70	<1	NA	0.713 j	<1	NA	NA	NA	<1	<0.2	NA	NA	1.135	NA	0.0931 j
CCR-214BR	Edge of WB	West Ash Basin	Downgradient	01/23/2019	7.1	<50	33	47	410	<1	0.443 j	75	<1	NA	0.946 j	<1	NA	NA	NA	0.354 j	<0.2	NA	NA	0.645	NA	0.063 j
CCR-215BR	Edge of WB	West Ash Basin	Downgradient	10/09/2018	6.7	<50	16	42	420	<1	<1	43	<1	NA	<1	<1	NA	NA	NA	0.352 j	<0.2	NA	NA	0.854	NA	0.23
CCR-215BR	Edge of WB	West Ash Basin	Downgradient	01/23/2019	6.9	<50	17	33	400	<1	<1	35	<1	NA	<1	<1	NA	NA	NA	0.443 j	<0.2	NA	NA	0.37	NA	0.24
CCR-216BR	Edge of WB	West Ash Basin	Downgradient	10/09/2018	**6.5**	<50	28	39	440	<1	<1	206	<1	NA	0.341 j	<1	NA	NA	NA	1.02	<0.2	NA	NA	1.278	NA	0.24
CCR-216BR	Edge of WB	West Ash Basin	Downgradient	01/23/2019	6.7	<50	32	40	460	<1	<1	207	<1	NA	<1	<1	NA	NA	NA	1.08	<0.2	NA	NA	0.4394	NA	0.23
CCR-217BR	Edge of WB	West Ash Basin	Downgradient	10/09/2018	**6.5**	<50	30	42	390	<1	<1	82	<1	NA	<1	<1	NA	NA	NA	0.413 j	<0.2	NA	NA	0.4276	NA	0.1
CCR-217BR	Edge of WB	West Ash Basin	Downgradient	01/30/2019	6.9	<50	27	47	340	<1	<1	69	<1	NA	<1	<1	NA	NA	NA	0.526 j	<0.2	NA	NA	1.313	NA	0.13
CCR-218BR	Edge of WB	West Ash Basin	Downgradient	10/09/2018	**6.4**	<50	32	44	340	<1	<1	124	<1	NA	0.417 j	<1	NA	NA	NA	<1	<0.2	NA	NA	0.978	NA	0.3
CCR-218BR	Edge of WB	West Ash Basin	Downgradient	01/23/2019	6.6	<50	30	45	330	<1	<1	120	<1	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	NA	0.3455	NA	0.28
CCR-219BR-BG IMP	---	---	---	04/02/2019	7.8	<50	9.7	<1	NA	<0.5	3.8	26	<0.1	<0.025	<0.5	<0.1	170	**76**	0.99	<0.5	<0.1	**0.46**	<10	1.075	0.00125	0.11 M1
CCR-219D-BG IMP	---	---	---	04/02/2019	6.8	<50	13	17	270	<1	<1	49	<1	<0.025	<1	<1	7.304 j	**398**	0.531 j	<1	<0.2	**1.48**	<5	0.593	0.000245	0.091 j
CW-01 IMP	North of EB on CB	East Ash Basin	Downgradient	07/25/2018	**6.0**	<50	14	99	430	<1	<1	121	<1	<0.025	<1	<1	51	33	0.954 j	0.51 j	0.179 j	**22.2**	1.919 j	NA	NA	0.6
CW-01	North of EB on CB	East Ash Basin	Downgradient	07/25/2018	**6.0**	<50	12	100	450	<1	<1	120	<1	NA	<5	<1	29	33	<5	<1	<0.2	**22.2**	<5	NA	NA	NA
CW-01 IMP	North of EB on CB	East Ash Basin	Downgradient	11/13/2018	**6.1**	<50	9.7	97	430	<1	<1	108	<1	<0.025	<1	0.985 j	238	**77**	1.02	0.544 j	<0.2	**24.7**	<5	0.633	0.000392	0.34
CW-01	North of EB on CB	East Ash Basin	Downgradient	11/13/2018	**6.1**	<50	11	99	420	<1	<1	123	<1	NA	<5	<1	126	49	<5	<1	<0.2	**22.5**	<5	NA	NA	NA
CW-01 IMP	North of EB on CB	East Ash Basin	Downgradient	04/24/2019	**5.8**	<50	9.9	97	460	<1	<1	NA	NA	0.058 P4	<1	0.55 j	24	**55**	NA	<1	NA	**17.9**	NA	NA	NA	NA
CW-01	North of EB on CB	East Ash Basin	Downgradient	04/24/2019	**5.8**	<50	11	96	480	<1	<1	143	<1	NA	<5	<1	33	**55**	<5	<1	<0.2	**18**	<5	NA	NA	NA
CW-02 IMP	North of WB, shore of cooling pond, in CB	West Ash Basin	Downgradient	07/25/2018	6.5	<50	16	85	420	<1	<1	87	<1	0.34	0.512 j	<1	210	**212**	0.385 j	<1	0.117 j	**21.5**	1.835 j	0.389	0.00188	0.67
CW-02	North of WB, shore of cooling pond, in CB	West Ash Basin	Downgradient	07/25/2018	6.5	<50	16	85	440	<1	<1	87	<1	NA	<5	<1	195	**187**	<5	<1	<0.2	**24.4**	<5	NA	NA	NA
CW-02 IMP	North of WB, shore of cooling pond, in CB	West Ash Basin	Downgradient	11/13/2018	6.7	<50	16	85	420	<1	<1	85	<1	0.54	0.561 j	<1	153	**99**	<1	<1	<0.2	**30.8**	<5	1.1817	0.00234	0.82
CW-02	North of WB, shore of cooling pond, in CB	West Ash Basin	Downgradient	11/13/2018	6.7	<50	16	89	410	<1	<1	86	<1	NA	<5	<1	158	**113**	<5	<1	<0.2	**32.5**	<5	NA	NA	NA
CW-02 CCR	North of WB, shore of cooling pond, in CB	West Ash Basin	Downgradient	01/24/2019	6.7	<50	17	71	430	<1	<1	87	<1	NA	0.777 j	<1	NA	NA	NA	<1	<0.2	NA	NA	0.4006	NA	0.85
CW-02 IMP	North of WB, shore of cooling pond, in CB	West Ash Basin	Downgradient	04/24/2019	**6.4**	<50	31	47	440	<1	1.32	NA	NA	<0.025	<1	<1	**25800**	**549**	NA	<1	NA	**11.7**	NA	0.358	0.00179	NA
CW-02	North of WB, shore of cooling pond, in CB	West Ash Basin	Downgradient	04/24/2019	**6.4**	<50	30	49	**540**	<1	<1	115	<1	NA	<5	<1	**465**	**515**	<5	<1	<0.2	**14.2**	<5	NA	NA	NA
CW-02D IMP	North of WB, shore of cooling pond, in CB	West Ash Basin	Downgradient	07/25/2018	6.5	17.873 j	16	130	420	<1	<1	150	<1	0.44	0.466 j	<1	<10	<5	<1	<1	<0.2	**12.4**	<5	1.757	0.00127	0.28
CW-02D	North of WB, shore of cooling pond, in CB	West Ash Basin	Downgradient	07/25/2018	6.5	<50	16	130	410	<1	<1	148	<1	NA	<5	<1	<10	<5	<5	<1	<0.2	**12.8**	<5	NA	NA	NA
CW-02D IMP	North of WB, shore of cooling pond, in CB	West Ash Basin	Downgradient	11/13/2018	6.6	19.807 j	15	130	400	<1	<1	145	<1	0.38	0.453 j	<1	<10	<5	<1	<1	<0.2	**13.2**	<5	0.556	0.00124	0.2
CW-02D	North of WB, shore of cooling pond, in CB	West Ash Basin	Downgradient	11/13/2018	6.6	<50	16	130	390	<1	<1	151	<1	NA	<5	<1	<10	<5	<5	<1	<0.2	**13.3**	<5	NA	NA	NA
CW-02D IMP	North of WB, shore of cooling pond, in CB	West Ash Basin	Downgradient	04/24/2019	6.5	22.856 j	15	120	420	<1	<1	NA	NA	0.47	0.769 j	<1	6.09 j	<5	NA	<1	NA	**13.1**	NA	0.458	0.00144	NA
CW-02D	North of WB, shore of cooling pond, in CB	West Ash Basin	Downgradient	04/24/2019	6.5	<50	16	120	420	<1	<1	153	<1	NA	<5	<1	<10	<5	<5	<1	<0.2	**13**	<5	NA	NA	NA
CW-03 IMP	On WB CB, on canal	West Ash Basin	Downgradient	07/25/2018	**6.4**	<50	60	69	470	<1	<1	135	<1	0.074	<1	<1	13	<5	0.348 j	0.433 j	<0.2	**3.7**	<5	NA	NA	0.21
CW-03	On WB CB, on canal	West Ash Basin	Downgradient	07/25/2018	**6.4**	<50	62	70	470	<1	<1	135	<1	NA	<5	<1	10	<5	<5	<1	<0.2	**3.43**	<5	NA	NA	NA
CW-03 IMP	On WB CB, on canal	West Ash Basin	Downgradient	11/13/2018	**6.1**	<50	18	27	210	<1	0.435 j	61	<1	0.044	1.12	**1.2**	**3320**	**116**	1.06	<1	<0.2	**9.72**	4.789 j	NA	NA	0.082 j

FACILITY NAME: ROXBORO
DATE UPDATED: 06/24/2019
SHEET UPDATED BY: BRANDON RUSSO
SHEET CHECKED BY: CRAIG EADY

	PARAME	TED 40CFR257 APPENDIX III CONSTITUENTS				INORGANIC PARAMETERS (TOTAL CONCENTRATION)														RADIONUCLIDES		ER PARAME
Reporting Units	S.U.	ug/L	mg/L	mg/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/mL	mg/L
15A NCAC 02L Standard	6.5-8.5	700	250	250	500	1*	10	700	4*	10	10	1*	300	50	100	20	0.2*	0.3*	1000	5^	0.03^	2
Provisional Background Threshold Values (Transition Zone Unit)	6.3-7.6	50	150	37	540	1	1	91	1	16.1	24.1	1	1173	405	5.22	1.78	0.2	30.2	12	5.45	0.00516	NE
Provisional Background Threshold Values (Bedrock Unit)	6.8-8.3	50	120	73.5	530	1	1	185	1	0.19	3.61	6.4	4227	1198	2.11	1	0.2	2.49	7	5.21	0.00324	NE

					PARAME	TED 40CFR257 APPENDIX III CONSTITUENTS				INORGANIC PARAMETERS (TOTAL CONCENTRATION)														RADIONUCLIDES		ER PARAME
Sample ID	Location Description	Associated Unit	Location With Respect to Groundwater Flow Direction	Sample Collection Date	pH	Boron	Chloride	Sulfate	Total Dissolved Solids	Antimony	Arsenic	Barium	Beryllium	Chromium (VI)	Chromium	Cobalt	Iron	Manganese	Nickel	Selenium	Thallium	Vanadium	Zinc	Total Radium	Total Uranium	Fluoride
CW-03	On WB CB, on canal	West Ash Basin	Downgradient	11/13/2018	**6.1**	<50	19	28	200	<1	<1	64	<1	NA	<5	**1.15**	**3380**	**120**	<5	<1	<0.2	**10.1**	<5	NA	NA	NA
CW-03 CCR	On WB CB, on canal	West Ash Basin	Downgradient	01/30/2019	**6.2**	<50	28	37	220	<1	<1	76	<1	NA	0.57 j	**2**	NA	NA	NA	<1	<0.2	NA	NA	0.992	NA	0.072 j
CW-03 IMP	On WB CB, on canal	West Ash Basin	Downgradient	04/24/2019	**5.6**	<50	59	51	240	<1	<1	NA	NA	0.035	0.403 j	0.68 j	249	**131**	NA	<1	NA	**2.06**	NA	NA	NA	NA
CW-03	On WB CB, on canal	West Ash Basin	Downgradient	04/24/2019	**5.6**	<50	61	52	290	<1	<1	105	<1	NA	<5	<1	**377**	**130**	<5	<1	<0.2	**2.12**	<5	NA	NA	NA
CW-03D IMP	On WB CB, on canal	West Ash Basin	Downgradient	07/25/2018	7.4	<50	25	32	320	<1	0.642 j	50	<1	0.079	<1	<1	24	4.933 j	0.366 j	<1	<0.2	**2.73**	2.623 j	NA	NA	0.18
CW-03D	On WB CB, on canal	West Ash Basin	Downgradient	07/25/2018	7.4	<50	24	32	320	<1	<1	52	<1	NA	<5	<1	23	<5	<5	<1	<0.2	**2.76**	<5	NA	NA	NA
CW-03D IMP	On WB CB, on canal	West Ash Basin	Downgradient	11/13/2018	7.5	<50	24	33	330	<1	0.654 j	64	<1	0.11	1.24	0.456 j	**916**	**113**	0.889 j	<1	<0.2	**5.08**	3.541 j	NA	NA	0.15
CW-03D	On WB CB, on canal	West Ash Basin	Downgradient	11/13/2018	7.5	<50	25	38	330	<1	<1	65	<1	NA	<5	<1	**1020**	**117**	<5	<1	<0.2	**5.06**	<5	NA	NA	NA
CW-03D IMP	On WB CB, on canal	West Ash Basin	Downgradient	04/24/2019	7.2	<50	25	32	350	<1	0.414 j	NA	NA	0.19	0.664 j	<1	<10	28	NA	<1	NA	**2.16**	NA	NA	NA	NA
CW-03D	On WB CB, on canal	West Ash Basin	Downgradient	04/24/2019	7.2	<50	27	33	360	<1	<1	44	<1	NA	<5	<1	<10	27	<5	<1	<0.2	**2.02**	<5	NA	NA	NA
CW-04 IMP	Southwest of WB in CB	West Ash Basin	Downgradient	07/25/2018	**6.5**	<50	28	38	320	<1	<1	124	<1	0.23	0.347 j	<1	5.373 j	<5	<1	0.467 j	<0.2	**2.18**	2.161 j	NA	NA	0.28
CW-04	Southwest of WB in CB	West Ash Basin	Downgradient	07/25/2018	**6.5**	<50	28	37	330	<1	<1	133	<1	NA	<5	<1	<10	<5	<5	<1	<0.2	**2.09**	<5	NA	NA	NA
CW-04 IMP	Southwest of WB in CB	West Ash Basin	Downgradient	11/14/2018	6.5	<50	28	39	330	<1	<1	131	<1	0.24	0.335 j,B2	<1	7.521 j,B2	<5	<1	0.411 j	<0.2	**2.08**	<5	NA	NA	0.26
CW-04	Southwest of WB in CB	West Ash Basin	Downgradient	11/14/2018	6.5	<50	28	38	320	<1	<1	130	<1	NA	<5	<1	33	<5	<5	<1	<0.2	**2.21**	<5	NA	NA	NA
CW-04 IMP	Southwest of WB in CB	West Ash Basin	Downgradient	04/23/2019	**6.4**	<50	27	37	350	<1	<1	NA	NA	0.21 P4,R0	0.735 j	<1	173	3.853 j	NA	<1	NA	**2.46**	NA	NA	NA	NA
CW-04	Southwest of WB in CB	West Ash Basin	Downgradient	04/23/2019	**6.4**	<50	27	37	360	<1	<1	130	<1	NA	<5	<1	76	<5	<5	<1	<0.2	**2.37**	<5	NA	NA	NA
CW-05 IMP	North of WB, on CB	West Ash Basin	Downgradient	07/25/2018	**6.3**	286	5.7	200	470	<1	<1	42	<1	0.33	0.449 j	<1	9.964001 j	<5	0.803 j	<1	<0.2	**25.1**	1.916 j	0.3297	0.000578	0.456 j
CW-05	North of WB, on CB	West Ash Basin	Downgradient	07/25/2018	**6.3**	283	5.8	200	490	<1	<1	42	<1	NA	<5	<1	12	<5	<5	<1	<0.2	**25**	<5	NA	NA	NA
CW-05 IMP	North of WB, on CB	West Ash Basin	Downgradient	11/13/2018	**6.4**	220	3.9	160	400	<1	<1	54	<1	0.36	0.362 j	<1	5.419 j	<5	<1	<1	<0.2	**33.5**	<5	0.589	0.000153 j	0.257 j
CW-05	North of WB, on CB	West Ash Basin	Downgradient	11/13/2018	**6.4**	211	4	120	370	<1	<1	57	<1	NA	<5	<1	11	<5	<5	<1	<0.2	**34**	<5	NA	NA	NA
CW-05 IMP	North of WB, on CB	West Ash Basin	Downgradient	04/24/2019	**6.2**	182	4.8	100	380	<1	<1	NA	NA	0.35	0.741 j	<1	6.956 j	<5	NA	<1	NA	**27.1**	NA	0.704	0.000131 j	NA
CW-05	North of WB, on CB	West Ash Basin	Downgradient	04/24/2019	**6.2**	182	5.1	96	350	<1	<1	47	<1	NA	<5	<1	<10	<5	<5	<1	<0.2	**27.7**	<5	NA	NA	NA
GMW-01A CCR	Edge of EB	East Ash Basin	Downgradient	10/08/2018	6.6	109	9.7	63	330	<1	<1	32	<1	NA	<1	**1.69**	NA	NA	NA	11	<0.2	NA	NA	0.5322	NA	0.27
GMW-01A CCR	Edge of EB	East Ash Basin	Downgradient	01/29/2019	6.9	116	8.6	85	380	<1	<1	36	<1	NA	<1	**1.93**	NA	NA	NA	5.18	<0.2	NA	NA	0.2805	NA	0.26
GMW-02 CCR	Edge of EB	East Ash Basin	Downgradient	10/08/2018	6.6	**5290**	29	**930**	**1500**	<1	<1	21	<1	NA	<1	<1	NA	NA	NA	3.16	<0.2	NA	NA	0.487	NA	0.09 j
GMW-02 CCR	Edge of EB	East Ash Basin	Downgradient	01/30/2019	6.7	**5950**	30	**850**	**1500**	<1	<1	21	<1	NA	0.658 j	<1	NA	NA	NA	3.21	<0.2	NA	NA	0.1	NA	<1
GMW-06	North of EB in CB	East Ash Basin	Downgradient	07/26/2018	**6.4**	**2500**	57	**570**	**1300**	<1	<1	31	<1	0.64	0.746 j	<1	8.106 j	5	1.01	**61**	<0.2	**4.25**	<5	1.536	0.00225	0.663 j
GMW-06 CCR	North of EB in CB	East Ash Basin	Downgradient	10/08/2018	**6.4**	**2330**	57	**770 M2**	**1200**	<1	<1	30	<1	NA	1.22 S1	<1	NA	NA	NA	**57.3**	0.091 j	NA	NA	1.01	NA	0.045 j
GMW-06 IMP	North of EB in CB	East Ash Basin	Downgradient	11/12/2018	**6.3**	**2700**	55	**610**	**1300**	<1	<1	31	<1	0.51	0.87 j	<1	51	8	0.751 j	**57.6**	<0.2	**4.14**	<5	0.796	0.00193	0.521 j
GMW-06	North of EB in CB	East Ash Basin	Downgradient	11/12/2018	**6.3**	**2510**	54.5	**596**	**1260**	NA	<1	30.1	NA	NA	1.34 j	NA	80	7.85	0.898 j	**57.7**	0.197 j	NA	2.39 j	NA	NA	0.605 j
GMW-06 CCR	North of EB in CB	East Ash Basin	Downgradient	01/30/2019	6.7	**2720**	57	**800**	**1200**	<1	<1	32	<1	NA	0.933 j	<1	NA	NA	NA	**49.3**	0.088 j	NA	NA	1.172	NA	0.089 j
GMW-06 IMP	North of EB in CB	East Ash Basin	Downgradient	04/30/2019	**6.5**	**2800**	58	**600**	**1300**	<1	<1	NA	NA	1.5	1.91	0.448 j	29	4.006 j	NA	**50.8**	NA	**4.19**	NA	NA	NA	NA
GMW-06	North of EB in CB	East Ash Basin	Downgradient	04/30/2019	**6.5**	**2750**	58.9	**602**	**1270**	NA	<1	45.8	NA	NA	1.61 j	NA	37	4.16 j	1.53 j	**46.5**	<0.2	NA	<5	NA	NA	0.521 j
GMW-07	Western edge of EB in CB	East Ash Basin	Downgradient	07/25/2018	**6.4**	**2060**	230	240	**970**	<1	1.39	187	<1	0.31 M1	1.17	<1	117	2.484 j	1.05	12	0.092 j	**6.86**	3.006 j	NA	NA	0.395 j
GMW-07 IMP	Western edge of EB in CB	East Ash Basin	Downgradient	11/13/2018	6.5	**2470**	**300**	**340**	**870**	<1	<1	168	<1	0.2	0.787 j	<1	283	7	0.515 j	17.5	<0.2	**7.15**	<5	NA	NA	<1
GMW-07	Western edge of EB in CB	East Ash Basin	Downgradient	11/13/2018	6.5	**2490**	214	243	**900**	NA	<1	177	NA	NA	1.31 j	NA	**308**	8.78	1.12 j	16.8	<0.2	NA	3.54 j	NA	NA	0.279 j
GMW-07 IMP	Western edge of EB in CB	East Ash Basin	Downgradient	04/30/2019	**6.4**	**6040**	**460**	**710**	**2000**	<1	<1	NA	NA	0.3	0.593 j	<1	16	<5	NA	16.3	NA	**5.44**	NA	NA	NA	NA
GMW-07	Western edge of EB in CB	East Ash Basin	Downgradient	04/30/2019	**6.4**	**6230**	**476**	**738**	**950**	NA	<1	112	NA	NA	0.614 j	NA	85.2	<5	0.761 j	15.7	<0.2	NA	1.82 j	NA	NA	0.275 j
GMW-08	Southern edge of EB in CB	East Ash Basin	Sidegradient	07/26/2018	**6.5**	**3910**	170	**480**	**1400**	<1	<1	41	<1	0.036	3.21	<1	42	**52**	1.4	<1	<0.2	**2**	3.954 j	NA	NA	0.511 j
GMW-08R	Southern edge of EB in CB	East Ash Basin	Sidegradient	09/06/2018	6.6	**3580**	170	**440**	**1400**	<1	0.636 j	64	<1	0.13	0.433 j	0.924 j	23	**193**	5.05	<1	<0.2	**2.32**	40	0.589	0.014	0.543 j
GMW-08R	Southern edge of EB in CB	East Ash Basin	Sidegradient	09/20/2018	6.6	**3520**	170	**440**	**1300**	<1	0.497 j	64	<1	0.16	0.423 j	0.774 j	27	**171**	3.88	<1	<0.2	**2.29**	29	0.848	0.0151	0.461 j
GMW-08R IMP	Southern edge of EB in CB	East Ash Basin	Sidegradient	11/12/2018	6.6	**3440**	170	**430**	**1300**	<1	0.734 j	84	<1	0.095	<1	0.728 j	44	**258**	3.69	0.38 j	<0.2	**2.17**	37	NA	NA	0.404 j
GMW-08R	Southern edge of EB in CB	East Ash Basin	Sidegradient	11/12/2018	6.6	**3450**	173	**431**	**1240**	NA	0.704 j	85.8	NA	NA	0.625 j	NA	47.5	**263**	3.73 j	0.324 j	<0.2	NA	37.4	NA	NA	0.466 j
GMW-08R	Southern edge of EB in CB	East Ash Basin	Sidegradient	01/30/2019	6.8	**3420**	170	**400**	**1300**	<1	0.636 j	86	<1	<0.025	<1	0.486 j	6.446 j	**246**	3.57	0.352 j	<0.2	**1.96**	30	NA	NA	0.116 j
GMW-08R IMP	Southern edge of EB in CB	East Ash Basin	Sidegradient	04/30/2019	6.6	**3260**	180	**390**	**1300**	<1	0.717 j	NA	NA	0.084	0.427 j	0.613 j	34	**199**	NA	<1	NA	**2.2**	NA	NA	NA	NA
GMW-08R	Southern edge of EB in CB	East Ash Basin	Sidegradient	04/30/2019	6.6	**3290**	178	**404**	**1250**	NA	0.7 j	78.3	NA	NA	<5	NA	34.3	**206**	2.72 j	<1	<0.2	NA	22.5	NA	NA	<1
GMW-09	Southeast edge of EB in CB	East Ash Basin	Sidegradient	07/26/2018	**6.0**	<50	4.2	40	190	<1	<1	58	<1	0.13	<1	<1	14	<5	<1	<1	<0.2	**3.76**	<5	NA	NA	0.11
GMW-09 CCR	Southeast edge of EB in CB	East Ash Basin	Sidegradient	10/08/2018	**6.3**	<50	3.3	21	140	<1	<1	38	<1	NA	0.358 j	<1	NA	NA	NA	<1	<0.2	NA	NA	0.594	NA	0.13
GMW-09 IMP	Southeast edge of EB in CB	East Ash Basin	Sidegradient	11/12/2018	**6.1**	<50	2.9	14	230	<1	<1	31	<1	0.13	<1	<1	50	<5	<1	<1	<0.2	**3.91**	<5	NA	NA	0.16
GMW-09	Southeast edge of EB in CB	East Ash Basin	Sidegradient	11/12/2018	**6.1**	<50	2.85	13.1	137	NA	<1	29.1	NA	NA	1.07 j	NA	41.9	<5	<5	<1	0.121 j	NA	1.76 j	NA	NA	0.133
GMW-09 CCR	Southeast edge of EB in CB	East Ash Basin	Sidegradient	01/29/2019	**6.3**	<50	2.5	13	170	<1	<1	30	<1	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	NA	0.458	NA	0.11
GMW-09 IMP	Southeast edge of EB in CB	East Ash Basin	Sidegradient	04/30/2019	**6.1**	<50	4	29	160	<1	<1	NA	NA	0.11	0.725 j	<1	123	2.057 j	NA	<1	NA	**3.7**	NA	NA	NA	NA
GMW-09	Southeast edge of EB in CB	East Ash Basin	Sidegradient	04/30/2019	**6.1**	<50	3.55	26.8	190	NA	<1	48	NA	NA	1.05 j	NA	52.2	<5	0.662 j	<1	0.114 j	NA	<5	NA	NA	0.146
GMW-10	Northern edge of EB in CB	East Ash Basin	Downgradient	07/26/2018	**5.7**	100	19	40	220	<1	<1	90	<1	0.16	<1	<1	69	<5	2.22	2.39	<0.2	**2.85**	2.071 j	NA	NA	0.13
GMW-10 CCR	Northern edge of EB in CB	East Ash Basin	Downgradient	10/08/2018	**6.0**	132	19	59	230	<1	<1	101	<1	NA	0.556 j	<1	NA	NA	NA	3.97	<0.2	NA	NA	0.937	NA	0.14
GMW-10 IMP	Northern edge of EB in CB	East Ash Basin	Downgradient	11/12/2018	**5.9**	138	18	61	140	<1	<1	104	<1	0.16	<1	<1	39	<5	1.46	4.87	<0.2	**2.4**	<5	NA	NA	0.15
GMW-10	Northern edge of EB in CB	East Ash Basin	Downgradient	11/12/2018	**5.9**	67.8	19.3	47.1	213	NA	<1	80.4	NA	NA	1.09 j	NA	107	2.43 j	2.23 j	2.35	<0.2	NA	3.64 j	NA	NA	0.138
GMW-10 CCR	Northern edge of EB in CB	East Ash Basin	Downgradient	01/30/2019	**6.0**	150	19	65	230	<1	<1	112	<1	NA	0.41 j	<1	NA	NA	NA	4.8	<0.2	NA	NA	0.814	NA	0.1
GMW-10 IMP	Northern edge of EB in CB	East Ash Basin	Downgradient	04/30/2019	**5.9**	125	20	51	230	<1	<1	NA	NA	0.24	0.617 j	<1	30	<5	NA	3.65	NA	**2.5**	NA	NA	NA	NA
GMW-10	Northern edge of EB in CB	East Ash Basin	Downgradient	04/30/2019	**5.9**	109	20.3	50.6	255	NA	<1	97.1	NA	NA	0.494 j	NA	27.7	<5	2.01 j	2.93	<0.2	NA	7.02	NA	NA	0.139
GMW-11	Northern edge of EB in CB	East Ash Basin	Downgradient	07/27/2018	**6.4**	**3450**	29	**520**	**930**	<1	<1	49	<1	0.22	0.641 j	<1	162	2.981 j	5.6	**96.6**	<0.2	**6.27**	2.369 j	NA	NA	0.422 j
GMW-11 IMP	Northern edge of EB in CB	East Ash Basin	Downgradient	11/12/2018	**6.4**	**2190**	31	**350**	**840**	<1	<1	40	<1	0.3	0.668 j	<1	25	<5	3.54	**100**	<0.2	**6.61**	<5	NA	NA	0.371 j
GMW-11	Northern edge of EB in CB	East Ash Basin	Downgradient	11/12/2018	**6.4**	**1960**	30.2	**352**	**752**	NA	<1	40.3	NA	NA	0.772 j	NA	66.7	<5	3.76 j	**95.5**	<0.2	NA	3.01 j	NA	NA	<1

FACILITY NAME: ROXBORO
DATE UPDATED: 06/24/2019
DSHEET UPDATED BY: BRANDON RUSSO
DSHEET CHECKED BY: CRAIG EADY

	D PARAME	TED 40CFR257 APPENDIX III CONSTITUENTS p				INORGANIC PARAMETERS (TOTAL CONCENTRATION)														RADIONUCLIDES		ER PARAME
Reporting Units	**S.U.**	**ug/L**	**mg/L**	**mg/L**	**mg/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**pCi/L**	**ug/mL**	**mg/L**
15A NCAC 02L Standard	**6.5-8.5**	**700**	**250**	**250**	**500**	**1***	**10**	**700**	**4***	**10**	**10**	**1***	**300**	**50**	**100**	**20**	**0.2***	**0.3***	**1000**	**5^**	**0.03^**	**2**
Provisional Background Threshold Values (Transition Zone Unit)	**6.3-7.6**	**50**	**150**	**37**	**540**	**1**	**1**	**91**	**1**	**16.1**	**24.1**	**1**	**1173**	**405**	**5.22**	**1.78**	**0.2**	**30.2**	**12**	**5.45**	**0.00516**	**NE**
Provisional Background Threshold Values (Bedrock Unit)	**6.8-8.3**	**50**	**120**	**73.5**	**530**	**1**	**1**	**185**	**1**	**0.19**	**3.61**	**6.4**	**4227**	**1198**	**2.11**	**1**	**0.2**	**2.49**	**7**	**5.21**	**0.00324**	**NE**

					D PARAME	TED 40CFR257 APPENDIX III CONSTITUENTS p				INORGANIC PARAMETERS (TOTAL CONCENTRATION)														RADIONUCLIDES		ER PARAME
Sample ID	**Location Description**	**Associated Unit**	**Location With Respect to Groundwater Flow Direction**	**Sample Collection Date**	**pH**	**Boron**	**Chloride**	**Sulfate**	**Total Dissolved Solids**	**Antimony**	**Arsenic**	**Barium**	**Beryllium**	**Chromium (VI)**	**Chromium**	**Cobalt**	**Iron**	**Manganese**	**Nickel**	**Selenium**	**Thallium**	**Vanadium**	**Zinc**	**Total Radium**	**Total Uranium**	**Fluoride**
GMW-11 IMP	Northern edge of EB in CB	East Ash Basin	Downgradient	04/30/2019	6.6	**1620**	32	**320**	**820**	<1	<1	NA	NA	0.41	0.73 j	<1	<10	<5	NA	**111**	NA	**7.56**	NA	NA	NA	NA
GMW-11	Northern edge of EB in CB	East Ash Basin	Downgradient	04/30/2019	6.6	**1640**	33.7	**335**	**804**	NA	<1	38.2	NA	NA	0.518 j	NA	4.19 j	<5	3.53 j	**104**	<0.2	NA	9.95	NA	NA	<1
GPMW-01BR	Northwest of the GSA, edge of RR, outside of CB	Gypsum Storage Area	Downgradient	07/31/2018	6.6	**1620**	25	**1200**	**1800**	<1	1.06	47	<1	<0.025	<1	0.54 j	**833**	**141**	1.49	<1	<0.2	**0.824 B2**	1.828 j	NA	NA	<2
GPMW-01BR	Northwest of the GSA, edge of RR, outside of CB	Gypsum Storage Area	Downgradient	11/15/2018	6.6	**1600**	21	**1100**	**1700**	<1	0.743 j	45	<1	<0.025	<1	0.474 j	**593**	**99**	1.61	<1	<0.2	**0.74**	9	NA	NA	<2
GPMW-01BR	Northwest of the GSA, edge of RR, outside of CB	Gypsum Storage Area	Downgradient	05/01/2019	**6.5**	**1580**	19	**1100**	**1700**	<1	0.732 j	NA	NA	<0.025	<1	0.417 j	**512**	**100**	NA	0.568 j	NA	**0.734**	NA	NA	NA	NA
GPMW-01D	Northwest of the GSA, edge of RR, outside of CB	Gypsum Storage Area	Downgradient	07/31/2018	6.6	**1110**	24	**1200**	**1800**	<1	<1	57	<1	<0.025	<1	<1	53	**62**	0.566 j	<1	<0.2	**4.1 B2**	<5	NA	NA	<2
GPMW-01D	Northwest of the GSA, edge of RR, outside of CB	Gypsum Storage Area	Downgradient	11/15/2018	6.6	**1150**	21	**1200**	**1700**	<1	<1	56	<1	<0.025	0.425 j	<1	66	**57**	0.674 j	<1	<0.2	**4.33**	1.924 j	NA	NA	<2
GPMW-01D CCR	Northwest of the GSA, edge of RR, outside of CB	Gypsum Storage Area	Downgradient	01/30/2019	6.6	**1240**	20	**1100**	**1700**	<1	<1	57	<1	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	NA	0.2979	NA	<2
GPMW-01D	Northwest of the GSA, edge of RR, outside of CB	Gypsum Storage Area	Downgradient	05/01/2019	**6.5**	**1200**	19	**1100**	**1800**	<1	<1	NA	NA	<0.025	<1	<1	18	**54**	NA	0.502 j	NA	**4.48**	NA	NA	NA	NA
GPMW-01S	Northwest of the GSA, edge of RR, outside of CB	Gypsum Storage Area	Downgradient	07/31/2018	**6.2**	**1940**	21	**1400**	**2000**	<1	<1	68	<1	<0.025	<1	**9.56**	231	**3360**	7.44	<1	<0.2	**4.64 B2**	<5	NA	NA	0.95 j
GPMW-01S	Northwest of the GSA, edge of RR, outside of CB	Gypsum Storage Area	Downgradient	11/15/2018	**6.2**	**2180**	13	**1200**	**1700**	<1	<1	57	<1	<0.025	<1	**12.3**	**345**	**3720**	6.61	<1	0.151 j	**4.59**	9	NA	NA	<2
GPMW-01S	Northwest of the GSA, edge of RR, outside of CB	Gypsum Storage Area	Downgradient	05/01/2019	**6.2**	**1900**	12	**930**	**1500**	<1	<1	NA	NA	0.032	0.388 j	**8.92**	60	**3030**	NA	<1	NA	**5.04**	NA	NA	NA	NA
GPMW-02BR	North of the GSA, edge of RR, outside of CB	Gypsum Storage Area	Downgradient	07/31/2018	**6.5**	**2530**	61	**1100**	**2000**	<1	<1	59	<1	<0.025	<1	0.474 j	139	**1030**	4.62	<1	<0.2	**1.39 B2**	<5	NA	NA	<2
GPMW-02BR	North of the GSA, edge of RR, outside of CB	Gypsum Storage Area	Downgradient	11/15/2018	6.6	**2570**	63	**1200**	**2000**	<1	<1	59	<1	<0.025	<1	0.684 j	**332**	**1220**	4.92	<1	<0.2	**1.74**	2.608 j	NA	NA	<2
GPMW-02BR	North of the GSA, edge of RR, outside of CB	Gypsum Storage Area	Downgradient	05/01/2019	**6.4**	**2520**	52	**1200**	**2100**	<1	<1	NA	NA	<0.025 P4,R1	0.456 j	0.719 j	152	**1310**	NA	<1	NA	**1.87**	NA	NA	NA	NA
GPMW-02D	North of the GSA, edge of RR, outside of CB	Gypsum Storage Area	Downgradient	07/31/2018	6.7	<50	54	**610**	**1200**	<1	2.31	323	<1	<0.025	<1	**6.61**	**93700**	**9520**	<1	<1	<0.2	**0.612 B2**	2.458 j	NA	NA	0.491 j
GPMW-02D	North of the GSA, edge of RR, outside of CB	Gypsum Storage Area	Downgradient	11/15/2018	6.7	<50	52	**680**	**1100**	<1	2.43	292	<1	<0.025	0.358 j	**7.31**	**93000**	**10100**	<1	<1	<0.2	**0.748**	<5	NA	NA	<1
GPMW-02D	North of the GSA, edge of RR, outside of CB	Gypsum Storage Area	Downgradient	05/01/2019	6.5	24.701 j	51	**690**	**1200**	<1	2.28	NA	NA	<0.025 P4	0.48 j	**6.82**	**98000**	**11400**	NA	<1	NA	**0.62**	NA	NA	NA	NA
GPMW-03BR	North of the GSA, edge of RR, outside of CB	Gypsum Storage Area	Downgradient	07/31/2018	7.5	238	17	**440**	**760**	<1	1.01	27	<1	<0.025	<1	<1	66	6	<1	<1	<0.2	**0.466 B2**	2.049 j	NA	NA	0.921 j
GPMW-03BR	North of the GSA, edge of RR, outside of CB	Gypsum Storage Area	Downgradient	11/15/2018	7.4	221	16	**440**	**720**	<1	1.75	26	<1	<0.025	<1	0.345 j	190	**100**	0.587 j	<1	<0.2	**0.368**	4.648 j	NA	NA	<1
GPMW-03BR	North of the GSA, edge of RR, outside of CB	Gypsum Storage Area	Downgradient	05/01/2019	7.4	196	15	**510**	**760**	<1	1.93	NA	NA	<0.025	0.355 j	<1	**476**	**93**	NA	<1	NA	0.174 j	NA	NA	NA	NA
GPMW-03D	North of the GSA, edge of RR, outside of CB	Gypsum Storage Area	Downgradient	07/31/2018	**6.0**	**1240**	14	**1200**	**1800**	<1	<1	33	<1	0.061	<1	**6.02**	**355**	**617**	2.86	**68.1**	<0.2	**1.39 B2**	2.182 j	NA	NA	<2
GPMW-03D	North of the GSA, edge of RR, outside of CB	Gypsum Storage Area	Downgradient	11/15/2018	**6.0**	**1300**	12	**1300**	**1800**	<1	<1	32	<1	0.07	<1	**1.26**	276	**250**	2.88	**76.4**	0.088 j	**1.72**	3.001 j	NA	NA	<2
GPMW-03D	North of the GSA, edge of RR, outside of CB	Gypsum Storage Area	Downgradient	05/01/2019	**5.9**	**897**	11	**1200**	**1900**	<1	<1	NA	NA	<0.025	0.451 j	**3.06**	45	**334**	NA	**73.2**	NA	**1.22**	NA	NA	NA	NA
HWMW-01BR	Toe of WB main dam, in CB	West Ash Basin	Downgradient	04/09/2019	7.5	33.721 j	13	140	490	<1	<1	8	<1	<0.025	<1	<1	136	**67**	<1	<1	<0.2	0.121 j	<5	0.972	0.000848	0.2965 j
MW-01BR	North of EB, on CB	East Ash Basin	Downgradient	07/31/2018	**6.4**	**1330**	41	98	**610**	0.798 j	0.368 j	354	<1	0.065	3.63	**1.83**	**438**	**959**	7.18	4.16	<0.2	**12 B2**	15	NA	NA	0.4
MW-01BR	North of EB, on CB	East Ash Basin	Downgradient	11/14/2018	6.5	**1930**	44	140	**660**	0.845 j	<1	266	<1	0.17	1.83 B2	**1.68**	**371 B2**	**598**	4.11	11.1	<0.2	**18.2**	7 B	NA	NA	0.39
MW-01BR	North of EB, on CB	East Ash Basin	Downgradient	04/29/2019	6.7	**3380**	45	230	**830**	<1	<1	NA	NA	0.26	1.03	0.98 j	137	**166**	NA	18.5	NA	**19.3**	NA	NA	NA	NA
MW-01BRL	North of EB, on CB	East Ash Basin	Downgradient	04/09/2019	7.0	22.934 j	42	99	**620**	<1	0.888 j	16	<1	<0.025	0.511 j	<1	**2150**	**1480**	<1	<1	<0.2	**0.359**	<5	1.01	0.000516	0.2385 j
MW-02	Toe of WB main dam, in CB	West Ash Basin	Downgradient	07/26/2018	**6.1**	**3290**	**860**	220	**2500**	<1	<1	304	<1	0.13	0.682 j	**1.13**	168	**80**	3.98	<1	0.159 j	**4.95**	<5	1.17	0.00325	<2
MW-02 CCR	Toe of WB main dam, in CB	West Ash Basin	Downgradient	10/09/2018	**6.0**	**3550**	**910**	220	**2600**	<1	<1	292	<1	NA	0.691 j	**1.04**	NA	NA	NA	<1	<0.2	NA	NA	2.52	NA	<2
MW-02	Toe of WB main dam, in CB	West Ash Basin	Downgradient	11/15/2018	**5.8**	**3780**	**930**	220	**2400**	<1	<1	287	<1	0.11	1.18	**1.24**	186	**71**	7.48	<1	<0.2	**5.28**	1.765 j	0.1338	0.00403	<2
MW-02 CCR	Toe of WB main dam, in CB	West Ash Basin	Downgradient	01/23/2019	**6.0**	**3340**	**810**	180	**2100**	<1	<1	268	<1	NA	1.53	0.953 j	NA	NA	NA	<1	<0.2	NA	NA	0.0833	NA	<2
MW-02	Toe of WB main dam, in CB	West Ash Basin	Downgradient	04/29/2019	**6.1**	**4090**	**900**	210	**2300**	0.753 j	<1	NA	NA	0.095	6.42	0.773 j	158	**59**	NA	<1	NA	**4.85**	NA	0.377	0.00428	NA
MW-02BR	Between EB and WB, in CB	West Ash Basin	Downgradient	07/31/2018	**6.2**	<50	100	49	**520**	<1	0.617 j	**1140**	<1	<0.025 M1	<1	**3.35**	**16100**	**1290**	0.551 j	<1	<0.2	0.193 j,B2	2.03 j	NA	NA	0.1356 j
MW-02BR	Between EB and WB, in CB	West Ash Basin	Downgradient	11/16/2018	**5.8**	<50	99	48	470	<1	1.03	629	<1	<0.025	1.21	**5.06**	**15300**	**805**	0.893 j	<1	<0.2	<0.3	3.707 j	NA	NA	0.1028 j
MW-02BR	Between EB and WB, in CB	West Ash Basin	Downgradient	04/30/2019	6.6	<50	83	48	460	<1	0.543 j	NA	NA	<0.025 M1	**35.6**	**3.31**	**6280**	**364**	NA	<1	NA	**0.308**	NA	NA	NA	NA
MW-03BR	In gypsum storage area, in CB	East Ash Basin	Downgradient	07/27/2018	6.7	**2670**	68	**1500**	**2300**	<1	<1	36	<1	<0.025	<1	**1.12**	59	39	1.36	2.73	<0.2	**15.9**	3.451 j	0.4163	**0.0345**	<5
MW-03BR	In gypsum storage area, in CB	East Ash Basin	Downgradient	11/15/2018	6.7	**2860**	73	**1400**	**2300**	<1	<1	36	<1	<0.025	<1	**1.09**	121	37	1.29	2.4	<0.2	**17.2**	<5	0.62	**0.0403**	<2
MW-03BR	In gypsum storage area, in CB	East Ash Basin	Downgradient	04/29/2019	6.7	**2850**	74	**1300**	**2400**	<1	<1	NA	NA	0.033	0.478 j	**1.01**	91	35	NA	2.48	NA	**16.6**	NA	0.3235	**0.0415**	NA
MW-04BR	Southwest of WB in CB	West Ash Basin	Downgradient	07/25/2018	7.3	<50	18	32	270	0.619 j	1.37	43	<1	0.072 M1	0.43 j	<1	73	35	0.989 j	<1	<0.2	**0.861**	6	NA	NA	0.17
MW-04BR	Southwest of WB in CB	West Ash Basin	Downgradient	11/15/2018	7.5	17.334 j	19	32	260	<1	1.4	46	<1	0.055	<1	<1	**303**	**98**	0.521 j	<1	<0.2	0.19 j	<5	NA	NA	0.11
MW-04BR	Southwest of WB in CB	West Ash Basin	Downgradient	04/23/2019	7.3	<50	19	31	330	<1	1.63	NA	NA	0.046	0.465 j	<1	**446**	**113**	NA	<1	NA	0.212 j	NA	NA	NA	NA
MW-05BR	North of WB, on CB	West Ash Basin	Downgradient	07/26/2018	7.0	48.97 j	17	220	**560**	<1	0.386 j	14	<1	<0.025	<1	**5.6**	**347**	**275**	0.372 j	<1	<0.2	**0.451**	<5	1.422	0.00452	0.2595 j
MW-05BR	North of WB, on CB	West Ash Basin	Downgradient	11/14/2018	7.1	52	16	210	**520**	<1	0.484 j	14	<1	<0.025	<1	**7.68**	**303 B2**	**447**	<1	<1	0.094 j	**0.713**	<5	1.802	0.00275	<0.5
MW-05BR	North of WB, on CB	West Ash Basin	Downgradient	04/30/2019	7.2	59	16	210	**560**	<1	0.667 j	NA	NA	<0.025	0.657 j	**8.76**	**685**	**485**	NA	<1	NA	**0.679**	NA	2.48	0.00321	NA
MW-05D	North of WB, on CB	West Ash Basin	Downgradient	07/27/2018	**6.3**	696	12	**390**	**680**	0.712 j	<1	29	<1	0.67	0.657 j	<1	9.749 j	6	0.874 j	0.375 j	<0.2	**14**	2.462 j	0.2258	0.000237	0.469 j
MW-05D	North of WB, on CB	West Ash Basin	Downgradient	11/15/2018	**6.4**	**709**	11	**480**	**660**	0.774 j	<1	27	<1	1.3	1.21	<1	5.854 j	3.075 j	0.861 j	0.452 j	<0.2	**16**	2.948 j	0.558	0.000286	<1
MW-05D	North of WB, on CB	West Ash Basin	Downgradient	04/30/2019	**6.4**	568	15	**310**	**610**	0.753 j	0.405 j	NA	NA	1	1.25	<1	5.555 j	3.034 j	NA	0.673 j	NA	**12.8**	NA	0.186	0.000697	NA
MW-06BR	North of WB, on CB	West Ash Basin	Downgradient	05/01/2019	7.4	<50	8.6	21	240	<1	<1	NA	NA	<0.025	0.396 j	<1	294	**78**	NA	<1	NA	0.159 j	NA	0.549	0.000392	NA
MW-06D	North of WB, on CB	West Ash Basin	Downgradient	05/01/2019	6.6	<50	21	33	210	<1	<1	NA	NA	0.035	0.383 j	<1	7.296 j	3.533 j	NA	0.506 j	NA	**6.01**	NA	0.2842	0.000212	NA
MW-07BR	West of WB, outside of CB	West Ash Basin	Downgradient	07/27/2018	7.0	<50	7	26	180	<1	0.724 j	12	<1	0.15	<1	<1	75	17	<1	0.802 j	<0.2	**16.7**	8	NA	NA	0.2
MW-07BR	West of WB, outside of CB	West Ash Basin	Downgradient	11/13/2018	6.7	<50	6	26	180	<1	0.636 j	11	<1	0.18	<1	<1	53	19	<1	0.705 j	<0.2	**18.4**	9	NA	NA	0.24
MW-07BR	West of WB, outside of CB	West Ash Basin	Downgradient	04/25/2019	6.9	<50	4.9	28	200	<1	0.614 j	NA	NA	0.12	0.353 j	<1	6.983 j	3.799 j	NA	0.466 j	NA	**16.9**	NA	NA	NA	NA
MW-08BR	West of WB, outside of CB	West Ash Basin	Downgradient	07/30/2018	7.2	<50	25	27	380	0.78 j	0.355 j	30	<1	<0.025	0.516 j	<1	**1020**	**628**	1.32	<1	<0.2	**0.639**	16	NA	NA	0.22
MW-08BR	West of WB, outside of CB	West Ash Basin	Downgradient	11/15/2018	7.1	<50	24	26	350	<1	0.504 j	31	<1	<0.025	0.351 j	<1	**2110**	**741**	0.8 j	<1	<0.2	**0.346**	4.204 j	NA	NA	0.2
MW-08BR CCR	West of WB, outside of CB	West Ash Basin	Downgradient	01/28/2019	7.2	<50	24	27	370	<1	<1	31	<1	NA	0.448 j	<1	NA	NA	NA	<1	<0.2	NA	NA	0.484	NA	0.2
MW-08BR	West of WB, outside of CB	West Ash Basin	Downgradient	04/29/2019	7.2	<50	25	27	450	<1	<1	NA	NA	<0.025	0.443 j	<1	**1550**	**915**	NA	<1	NA	0.25 j	NA	NA	NA	NA
MW-09BR	Northwest of WB, outside of CB	West Ash Basin	Downgradient	07/30/2018	**6.2**	<50	15	23	240	<1	<1	28	<1	0.025	<1	**1.16**	59	**131**	1.2	<1	<0.2	**6**	7	0.339	0.000193 j	0.13
MW-09BR	Northwest of WB, outside of CB	West Ash Basin	Downgradient	11/14/2018	6.6	<50	17	24	220	<1	<1	29	<1	<0.025	0.513 j,B2	**1.27**	179 B2	**139**	0.533 j	<1	<0.2	**5.86**	<5	0.838	0.00019 j	0.11
MW-09BR CCR	Northwest of WB, outside of CB	West Ash Basin	Downgradient	01/28/2019	**6.3**	<50	19	24	230	<1	<1	35	<1	NA	<1	**1.18**	NA	NA	NA	<1	<0.2	NA	NA	1.36	NA	0.075 j
MW-09BR	Northwest of WB, outside of CB	West Ash Basin	Downgradient	04/29/2019	**6.5**	<50	20	24	250	<1	<1	NA	NA	<0.025	0.392 j	**1.09**	28	**128**	NA	<1	NA	**8.27**	NA	0.964	0.00024	NA
MW-108BRL	Edge of EB	East Ash Basin	Downgradient	04/09/2019	6.6	**5220**	21	**470**	**930**	**1.06**	1.27	20	<1	<0.025 M1,R1	0.596 j	0.415 j	207	**312**	1.32	<1	0.082 j	**2.27**	977	0.565	0.00265	0.305 j

			PARAME	TED 40CFR257 APPENDIX III CONSTITUENTS				INORGANIC PARAMETERS (TOTAL CONCENTRATION)														RADIONUCLIDES		R PARAME
FACILITY NAME:	**ROXBORO**																							
DATE UPDATED:	**06/24/2019**	**Reporting Units**	**S.U.**	**ug/L**	**mg/L**	**mg/L**	**mg/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**pCi/L**	**ug/mL**	**mg/L**
SHEET UPDATED BY:	**BRANDON RUSSO**	**15A NCAC 02L Standard**	**6.5-8.5**	**700**	**250**	**250**	**500**	**1***	**10**	**700**	**4***	**10**	**10**	**1***	**300**	**50**	**100**	**20**	**0.2***	**0.3***	**1000**	**5^**	**0.03^**	**2**
SHEET CHECKED BY:	**CRAIG EADY**	**Provisional Background Threshold Values (Transition Zone Unit)**	**6.3-7.6**	**50**	**150**	**37**	**540**	**1**	**1**	**91**	**1**	**16.1**	**24.1**	**1**	**1173**	**405**	**5.22**	**1.78**	**0.2**	**30.2**	**12**	**5.45**	**0.00516**	**NE**
		Provisional Background Threshold Values (Bedrock Unit)	**6.8-8.3**	**50**	**120**	**73.5**	**530**	**1**	**1**	**185**	**1**	**0.19**	**3.61**	**6.4**	**4227**	**1198**	**2.11**	**1**	**0.2**	**2.49**	**7**	**5.21**	**0.00324**	**NE**

					PARAME	TED 40CFR257 APPENDIX III CONSTITUENTS				INORGANIC PARAMETERS (TOTAL CONCENTRATION)														RADIONUCLIDES		R PARAME
Sample ID	**Location Description**	**Associated Unit**	**Location With Respect to Groundwater Flow Direction**	**Sample Collection Date**	**pH**	**Boron**	**Chloride**	**Sulfate**	**Total Dissolved Solids**	**Antimony**	**Arsenic**	**Barium**	**Beryllium**	**Chromium (VI)**	**Chromium**	**Cobalt**	**Iron**	**Manganese**	**Nickel**	**Selenium**	**Thallium**	**Vanadium**	**Zinc**	**Total Radium**	**Total Uranium**	**Fluoride**
MW-108BRLL	Edge of EB	East Ash Basin	Downgradient	04/09/2019	7.6	**24300**	31	**2000**	**3100**	<1	<1	38	<1	<0.025	<1	**11.9**	**831**	**2620**	13.4	<1	<0.2	**2.03**	23	1.299	0.00786	<5
MW-10BR	South of CB	Background	Background	07/30/2018	7.0	<50	18	39	340	<1	<1	125	<1	0.14	<1	**15.8**	5.719 j	**191**	0.34 j	<1	<0.2	**2.78**	<5	0.809	0.00261	0.35
MW-10BR CCR	South of CB	Background	Background	10/09/2018	6.9	<50	19	39	320	<1	<1	118	<1	NA	<1	**12.9**	NA	NA	NA	0.41 j	<0.2	NA	NA	0.861	NA	0.4
MW-10BR	South of CB	Background	Background	11/14/2018	6.9	<50	19	39	310	<1	<1	122	<1	0.24	<1	**13.3**	14	**135**	<1	0.364 j	<0.2	**3.03**	<5	1.021	0.00238	0.32
MW-10BR CCR	South of CB	Background	Background	01/29/2019	6.9	<50	19	39	350	<1	<1	117	<1	NA	0.519 j	**12.3**	NA	NA	NA	0.337 j	<0.2	NA	NA	0.6388	NA	0.39
MW-10BR	South of CB	Background	Background	04/24/2019	6.9	<50	20	40	340	<1	<1	NA	NA	0.21	0.524 j	**10.7**	19	**122**	NA	0.416 j	NA	**2.79**	NA	0.3247	0.00232	NA
MW-11BR	North east of EB, in contractor lot	East Ash Basin	Downgradient	07/27/2018	6.6	<50	12	41	300	<1	<1	177	<1	0.26	<1	<1	42	23	1.8	<1	<0.2	**4.68**	2.754 j	-0.1665	0.000586	0.1
MW-11BR CCR	North east of EB, in contractor lot	East Ash Basin	Downgradient	10/08/2018	**6.4**	<50	14	42	320	<1	<1	187	<1	NA	<1	<1	NA	NA	NA	<1	0.087 j	NA	NA	1.328	NA	0.1
MW-11BR	North east of EB, in contractor lot	East Ash Basin	Downgradient	11/15/2018	6.7	<50	14	42	310	<1	<1	191	<1	0.11	<1	<1	4.562 j	33	2.92	<1	<0.2	**5.25**	<5	0.834	0.000683	<0.1
MW-11BR CCR	North east of EB, in contractor lot	East Ash Basin	Downgradient	01/29/2019	6.6	<50	13	43	350	<1	<1	178	<1	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	NA	0.829	NA	0.084 j
MW-11BR	North east of EB, in contractor lot	East Ash Basin	Downgradient	04/29/2019	6.8	<50	13	40	330	<1	<1	NA	NA	0.24	0.506 j	<1	<10	23	NA	<1	NA	**5.18**	NA	0.633	0.000706	NA
MW-11D	North east of EB, in contractor lot	East Ash Basin	Downgradient	07/27/2018	6.9	<50	17	37	280	<1	<1	189	<1	<0.025	<1	**6.18**	137	**1230**	2.74	<1	<0.2	**3.49**	2.146 j	0.74	0.000104 j	0.11
MW-11D CCR	North east of EB, in contractor lot	East Ash Basin	Downgradient	10/08/2018	**6.1**	<50	18	38	300	<1	<1	176	<1	NA	<1	**6.2**	NA	NA	NA	<1	<0.2	NA	NA	1.006	NA	0.13
MW-11D	North east of EB, in contractor lot	East Ash Basin	Downgradient	11/15/2018	**6.3**	<50	17	37	280	<1	<1	183	<1	<0.025	<1	**7.36**	114	**1390**	2.61	<1	<0.2	**3.36**	<5	0.2801	0.0000853 j	0.061 j
MW-11D CCR	North east of EB, in contractor lot	East Ash Basin	Downgradient	01/29/2019	**6.4**	<50	17	39	320	<1	<1	177	<1	NA	<1	**3.44**	NA	NA	NA	<1	<0.2	NA	NA	0.455	NA	0.11
MW-11D	North east of EB, in contractor lot	East Ash Basin	Downgradient	04/29/2019	**6.2**	<50	18	37	290	<1	<1	NA	NA	0.04	<1	**4.18**	42	**961**	NA	<1	NA	**3.7**	NA	-0.027	0.0000974 j	NA
MW-12BR	West of WB, in CB	West Ash Basin	Downgradient	07/31/2018	7.0	<50	54	39	450	<1	0.761 j	49	<1	<0.025	<1	**12.8**	**3350**	**1270**	0.646 j	<1	<0.2	**0.409 B2**	10	NA	NA	0.15
MW-12BR	West of WB, in CB	West Ash Basin	Downgradient	11/14/2018	7.1	<50	56	39	420	<1	0.745 j	44	<1	<0.025	<1	**21.9**	**3090 B2**	**1200**	<1	<1	<0.2	0.242 j	<5	NA	NA	0.14
MW-12BR	West of WB, in CB	West Ash Basin	Downgradient	04/29/2019	7.1	<50	49	37	420	<1	0.43 j	NA	NA	<0.025	<1	**17.7**	**2610**	**1160**	NA	<1	NA	0.26 j	NA	NA	NA	NA
MW-13BR	South of EB, outside of CB	East Ash Basin	Sidegradient	07/27/2018	**6.2**	<50	96	33	360	<1	<1	417	<1	0.05 M1	<1	**2.38**	153	**155**	2.08	<1	<0.2	**5.39**	4.954 j	0.98	0.000993	0.1208 j
MW-13BR CCR	South of EB, outside of CB	East Ash Basin	Sidegradient	10/08/2018	**6.1**	<50	90	33	380	<1	<1	370	<1	NA	0.337 j	**1.76**	NA	NA	NA	<1	<0.2	NA	NA	1.211	NA	0.102 j
MW-13BR	South of EB, outside of CB	East Ash Basin	Sidegradient	11/14/2018	**6.3**	<50	99	34	380	<1	<1	425	<1	0.14	0.455 j	**2.07**	70	**141**	1.38	<1	<0.2	**6.77**	2.011 j	0.514	0.0000832 j	0.1066 j
MW-13BR CCR	South of EB, outside of CB	East Ash Basin	Sidegradient	01/29/2019	**6.2**	<50	96	33	390	<1	<1	389	<1	NA	0.695 j	**1.98**	NA	NA	NA	<1	<0.2	NA	NA	1.535	NA	0.053 j
MW-13BR	South of EB, outside of CB	East Ash Basin	Sidegradient	04/24/2019	**6.1**	<50	93	32	410	<1	<1	NA	NA	0.12	0.499 j	**1.71**	50	**102**	NA	<1	NA	**6.68**	NA	0.2863	0.000074 j	NA
MW-14BR	Northeast of EB, outside of CB	Background	Background	07/25/2018	7.3	<50	47	13	360	0.373 j	0.479 j	35	<1	<0.025	0.895 j	**4.22**	**1730**	**397**	1.05	<1	<0.2	**0.522**	6	1.388	0.000328	0.18
MW-14BR	Northeast of EB, outside of CB	Background	Background	11/13/2018	7.2	<50	52	13	340	<1	0.503 j	36	<1	<0.025	<1	**2.68**	**1640**	**353**	<1	<1	<0.2	0.133 j	<5	1.88	0.000296	0.15
MW-14BR	Northeast of EB, outside of CB	Background	Background	04/23/2019	7.1	<50	47	12	390	<1	0.438 j	NA	NA	<0.025	1.92	**3.98**	**1640**	**384**	NA	<1	NA	0.198 j	NA	0.84	0.000184 j	NA
MW-15BR	Southwest of WB, outside of CB	Background	Background	07/30/2018	7.5	<50	41	32	380	<1	<1	16	<1	0.091	0.365 j	<1	**575**	38	0.698 j	<1	<0.2	0.238 j	<5	0.895	0.000549	0.0877 j
MW-15BR CCR	Southwest of WB, outside of CB	Background	Background	10/09/2018	7.8	18.259 j	42	31	340	<1	<1	16	<1	NA	0.431 j	<1	NA	NA	NA	<1	<0.2	NA	NA	0.4052	NA	0.0895 j
MW-15BR	Southwest of WB, outside of CB	Background	Background	11/14/2018	7.5	<50	42	33	320	<1	<1	17	<1	0.039	0.632 j,B2	<1	**598 B2**	41	0.402 j	<1	<0.2	0.282 j	<5	0.6186	0.000611	0.0746 j
MW-15BR CCR	Southwest of WB, outside of CB	Background	Background	01/28/2019	7.9	<50	40	33	330	<1	<1	15	<1	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	NA	0.43	NA	<0.1
MW-15BR	Southwest of WB, outside of CB	Background	Background	04/25/2019	7.4	<50	40	33	320	<1	<1	NA	NA	0.072	0.615 j	<1	**396**	30	NA	<1	NA	0.117 j	NA	0.3263	0.000601	NA
MW-15D	Southwest of WB, outside of CB	Background	Background	07/30/2018	**6.3**	<50	40	27	420	<1	<1	5	<1	3.1	2.59	<1	25	<5	6.6	<1	<0.2	**9.8**	<5	0.693	0.000628	0.0695 j
MW-15D CCR	Southwest of WB, outside of CB	Background	Background	10/09/2018	6.7	18.033 j	45	28	410	<1	<1	5	<1	NA	2.84	<1	NA	NA	NA	<1	<0.2	NA	NA	0.529	NA	0.0751 j
MW-15D	Southwest of WB, outside of CB	Background	Background	11/14/2018	6.5	<50	43	27	390	<1	<1	6	<1	2.9	2.72 B2	<1	18 B2	<5	6.03	<1	<0.2	**10.4**	3.497 j,B	0.281	0.000579	<0.1
MW-15D CCR	Southwest of WB, outside of CB	Background	Background	01/28/2019	6.8	<50	44	29	380	<1	<1	6	<1	NA	3.05	<1	NA	NA	NA	<1	<0.2	NA	NA	-0.073	NA	<0.1
MW-15D	Southwest of WB, outside of CB	Background	Background	04/25/2019	6.5	<50	52	35	360	<1	<1	NA	NA	3.8 P4	3.8	<1	59	3.346 j	NA	<1	NA	**10.2**	NA	0.025	0.000574	NA
MW-16BR	Southwest of EB, outside of CB	East Ash Basin	Sidegradient	07/27/2018	6.9	<50	9.2	22	260	<1	<1	66	<1	0.076	<1	<1	20	19	0.635 j	<1	<0.2	**3.05**	3.457 j	0.2249	0.00122	0.14
MW-16BR CCR	Southwest of EB, outside of CB	East Ash Basin	Sidegradient	10/08/2018	**6.0**	<50	9.6	23	270	<1	<1	60	<1	NA	<1	<1	NA	NA	NA	<1	0.181 j	NA	NA	0.516	NA	0.16
MW-16BR	Southwest of EB, outside of CB	East Ash Basin	Sidegradient	11/14/2018	6.9	<50	10	23	280	<1	<1	60	<1	0.13	<1	<1	8.511001 j	9	0.374 j	0.334 j	0.091 j	**3.22**	<5	1.214	0.00105	0.13
MW-16BR CCR	Southwest of EB, outside of CB	East Ash Basin	Sidegradient	01/30/2019	7.0	<50	9.7	22	260	<1	<1	60	<1	NA	0.363 j	<1	NA	NA	NA	<1	0.105 j	NA	NA	0.1228	NA	0.14
MW-16BR	Southwest of EB, outside of CB	East Ash Basin	Sidegradient	04/29/2019	6.9	<50	9.9	21	330	<1	<1	NA	NA	0.086	0.525 j	<1	16	10	NA	<1	NA	**3.2**	NA	0.149	0.00104	NA
MW-17BR	East of EB, outside of CB	East Ash Basin	Sidegradient	07/26/2018	7.2	<50	13	37	370	<1	<1	97	<1	<0.025	<1	<1	**1820 M2**	**341**	<1	<1	0.082 j	0.221 j	<5	0.7127	0.000275	0.14
MW-17BR CCR	East of EB, outside of CB	East Ash Basin	Sidegradient	10/08/2018	7.2	<50	12	37	360	<1	<1	92	<1	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	NA	0.687	NA	0.15
MW-17BR	East of EB, outside of CB	East Ash Basin	Sidegradient	11/13/2018	7.2	<50	13	36	360	<1	0.365 j	91	<1	0.029	<1	<1	244	**181**	0.505 j	<1	<0.2	**0.332**	<5	1.375	0.000201	0.11
MW-17BR CCR	East of EB, outside of CB	East Ash Basin	Sidegradient	01/29/2019	7.2	<50	12	37	400	<1	0.356 j	88	<1	NA	0.464 j	<1	NA	NA	NA	<1	<0.2	NA	NA	0.986	NA	0.13
MW-17BR	East of EB, outside of CB	East Ash Basin	Sidegradient	04/24/2019	7.2	<50	13	36	390	<1	<1	NA	NA	0.093	0.577 j	<1	**321**	**227**	NA	<1	NA	**0.31**	NA	0.498	0.000225	NA
MW-18BR	Southeast of WB, outside of CB	Background	Background	07/30/2018	7.9	<50	130	12	**530**	<1	<1	88	<1	<0.025	<1	**1.62**	**1270**	**833**	0.424 j	<1	<0.2	0.233 j	2.18 j	**6.695**	0.000409	0.2525 j
MW-18BR CCR	Southeast of WB, outside of CB	Background	Background	10/09/2018	7.9	<50	130	14	**510**	<1	0.35 j	100	<1	NA	<1	**1.02**	NA	NA	NA	<1	<0.2	NA	NA	2.699	NA	0.07 j
MW-18BR	Southeast of WB, outside of CB	Background	Background	11/14/2018	8.1	<50	130	16	500	<1	0.4 j	99	<1	<0.025	1.43 B2	**1.6**	**822 B2**	**811**	0.463 j	<1	<0.2	**0.344**	17 B	1.75	0.000686	<0.5
MW-18BR CCR	Southeast of WB, outside of CB	Background	Background	01/28/2019	8.0	<50	130	15	440	<1	0.347 j	98	<1	NA	0.632 j	**2.6**	NA	NA	NA	<1	<0.2	NA	NA	1.357	NA	<0.2
MW-18BR	Southeast of WB, outside of CB	Background	Background	04/25/2019	7.7	<50	140	15	490	<1	<1	NA	NA	<0.025	0.448 j	**1.75**	**507**	**621**	NA	<1	NA	0.267 j	NA	1.909	0.000566	NA
MW-18D	Southeast of WB, outside of CB	Background	Background	07/30/2018	7.1	<50	150	33	**590**	<1	0.354 j	31	<1	2.8	3.51	<1	165	**86**	2.35	0.338 j	<0.2	**1.2**	2.94 j	1.156	0.0027	0.24 j
MW-18D CCR	Southeast of WB, outside of CB	Background	Background	10/09/2018	7.2	<50	160	33	**610**	<1	0.353 j	25	<1	NA	3.12	<1	NA	NA	NA	<1	<0.2	NA	NA	1.243	NA	0.21 j
MW-18D	Southeast of WB, outside of CB	Background	Background	11/14/2018	6.8	<50	170	29	**570**	<1	<1	46	<1	**12.1**	**12.7**	<1	180	**93**	1.65	0.475 j	<0.2	**1.13**	<5	1.664	0.00264	0.189 j
MW-18D CCR	Southeast of WB, outside of CB	Background	Background	01/28/2019	6.8	<50	130	32	420	<1	<1	36	<1	NA	4.96	<1	NA	NA	NA	<1	<0.2	NA	NA	0.5931	NA	<0.5
MW-18D	Southeast of WB, outside of CB	Background	Background	04/25/2019	6.9	<50	110	34	450	<1	<1	NA	NA	3.2	4.78	<1	61	20	NA	<1	NA	**1.4**	NA	0.5537	0.0034	NA
MW-19BRL	South of EB, outside of CB	Background	Background	07/27/2018	7.0	<50	77	17	430	<1	2.18	49	<1	<0.025	<1	<1	**3820**	**1440**	<1	<1	<0.2	**0.476**	4.399 j	1.278	<0.0002	0.1684 j
MW-19BRL	South of EB, outside of CB	Background	Background	11/14/2018	7.1	<50	73	23	470	<1	2.12	52	<1	<0.025	<1	<1	**3610**	**1470**	<1	<1	<0.2	**0.324**	<5	0.882	0.000143 j	0.1434 j
MW-19BRL	South of EB, outside of CB	Background	Background	04/24/2019	7.0	<50	70	25	480	<1	1.93	NA	NA	<0.025	<1	<1	**4280**	**1510**	NA	<1	NA	0.17 j	NA	1.735	0.000144 j	NA
MW-205BRL	Edge of WB	West Ash Basin	Downgradient	04/08/2019	6.8	**5990**	**570**	99	**1500**	<1	<1	179	<1	<0.025	0.598 j	**3.04**	288	**1800**	1.29	<1	<0.2	**0.757**	2.171 j	1.73	0.000672	<1
MW-205BRLL	Edge of WB	West Ash Basin	Downgradient	04/08/2019	7.0	**8240**	**840**	240	**2000**	<1	0.94 j	194	<1	<0.025	0.436 j	0.474 j	**4130**	**1690**	0.855 j	<1	0.124 j	0.229 j	<5	4.79	0.00299	<1
MW-205BRLLL	Edge of WB	West Ash Basin	Downgradient	04/08/2019	6.7	**18900**	**1900**	**500**	**4700**	<1	3.03	133	<1	<0.025 P4,R0	0.547 j	**2.59**	**2590**	**3140**	3.25	<1	0.089 j	**0.423**	**1060**	3.383	0.00667	<5

FACILITY NAME: ROXBORO
DATE UPDATED: 06/24/2019
SHEET UPDATED BY: BRANDON RUSSO
SHEET CHECKED BY: CRAIG EADY

	PARAMETED 40CFR257 APPENDIX III CONSTITUENTS					INORGANIC PARAMETERS (TOTAL CONCENTRATION)														RADIONUCLIDES		R PARAME
Reporting Units	S.U.	ug/L	mg/L	mg/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L	ug/mL	mg/L
15A NCAC 02L Standard	6.5-8.5	700	250	250	500	1*	10	700	4*	10	10	1*	300	50	100	20	0.2*	0.3*	1000	5^	0.03^	2
Provisional Background Threshold Values (Transition Zone Unit)	6.3-7.6	50	150	37	540	1	1	91	1	16.1	24.1	1	1173	405	5.22	1.78	0.2	30.2	12	5.45	0.00516	NE
Provisional Background Threshold Values (Bedrock Unit)	6.8-8.3	50	120	73.5	530	1	1	185	1	0.19	3.61	6.4	4227	1198	2.11	1	0.2	2.49	7	5.21	0.00324	NE

					PARAMETED 40CFR257 APPENDIX III CONSTITUENTS					INORGANIC PARAMETERS (TOTAL CONCENTRATION)														RADIONUCLIDES		R PARAME
Sample ID	**Location Description**	**Associated Unit**	**Location With Respect to Groundwater Flow Direction**	**Sample Collection Date**	**pH**	**Boron**	**Chloride**	**Sulfate**	**Total Dissolved Solids**	**Antimony**	**Arsenic**	**Barium**	**Beryllium**	**Chromium (VI)**	**Chromium**	**Cobalt**	**Iron**	**Manganese**	**Nickel**	**Selenium**	**Thallium**	**Vanadium**	**Zinc**	**Total Radium**	**Total Uranium**	**Fluoride**
MW-208BRL	Edge of WB	West Ash Basin	Downgradient	04/09/2019	7.5	**865**	220	150	**720**	0.46 j	1.9	72	<1	<0.025	2.06	0.465 j	**1280**	**459**	0.653 j	<1	<0.2	**1.3**	9	1.02	0.00171	0.214 j
MW-208BRLL	Edge of WB	West Ash Basin	Downgradient	04/08/2019	7.8	**1400**	**390**	110	**990**	0.617 j	0.67 j	61	<1	<0.025	1.03	<1	236	**568**	<1	<1	0.086 j	0.16 j	<5	1.762	0.000484	<1
MW-208BRLLL	Edge of WB	West Ash Basin	Downgradient	04/08/2019	7.5	**1570**	**460**	**310**	**820**	<1	1.08	89	<1	<0.0025 M1	0.551 j	0.704 j	246	**789**	0.438 j	<1	<0.2	**0.626**	347	2.808	0.0132	<1
MW-20BRL	East of EB, outside of CB	East Ash Basin	Sidegradient	07/26/2018	7.4	<50	14	13	260	<1	<1	5	<1	<0.025	<1	<1	92	**437**	<1	<1	0.126 j	0.256 j	<5	NA	NA	0.13
MW-20BRL	East of EB, outside of CB	East Ash Basin	Sidegradient	11/15/2018	7.7	<50	14	13	240	<1	<1	5	<1	<0.025	<1	<1	67	**406**	<1	<1	<0.2	<0.3	5	NA	NA	0.073 j
MW-20BRL CCR	East of EB, outside of CB	East Ash Basin	Sidegradient	01/29/2019	7.0	<50	15	13	300	<1	<1	5	<1	NA	0.374 j	<1	NA	NA	NA	<1	<0.2	NA	NA	0.96	NA	0.1
MW-20BRL	East of EB, outside of CB	East Ash Basin	Sidegradient	04/24/2019	7.2	<50	14	13	260	<1	<1	NA	NA	0.028	<1	<1	64	**415**	NA	<1	NA	<0.3	NA	NA	NA	NA
MW-21BRLR	Southern edge of EB, in CB	East Ash Basin	Sidegradient	09/06/2018	7.4	45.315 j	28	40	360	<1	0.757 j	17	<1	0.03	<1	<1	30	**97**	0.382 j	<1	<0.2	**1.58**	16	0.83	0.00603	0.24
MW-21BRLR	Southern edge of EB, in CB	East Ash Basin	Sidegradient	09/20/2018	7.2	42.392 j	42	57	370	<1	0.924 j	18	<1	<0.025	<1	<1	13	**101**	0.359 j	<1	<0.2	**1.51**	23	0.3229	0.00562	0.23
MW-21BRLR	Southern edge of EB, in CB	East Ash Basin	Sidegradient	11/14/2018	7.4	52	80	98	490	<1	1.72	27	<1	<0.025	<1	<1	66 B2	**129**	<1	<1	<0.2	**1.14**	24 B	NA	NA	0.21
MW-21BRLR	Southern edge of EB, in CB	East Ash Basin	Sidegradient	01/30/2019	7.5	72	120	140	**580**	<1	3.25	30	<1	<0.025	0.44 j	<1	154	**159**	0.654 j	<1	<0.2	**0.614**	8	NA	NA	0.1946 j
MW-21BRLR	Southern edge of EB, in CB	East Ash Basin	Sidegradient	04/30/2019	7.4	117	160	200	**740**	<1	4.82	NA	NA	<0.025	0.415 j	0.371 j	296	**200**	NA	<1	NA	**0.458**	NA	NA	NA	NA
MW-22BR	Southwest edge of gypsum storage area	East Ash Basin	Downgradient	07/26/2018	**6.4**	**805**	20	**490**	**990**	<1	<1	72	<1	<0.025	<1	**7.37**	285	**488**	2.17	6.2	0.098 j	**0.859**	<5	NA	NA	<1
MW-22BR	Southwest edge of gypsum storage area	East Ash Basin	Downgradient	11/15/2018	6.6	**887**	21	**660**	**950**	<1	<1	51	<1	0.06	<1	**5.12**	89	**355**	1.62	11	<0.2	**1.24**	3.117 j	NA	NA	<1
MW-22BR	Southwest edge of gypsum storage area	East Ash Basin	Downgradient	04/30/2019	**6.5**	**781**	30	**400**	**860**	<1	<1	NA	NA	0.027	0.41 j	**1.86**	25	**373**	NA	11.7	NA	**1.24**	NA	NA	NA	NA
MW-22D	Southwest edge of gypsum storage area	East Ash Basin	Downgradient	07/26/2018	**6.0**	342	20	**1100**	**1800**	<1	<1	37	<1	<0.025	<1	**5.92**	6.862 j	**1610**	2.24	**149**	<0.2	**4.02**	2.01 j	NA	NA	1.124 j
MW-22D	Southwest edge of gypsum storage area	East Ash Basin	Downgradient	11/15/2018	**6.2**	641	16	**620**	**1100**	<1	<1	24	<1	<0.025	<1	**2.69**	11	**1020**	1.53	**31.3**	<0.2	**4.71**	1.959 j	NA	NA	<2
MW-22D	Southwest edge of gypsum storage area	East Ash Basin	Downgradient	04/30/2019	**5.8**	**820**	20	**580**	**1000**	<1	<1	NA	NA	0.025	0.382 j	**2.5**	6.69 j	**949**	NA	8.19	NA	**4.5**	NA	NA	NA	NA
MW-23BRR	West of EB, adjacent to EEI, outside of CB	East Ash Basin	Downgradient	07/26/2018	6.8	<50	38	15	270	<1	0.644 j	9	<1	<0.025	<1	<1	63	29	<1	<1	<0.2	**1.1**	7	NA	NA	0.13
MW-23BRR	West of EB, adjacent to EEI, outside of CB	East Ash Basin	Downgradient	11/13/2018	6.9	<50	39	15	250	<1	0.517 j	8	<1	<0.025 M1	<1	<1	42	24	<1	<1	<0.2	**0.858**	2.06 j	NA	NA	0.093 j
MW-23BRR CCR	West of EB, adjacent to EEI, outside of CB	East Ash Basin	Downgradient	01/29/2019	6.9	<50	38	15	280	<1	0.575 j	10	<1	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	NA	0.1299	NA	0.11
MW-23BRR	West of EB, adjacent to EEI, outside of CB	East Ash Basin	Downgradient	04/24/2019	6.8	<50	38	16	270	<1	0.561 j	NA	NA	<0.025	<1	<1	21	27	NA	<1	NA	**0.763**	NA	NA	NA	NA
MW-24BR	East of EB, in CB	East Ash Basin	Sidegradient	07/27/2018	7.8	36.453 j	24	65	260	**2.46**	4.39	57	<1	<0.025	0.628 j	<1	**367**	**105**	1.98	<1	<0.2	**0.396**	2.852 j	NA	NA	0.58
MW-24BR	East of EB, in CB	East Ash Basin	Sidegradient	11/14/2018	7.9	34.81 j	25	61	300	0.393 j	4.93	58	<1	0.094	<1	<1	**305**	**115**	<1	<1	<0.2	0.246 j	<5	NA	NA	0.54
MW-24BR	East of EB, in CB	East Ash Basin	Sidegradient	04/24/2019	7.9	41.176 j	25	60	320	<1	5.86	NA	NA	<0.025	0.72 j	<1	**414**	**123**	NA	<1	NA	<0.3	NA	NA	NA	NA
MW-25BR	East of EB, outside of CB	East Ash Basin	Sidegradient	07/26/2018	7.1	20.94 j	63	94	**570**	<1	4.04	65	<1	<0.025	<1	0.624 j	**2400**	**583**	0.776 j	<1	<0.2	0.285 j	<5	NA	NA	0.21
MW-25BR	East of EB, outside of CB	East Ash Basin	Sidegradient	11/13/2018	7.0	23.45 j	66	100	**560**	<1	2.54	65	<1	<0.025	<1	0.529 j	**2120**	**569**	<1	<1	<0.2	0.18 j	33	NA	NA	0.123 j
MW-26BR	Southeast of WB, outside of CB	West Ash Basin	Sidegradient	07/26/2018	7.2	<50	39	67	**510**	<1	5.54	65	<1	<0.025	0.443 j	0.847 j	**2300**	**570**	1.28	<1	0.09 j	**0.399**	9	NA	NA	0.13
MW-26BR	Southeast of WB, outside of CB	West Ash Basin	Sidegradient	11/14/2018	7.2	<50	39	69	**510**	<1	3.13	65	<1	<0.025	<1	0.627 j	**1620**	**530**	0.404 j	<1	<0.2	**0.317**	<5	NA	NA	0.12
MW-26BR	Southeast of WB, outside of CB	West Ash Basin	Sidegradient	04/24/2019	7.1	19.725 j	39	68	**520**	<1	2.54	NA	NA	<0.025	0.343 j	0.661 j	**1690**	**562**	NA	<1	NA	0.168 j	NA	NA	NA	NA
MW-27BR	North of EB, between EB and GSA, in CB	East Ash Basin	Downgradient	07/27/2018	7.2	<50	20	**260**	**620**	<1	1.58	26	<1	<0.025	<1	0.458 j	**711**	**268**	0.785 j	<1	<0.2	**0.4**	3.221 j	NA	NA	0.2195 j
MW-27BR	North of EB, between EB and GSA, in CB	East Ash Basin	Downgradient	11/14/2018	7.3	<50	21	**280**	**630**	<1	1.07	21	<1	<0.025	<1	<1	**480 B2**	**278**	<1	<1	<0.2	0.238 j	<5	NA	NA	0.1755 j
MW-27BR	North of EB, between EB and GSA, in CB	East Ash Basin	Downgradient	04/30/2019	7.2	<50	20	**280**	**670**	<1	1.32	NA	NA	<0.025	0.687 j	<1	**540**	**271**	NA	<1	NA	0.157 j	NA	NA	NA	NA
MW-28BR	Northeast of the EB and GSA, outside of CB	East Ash Basin	Upgradient	07/25/2018	7.5	49.234 j	28	67	380	0.566 j	4.05	37	<1	<0.025	0.595 j	<1	**671**	**214**	2.54	<1	0.088 j	**1.23**	2.373 j	NA	NA	0.24
MW-28BR	Northeast of the EB and GSA, outside of CB	East Ash Basin	Upgradient	11/13/2018	7.4	52	29	73	410	<1	4.03	35	<1	0.035	<1	<1	**514**	**222**	<1	<1	<0.2	**0.494**	<5	NA	NA	0.25
MW-28BR	Northeast of the EB and GSA, outside of CB	East Ash Basin	Upgradient	04/23/2019	7.5	61	28	77	490	<1	4.08	NA	NA	<0.025	0.484 j	<1	**545**	**242**	NA	<1	NA	**0.485**	NA	NA	NA	NA
MW-29BR	Northeast of the EB, outside of CB	East Ash Basin	Upgradient	07/25/2018	7.3	<50	11	11	270	<1	1.18	34	<1	<0.025	<1	<1	**380**	**77**	0.443 j	<1	<0.2	**0.34**	<5	NA	NA	0.18
MW-29BR	Northeast of the EB, outside of CB	East Ash Basin	Upgradient	11/13/2018	7.2	<50	11	11	260	<1	0.859 j	29	<1	<0.025	<1	<1	**331**	**81**	<1	<1	<0.2	0.169 j	<5	NA	NA	0.15
MW-29BR CCR	Northeast of the EB, outside of CB	East Ash Basin	Upgradient	01/29/2019	7.3	<50	11	12	300	<1	0.744 j	35	<1	NA	<1	<1	NA	NA	NA	<1	0.111 j	NA	NA	0.0994	NA	0.16
MW-29BR	Northeast of the EB, outside of CB	East Ash Basin	Upgradient	04/23/2019	7.3	<50	11	12	300	<1	1.44	NA	NA	0.15	0.364 j	<1	47	**174**	NA	<1	NA	**0.592**	NA	NA	NA	NA
MW-30BR	East of the EB, outside of CB	East Ash Basin	Upgradient	07/26/2018	6.8	25.522 j	32	62	450	<1	1.21	13	<1	<0.025	<1	0.529 j	**2180**	**1070**	0.601 j	<1	<0.2	**0.302**	3.02 j	NA	NA	0.12
MW-30BR	East of the EB, outside of CB	East Ash Basin	Upgradient	11/13/2018	6.9	27.242 j	32	63	470	<1	1.17	12	<1	<0.025	<1	0.511 j	**2080**	**1080**	<1	<1	<0.2	0.222 j	<5	NA	NA	0.09 j
MW-30BR CCR	East of the EB, outside of CB	East Ash Basin	Upgradient	01/29/2019	6.9	27.798 j	32	64	**510**	<1	0.927 j	13	<1	NA	0.375 j	0.496 j	NA	NA	NA	<1	<0.2	NA	NA	0.594	NA	0.11
MW-30BR	East of the EB, outside of CB	East Ash Basin	Upgradient	04/23/2019	6.8	26.342 j	32	63	**510**	<1	0.912 j	NA	NA	<0.025	0.38 j	0.413 j	**2210**	**1090**	NA	<1	NA	0.154 j	NA	NA	NA	NA
MW-31BR	West of the WB, outside of CB	West Ash Basin	Upgradient	07/27/2018	6.8	<50	28	34	370	<1	<1	41	<1	<0.025	<1	0.519 j	43	**361**	0.777 j	1.74	<0.2	**2.5**	2.102 j	NA	NA	0.1
MW-31BR	West of the WB, outside of CB	West Ash Basin	Upgradient	11/13/2018	7.0	<50	27	34	400	<1	<1	43	<1	<0.025	<1	0.513 j	9.125 j	**378**	<1	1.54	<0.2	**2.36**	2.466 j	NA	NA	0.065 j
MW-31BR	West of the WB, outside of CB	West Ash Basin	Upgradient	04/30/2019	6.8	<50	28	36	410	<1	<1	NA	NA	0.18	0.519 j	0.435 j	4.62 j	**213**	NA	1.66	NA	**2.18**	NA	NA	NA	NA
MW-32BR	West of the WB, outside of CB	West Ash Basin	Upgradient	07/26/2018	7.5	17.886 j	12	**330**	**690**	<1	1.78	27	<1	0.064	<1	<1	173	**117**	0.8 j	<1	<0.2	0.265 j	1.935 j	NA	NA	1.1
MW-32BR	West of the WB, outside of CB	West Ash Basin	Upgradient	11/13/2018	7.6	24.713 j	17	**380**	**660**	<1	2.74	30	<1	0.073	<1	<1	200	**137**	<1	<1	<0.2	**0.419**	<5	NA	NA	0.89
MW-32BR CCR	West of the WB, outside of CB	West Ash Basin	Upgradient	01/28/2019	7.5	29.014 j	16	**370**	**690**	<1	3.39	35	<1	NA	0.957 j	<1	NA	NA	NA	<1	<0.2	NA	NA	0.696	NA	0.8
MW-32BR	West of the WB, outside of CB	West Ash Basin	Upgradient	04/25/2019	7.4	32.716 j	14	**320**	**690**	<1	3.62	NA	NA	<0.025	0.566 j	<1	**417**	**174**	NA	<1	NA	0.266 j	NA	NA	NA	NA
MW-33BR	West of the WB, outside of CB	West Ash Basin	Upgradient	07/26/2018	**12.3**	<50	29	43	**1200**	<1	0.722 j	327	<1	0.15	<1	<1	3.558 j	<5	2.12	<1	0.088 j	**4.15**	<5	NA	NA	0.0592 j
MW-33BR	West of the WB, outside of CB	West Ash Basin	Upgradient	11/13/2018	**12.4**	<50	31	29	**1400**	<1	0.48 j	543	<1	0.23	<1	<1	<10	<5	1.89	0.362 j	<0.2	**3**	<5	NA	NA	<0.1
MW-33BR CCR	West of the WB, outside of CB	West Ash Basin	Upgradient	01/28/2019	**12.9**	<50	29	27	**1500**	<1	0.449 j	558	<1	NA	<1	<1	NA	NA	NA	<1	0.087 j	NA	NA	4.7	NA	0.056 j
MW-33BR	West of the WB, outside of CB	West Ash Basin	Upgradient	04/25/2019	**12.6**	<50	33	19	**1900**	0.859 j	0.436 j	NA	NA	0.17	<1	<1	17	<5	NA	0.418 j	NA	**1.76**	NA	NA	NA	NA
MW-34BR	Dry Fly Ash Handling Area	East Ash Basin	Downgradient	04/09/2019	7.2	**800**	36	**480**	**1000**	<1	<1	57	<1	<0.025	0.478 j	0.358 j	204	26	<1	5.79	<0.2	**4.08**	2.645 j	0.02	0.00683	<0.5
MW-34D	Dry Fly Ash Handling Area	East Ash Basin	Downgradient	04/09/2019	6.8	521	40	**690**	**1200**	<1	<1	77	<1	2.9	1.61	<1	24	12	<1	**24.3**	<0.2	**5.98**	<5	0.53	0.00368	<5
MW-35BR	Dry Fly Ash Handling Area	East Ash Basin	Downgradient	04/09/2019	7.2	**1460**	21	240	**630**	<1	<1	34	<1	0.17	0.97 j	**1.05**	226	**118**	0.568 j	4.37	<0.2	**3.54**	113	0.4205	0.00372	<0.5
MW-35D	Dry Fly Ash Handling Area	East Ash Basin	Downgradient	04/09/2019	**6.5**	**7880**	39	**700**	**1400**	<1	<1	75	<1	0.092	0.532 j	0.497 j	33	**103**	9.77	**39.7**	<0.2	**5.7**	32	1.841	0.0052	<5
MW-35S	Dry Fly Ash Handling Area	East Ash Basin	Downgradient	04/11/2019	6.5	**7820**	27	**640**	**1400**	<1	<1	87	<1	0.1	0.687 j	**1.9**	**363**	**226**	7.84	**37.2**	<0.2	**9.99**	3.045 j	0.67	0.0018	0.425 j
MW-36BR	Dry Fly Ash Handling Area	East Ash Basin	Downgradient	04/10/2019	6.7	**1070**	32	**940**	210	<1	<1	28	<1	<0.025	0.47 j	0.533 j	135	39	<1	9.91	<0.2	**2.14**	1.998 j	2.218	0.0117	<1
MW-36D	Dry Fly Ash Handling Area	East Ash Basin	Downgradient	04/10/2019	**6.5**	**1230**	21	**1300**	100	<1	<1	38	<1	<0.025	0.757 j	0.384 j	**309**	**173**	4.22	**24.9**	<0.2	**11.6**	24	0.2057	0.00455	0.472 j
MW-37BR	Dry Fly Ash Handling Area	East Ash Basin	Downgradient	04/10/2019	7.6	**4200**	23	**490**	200	<1	<1	62	<1	0.38	0.775 j	<1	14	**132**	0.765 j	**25.5**	<0.2	**2.18**	<5	1.232	0.00239	<1

FACILITY NAME: **ROXBORO**
DATE UPDATED: **06/24/2019**
)SHEET UPDATED BY: **BRANDON RUSSO**
)SHEET CHECKED BY: **CRAIG EADY**

	) PARAME	TED 40CFR257 APPENDIX III CONSTITUENTS p				INORGANIC PARAMETERS (TOTAL CONCENTRATION)															RADIONUCLIDES		:R PARAME
Reporting Units	**S.U.**	**ug/L**	**mg/L**	**mg/L**	**mg/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**pCi/L**	**ug/mL**	**mg/L**
15A NCAC 02L Standard	**6.5-8.5**	**700**	**250**	**250**	**500**	**1***	**10**	**700**	**4***	**10**	**10**	**1***	**300**	**50**	**100**	**20**	**0.2***	**0.3***	**1000**	**5^**	**0.03^**	**2**
Provisional Background Threshold Values (Transition Zone Unit)	**6.3-7.6**	**50**	**150**	**37**	**540**	**1**	**1**	**91**	**1**	**16.1**	**24.1**	**1**	**1173**	**405**	**5.22**	**1.78**	**0.2**	**30.2**	**12**	**5.45**	**0.00516**	**NE**
Provisional Background Threshold Values (Bedrock Unit)	**6.8-8.3**	**50**	**120**	**73.5**	**530**	**1**	**1**	**185**	**1**	**0.19**	**3.61**	**6.4**	**4227**	**1198**	**2.11**	**1**	**0.2**	**2.49**	**7**	**5.21**	**0.00324**	**NE**

					) PARAME	TED 40CFR257 APPENDIX III CONSTITUENTS p				INORGANIC PARAMETERS (TOTAL CONCENTRATION)															RADIONUCLIDES		:R PARAME
Sample ID	**Location Description**	**Associated Unit**	**Location With Respect to Groundwater Flow Direction**	**Sample Collection Date**	**pH**	**Boron**	**Chloride**	**Sulfate**	**Total Dissolved Solids**	**Antimony**	**Arsenic**	**Barium**	**Beryllium**	**Chromium (VI)**	**Chromium**	**Cobalt**	**Iron**	**Manganese**	**Nickel**	**Selenium**	**Thallium**	**Vanadium**	**Zinc**	**Total Radium**	**Total Uranium**	**Fluoride**
MW-37D	Dry Fly Ash Handling Area	East Ash Basin	Downgradient	04/10/2019	**6.2**	499	21	**630**	110	<1	<1	52	<1	0.29	0.609 j	<1	36	7	2.09	9.43	<0.2	**4.92**	<5	0.2354	0.000648	<1
MW-37S	Dry Fly Ash Handling Area	East Ash Basin	Downgradient	04/11/2019	**6.3**	410	21	**550**	**1000**	<1	<1	83	<1	0.14	0.949 j	0.824 j	289	**156**	13.8	11.9	<0.2	**4.54**	10	0.362	0.000396	0.374 j
MW-39BR	South of WB, on CB	West Ash Basin	Upgradient	04/22/2019	8.5	<50	37	30	310	0.492 j	0.411 j	27	<1	0.64	1.68 B2	<1	13	**62**	0.546 j	<1	<0.2	**1.05**	<5	2.797	0.00365	0.2
MW-39D	South of WB, on CB	West Ash Basin	Upgradient	04/22/2019	**6.1**	<50	18	25	200	**5.63**	<1	45	<1	0.085	0.629 j,B2	0.648 j	45	**65**	1.89	<1	<0.2	**1.44**	11 B	0.766	0.0000761 j	0.1
RO-10-1	7391 Semora Road Semora, NC 27343	Private Well	Upgradient	06/20/2018	7.1	<100	220	18	**800**	<2	<5	230	<2	NA	<1	**1.9**	**510**	**840**	<10	<5	<9.999999E-02	**4.2**	<50	NA	NA	<0.2

COLOR NOTES

Bold highlighted concentration indicates exceedance of the 15A NCAC 02L .0202 Standard or the IMAC. (Effective date for 15A NCAC 02L .0202 Standard and IMAC is April 1, 2013)

Turbidity of Sample ≥ 10 NTUs

Provisional Background Threshold Values updated with Background Results through June 2017.

Analytical data review has not been completed for this dataset.

ABBREVIATION NOTES

BGS - below ground surface
BOD - Biologic Oxygen Demand
CB - Compliance Boundary
COD - Chemical Oxygen Demand
Deg C - Degrees Celsius
DMAs - dimethylarsinic acid
DUP - Duplicate
EB - East Ash Basin
EEI - Eastern Extension Impoundment of the East Ash Basin
Eh - Redox Potential
ft - Feet
GPM - gallons per minute
GSA - Gypsum Storage Area
IMAC - Interim Maximum Allowable Concentrations. From the 15A NCAC 02L Standard, Appendix 1, April, 1, 2013.
MDC - Minimum Detectable Concentration
MeSe - Methylseleninic acid
meg/100g - millequivalents per 100 grams
mg/kg - milligrams per kilogram
mg/L - milligrams per liter
mg-N/L - Milligram nitrogen per liter
MMAs - monomethylarsonic acid

MMAs - monomethylarsonic acid
NA - Not available or Not Applicable
NE - Not established
NM - Not measured
NTUs - Nephelometric Turbidity Units
pCi/L - picocuries per liter
PSRG - Primary Soil Remediation Goals
RL - Reporting Limit
RR - Railroad
SeCN - selnocynante
SEI - Southern Extension Impoundment of the West Ash Basin
SeMe (IV) - Selenomethionine
SPLP - Synthetic Precipitation Leaching Procedure
S.U. - Standard Units
TCLP - Toxicity Characteristic Leaching Procedure
ug/L - micrograms per liter
ug/mL - microgram per milliliter
umhos/cm - micromhos per centimenter
WB - West Ash Basin
Well Locations referenced to NAD83 and elevations referenced to NAVD88

ATTACHMENT C

2018 AND 2019 NPDES GROUNDWATER MONITORING REPORT

DUKE ENERGY.

526 South Church St.
Charlotte, NC 28202

P.O. Box 1006
Mail Code EC13K
Charlotte, NC 28201-1006
336-215-4576
704-382-6240 fax

File: 12520Q

August 16, 2018

NCDEQ – Division of Water Resources
Information Processing Unit
1617 Mail Service Center
Raleigh, NC 27699-1617

Subject: : Roxboro Steam Electric Plant
Groundwater Monitoring Sampling and Analysis Results
NPDES Permit #NC0003425

Dear Sir or Madam:

Duke Energy Progress, LLC. (DEP) sampled eight compliance wells around the ash basins at the Roxboro Steam Electric Plant on July 25, 2018. Attached are two copies of the results on DEQ approved electronic version of Form GW-59CCR.

Please contact Kim Witt at (336) 215-4576 or kimberlee.witt@duke-energy if you have any questions on the sampling results.

> *I certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.*

Sincerely,

Jason Haynes
GM III Regulated Fossil
Roxboro Steam Electric Plant

Attachment

NCDEQ Cc : Debra Watts
Rick Bolich

Duke Cc (electronic): Robert Howard
Kimberlee Witt
Lori Tollie
Ed Sullivan

GROUNDWATER QUALITY MONITORING COMPLIANCE REPORT FORM

Mail original and 1 copy to: **DEPARTMENT OF ENVIRONMENTAL QUALITY**
DIVISION OF WATER QUALITY - INFORMATION PROCESSING UNIT
1617 MAIL SERVICE CENTER, RALEIGH, NC 27699-1617 Phone: (919) 733-3221

FACILITY INFORMATION

Please Print Clearly or Type

Facility Name: Roxboro Steam Electric Plant
Permit Name (if different): Duke Energy Progress, LLC
Facility Address: 1700 Dunnaway Road (Street)
Semora (City) NC (State) 27343 (Zip) **County** Person

Contact Person: Kim Witt **Telephone#** 336-215-4576
Well Location/Site Name: Roxboro Ash Pond Wells **No. of wells to be sampled:** 8 (from Permit)

Permit Type: NPDES **Expiration Date:** 03/31/2012
PERMIT Number: NC0003425

TYPE OF PERMITTED OPERATION BEING MONITORED Ash Impoundment Groundwater

Monitoring Well Construction Information

Well ID Number (From Permit)

	Units	CW-1	CW-2	CW-2D	CW-3	CW-3D	CW-4	CW-5	BG-1	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-
Well Depth [ft below land surface]	ft	39.75	17.50	29.90	11.40	46.50	39.00	19.50	52.00										
Measuring Point (toc) [ft above land surface]	ft	2.47	2.86	2.45	3.33	3.49	2.39	2.31	2.85										
Well Diameter	in	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0										
Screen Top [ft below land surface]	ft	19.95	7.70	25.10	3.40	41.70	24.20	4.70	32.50										
Screen Bottom [ft below land surface]	ft	39.75	17.50	29.90	11.40	46.50	39.00	19.50	52.00										
Relative Measuring Point Elevation	ft	508.24	424.60	424.60	451.79	451.61	479.65	459.74	533.74										

Sampling Information and Field Analysis

CHECK IF DRY WELL AT TIME OF SAMPLING			☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY
	15A-2L	Units	CW-1	CW-2	CW-2D	CW-3	CW-3D	CW-4	CW-5	BG-1	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-
Sample Date			07/25/2018	07/25/2018	07/25/2018	07/25/2018	07/25/2018	07/25/2018	07/25/2018	07/25/2018										
Volume of Water pumped/bailed		gal	0.28	0.46	1.25	1.20	2.00	0.34	1.50	2.17										
Temperature (00010)		deg. C	25	22	23	20	21	25	24	18										
Odor (00085)			None	None	None	None	None	None	None	None										
Appearance			Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear										
Turbidity (82078)		NTU	0.8	3.30	1.7	0.80	3.2	0.9	1.1	1.0										
Dissolved Oxygen (00300)		mg/L	0.69	1.24	3.5	3.64	2.05	1.64	3.92	4.13										
Oxidation Reduction Potential (00090)		mV	360	191	285	321	299	333	282	322										
Specific Cond - field (00094)		umhos/cm	668	756	663	817	519	597	618	564										
Water Level [ft below measuring pt.] (82546)		ft	24.60	13.70	13.70	5.20	2.76	28.40	10.27	38.51										
pH - field (00400)	6.5 - 8.5	SU	6.04	6.50	6.52	6.41	7.41	6.49	6.27	6.29										

Laboratory Information

Laboratory Name Duke Energy Analytical Laboratory[2]
Sample Analysis Date July 26 through August 6, 2018
Certification # NC DENR # 248

Samples for metals were collected unfiltered: ☑ Yes ☐ No
and field acidified: ☑ Yes ☐ No

	IMAC[1]	15A-2L	Units	CW-1	CW-2	CW-2D	CW-3	CW-3D	CW-4	CW-5	BG-1	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-
TDS - Total Diss. Solids (70300)	—	500	mg/l	450	440	410	470	320	330	490	340										
Cl - Chloride (00940)	—	250	mg/l	12	16	16	62	24	28	5.8	18										
As - Arsenic (01002)	---	10	ug/l	<1	<1	<1	<1	<1	<1	<1	<1										
SO4 - Sulfate (00945)	—	250	mg/l	100	85	130	70	32	37	200	17										
Nitrate (NO3) as N (00620)	---	10	mg/l	<0.046	0.22	0.17	0.66	0.06	0.29	0.58	2.5										
Cd - Cadmium (01027)	---	2	ug/l	<1	<1	<1	<1	<1	<1	<1	<1										
Cr - Chromium (01034)	—	10	ug/l	<5	<5	<5	<5	<5	<5	<5	<5										
Cu - Copper (01042)	---	1	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005										
Fe - Iron (01045)	—	300	ug/l	29	195	<10	10	23	<10	12	26										
Hg - Mercury (71900)	—	1	ug/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05										
Mn - Manganese (01055)	---	50	ug/l	33	**187**	<5	<5	<5	<5	<5	<5										
Ni - Nickel (01067)	—	100	ug/l	<5	<5	<5	<5	<5	<5	<5	<5										
Pb - Lead (01051)	—	15	ug/l	<1	<1	<1	<1	<1	<1	<1	<1										
Zn - Zinc (01092)	---	1	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005										
Ba - Barium (01007)	—	700	ug/l	120	87	148	135	52	133	42	87										
B - Boron (01022)	---	700	ug/l	<50	<50	<50	<50	<50	<50	283	<50										
Tl - Thallium (01059)	0.2	NE	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2										
Sb - Antimony (01097)	1	NE	ug/l	<1	<1	<1	<1	<1	<1	<1	<1										
Se - Selenium (01147)	—	20	ug/l	<1	<1	<1	<1	<1	<1	<1	<1										
Alkalinity - (00410)	—	NE	mg/l	223	292	206	301	213	227	135	243										
Al - Aluminum (01105)	—	NE	ug/l	20	10	<5	14	25	10	13	26										
Be - Beryllium (01012)	4	NE	ug/l	<1	<1	<1	<1	<1	<1	<1	<1										
HCO3 - Bicarbonate (00440)	—	NE	mg/l	223	292	206	301	213	227	135	243										
Ca - Calcium (00916)	---	NE	mg/l	42.3	43.8 (M4)	47.8	70.2	64.6	42.9	56.7	46.2 (M4)										
CO3 - Carbonate (00445)	—	NE	mg/l	<5	<5	<5	<5	<5	<5	<5	<5										
Co - Cobalt (01037)	1	NE	ug/l	<1	<1	<1	<1	<1	<1	<1	<1										
Mg - Magnesium (00927)	---	NE	mg/l	19.0	33.2	38.2	37.2	17.5	26.5	36.0	26 (M4)										
Mo - Molybdenum (01062)	—	NE	ug/l	<1	<1	<1	<1	3.07	5.73	<1	<1										
K - Potassium (00937)	---	NE	mg/l	2.50	1.22	2.48	3.73	4.78	4.26	0.901	1.79										
Na - Sodium (82035)	—	NE	mg/l	69 (M4)	71.8	36.4	54.1	18.6	44.6	28.8	32.9 (M4)										
TSS - Total Susp. Solids (70031)	—	NE	mg/l	<5	<5	<5	<5	<5	<5	<5	<5										
V - Vanadium (01087)	0.3	NE	ug/l	22.2	24.4	12.8	3.43	2.76	2.09	25.0	17.3										
Sr - Strontium (01082)	—	NE	mg/l	0.443	0.376	0.324	0.449	0.263	0.196	0.305	0.449										

Notes:
NE = Not Established
Turbidity is field analyzed for information use only.

BOLD values equal or exceed the corresponding 2L standard

Qualifiers: (M4): The spike recovery value was unusable since the analyte concentration in the sample was disproportionate to the spike level. The associated Laboratory Control Spike recovery was acceptable.

I certify that, to the best of my knowledge and belief, the information submitted in this report is true, accurate, and complete, and that the laboratory analytical data was produced using approved methods of analysis by a DWQ-certified laboratory. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Jason Haynes GM Regulatory Fossil
Permittee (or Authorized Agent) Name and Title - Please print or type

Signature of Permittee (or Authorized Agent)

8-22-18
Date

GW-59CCR 09/2015

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[1] The IMACs were issued in 2010, 2011, and 2012; however NCDEQ has not established a 2L for these constituents as described in 15A NCAC 02L.0202 (c). For this reason, IMACs noted on the report are for reference only.

[2] Alkalinity, Bicarbonate, and Carbonate were subcontracted by Duke Energy Analytical Laboratory to Pace Analytical Services, LLC in Huntersville, NC.

DUKE
ENERGY.

526 South Church St.
Charlotte, NC 28202

P.O. Box 1006
Mail Code EC13K
Charlotte, NC 28201-1006
336-215-4576
704-382-6240 fax

File: 12520Q

December 12, 2018

NCDEQ – Division of Water Resources
Information Processing Unit
1617 Mail Service Center
Raleigh, NC 27699-1617

Subject: : Roxboro Steam Electric Plant
Groundwater Monitoring Sampling and Analysis Results
NPDES Permit #NC0003425

Dear Sir or Madam:

Duke Energy Progress, LLC. (DEP) sampled eight compliance wells around the ash basins at the Roxboro Steam Electric Plant on November 13 and 14, 2018. Attached are two copies of the results on DEQ approved electronic version of Form GW-59CCR.

Please contact Kim Witt at (336) 215-4576 or kimberlee.witt@duke-energy if you have any questions on the sampling results.

> *I certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.*

Sincerely,

Jason Haynes
GM III Regulated Fossil
Roxboro Steam Electric Plant

Attachment

NCDEQ Cc : Debra Watts
Rick Bolich

Duke Cc (electronic): Robert Howard
Kimberlee Witt
Lori Tollie
Ed Sullivan

GROUNDWATER QUALITY MONITORING COMPLIANCE REPORT FORM

Mail original and 1 copy to:
DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER QUALITY - INFORMATION PROCESSING UNIT
1617 MAIL SERVICE CENTER, RALEIGH, NC 27699-1617 Phone: (919) 733-3221

FACILITY INFORMATION

Please Print Clearly or Type

Facility Name: Roxboro Steam Electric Plant
Permit Name (if different): Duke Energy Progress, LLC
Facility Address: 1700 Dunnaway Road (Street)
Semora (City) NC (State) 27343 (Zip) **County** Person

Contact Person: Kim Witt **Telephone#** 336-215-4576
Well Location/Site Name: Roxboro Ash Pond Wells **No. of wells to be sampled:** 8 (from Permit)

Permit Type: NPDES **Expiration Date:** 03/31/2012
PERMIT Number: NC0003425

TYPE OF PERMITTED OPERATION BEING MONITORED Ash Impoundment Groundwater

Monitoring Well Construction Information

											Well ID Number (From Permit)									
		Units	CW-1	CW-2	CW-2D	CW-3	CW-3D	CW-4	CW-5	BG-1	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-
Well Depth (ft below land surface)		ft	39.75	17.50	29.90	11.40	46.50	39.00	19.50	52.00										
Measuring Point (toc) (ft above land surface)		ft	2.47	2.86	2.45	3.33	3.49	2.39	2.31	2.85										
Well Diameter		in	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0										
Screen Top (ft below land surface)		ft	19.95	7.70	25.10	3.40	41.70	24.20	4.70	32.50										
Screen Bottom (ft below land surface)		ft	39.75	17.50	29.90	11.40	46.50	39.00	19.50	52.00										
Relative Measuring Point Elevation		ft	508.24	424.60	424.60	451.79	451.61	479.65	459.74	533.74										

Sampling Information and Field Analysis

CHECK IF DRY WELL AT TIME OF SAMPLING			☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY
	15A-2L	Units	CW-1	CW-2	CW-2D	CW-3	CW-3D	CW-4	CW-5	BG-1	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-
Sample Date			11/13/2018	11/13/2018	11/13/2018	11/13/2018	11/13/2018	11/14/2018	11/13/2018	11/14/2018										
Volume of Water pumped/bailed		gal	0.28	0.37	1.06	10.14	7.65	0.46	1.34	2.76										
Temperature (00010)		deg. C	16	15	15	17	14	13	15	14										
Odor (00085)			None	None	None	None	None	None	None	None										
Appearance			Clear	Clear	Clear	Clear w/ Fines	Clear w/ Fines	Clear	Clear	Clear										
Turbidity (82078)		NTU	2.9	4.2	1.7	40.4	20.3	4.1	2.2	1.3										
Dissolved Oxygen (00300)		mg/L	0.49	2.07	2.55	0.29	3.86	1.75	6.45	4.34										
Oxidation Reduction Potential (00090)		mV	468	560	507	306	339	570	531	517										
Specific Cond - field (00094)		umhos/cm	879	962	852	311	546	616	556	566										
Water Level (ft below measuring pt.) (82546)		ft	22.25	12.15	12.10	3.22	0.89	27.90	7.95	37.74										
pH - field (00400)	6.5 - 8.5	SU	6.07	6.67	6.56	6.14	7.49	6.53	6.42	6.45										

Laboratory Information

Laboratory Name Duke Energy Analytical Laboratory[2]
Sample Analysis Date November 14 - 27, 2018
Certification # NC DENR # 248

Samples for metals were collected unfiltered: ☑ Yes ☐ No
and field acidified: ☑ Yes ☐ No

	IMAC[1]	15A-2L	Units	CW-1	CW-2	CW-2D	CW-3	CW-3D	CW-4	CW-5	BG-1	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-
TDS - Total Diss. Solids (70300)	---	500	mg/l	420	410	390	200	330	320	370	310										
Cl - Chloride (00940)	—	250	mg/l	11	16	16	19	25	28	4	18										
As - Arsenic (01002)	—	10	ug/l	<1	<1	<1	<1	<1	<1	<1	<1										
SO4 - Sulfate (00945)	---	250	mg/l	99	89	130	28	38	38	120	18										
Nitrate (NO3) as N (00620)	—	10	mg/l	0.07	0.28	0.36	0.08	<0.023	0.23	0.43	2.6										
Cd - Cadmium (01027)	—	2	ug/l	<1	<1	<1	<1	<1	<1	<1	<1										
Cr - Chromium (01034)	---	10	ug/l	<5	<5	<5	<5	<5	<5	<5	<5										
Cu - Copper (01042)	---	1	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005										
Fe - Iron (01045)	—	300	ug/l	126	158	<10	3380	1020	33	11	19										
Hg - Mercury (71900)	—	1	ug/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05										
Mn - Manganese (01055)	---	50	ug/l	49	113	<5	120	117	<5	<5	<5										
Ni - Nickel (01067)	—	100	ug/l	<5	<5	<5	<5	<5	<5	<5	<5										
Pb - Lead (01051)	—	15	ug/l	<1	<1	<1	<1	<1	<1	<1	<1										
Zn - Zinc (01092)	---	1	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005										
Ba - Barium (01007)	---	700	ug/l	123	86	151	64	65	130	57	92										
B - Boron (01022)	—	700	ug/l	<50	<50	<50	<50	<50	<50	211	<50										
Tl - Thallium (01059)	0.2	NE	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2										
Sb - Antimony (01097)	1	NE	ug/l	<1	<1	<1	<1	<1	<1	<1	<1										
Se - Selenium (01147)	---	20	ug/l	<1	<1	<1	<1	<1	<1	<1	<1										
Alkalinity - (00410)	—	NE	mg/l	239	265	191	88.1	210	223	139	233										
Al - Aluminum (01105)	—	NE	ug/l	92 (B1)	35 (B1)	<5 (B)	4030 (B1)	1130 (B1)	34	16 (B)	15										
Be - Beryllium (01012)	4	NE	ug/l	<1	<1	<1	<1	<1	<1	<1	<1										
HCO3 - Bicarbonate (00440)	—	NE	mg/l	239	265	191	88.1	210	223	139	233										
Ca - Calcium (00916)	---	NE	mg/l	46.4	42.8	48.2	22.7	69.7	41.8	41.3	47.3										
CO3 - Carbonate (00445)	---	NE	mg/l	<5	<5	<5	<5	<5	<5	<5	<5										
Co - Cobalt (01037)	1	NE	ug/l	<1	<1	<1	1.15	<1	<1	<1	<1										
Mg - Magnesium (00927)	—	NE	mg/l	20.6	32.6	38.5	12.4	18.3	25.8	26.6	26.9										
Mo - Molybdenum (01062)	---	NE	ug/l	<1	<1	<1	<1	3.12	5.69	<1	<1										
K - Potassium (00937)	---	NE	mg/l	2.72	1.24	2.54	1.64	4.83	4.13	0.878	1.84										
Na - Sodium (82035)	---	NE	mg/l	78.5	71.6	37.1	19.3	19.4	43.5	27.8	34.6										
TSS - Total Susp. Solids (70031)	—	NE	mg/l	6	<5	<5	<5	11	<5	<5	<5										
V - Vanadium (01087)	0.3	NE	ug/l	22.5	32.5	13.3	10.1	5.06	2.21	34.0	17.6										
Sr - Strontium (01082)	—	NE	mg/l	0.495	0.369	0.331	0.171	0.280	0.195	0.262	0.473										

Notes:
NE = Not Established
Turbidity is field analyzed for information use only.

BOLD values equal or exceed the corresponding 2L standard

Qualifiers:
(B): Target analyte detected in Method/Prep Blank at or above the reporting limit. Target analyte concentration in sample is less than 10X the concentration in the Method/Prep Blank. Analyte concentration in sample could be due to contamination.
(B1): Target analyte was detected in Method/Prep Blank at or above the reporting limit. Target analyte concentration in sample is below the reporting limit or greater than 10X the concentration of the target analyte detected in the Method/Prep Blank. Analyte concentration in the sample is not affected.

I certify that, to the best of my knowledge and belief, the information submitted in this report is true, accurate, and complete, and that the laboratory analytical data was produced using approved methods of analysis by a DWQ-certified laboratory. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Jason Haynes GM III Reg Fossil
Permittee (or Authorized Agent) Name and Title - Please print or type

Jason Haynes
Signature of Permittee (or Authorized Agent)

12-12-18
Date

GW-59CCR 09/2015

[1] The IMACs were issued in 2010, 2011, and 2012; however NCDEQ has not established a 2L for these constituents as described in 15A NCAC 02L.0202 (c). For this reason, IMACs noted on the report are for reference only.
[2] Alkalinity, Bicarbonate, and Carbonate were subcontracted by Duke Energy Analytical Laboratory to Pace Analytical Services, LLC in Huntersville, NC.

DUKE ENERGY.
PROGRESS

Duke Energy Progress, LLC
Roxboro Steam Electric Plant
1700 Dunnaway Road
Semora, NC 27343

File: 12520Q

May 28, 2019

NCDEQ – Division of Water Resources
Information Processing Unit
1617 Mail Service Center
Raleigh, NC 27699-1617

Subject::
Roxboro Steam Electric Plant
Groundwater Monitoring Sampling and Analysis Results
NPDES Permit #NC0003425

Dear Sir or Madam:

Duke Energy Progress, LLC. (DEP) sampled eight compliance wells around the ash basins at the Roxboro Steam Electric Plant on April 23 and 24, 2019. Attached are two copies of the results on DEQ approved electronic version of Form GW-59CCR.

Please contact Kim Witt at (336) 215-4576 or kimberlee.witt@duke-energy if you have any questions on the sampling results.

> *I certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.*

Sincerely,

Tom Copolo
GM III Regulated Fossil
Roxboro Steam Electric Plant

Attachment

NCDEQ Cc :
Debra Watts
Rick Bolich

Duke Cc (electronic):	Robert Howard Kimberlee Witt Lori Tollie Ed Sullivan

GROUNDWATER QUALITY MONITORING COMPLIANCE REPORT FORM

Mail original and 1 copy to: DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER QUALITY - INFORMATION PROCESSING UNIT
1617 MAIL SERVICE CENTER, RALEIGH, NC 27699-1617 Phone: (919) 733-3221

FACILITY INFORMATION

Please Print Clearly or Type

Facility Name: Roxboro Steam Electric Plant
Permit Name (if different): Duke Energy Progress, LLC
Facility Address: 1700 Dunnaway Road (Street)
Semora (City) NC (State) 27343 (Zip) County: Person

Contact Person: Kim Witt
Telephone#: 336-215-4576
Well Location/Site Name: Roxboro Ash Pond Wells
No. of wells to be sampled: 8 (from Permit)

Permit Type: NPDES
PERMIT Number: NC0003425
Expiration Date: 03/31/2012
TYPE OF PERMITTED OPERATION BEING MONITORED: Ash Impoundment Groundwater

Monitoring Well Construction Information

	Units	CW-1	CW-2	CW-2D	CW-3	CW-3D	CW-4	CW-5	BG-1	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-
Well Depth (ft below land surface)	ft	39.75	17.50	29.90	11.40	46.50	39.00	19.50	52.00										
Measuring Point (toc) (ft above land surface)	ft	2.47	2.86	2.45	3.33	3.49	2.39	2.31	2.85										
Well Diameter	in	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0										
Screen Top (ft below land surface)	ft	19.95	7.70	25.10	3.40	41.70	24.20	4.70	32.50										
Screen Bottom (ft below land surface)	ft	39.75	17.50	29.90	11.40	46.50	39.00	19.50	52.00										
Relative Measuring Point Elevation	ft	508.24	424.60	424.60	451.79	451.61	479.65	459.74	533.74										

Well ID Number (From Permit)

Sampling Information and Field Analysis

CHECK IF DRY WELL AT TIME OF SAMPLING			☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY
	15A-2L	Units	CW-1	CW-2	CW-2D	CW-3	CW-3D	CW-4	CW-5	BG-1	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-
Sample Date			04/24/2019	04/24/2019	04/24/2019	04/24/2019	04/24/2019	04/23/2019	04/24/2019	04/24/2019										
Volume of Water pumped/bailed		gal	0.50	0.50	0.75	1.00	0.40	3.00	1.00	1.25										
Temperature (00010)		deg. C	24.0	17.0	18.0	14.0	16.0	17.0	15.0	19.0										
Odor (00085)			Sulfur	None	None	None	None	None	None	None										
Appearance			Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear										
Turbidity (82078)		NTU	6.6	2.7	1.8	5.8	1.8	8.8	1.8	1.4										
Dissolved Oxygen (00300)		mg/L	0.25	0.21	2.79	0.3	5.1	0.96	3.3	4.47										
Oxidation Reduction Potential (00090)		mV	24	-53	30	107	111	27	108	88										
Specific Cond - field (00094)		umhos/cm	698	952	655	481	566	595	432	555										
Water Level (ft below measuring pt.) (82546)		ft	17.84	12.4	12.43	4.23	1.16	28.35	7.43	35.52										
pH - field (00400)	6.5 - 8.5	SU	5.8	6.4	6.5	5.6	7.2	6.4	6.2	6.0										

Laboratory Information

Laboratory Name: Duke Energy Analytical Laboratory[2]
Sample Analysis Date: April 24 - 30, 2019
Certification #: NC DENR # 248
Samples for metals were collected unfiltered: ☑ Yes ☐ No
and field acidified: ☑ Yes ☐ No

	IMAC[1]	15A-2L	Units	CW-1	CW-2	CW-2D	CW-3	CW-3D	CW-4	CW-5	BG-1	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-
TDS - Total Diss. Solids (70300)	---	500	mg/l	480	**540**	420	290	360	360	350	350										
Cl - Chloride (00940)	---	250	mg/l	11	30	16	61	27	27	5.1	20										
As - Arsenic (01002)	---	10	ug/l	<1	<1	<1	<1	<1	<1	<1	<1										
SO4 - Sulfate (00945)	---	250	mg/l	96	49	120	52	33	37	96	16										
Nitrate (NO3) as N (00620)	---	10	mg/l	<0.046	0.15	0.37	0.04	<0.023	0.32	0.48	2.6										
Cd - Cadmium (01027)	---	2	ug/l	<1	<1	<1	<1	<1	<1	<1	<1										
Cr - Chromium (01034)	---	10	ug/l	<5	<5	<5	<5	<5	<5	<5	<5										
Cu - Copper (01042)	---	1	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005										
Fe - Iron (01045)	---	300	ug/l	33	**465**	<10	**377**	<10	76	<10	58										
Hg - Mercury (71900)	---	1	ug/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05										
Mn - Manganese (01055)	---	50	ug/l	**55**	**515**	<5	**130**	27	<5	<5	<5										
Ni - Nickel (01067)	---	100	ug/l	<5	<5	<5	<5	<5	<5	<5	<5										
Pb - Lead (01051)	---	15	ug/l	<1	<1	<1	<1	<1	<1	<1	<1										
Zn - Zinc (01092)	---	1	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005										
Ba - Barium (01007)	---	700	ug/l	143	115	153	105	44	130	47	96										
B - Boron (01022)	---	700	ug/l	<50	<50	<50	<50	<50	<50	182	<50										
Tl - Thallium (01059)	0.2	NE	ug/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2										
Sb - Antimony (01097)	1	NE	ug/l	<1	<1	<1	<1	<1	<1	<1	<1										
Se - Selenium (01147)	---	20	ug/l	<1	<1	<1	<1	<1	<1	<1	<1										
Alkalinity - (00410)	---	NE	mg/l	258	387	201	87.7	230	229	139	246										
Al - Aluminum (01105)	---	NE	ug/l	<10	16	<10	637	<10	116	<10	57										
Be - Beryllium (01012)	4	NE	ug/l	<1	<1	<1	<1	<1	<1	<1	<1										
HCO3 - Bicarbonate (00440)	---	NE	mg/l	258	387	201	87.7	230	229	139	246										
Ca - Calcium (00916)	---	NE	mg/l	48.8	52.2	47.6	32.0	75.4	42.7	37.9	47.5										
CO3 - Carbonate (00445)	---	NE	mg/l	<5	<5	<5	<5	<5	<5	<5	<5										
Co - Cobalt (01037)	1	NE	ug/l	<1	<1	<1	<1	<1	<1	<1	<1										
Mg - Magnesium (00927)	---	NE	mg/l	21.7	39.6	37.9	18.8	18.8	26.3	23.8	27.3										
Mo - Molybdenum (01062)	---	NE	ug/l	<1	<1	<1	<1	2.56	5.84	<1	<1										
K - Potassium (00937)	---	NE	mg/l	2.73	1.43	2.63	1.41	4.23	4.21	0.783	1.57										
Na - Sodium (82035)	---	NE	mg/l	77.3	96.6	37.2	32.0	19.1	44.4	30.0	34.4										
TSS - Total Susp. Solids (70031)	---	NE	mg/l	<5	<5	<5	<5	<5	<5	<5	<5										
V - Vanadium (01087)	0.3	NE	ug/l	18	14.2	13.0	2.12	2.02	2.37	27.7	20.4										
Sr - Strontium (01082)	---	NE	mg/l	0.512	0.459	0.320	0.287	0.285	0.192	0.231	0.463										

Notes:
NE = Not Established
Turbidity is field analyzed for information use only.

BOLD values equal or exceed the corresponding 2L standard

Qualifiers: None

I certify that, to the best of my knowledge and belief, the information submitted in this report is true, accurate, and complete, and that the laboratory analytical data was produced using approved methods of analysis by a DWQ-certified laboratory. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Tom Copolo
Permittee (or Authorized Agent) Name and Title - Please print or type

Signature of Permittee (or Authorized Agent)

05/29/19
Date

GW-59CCR 09/2015

---

[1] The IMACs were issued in 2010, 2011, and 2012; however NCDEQ has not established a 2L for these constituents as described in 15A NCAC 02L.0202 (c). For this reason, IMACs noted on the report are for reference only.

[2] Alkalinity, Bicarbonate, and Carbonate were subcontracted by Duke Energy Analytical Laboratory to Pace Analytical Services, LLC in Huntersville, NC.

I/A

Hart Exhibit 57
Docket No. E-2, Sub 1219

ADVANCED GeoServices
Engineering for the Environment. Planning for People.™
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THE ELM CONSULTING GROUP INTERNATIONAL LLC

ENVIRONMENTAL AUDIT IN SUPPORT OF THE COURT APPOINTED MONITOR

L. V. Sutton Energy Complex
Wilmington, North Carolina
USA

April 2019

Final Report Issued to:

Duke Energy and the Court Appointed Monitor

Prepared By:

Advanced GeoServices Corp.
and
The Elm Consulting Group International LLC

TABLE OF CONTENTS

PAGE NO.:

1.0 INTRODUCTION

Advanced GeoServices Corp. (AGC) and The Elm Consulting Group International LLC (Elm) (collectively, the Audit Team) are conducting environmental compliance audits (the Audits) of certain coal combustion residuals (CCR) management locations owned or operated by Duke Energy Business Services LLC, Duke Energy Carolinas, LLC, and Duke Energy Progress, Inc. (collectively, Duke Energy). The Audits are being conducted under the direction of Mr. Benjamin Wilson, the Court Appointed Monitor, pursuant to an Order issued by the U.S. District Court, Eastern District of North Carolina, in case numbers 5:15-CR-62-H, 5:15-CR-67-H, and 5:15-CR-68-H.

The scope of the Audits is set forth in the plea agreements entered into by Duke Energy and the United States in the above cases, the Court's judgments in these cases, and a written Audit scoping document agreed to by Duke Energy and the United States.

1.1 BACKGROUND INFORMATION FOR THE L. V. SUTTON AUDIT

The subject of this report is the Audit completed at Duke Energy's L. V. Sutton Energy Complex located in Wilmington, NC (Sutton Facility). The on-site portion of the Audit was conducted on February 11-12, 2019 for a total of two days on-site. The Audit Team consisted of the following senior auditors:

Mr. Christopher Reitman, P.E. AGC	Project Director, Audit Team Leader, Sr. Subject Matter Expert (on-site)
Mr. Joseph Cotier, CPEA, Elm	Sr. Environmental Auditor (on-site)
Mr. Bernie Beegle, P.G., AGC	Sr. Subject Matter Expert (off-site)

The Sutton Facility was represented by:

- Mr. Jason Talbott, Station General Manager
- Mr. Tim Russell, CCP System Owner
- Mr. Don Gibbs, CCP Engineering & Closure Engineering
- Mr. Issa Zarzar, General Manager, Carolinas East Region, CCP Operations and Maintenance
- Mr. Bobby Barnes, Manager, Engineering & Closure Engineering
- Mr. Steve Gordy, CCP Projects
- Mr. Steve Cahoon, EHS CCP Permitting and Compliance
- Ms. Cynthia Winston, Manager, Environmental Permitting and Compliance
- Mr. John Toepfer, EHS CCP Waste & Groundwater
- Ms. Tammy Jett, EHS CCP Waste & Groundwater (by phone)
- Mr. Randy Hart, Regulatory Affairs
- Mr. Shane Johnson, Environmental Rover, EHS CCP Compliance
- Mr. Mike Phillips, Manager, EHS CCP Compliance
- Mr. Ricky Stroupe, EHS CCP Environmental Field Support
- Mr. Kent Tyndall, Station Environmental Field Support
- Mr. James Hailey, EHS CCP H&S Field Support
- Mr. Josh Schieffer, Station H&S Field Support
- Mr. Keith Higgins, EHS CCP Compliance

1.2 FACILITY OVERVIEW

The Duke Energy Sutton Facility is located at 801 Sutton Steam Plant Road, Wilmington, North Carolina. The Sutton Facility covers approximately 3500 acres and is located along the east side of the Cape Fear River and Sutton Lake (formerly the Sutton Facility cooling pond). According to Duke Energy personnel, the Sutton Facility first began power generation in 1954 and three coal burning units were operated until their retirement in November 2013. No coal combustion has occurred since 2013. Current power generation at the Sutton Facility is by natural gas-fired combined cycle and combustion turbine units. Since coal combustion has been terminated at the Sutton Facility, there was no active ash generation observed by the Audit Team.

1.2.1 Ash Management Activities

The 2015 Update to the Coal Ash Excavation Plan indicates ash generated by coal combustion was historically placed in the following three discrete areas on-site:

- 1971 Ash Basin – The 1971 Ash Basin was operated from 1971 to 1985. It was opened again in 2011 for temporary use during repair work and ash removal activities. The 1971 Ash Basin is unlined with a crest elevation of 28 feet mean sea level (msl). An area underneath, but within the footprint of the 1971 Ash Basin, contains additional CCR and is referred to as the 1971 Borrow Area. This area is below the groundwater table. The 1971 Ash Basin and the 1971 Borrow Area originally contained approximately 3.5 million tons of CCR. The southern dikes of the 1971 Ash Basin contain ash and will be excavated as part of the final closure. The 1971 Ash Basin has been intentionally breached, in accordance with design documents developed by Duke Energy and approved by the North Carolina Department of Environmental Quality (NCDEQ), to facilitate ongoing CCR removal activities, and currently a sheetpile wall separates the basin from Sutton Lake, which is considered a water of the state of North Carolina.

- 1984 Ash Basin – The 1984 Ash Basin was operated from 1984 to 2013. The 1984 Ash Basin reportedly has a 12-inch thick clay liner at the basin bottom which extends along the side slopes where it is protected by a 2-foot thick sand layer. The 1984 Ash Basin crest elevation is 34 feet msl. In 2006, an Interior Containment

Area (ICA) was constructed within the 1984 Ash Basin with a crest elevation of 42 feet msl. The 1984 Ash Basin originally contained an estimated 2.8 million tons of CCR. The CCR materials in the 1984 Ash Basin are currently being excavated and placed in the on-site Industrial Landfill.

- LOLA – The LOLA ("Lay of the Land Area") is located between the discharge canal and the former coal storage area or pile. It is believed by Duke Energy personnel that this area may have been used between 1954 and 1972. The LOLA and the LOLA dikes contain ash. Current plans call for the LOLA eastern dike to be excavated as part of the final closure and the LOLA western dike to remain in place with rip-rap armoring. This area contains approximately 686,000 tons of CCR and soil mixture at depths of 0 to 15 feet. The LOLA was listed on the North Carolina Inactive Hazardous Waste Sites Priority List, but the LOLA unit was officially moved to the NCDEQ Division of Water Resources on February 10, 2017 to facilitate management of this area, including post-closure groundwater remediation, in a manner consistent with the Ash Basins.

- Industrial Landfill – Over the last 3 years, Duke Energy has utilized an on-site landfill to contain the CCR materials removed from the 1971 and 1984 Ash Basins. The landfill was designed to accommodate up to eight cells. At the time of the Audit, Cell 3 had an interim cover, an interim cover was being placed on cell 4, cells 5, 6, and 7 were being actively filled, and cell 8 was active from contact with stormwater during Hurricane Florence.

1.2.2 Environmental Permits and Programs

The Sutton Facility operates under the environmental permits and programs described below:

- **National Pollutant Discharge Elimination System (NPDES) Wastewater Permitting** – NCDEQ issued the renewal of NPDES Permit No. NC0001422 on September 29, 2017 with an effective date of October 1, 2017 and an expiration date of September 30, 2022. The permit covers the following ash management related activities:

  - Outfall 001 – discharge from the Duke Energy discharge canal of Sutton Lake to the Cape Fear River (both waters of the State). In effect, outfall 001 is a mixing area where discharged waters, Sutton Lake, and the Cape Fear River converge. It includes ash pond water, recirculated cooling water, non-contact cooling water, and treated wastewater from Outfalls 002 and 004. The Wastewater Treatment System (WTS), operated by Duke Energy contractor Evoqua, Inc., treats ash pond water prior to discharge at Outfall 001. The renewed NPDES Permit also allows discharge of landfill leachate and groundwater extraction well water at Outfall 001 after treatment at the WTS. At the time of the Audit, the Sutton Facility was decanting waters from the 1984 Ash Basin as it continued the excavation of remaining ash.
  - Outfall 002 – discharge to Sutton Lake or the 1971 Ash Basin, including free water above the settled ash layer of the 1971 Ash Basin. This water included: coal pile runoff, low volume wastes, ash sluice waters, and stormwater runoff. Note that ash-related waters are no longer generated as the former coal-fired units have been demolished.
  - Outfall 004 – discharge to Outfall 001, including free water above the settled ash layer of the 1984 Ash Basin during dewatering. This water included: ash sluice water, coal pile runoff, low volume wastes and stormwater runoff. Note that ash-related waters are no longer generated as

the former coal-fired units have been demolished. All water from Outfall 004 has been routed as an internal discharge to Outfall 001.

- Outfall 008 – discharge to Sutton Lake from internal Outfalls 005, 006, 007, and 009 and internal stormwater Outfalls SW001 thru SW007.
- Outfall 010 – discharge to Sutton Lake via an emergency spillway for non-contact stormwater from the North Stormwater Pond at the landfill.
- Outfall 011 – discharge to the Sutton Facility Effluent Channel Lake via an emergency spillway for non-contact stormwater from the South Stormwater Pond at the landfill.

The NPDES permit requires separation of Outfalls 002 and 004 from the Sutton Lake discharge at Outfall 001. Duke Energy has initiated discussions with NCDEQ regarding the implementation of this requirement, including modeling of metals limits. This modeling has been submitted to NCDEQ, and Duke Energy is awaiting a response or input from NCDEQ.

The NPDES Permit has eliminated the groundwater monitoring requirements included in the earlier NPDES permit. However, Part I., Paragraph A(31) of the NPDES Permit states an exceedance of groundwater standards at or beyond the compliance boundary is subject to remediation action according to 15A NCAC 02L.0106(c), (d), or (e), as well as enforcement actions in accordance with North Carolina General Statute 143-215.6A through 143-215.6C.

Impact of Hurricane Florence

Hurricane Florence made landfall near Wrightsville Beach, North Carolina, a point approximately 14 miles due east-southeast of the Sutton Facility, on the morning of September 14, 2018. Based on review of the notes section of the electronic

Discharge Monitoring Report (eDMR) submitted to NCDEQ for September 2018, the Sutton Facility reported the following actions related to Hurricane Florence:

- Irregular Monitoring – There was no discharge from Outfall 001 from September 12 to September 26, 2018. Due to no discharge and the unsafe conditions, the required weekly sampling event was not conducted for the week of September 17 to September 23, 2018.
- Outfall 001 Discharge Pipe Damage – A section of the Outfall 001 discharge pipe was destroyed during Hurricane Florence. Duke Energy requested that discharge to the Effluent Channel be allowed while the pipe was being repaired. NCDEQ approved this request on September 25, 2018 and granted permission to discharge to the Effluent Channel through October 10, 2018. The discharge commenced at approximately 9:00 am on September 27, 2018. A sample for analysis was collected at approximately 2:00 pm. Because repairs took longer than expected, Duke Energy requested an extension of the Effluent Channel discharge through October 24, 2018. This request was made on October 8, 2018, with approval by NCDEQ provided on October 9, 2018. The discharge pipe was repaired and normal discharge to Outfall 001 commenced on October 11, 2018.
- Outfalls 010 and 011 – The North and South Pond Emergency Spillways (Outfalls 010 and 011, respectively) at the landfill both received stormwater during Hurricane Florence. Sutton Facility staff reported that the South Pond also received ash. There were no noted discharges from either Pond to Sutton Lake (Outfall 010) or the Effluent Channel (Outfall 011). Facility personnel attribute the lack of discharges to the extremely sandy soils that make-up the base of the North and South Ponds.
- Chlorides – Outfall 001 has a total chlorides limit of 230 mg/L (monthly average and daily maximum). The September 10, 2018 sample results for Outfall 001 noted a chlorides concentration of 1380 mg/L. As there had

been no other exceedances of the chlorides limit noted during the period of review, it seemed likely that the elevated chlorides was caused by tidal surge of sea water caused by Hurricane Florence.

- Cenospheres – Cenospheres (lightweight hollow beads that are a byproduct of coal combustion) originating from the landfill reportedly were discharged to a wetlands located north of and adjacent to the landfill and to Sutton Lake. Duke Energy reported the release to both the NCDEQ and the Army Corps of Engineers on September 17, 2018. The Army Corps of Engineers' response on September 25, 2018 recommended cleanup of the area and taking pictures. There was no documented reply from NCDEQ and no additional follow-up by the Army Corps of Engineers.

Several days following the main rain event associated with Hurricane Florence, the Cape Fear River, which is adjacent to Sutton Lake, crested and overflowed into Sutton Lake. The level of the water in the Sutton Lake subsequently rose and overtopped the 1971 Ash Basin's sheetpile wall and entered the Basin. Cenospheres, a type of CCR material which float, were observed in Sutton Lake. The source of these cenospheres may have been from the 1971 Ash Basin, although, as noted above, there were other specific releases which may have contributed to the cenospheres (i.e., there were known releases from other Sutton Facility areas).

- **NPDES Stormwater Permitting** – NCDEQ issued a revision to Individual Stormwater Permit No. SW8 150902 on December 2, 2016 as a North Master Stormwater Permit, now including activities at the ash basins. A revision to include site access roads was issued on July 25, 2017. The original stormwater permit, covering site generation activities, was issued by NCDEQ on October 7, 2015. This permit now covers electrical generation activities. Stormwater related to ash basin and landfill activities are covered in the Sutton Facility NPDES permit.

A Stormwater Pollution Prevention Plan (SWPPP) and associated erosion and sedimentation control plans cover the permitted activity.

- **NPDES Stormwater Construction Permitting** – An NCDEQ-issued stormwater construction permit governing activities related to ash basins and ash management has been issued to the Sutton Facility. This permit was issued by NCDEQ under its Stormwater General Permit for Construction Activities No. NCG010000.
  - NEWHA-2016-025 was issued on June 23, 2017 as a modification and consolidation of permits related to the Landfill Project Area Master Permit. A subsequent modification was issued by NCDEQ on March 21, 2018 and referred to as the Sitewide L.V. Sutton Energy Complex E&SC Modification.

An erosion and sedimentation control plan was in place for this project.

- **Title V Permitting** – The Sutton Facility's Title V Permit No. 01318T33 has an effective date of December 5, 2017 and an expiration date of June 30, 2019. A timely permit renewal application was submitted to NCDEQ on September 20, 2018. Submittal of the permit renewal application is required at least 9 months prior to permit expiration. The latest modification to the Title V Permit reflected removal of combustion turbine equipment. Fugitive dust for ash handling was listed as an insignificant source and identified as follows:
  - Source ID I67 – site-wide fugitive dust from ash handling, parking lots, and unpaved roads;
  - Source ID I76 – monofill; and
  - Source ID I77 – ash handling to support monofill.

Site-wide fugitive dust is further covered under Section 3.MM of the Permit. The Annual Compliance Certification for 2017 was submitted to NCDEQ on February 28, 2018.

- **Spill Prevention, Control and Countermeasure (SPCC) Plan** – Trans Ash, Inc. operates the basin excavation and landfill operation activities as a contractor to Duke Energy. Oil storage associated with those activities were addressed in the Trans Ash, Inc. SPCC Plan which was last revised on January 31, 2019.

- **Tier II Reporting** – Tier II hazardous chemicals inventory reporting was completed for 2017 on February 6, 2018. The Tier II report for 2018 is required to be submitted prior to March 1, 2019, and was not available to be reviewed at the time of the 2019 Audit.

- **Ash Disposal Permit** – Duke Energy transported ash from the 1971 and 1984 Ash Basins to the Brickhaven mine from June 2015 through June 2017. The Brickhaven mine is owned and operated by Charah, Inc., under NCDEQ-issued Permit No. 1910-STRUC-2015, Brickhaven No. 2. This permit was issued by NCDEQ on October 15, 2015.

- **Industrial Landfill Permit** – NCDEQ issued Duke Energy a Complex Industrial Landfill Permit to Construct No. 6512-INDUS-2016 with an issuance and effective date of September 22, 2016 and an expiration date of September 21, 2026.

  The permit allows construction of 11 landfill cells totaling 101.1 acres in three Phases at the Sutton Facility. NCDEQ issued Duke Energy a permit to operate Cell 3, Cell 4, Cell 5, and Cell 6 on July 6, 2017, August 25, 2017, December 7, 2017, and February 7, 2018, respectively. NCDEQ also issued Duke Energy a permit to operate Cells 7 and 8 on May 16, 2018. At the time of the Audit, Cell 3 had an interim cover; an interim cover was being placed on cell 4; cells 5, 6, and 7 were being actively filled; and cell 8 was active due to the receipt of contact stormwater during Hurricane Florence.

On December 21, 2018, Duke Energy notified NCDEQ that there was an Action Leakage Rate Exceedance (i.e., greater than 216 gallons per acre per day was leaking into the detection monitoring zone) in Cell 6 of the Landfill. On January 14, 2019, Duke Energy presented a Preliminary Assessment Report regarding this condition which presented operational responses to continue to assess and isolate the leak. Duke Energy personnel stated the leak may have been associated with Hurricane Florence reparation activities. Active efforts to move landfilled materials and find the leak were observed during the 2019 Audit by the Audit Team.

On January 4, 2017, the NCDEQ approved a Water Quality Plan for the Industrial Landfill. The Water Quality Plan includes semi-annual groundwater monitoring of eight wells for Phase 1 (cells 3 through 8). To date, Duke Energy has conducted four baseline groundwater sampling events at the Industrial Landfill and three semi-annual post-operational sampling events in October 2017, March 2018, and October 2018. Duke Energy submitted to the NCDEQ the Semi-Annual Groundwater Monitoring Report in July 2018 for the March 2018 sampling event. At the time of this 2019 Audit, the Semi-Annual Groundwater Monitoring Report for the October 2018 sampling event had not been issued to the NCDEQ. Once eight sampling events are conducted at the Industrial Landfill, Duke Energy will perform statistical analyses to determine background concentrations.

Based in part on the observed erodibility of the locally available cover soils during Hurricane Florence, Duke Energy modified the landfill closure to use Closure Turf, a synthetic turf-like product, as an alternative final landfill cover. This modification was approved for use by NCDEQ on December 20, 2018.

- **CAMA** – CAMA requirements include identification of drinking water supply wells within a half mile of the Sutton Facility, submission of Groundwater Assessment Plans, installation and multiple rounds of sampling from assessment wells, submission of Groundwater Assessment Reports summarizing groundwater investigations, submission of an Annual Groundwater Protection and Restoration Report, submission of Discharge Assessment Plans to characterize seeps, submission of a Groundwater Corrective Action Plan, and ash basin closure/removal activities, all of which have been completed by Duke Energy.

On October 19, 2017, under CAMA, Duke Energy submitted to NCDEQ the Revised Interim Monitoring Plans (IMPs) for groundwater monitoring for 14 Duke Energy facilities located in North Carolina, including the Sutton Facility. The revised facility IMPs require groundwater monitoring on a quarterly basis commencing the fourth quarter of calendar year 2017 pursuant to 15A NCAC 02L.0110, until Corrective Action Plans are accepted for the individual facilities or as directed otherwise by the NCDEQ. The quarterly sampling events will be conducted in conjunction with planned compliance monitoring sampling events for three quarters during the calendar year, supplemented with an additional sampling event conducted at each facility in order to provide four rounds of monitoring data to evaluate seasonal fluctuations during a year-long timeframe. The 2018 CAMA groundwater monitoring network consists of 64 wells. On December 21, 2018, NCDEQ issued Duke Energy optimized IMPs for all the 14 Duke Energy Facilities with groundwater sampling to begin in the first quarter of 2019.

Under CAMA, Duke Energy submitted to NCDEQ the 2018 Groundwater Protection and Restoration Annual Report on January 25, 2019, and the 2018 Surface Water Protection and Restoration Annual Report on January 21, 2019. Duke Energy also submitted to NCDEQ the CAMA 2018 Comprehensive Site Assessment Update dated January 31, 2018 for the Sutton Facility.

- **CCR Rule** – The 1971 and 1984 Ash Basins are subject to the CCR Rule because the Sutton Facility currently produces electricity. A CCR groundwater monitoring well network of six background wells and 59 down gradient wells has been established at the 1971 and 1984 Ash Basins. Nine CCR sampling events had been completed at the time of this audit. Electronic deliverables of the sampling were provided to the Audit Team. On January 10, 2018, Duke Energy submitted the CCR Annual Groundwater Monitoring and Corrective Action Report for the 1971 and 1984 Ash Basins to NCDEQ. Duke Energy plans to begin CCR assessment groundwater monitoring for CCR Rule Appendix IV parameters the week of February 19, 2018.

  The Initial Structural Stability Assessment states the foundation abutments would not be stable during a seismic event for both the 1971 and 1984 Ash Basins. The Initial Factor of Safety Assessment states the seismic minimum factor of safety is not met for the 1971 Ash Basin, and the dikes of both the 1971 and 1984 Ash Basins were constructed of soils that are susceptible to liquefaction. Duke Energy is addressing these issues through the ongoing excavation of the 1971 and 1984 Ash Basins.

The Industrial Landfill is subject to the CCR Rule because it receives CCR materials. A CCR groundwater monitoring well network of six background wells and 24 down gradient wells has been established at the Industrial Landfill.

On March 14, 2018, Duke Energy provided notice on Duke Energy's public website that the 1971 and 1984 Ash Basins are now in the CCR assessment monitoring program due to statistically significant increases over the background values of the Appendix III parameters.

On November 7, 2018, Duke Energy posted the required location restrictions for impoundments which stated the 1971 and 1984 Ash Basins did not meet the surface impoundment standard for placement above the uppermost aquifer (40 C.F.R. §257.60(a)), wetlands (40 C.F.R. § 257.61(a)), unstable areas, (40 C.F.R. §257.64(a)), or seismic impact zones (40 C.F.R. § 257.63(a))

On December 14, 2018, Duke Energy provided notice on Duke Energy's public website that the following CCR Rule Appendix IV constituents were detected at levels above the applicable Groundwater Protection Standards (GWPS):

- Arsenic
- Cobalt
- Lithium
- Molybdenum

Duke Energy was continuing to implement the groundwater assessment process prescribed by the CCR Rule at the time of the Audit.

Duke Energy has submitted to NCDEQ its 2018 CCR Annual Groundwater Monitoring and Corrective Action Reports for the 1971 and 1984 Ash Basins and the Industrial Landfill, dated January 18, 2019. Duke Energy is currently conducting statistical analyses on the Industrial Landfill CCR groundwater data to determine background concentrations.

Duke Energy has also developed numerous required CCR submittals which are identified on Tables 1a, 1b, and 1c.

1.2.3 Dam and Other Structural Permits and Approvals

Two active dams, for the 1971 Ash Basin and 1984 Ash Basin, exist on-site and are associated with ash management activities. The dams were grandfathered under North Carolina's Session Law 2009-390 (Senate Bill 1004, effective date January 1, 2010). Under this grandfathering, the original design of the dams is not subject to current design standards for new dam construction, although modifications after the effective date may be subject to these standards.

According to the 2018 Annual Inspection Report, the 1971 Ash Basin dam length was 7,000 feet in length with a maximum height of 24 feet, a crest at 28 feet above mean sea level and a reported pond area of 49.92 acres, prior to being breached. The breach, a permitted activity performed in 2018, is on the southwest side of the basin along the discharge canal and was accomplished with the installation of a sheetpile wall. The dam meets the size definition of "small" under the Dam Safety Regulations and is classified as "high hazard" by the NCDEQ on the Dam Inventory List. At the time of the 2018 Annual Inspection, on May 25, 2018, the basin contained 900,000 cubic yards of CCR and 430,000 cubic yards of impounded water. The Annual Inspection notes there were no signs of structural weakness in the 1971 Ash Basin impoundment.

The 2018 Annual Report indicates the 1984 Ash Basin dam is 10,000 feet in length with a maximum dam height of 32 feet, a maximum crest elevation of 34 feet above mean sea level (msl), and a pond area of 81.99 acres. The dam meets the size definition of "medium" under the Dam Safety Regulations and is classified as "high hazard" by NCDEQ. At the time of NCDEQ's 2018 Annual Inspection, the basin contained 2000 cubic yards of water and 1.2 million cubic yards of CCR. The Annual Report notes the 1984 Ash Basin impoundment was generally in good condition. Active removal of the ash was in progress in both the 1971 and 1984 Ash Basins at the time of the Audit.

Risers on both dams were grouted during 2018. The decommissioning of the 1971 and 1984 Ash Basin dams began in February 2018.

Both dams are immediately adjacent to Sutton Lake. As previously noted, Sutton Lake is considered Waters of the State and is used for recreational purposes.

1.2.4 Activities Completed Since Last Audit

During the 2018 Audit, the Audit Team observed Duke Energy efforts to close the 1971 and 1984 Ash Basins by the August 1, 2019 deadline specified in CAMA. Mechanical excavation of CCR from the 1971 Ash Basin was nearly complete, with the exception of one relatively small area on the north side, and dredging of the CCR below the water table had begun. Sheetpile was installed in sections of the 1971 Ash Basin along the discharge canal, adjacent to Sutton Lake, and along the LOLA. In early 2018, permits from NC Dam Safety were received to commence the sequenced removal of the berms of the 1971 and 1984 Ash Basins.

During this Audit, the Audit Team observed materials being mechanically dredged from the 1971 Ash Basin. The dredged CCR was discharged into the 1984 Ash Basin where it was allowed to dewater. Dewatered ash excavated from the 1984 Ash Basin was trucked to the on-site landfill.

Duke Energy personnel noted that as of January 1, 2019, 1.2 million tons of the estimated 2.46 million tons remained in the 1984 Ash Basin and 110,000 tons of the estimated 3.31 million tons remained in the 1971 Ash Basin. Overall, 2 million tons were disposed off-site and 4.45 million tons of material from the 1971 and 1984 Ash Basins will be placed in the on-site landfill.

On November 16, 2018, Duke Energy submitted a CAMA variance request to NCDEQ to extend the closure deadline by six months from August 1, 2019 to February 1, 2020. Duke Energy cited several permitting delays, two major hurricanes, and the extraordinary amount of rain in 2018, among other factors, in support of its request. NCDEQ held a public meeting in January 2019 and accepted public comments until February 4, 2019. NCDEQ's decision on the request remained pending at the time of the Audit.

The Sutton Facility is completing accelerated groundwater remediation. The plan includes extraction wells on the eastern side of the property which became operational in August 2017, an effectiveness monitoring report is submitted annually by May 15, with the most recent report submitted on May 11, 2018.

During September 2018, Hurricane Florence made landfall in close proximity to the Sutton Facility. Both the Hurricane itself, which produced approximately 30+ inches of rain, and the ensuing flood from the Cape Fear River had a substantial impact on Sutton Facility operations. The initial rainfall itself created a breach in cell 5 of the Industrial Landfill due to the ponding water. CCR materials including cenospheres moved from the landfill into Sutton Lake. On the northeast side of cell 3, deep rills developed, exposing CCR which eroded and migrated through a ditch and culvert onto the adjacent Wooten property. On the southwest side of the landfill, some material moved outside of cell 8 onto the south drainage basin but remained on the property.

2.0 AUDIT SCOPE AND SUBJECT MATTER

The Audit was completed in accordance with the court documents and the audit scoping document agreed to by Duke Energy and the United States. A description of the scope is provided as Attachment A. The Audit included ash management activities, including aspects of generation that affect the nature of the waste streams from the point of generation into surface impoundments or ash management basins, landfills, and/or storage piles. The Audit focused on the activities at the Sutton Facility since the date of the last Audit, which was February 12-13, 2018.

3.0 AUDIT FINDINGS

3.1 EXCEEDANCES OF THE STATE GROUNDWATER QUALITY STANDARDS

Requirement – The State groundwater rules establish maximum contaminant levels for groundwater at or beyond the compliance boundaries for the Ash Basins. *See* 15A NCAC 02L.0202. 15A NCAC 02L.0103(d) provides that "[n]o person shall conduct or cause to be conducted, any activity which causes the concentration of any substance to exceed that specified" under the Class GA standards or the interim maximum acceptable concentrations (IMACs) established for groundwater quality pursuant to 15A NCAC 02L.0202. Further, under N.C.G.S.A. § 143-215.1(i), "[a]ny person … who is required to obtain an individual permit … for a disposal system under the authority of N.C.G.S.A. § 143-215.1 [water pollution control] … shall have a compliance boundary … beyond which groundwater quality standards may not be exceeded." *See also* 15A NCAC 02L.0102(3) (defining "compliance boundary" as "a boundary around a disposal system at and beyond which groundwater quality standards may not be exceeded").

In addition, under N.C.G.S.A. § 143-215.6A(a)(1), civil penalties may be assessed against any person who violates any standard established by the NCDEQ under the authority of N.C.G.S.A. § 143-214.1, which covers groundwater standards.

Finding – Constituents exceeding the standards for Class GA waters, established in 15A NCAC 2L.0202, were documented in monitoring wells located at or beyond the compliance boundaries for the 1971 Ash Basin and the 1984 Ash Basin. The 2018 CAMA groundwater monitoring network consisted of 64 wells. Based on a review of the 2018 CAMA groundwater monitoring analyses, pH, boron, total dissolved solids (TDS), arsenic, cobalt, chromium (VI), chromium, iron, manganese, selenium, thallium, and vanadium all exceed the 2L groundwater standards or the NCDEQ-approved Provisional Background Threshold Values (PBTVs), if the PBTV was greater than the 2L or IMAC groundwater standards, one or more times at or beyond the compliance boundaries for the 1971 Ash Basin and the 1984 Ash Basin. Attachment B provides a summary of the 2018 CAMA groundwater data reviewed and a Figure showing the CAMA well locations.

Duke Energy has stated its opinion that, pursuant to a September 2015 Settlement Agreement with the NCDEQ, “Duke Energy is not subject to any further financial penalties for exceedances of groundwater standards” and “Duke Energy is not subject to any further enforcement action based on exceedances of groundwater standards as long as it remains in substantial compliance with CAMA groundwater requirements.”

The CAM has advised the Audit Team that the Audit scope does not include an evaluation of compliance with the September 2015 Settlement Agreement, and therefore the Audit Team does not take a position on Duke Energy’s opinion.

4.0 OPEN LINES OF INQUIRY

Open Lines of Inquiry are items identified by the Audit Team while on-site that, due to limited available information or the need for additional research, could not be determined as being in compliance or out of compliance.

4.1 AMENDMENT OF EMERGENCY ACTION PLAN (EAP) PROCEDURES

Requirement – The Disposal of Coal Combustion Residuals from Electric Utilities rule (CCR Rule) became effective on October 19, 2015. Under 40 C.F.R. § 257.53, a CCR surface impoundment or impoundment is defined as "a natural topographic depression, man-made excavation, or diked area, which is designed to hold an accumulation of CCR and liquids, and the unit treats, stores, or disposes of CCR." A dike is defined in the CCR Rule as an "embankment, berm, or ridge of either natural or man-made materials used to prevent the movement of liquids, sludges, solids, or other materials."

Under 40 C.F.R. § 257.73(a)(3)(i), "[n]o later than April 17, 2017, the owner or operator of a CCR unit determined to be either a high hazard potential CCR surface impoundment or a significant hazard potential CCR surface impoundment under paragraph (a)(2) of this section must prepare and maintain a written EAP. At a minimum the EAP must: (A) Define the events or circumstances involving the CCR unit that represent a safety emergency, along with a description of the procedures that will be followed to detect a safety emergency in a timely manner..."

Under 40 C.F.R. § 257.73(a)(3)(ii)(A), "[t]he owner or operator must amend the written EAP whenever there is a change in conditions that would substantially affect the EAP in effect."

Under 40 C.F.R. § 257.73(a)(3)(v), "[t]he EAP must be implemented once events or circumstances involving the CCR unit that represent a safety emergency are detected ..."

Open Line of Inquiry

Information Provided in the EAP and Annual Inspection Report

As required by the CCR Regulations, Duke Energy has posted an EAP on their website. The EAP was stamped by a professional engineer on September 13, 2018. On the certification page of the EAP, it states that the "1971 ASH POND DAM has been determined to be a high hazard potential CCR surface impoundment."

The Sutton Facility EAP describes the events and circumstances involving the CCR unit that represent safety emergencies, along with descriptions of the procedures that will be followed to detect, monitor, and respond to a developing safety emergency. The descriptions of the potential EAP activation conditions are all predicated on the dam remaining in place.

The EAP describes the following conditions associated with the dam:

- "Emergency Level 3 – Abnormal Event, slowly developing: This situation is not normal but has not yet threatened the operation or structural integrity of the dam, but possibly could if it continues to develop." An example provided in the EAP is the river level is rising and as a result of heavy rains and/or operational inflows that are less than three feet but greater than one foot below the dam crest.

- "Emergency Level 2 – Potential dam failure situation rapidly developing: This situation may eventually lead to dam failure and flash flooding downstream, but there is not an immediate threat of dam failure." An example in the EAP is when the reservoir or river level is 1 foot or less than the dam crest.

- "Emergency Level 1 – Urgent! Dam failure is imminent or in progress: This is an extremely urgent situation when a dam failure is occurring or obviously is about to occur and cannot be prevented. Flash flooding will occur downstream of the dam. This situation is also applicable when flow through the earth spillway is causing downstream flooding of people and roads." An example provided in the EAP is when the water from the reservoir or the river is flowing over the top of the dam.

Following the summary of activation conditions, Appendix B-7 of the EAP (page 115 of 120) states the 1971 Ash Basin Dam has been breached and does not hold any storage capacity currently due to the dam decommissioning activities under way. Appendix B-8, the Reservoir Elevation-Area-Volume and Spillway Capacity Data (page 116 of 120) provides similar information on the decommissioning of the 1971 Ash Basin Dam. These are the first references that the dam for the 1971 Ash Basin is decommissioned.

Section 1 of the 2018 Annual Report notes the 1971 Ash Basin Dam was intentionally breached. Section 5 of the 2018 Annual Report notes that the 1971 Ash Basin continues to impound 0.9 million cubic yards of CCR and 430,000 cubic yards of impounded water at the time of the May 31, 2018 inspection. The Audit Team understood this to mean the volume of water and CCR contained within the sheetpile wall and remaining 1971 Ash Basin dike structure.

2019 Audit Observations

During the 2019 Audit, the Audit Team observed a sheetpile wall separating the CCR and water within the 1971 Ash Basin from Sutton Lake. This sheetpile wall was an approved structure implemented in accordance with an NCDEQ dam breach design completed by Duke Energy. The sheetpile wall separated the coal ash within the 1971 Ash Basin from the adjacent Sutton Lake, which has been classified as a water of the state of North Carolina. Based on the definitions of both a CCR surface impoundment and a dike provided in the CCR rule and identified above, the

Audit Team believed the 1971 Ash Basin remained a CCR impoundment with the sheetpile wall functioning as a dike as defined in the CCR Rule (i.e., the sheetpile was constructed from a man-made material "to prevent the movement of solids or other materials") to contain the remaining CCR within the 1971 Ash Basin. Considering this, it is the opinion of the Audit Team that an EAP was required to be in effect for the Sutton Facility 1971 Ash Basin to be compliant with the CCR Rule.

Hurricane Florence (September 2018)

Hurricane Florence created a considerable series of challenges for CCR management activities at the Sutton Facility. As part of the storm, over 30+ inches of rain fell at the facility between September 13 and 16, 2018.

Several days following the main rain event associated with Hurricane Florence, the Cape Fear River, which is adjacent to Sutton Lake, crested and overflowed into Sutton Lake. In response to the storm impacts at the Sutton Facility, the EAP for the Sutton Lake Dam was activated. The level of the water in the Sutton Lake subsequently rose and overtopped the sheetpile wall and entered the 1971 Ash Basin. Cenospheres, a type of CCR material which float, were observed in Sutton Lake. The source of these cenospheres may have been from the 1971 Ash Basin, although there were other specific releases which may have contributed to the cenospheres (i.e., there were known releases from other Sutton Facility areas).

1971 Ash Basin EAP Activation

Duke Energy personnel stated the EAP had not been activated when water from Sutton Lake overtopped the sheetpile wall separating the Sutton Lake and the 1971 Ash Basin. Duke Energy personnel also clarified that since the dam had been decommissioned, the overtopping of the sheetpile wall and the possible release of cenospheres to Sutton Lake, was not considered a breach and there was no need for activation of the1971 Ash Basin EAP. Further, Duke Energy personnel also noted the Sutton Lake Dam EAP was activated since water from the Cape Fear River was overtopping the Sutton Lake Dam and entering Sutton Lake. This meant that the community and emergency responders in the area were informed of conditions at the Sutton Facility and storm management and recovery efforts were being coordinated with the local emergency responders.

Conclusions

The EAP is intended to be a safety planning document to assist an owner of a CCR surface impoundment and the surrounding community with coordination during an unexpected event which may impact the impoundment conditions. The EAP is intended to describe the sequence of notifications, monitoring, and actions to be taken associated with a safety emergency at a CCR surface impoundment. The owner or operator must amend the written EAP whenever there is a change in conditions that would substantially affect the EAP in effect.

The certification page for the EAP describes the “1971 ASH POND DAM” as “determined to be a high hazard potential CCR surface impoundment, . . .” without qualification. Although the appendix of the EAP did state the dam had been removed, the Audit Team believes the EAP should have been clearer on this point, since the beginning of the document stated the 1971 Ash Basin Dam was still in place. Further, since Duke Energy personnel believed the dam had been removed, there were apparently no identified actions in the EAP which may have necessitated the activation of the EAP, even though a clearly Abnormal Event was developing. Given that water entered the 1971 Ash Basin from Sutton Lake, the Audit Team believes this represented an Abnormal Event worthy of EAP activation.

Considering this information, the Audit Team believes the EAP should be amended to allow the Audit Team, Duke Energy field personnel, and the community to understand what criteria would necessitate whether the EAP should be activated when the dam is removed and only a sheetpile wall separates the Sutton Lake from the 1971 Ash Basin.

Under section (a)(3)(ii)(A) of the CCR Rule, the owner or operator must amend the written EAP whenever there is a change in conditions that would substantially affect the EAP. Considering the information presented above, the Audit Team was not able to verify this standard was met while they were on-site. Further, the Audit Team believes that EAP activation during dam breaching activities should be carefully reviewed, particularly in the mid-Atlantic regions which is subject to regular hurricane conditions, since the CCR impoundments may be particularly vulnerable during decommissioning activities.

The Audit Team understands that the notifications and the description to the emergency responders provided by Duke Energy in this instance would have been substantially the same as those provided during the activation of the EAP for Sutton Lake, since these conditions and the associated water management activities were integrated. Further, the Audit Team did review the Hurricane Florence planning and follow-up activities with Duke Energy personnel during the 2019 Audit and found the actions of Duke Energy to be carefully planned and extensive and although there was some migration of CCR cenospheres, there were no identified signs of long-term environmental impacts in the information reviewed by the Audit Team. However, decommissioning of the Ash Basin dams is an activity that should be carefully coordinated and communicated with the state and community, and the Audit Team believes additional attention to this issue is warranted.

5.0 AUDIT APPROACH

5.1 ON-SITE ACTIVITIES

During its time on-site, the Audit Team conducted an opening conference with facility personnel to discuss the scope of work and the plan for accomplishing necessary tasks while at the Sutton Facility. A site tour of the coal ash management and program support areas was subsequently completed. Following the tour, the Audit Team conducted a review of pertinent files, interviews with facility representatives, and verification of facility activities related to the Environmental Compliance Plans (ECPs), written programs, and permits. A debrief was conducted each Audit day to advise the facility representatives of Audit progress, Open Lines of Inquiry, possible Audit Findings, and needs for the next day. At the completion of the Audit, the Audit Team led a verbal discussion of draft Audit findings with facility representatives.

5.2 STANDARDS OF PRACTICE

The fieldwork portion of the Audit was conducted on February 11-12, 2019, with compliance reporting commencing May 14, 2015, the date of the court's judgments. The Audit focused on the activities at the facility since the date of the last Audit, which was February 12-13, 2018. The Audit was based on:

- Physical inspections of the facility;
- Examination of selected administrative and operating records made available by facility staff at the Audit Team's request;
- Interviews and discussions with key facility management and staff; and
- Verification procedures designed to assess the facility's application of, and adherence to, terms of the probation, environmental laws and regulations, and site policies and procedures. In addition, the Audit Team reviewed the facility's adherence to good management practices.

The Audit followed established audit protocols and procedures. It should be understood that the Audit consisted of evaluating a sample of practices and was conducted over a short period of time. Efforts were made toward sampling major facets of environmental performance during the period under review. This method is intended to uncover major system deficiencies and the Audit may not have identified all potential problems.

To support the overall independence of the Audit process, the Audit included an auditing professional certified by the Board of Environmental, Health and Safety Auditor Certifications (BEAC). BEAC is an accredited professional certification board that issues the Certified Professional Environmental Auditor (CPEA) designation to qualified auditors. Under BEAC, auditor independence is a key criterion for the implementation of an effective third-party audit program. The Audit was implemented in accordance with the standards related to auditor independence.

The process by which the Audit was conducted was consistent with the general state of the art of environment auditing and the best professional judgment of the Audit Team. To conduct the Audit, the team implemented a formal approach, drawing on process guidance from both BEAC and the Auditing Roundtable (AR) guidance documents. Guidance documents included:

- *Standards for the Professional Practice of Environmental, Health and Safety Auditing*. Prepared by the Board of Environmental, Health and Safety Auditor Certifications, 2008.

- ISO 19011:2002 – Guidelines for Quality and/or Environmental Management Systems Auditing. Prepared by the International Organization for Standardization, 2002.

- Standard for the Design and Implementation of an Environmental, Health and Safety Audit Program. Prepared by The Auditing Roundtable, Inc., 1995.

- Minimum Criteria for the Conduct of Environmental, Health and Safety Audits. Prepared by The Auditing Roundtable, Inc.

5.3 REPRESENTATIVE SAMPLING

When confronted with a large population of data to review or equipment to inspect, the Audit Team employed representative sampling techniques to evaluate records over the Audit period requested, and as necessary, for physical inspection of some types of common equipment. The sample size for record reviews or equipment inspections required professional judgment.

The Audit Team's judgement considered the following:

- The outcome of the evaluation of the records sampled. If problems are found in the representative sample, more records may need to be examined to evaluate compliance status.
- Potential for or severity of non-compliance.
- The general appearance and observed practices of certain operating areas.
- Information obtained during an interview that indicates a potential problem.
- Other specific information or guidance from the CAM.
- Time available during the Audit.

The Audit Team also employed the following types of sampling techniques, depending upon the characteristics of a specific population:

- Random sampling – every item has an equal chance of being selected.
- Interval sampling – select every n^{th} item, (e.g., every third manifest in chronological order as contained in facility files).
- Block sampling – auditor uses his/her judgment to select a specific block of items, (e.g., petroleum storage tank inspections from April to October).
- Stratified sampling – population is divided into groups, which are then sampled through random or judgmental techniques.

TABLES

TABLE 1a
1971 ASH BASIN - Plans and Reports Posted by Duke Energy Under the CCR Rule

DOCUMENT NAME	CATEGORY	RELEASE DATE
CCR Annual Groundwater Monitoring and Corrective Action Report 2018	Groundwater Monitoring and Corrective Action	03/01/2019
Notice of Initiation of Assessment of Corrective Measures	Groundwater Monitoring and Corrective Action	02/19/2019
Notice of Groundwater Protection Standard Exceedance 2018	Groundwater Monitoring and Corrective Action	12/14/2018
Annual Fugitive Dust Control Report 2018	Operating Criteria	12/05/2018
Wetlands	Location Restriction	11/07/2018
Unstable Areas	Location Restriction	11/07/2018
Seismic Impact Zones	Location Restriction	11/07/2018
Fault Areas	Location Restriction	11/07/2018
Placement Above Uppermost Aquifer	Location Restriction	11/07/2018
Emergency Action Plan for Sutton 1971 and 1984 Ash Ponds	Design Criteria	10/01/2018
CCR Annual Surface Impoundment Inspection Report 2018	Operating Criteria	07/17/2018
Annual Meeting with Local Emergency Responders 2018	Design Criteria	06/28/2018
Closure Plan Impoundments	Closure and Post Closure Care	06/19/2018
Inundation Map	Design Criteria	03/21/2018
Notice of Establishment of an Assessment Monitoring Program - Sutton 1971 Ash Basin	Groundwater Monitoring and Corrective Action	03/14/2018
Closure Plan Impoundments - 1971 and 1984 Ash Basins	Closure and Post Closure Care	02/27/2018
CCR Annual Groundwater Monitoring and Corrective Action	Groundwater	02/06/2018

TABLE 1a
(Continued)

DOCUMENT NAME	CATEGORY	RELEASE DATE
Report	Monitoring and Corrective Action	
Emergency Action Plan for Sutton 1971 and 1984 Ash Ponds Revision 007A	Design Criteria	01/25/2018
Sutton Inundation Maps	Design Criteria	01/25/2018
2017 Annual CCR Fugitive Dust Control Report-Sutton	Operating Criteria	11/29/2017
Groundwater Sampling and Analysis Program Selection of Statistical Method Certification-Sutton 1971 Ash Basin	Groundwater Monitoring and Corrective Action	10/25/2017
Groundwater Monitoring System Certification-Sutton 1971 Ash Basin	Groundwater Monitoring and Corrective Action	10/25/2017
Annual Meeting with Local Emergency Responders 2017	Design Criteria	07/21/2017
CCR Annual Surface Impoundment Inspection Report 2017	Operating Criteria	07/11/2017
CCR Fugitive Dust Control Plan Revision 1	Operating Criteria	07/11/2017
Closure Plan - 1971 and 1984 Ash Basins, Revision 1	Closure and Post Closure Care	03/16/2017
Notice of Intent to Close Sutton 1971 Ash Basin	Closure and Post Closure Care	02/16/2017
Annual Fugitive Dust Control Report 2016	Operating Criteria	12/05/2016
Inflow Design Flood Control System Revision 1	Design Criteria	11/22/2016
Initial Structural Stability Assessment Revision 1	Design Criteria	11/16/2016
Initial Structural Stability Assessment Revision 0	Design Criteria	11/16/2016
Initial Factor of Safety Assessment	Design Criteria	11/15/2016
Closure Plan for Impoundments	Closure and Post Closure Care	11/11/2016
Inflow Design Flood Control System	Operating Criteria	11/03/2016
History of Construction	Design Criteria	10/25/2016

TABLE 1a
(Continued)

DOCUMENT NAME	CATEGORY	RELEASE DATE
Initial Hazard Classification Assessment Certification	Design Criteria	10/12/2016
Existing Liner Design Criteria	Design Criteria	10/11/2016
Annual Surface Impoundment Report 2016	Operating Criteria	06/27/2016
Annual Surface Impoundment Report (Initial)	Operating Criteria	02/12/2016
Annual Surface Impoundment Report Revision 1	Operating Criteria	02/19/2016

*This summary of reports was downloaded on March 7, 2019

TABLE 1b
1984 ASH BASIN - Plans and Reports Posted by Duke Energy Under the CCR Rule

DOCUMENT NAME	CATEGORY	RELEASE DATE
CCR Annual Groundwater Monitoring and Corrective Action Report 2018	Groundwater Monitoring and Corrective Action	03/01/2019
Notice of Initiation of Assessment of Corrective Measures	Groundwater Monitoring and Corrective Action	02/19/2019
Notice of Groundwater Protection Standard Exceedance 2018	Groundwater Monitoring and Corrective Action	12/14/2018
Annual Fugitive Dust Control Report 2018	Operating Criteria	12/05/2018
Wetlands	Location Restriction	11/07/2018
Unstable Areas	Location Restriction	11/07/2018
Seismic Impact Zones	Location Restriction	11/07/2018
Fault Areas	Location Restriction	11/07/2018
Placement Above Uppermost Aquifer	Location Restriction	11/07/2018
Emergency Action Plan for Sutton 1971 and 1984 Ash Ponds	Design Criteria	10/01/2018
CCR Annual Surface Impoundment Inspection Report 2018	Operating Criteria	07/17/2018
Annual Meeting with Local Emergency Responders 2018	Design Criteria	06/28/2018
Closure Plan Impoundments	Closure and Post Closure Care	06/19/2018
Inundation Map	Design Criteria	03/21/2018
Notice of Establishment of an Assessment Monitoring Program - Sutton 1984 Ash Basin	Groundwater Monitoring and Corrective Action	03/14/2018
Closure Plan Impoundments - 1971 and 1984 Ash Basins	Closure and Post Closure Care	02/27/2018
CCR Annual Groundwater Monitoring and Corrective Action Report	Groundwater Monitoring and Corrective Action	02/06/2018
Emergency Action Plan for Sutton 1971 and 1984 Ash Ponds Revision 007A	Design Criteria	01/25/2018

TABLE 1b
(Continued)

DOCUMENT NAME	CATEGORY	RELEASE DATE
Sutton Inundation Maps	Design Criteria	01/25/2018
2017 Annual CCR Fugitive Dust Control Report-Sutton	Operating Criteria	11/29/2017
Groundwater Sampling and Analysis Program Selection of Statistical Method Certification-Sutton 1984 Ash Basin	Groundwater Monitoring and Corrective Action	10/25/2017
Groundwater Monitoring System Certification-Sutton 1984 Ash Basin	Groundwater Monitoring and Corrective Action	10/25/2017
Annual Meeting with Local Emergency Responders 2017	Design Criteria	07/21/2017
CCR Annual Surface Impoundment Inspection Report 2017	Operating Criteria	07/11/2017
CCR Fugitive Dust Control Plan Revision 1	Operating Criteria	07/11/2017
Closure Plan - 1971 and 1984 Ash Basins, Revision 1	Closure and Post Closure Care	03/16/2017
Notice of Intent to Close Sutton 1984 Ash Basin	Closure and Post Closure Care	02/16/2017
Annual Fugitive Dust Control Report 2016	Operating Criteria	12/05/2016
Initial Structural Stability Assessment Revision 1	Design Criteria	11/16/2016
Initial Structural Stability Assessment Revision 0	Design Criteria	11/16/2016
Initial Factor of Safety Assessment	Design Criteria	11/15/2016
Closure Plan for Impoundments	Closure and Post Closure Care	11/11/2016
Inflow Design Flood Control System	Operating Criteria	11/03/2016
History of Construction	Design Criteria	10/25/2016
Initial Hazard Classification Assessment Certification	Design Criteria	10/12/2016
Existing Liner Design Criteria	Design Criteria	10/11/2016
Annual Surface Impoundment Report 2016	Operating Criteria	06/27/2016
Annual Surface Impoundment Report (Initial)	Operating Criteria	02/12/2016
Annual Surface Impoundment Report Revision 1	Operating Criteria	02/19/2016

*This summary of reports was downloaded on March 7, 2019

TABLE 1c
CCP LANDFILL - Plans and Reports Posted by Duke Energy Under the CCR Rule

DOCUMENT NAME	CATEGORY	RELEASE DATE
CCR Annual Groundwater Monitoring and Corrective Action Report 2018	Groundwater Monitoring and Corrective Action	03/01/2019
Annual Fugitive Dust Control Report 2018	Operating Criteria	12/05/2018
CCR Annual Landfill Inspection Report 2018	Operating Criteria	11/19/2018
Design Criteria for Sutton CCP Landfill Cells 7 and 8 Liner, Leachate and Removal System	Design Criteria	05/01/2018
CCR Annual Groundwater Monitoring and Corrective Action Report	Groundwater Monitoring and Corrective Action	04/03/2018
Sutton Landfill Cell 6 Certification of Liner and Leachate Collection Removal System	Operating Criteria	02/16/2018
Certification of Leachate Collection and Removal System - Cell 5	Design Criteria	12/13/2017
2017 Annual CCR Fugitive Dust Control Report-Sutton	Operating Criteria	11/29/2017
CCR Annual Landfill Report 2017-Sutton CCP Landfill	Operating Criteria	11/29/2017
Fugitive Dust Control Plan Revision 1	Operating Criteria	07/21/2017
Placement above the Uppermost Aquifer - Sutton CCP Landfill	Location Restrictions	07/21/2017
Closure Plan for Sutton CCP Landfill	Closure and Post Closure Care	07/21/2017
Sutton CCP Landfill Certification of Leachate Collection and Removal System - Cells 3 & 4	Design Criteria	07/21/2017
Run On Run Off Control System Plan - Sutton CCP Landfill	Operating Criteria	07/21/2017
Post Closure Plan Sutton - CCP Landfill	Closure and Post Closure Care	07/21/2017

TABLE 1c
(Continued)

DOCUMENT NAME	CATEGORY	RELEASE DATE
Seismic Impact Zones Certification	Location Restrictions	07/21/2017
Unstable Areas	Location Restrictions	07/21/2017
Wetlands Certification - Sutton CCP Landfill	Location Restrictions	07/21/2017
Location Restrictions for Fault Areas	Location Restrictions	07/21/2017
Groundwater Monitoring System Certification	Groundwater Monitoring and Corrective Action	07/21/2017
Groundwater Sampling and Analysis Statistical Method Certification	Groundwater Monitoring and Corrective Action	07/21/2017
Sutton CCP Landfill Certification of Liner Equivalency	Design Criteria	12/13/2016
Sutton CCP Certification of Leachate Collection and Removal System - Cells 3 & 4	Design Criteria	12/13/2016

*This summary of reports was downloaded on March 7, 2019

ATTACHMENT A

ATTACHMENT A

AUDIT SCOPE

A-1 GENERAL AUDIT SCOPE ITEMS

The general Audit scope items included:

- Review and evaluation of documentation for maintenance and repair of structures and equipment used for coal ash disposal.

- Review and evaluation of documentation of modifications, failures, leaks, damage, disrepair and other problems at the coal ash management units.

- Review and evaluation of documentation of efforts to correct failures, leaks, damage, disrepair and other problems where they determine that employee/contractor actions were likely a primary or contributing cause to a compliance finding.

- Review and evaluation of documentation of communication of the items above within the organization.

- Review and evaluation of documentation associated with the specific environmental compliance items described below and laws, regulations, and policies associated these items.

- Review of compliance with administrative aspects and regulatory submissions related to coal ash management-specific regulations, including the Coal Combustion Residuals Rule found in 40 CFR Part 257, Subpart D.

More specific items which were addressed in the audits to comply with the general Audit scope are described below.

A-2 SPECIFIC COMPLIANCE WITH OTHER PROVISIONS OF THE PLEA AGREEMENTS

The following items related to specific items in the plea agreements were reviewed as part of the Audit:

1. Determine whether Defendants have opened, expanded, or reopened any coal ash or coal ash wastewater impoundment and, if so, verify that they are lined and do not allow unpermitted discharges of coal ash or coal ash wastewater to waters of the United States.

2. Review citations/notices of violation/notices of deficiency related to violations of federal, state, or local law to assure that they have been properly relayed to the court and, as appropriate under the plea agreements, determine their materiality.

3. Note any observations made during the audit that cause concern regarding the assets and/or security available to the Defendants to meet the obligations imposed by the court's judgment.

A-3 GENERAL ENVIRONMENTAL COMPLIANCE SUBJECT AREAS

The following items related to general environmental compliance were reviewed as part of the Audit:

1. Assess all waste streams from Duke Energy facilities with coal ash impoundments. Review Duke Energy's processes, procedures, and practices, as well as compliance with those processes, procedures, and practices, for:

   a. identifying waste streams (especially, but not limited to, waste streams with discharge points into bodies of water);
   b. identifying and communicating any modifications or changes, or potential modifications or changes, to waste streams;
   c. ensuring proper handling/disposal of waste streams;
   d. identifying, preventing, and mitigating any risks or hazards that could affect waste streams and/or the disposal of waste streams; and,
   e. ensuring proper permitting for waste streams.

For Item 1.d., the Audit Team evaluated such risk/hazard issues where there were compliance findings associated with waste streams.

2. Review and evaluate documentation of:

   a. maintenance and repair of structures and equipment related to coal ash disposal;
   b. modification of the coal ash impoundments and related pollution prevention equipment and structures;
   c. failures, leaks, damage, disrepair, and other problems;
   d. communication of the information described in a-c within the organization; and,
   e. efforts to correct failures, leaks, damage, disrepair, and other problems.

3. Assess the employees responsible for inspection, maintenance, and repair of coal ash basins and related structures and equipment. The assessment included an assessment of the workloads of such employees to assure that Duke Energy's facilities are adequately staffed. These assessments were made where the Audit Team determined that employee/contractor actions were likely a primary or contributing cause to a compliance finding.

4. Review the results and recommendations of any other audits (internal or external/state-mandated) and assess Duke Energy's implementation of those recommendations.

5. Review and assess Duke Energy's processes, procedures, and practices for identifying, communicating, and addressing problems and potential problems at its coal ash basins (leaks, unpermitted discharges, etc.).

6. Review and assess Duke Energy's policies, procedures, practices, and equipment for handling emergency releases from its coal ash basins and evaluate the personnel with duties in such situations.

7. Verify that Duke Energy is complying with its NPDES wastewater and stormwater permits, as well as other relevant environmental permits. This would include verifying Duke Energy's timely submission of permit applications, permit renewal applications, and responses to requests for additional information from the relevant regulatory authority.

8. Review and assess any actions or measures Duke Energy has undertaken to assure accountability and prevent recurrences when problems and/or failures occur (e.g., disciplinary actions, re-training, revision to policies and procedures, etc.). This review was conducted where the Audit Team determined that employee/contractor actions were likely a primary or contributing cause to a compliance finding.

9. Review and assess compliance with the following environmental regulations, as applicable to the management of coal ash:

a. Wastewater Discharges	40 CFR 122; 15A NCAC 2H.0100 *et seq*
b. Stormwater Discharges	40 CFR 122.26; 15A NCAC 2H.1000 *et seq;* NC General Permit (Construction) No. NCG010000
c. NC Groundwater Standards	15A NCAC 2L.0202(h)
d. Hazardous Waste Management	15A NCAC 13A .0100 to 13A .0107
e. Oil Pollution Prevention	40 CFR Part 112
f. Air Pollution (Title V)	15A NCAC 2Q, and
g. Hazardous Chemicals (Tier II)	40 CFR Part 370.

Reviews also included an analysis of overall compliance and the status and security of the asset. Subsequent reviews of individual facilities will evaluate the movement towards compliance. The Audit scope did not include an evaluation of compliance with the September 2015 Settlement Agreement with NCDEQ.

A-4 LIST OF PERMITS AND PROGRAMS DEEMED TO BE EITHER DIRECTLY OR INDIRECTLY IN SUPPORT OF ASH MANAGEMENT

During the Audit, the Audit Team reviewed a variety of written programs developed and implemented by Duke Energy and facility staff. State-issued permits and supporting documentation relative to environmental programs and geotechnical aspects of ash basin management were also requested and reviewed.

Requested documents, pertinent to management of ash in basins, landfills, ponds, etc., were outlined in the pre-Audit questionnaire for the facility and included, but were not limited to:

1. The Compliance Register developed for eTRAC for the facility.
2. The Duke Energy Operations Manual for the facility.
3. A site plan, site map, or aerial photo which shows the entire facility and key features of the facility, including NPDES outfalls associated environmental monitoring locations, storage tanks, etc.
4. Most recent two (2) years of maintenance, monitoring, and inspection records for each coal ash/CCR basin (just the physical inspections, not the groundwater records).
5. A “Phase 1 and Phase 2” summary of ash basin conditions prepared by an outside consultant.
6. Duke Energy’s permitting plans for addressing ash impoundments and landfills at the facility including the Site Analysis and Removal Plan.

7. Applicable pages from the Duke Energy basin-by-basin coal ash/CCR project tracking document for the facility.

8. Original basin/landfill/coal ash management unit construction records.

9. Documentation of changes to these units.

10. Coal ash unit construction permit application and approval.

11. State-issued permits and application materials for permits associated with coal ash/CCR management (including, e.g., dam permits).

12. Any currently effective state order, consent order, or similar state directive that addresses coal ash/CCR management at the facility.

13. Records required to be maintained in the facility's operating record under the federal CCR regulation and/or any state CCR regulatory program.

14. Records of off-site ash shipments from May 2015 forward.

15. Stormwater permit application and approval for all outfalls.

16. Industrial wastewater (NPDES/POTW) permit application and approval for all outfalls/discharges.

17. Industrial stormwater permit, sampling and monitoring records, and any corrective action plans (last two (2) years).

18. Stormwater Pollution Prevention Plan(s).

19. Landfill operating permit(s) with maintenance and monitoring requirements.

20. Landfill leak detection and groundwater monitoring records from the last two (2) years along with any workplans that describe the rationale for the monitoring system at the facility.

21. Air permits and applications for coal ash units and ancillary operations.

22. Testing and monitoring records completed to comply with air permits.

23. Any notices of violation associated with the coal ash/CCR management activities received over the last two (2) years.

24. Spill Prevention Control and Countermeasure Plan.

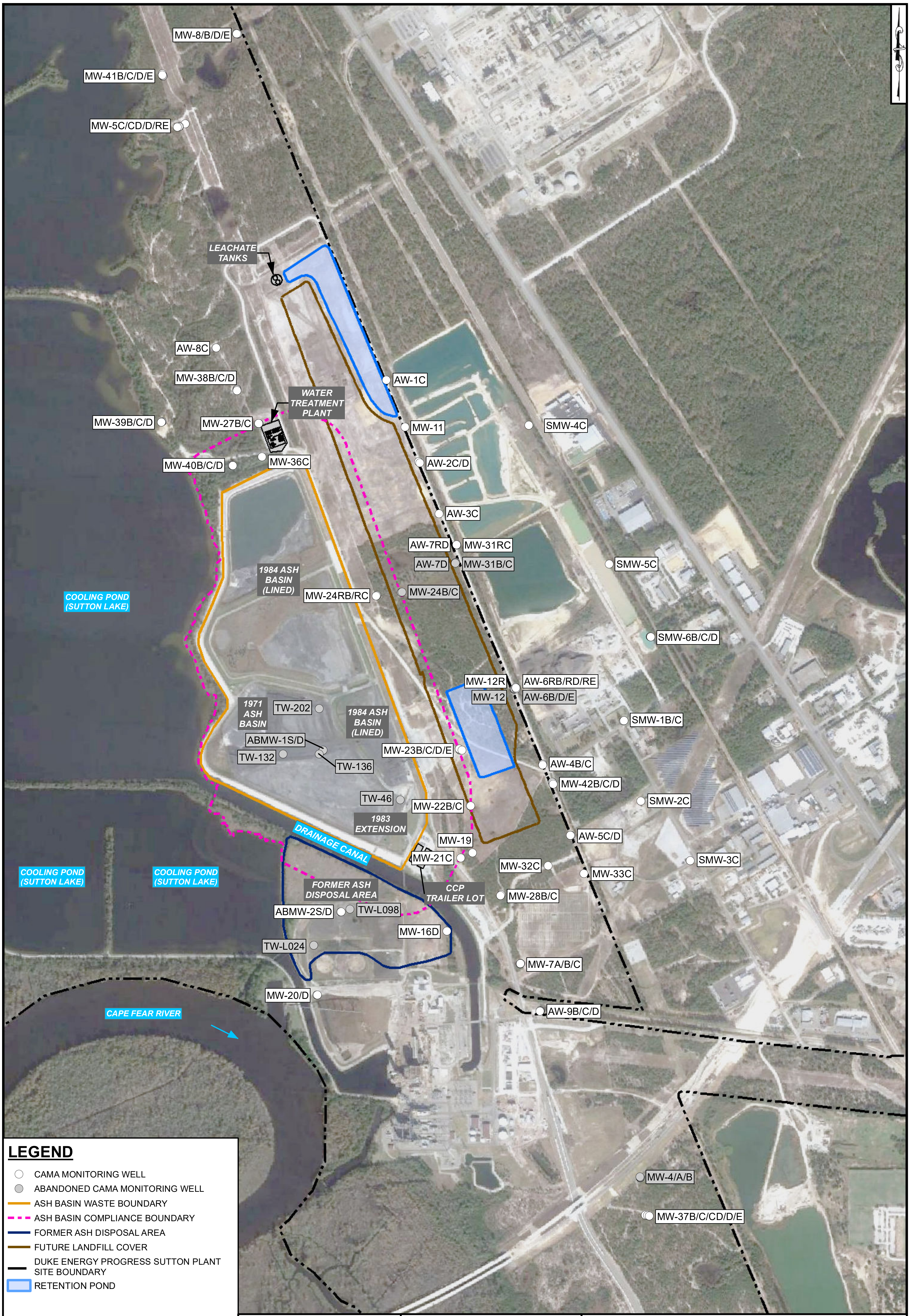
25. Community Right-to-Know:
    a. Lists of hazardous chemicals and/or MSDSs submitted;
    b. Tier I or II reports; and
    c. Form R (toxic release inventory) reports.

26. Copies of communications with employees and the public regarding availability of toll-free hotline and electronic mail inbox for reporting suspected environmental violations.

27. Management Systems:
    a. List of responsible party(ies) for each environmental activity.
    b. All environmental-related training records.
    c. All environmental policies and procedures.
    d. Organization chart.
    e. Site diagram identifying storage areas, tanks, etc.

ATTACHMENT B

Groundwater Compliance Boundaries and Exceedances



LEGEND

- ○ CAMA MONITORING WELL
- ● ABANDONED CAMA MONITORING WELL
- ━ ASH BASIN WASTE BOUNDARY
- ┅ ASH BASIN COMPLIANCE BOUNDARY
- ━ FORMER ASH DISPOSAL AREA
- ━ FUTURE LANDFILL COVER
- ━ DUKE ENERGY PROGRESS SUTTON PLANT SITE BOUNDARY
- ▭ RETENTION POND

NOTES:

WELL LOCATIONS WERE DERIVED FROM VARIOUS SOURCES AND ARE A MIX OF SURVEYED AND APPROXIMATE LOCATIONS. THEREFORE, WELL LOCATIONS ARE TO BE DEEMED APPROXIMATE.

PROPERTY BOUNDARY PROVIDED BY DUKE ENERGY PROGRESS.

AERIAL PHOTOGRAPHY OBTAINED FROM GOOGLE EARTH PRO ON DECEMBER 7, 2017. AERIAL WAS COLLECTED ON OCTOBER 29, 2016.

DRAWING HAS BEEN SET WITH A PROJECTION OF NORTH CAROLINA STATE PLANE COORDINATE SYSTEM FIPS 3200 (NAD83).

500 0 500 1,000
GRAPHIC SCALE IN FEET

148 RIVER STREET, SUITE 220
GREENVILLE, SOUTH CAROLINA 29601
PHONE 864-421-9999
www.synterracorp.com

DRAWN BY: B. YOUNG
DATE: 01/10/2019
PROJECT MANAGER: P. WALDREP
CHECKED BY: B. WYLIE

FIGURE 6
CAMA WELL LOCATION MAP
L.V. SUTTON ENERGY COMPLEX
DUKE ENERGY PROGRESS, LLC
WILMINGTON, NORTH CAROLINA

P:\Duke Energy Progress.1026\00 GIS BASE DATA\Sutton\Map_Docs\Program\Sutton_WellLoc_CAMA_20190108.mxd

	PARAM	ED 40CFR257 APPENDIX III CONSTITUENT				INORGANIC PARAMETERS (TOTAL CONCENTRATION)													
Reporting Units	S.U.	ug/L	mg/L	mg/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg-N/L	ug/L	ug/L	ug/L	pCi/L	mg/L
15A NCAC 02L Standard	6.5-8.5	700	250	250	500	1*	10	700	10	10	1*	300	50	10	20	0.2*	0.3*	5^	2
Provisional Background Threshold Values (Surficial Upper Unit)	3.9-5.0	50	4.73	15.6	25	1	1	45	0.03	1	4	1494	38	NE	1	0.2	0.621	2.75	NE
Provisional Background Threshold Values (Surficial Lower Unit)	4.9-7.4	50	23.6	16	210	1	5	97	0.12	1	3	13416	746	NE	1	0.2	1.68	5.32	NE
Provisional Background Threshold Values (Pee Dee Upper Unit)	7.8-9.3	3010	1932	277	2442	1	2.78	18.7	0.118	1	1	305	118	NE	1	0.2	1.91	4	NE
Provisional Background Threshold Values (Pee Dee Lower Unit)	6.9-9.7	4730	2567	171	3400	1	3	70	0.2	1	1	1230	93.9	NE	1	0.2	0.693	2.06	NE

				PARAM	ED 40CFR257 APPENDIX III CONSTITUENT				INORGANIC PARAMETERS (TOTAL CONCENTRATION)													
Sample ID	Location Description	Sample Location Aquifer Name	Sample Collection Date	pH	Boron	Chloride	Sulfate	Total Dissolved Solids	Antimony	Arsenic	Barium	Chromium (VI)	Chromium	Cobalt	Iron	Manganese	Nitrate (as N)	Selenium	Thallium	Vanadium	Total Radium	Fluoride
ABMW-02D	Center of FADA	urficial Lowe	03/19/2018	7.2	**868**	33	80	380	<1	**155**	137	<0.025	<1	**3.69**	**2440**	**260**	NA	<1	<0.2	**0.619**	NA	0.59
ABMW-02S	Center of FADA	sh Pore Wate	03/19/2018	6.6	175	4.9	0.5	280	<1	**26**	**1760**	<0.025	<1	<1	**19400**	**628**	NA	<1	<0.2	**0.888**	NA	0.13
AW-01C	NE of basins outside CB at propety line	urficial Lowe	03/20/2018	**5.3**	45.636 j	8.9	22	50	<1	<1	89	0.24	0.368 j	<1	22	**96**	NA	<1	<0.2	0.19 j	NA	<0.1
AW-01C	NE of basins outside CB at propety line	urficial Lowe	06/19/2018	**5.6**	46.671 j	8.4	21	50	<1	<1	72	0.65	0.741 j	<1	32	41	NA	<1	<0.2	**0.337 B2**	NA	<0.1
AW-01C	NE of basins outside CB at property line	urficial Lowe	09/11/2018	**6.5**	53	8.9	22	68	<1	<1	73	0.65 M1	0.74 j	<1	20	**56**	NA	<1	0.082 j	0.244 j	NA	<0.1
AW-02C	E of basins outside CB at propety line	urficial Lowe	03/20/2018	**5.4**	21.308 j	7.3	20	35	<1	<1	26	<0.025	0.423 j	<1	228	14	NA	<1	<0.2	**0.567**	NA	<0.1
AW-02C	E of basins outside CB at propety line	urficial Lowe	06/20/2018	**4.8**	20.554 j	8.2	26	50	<1	<1	28	<0.025	0.774 j	<1	**432**	18	NA	0.369 j	<0.2	**0.575**	NA	0.0485 j
AW-02C	E of basins outside CB at property line	urficial Lowe	09/11/2018	**5.1**	34.27 j	8.4	27	63	<1	<1	28	<0.025	0.759 j	<1	269	17	NA	<1	<0.2	**0.815**	NA	0.047 j
AW-02D	E of basins outside CB at propety line	ee Dee Uppe	03/20/2018	8.1	**758**	180	23	**530**	<1	0.612 j	17	0.05	2.06	<1	**467**	38	NA	<1	<0.2	**0.675**	NA	0.66
AW-02D	E of basins outside CB at propety line	ee Dee Uppe	06/20/2018	8.1	**748**	160	21	**510**	<1	0.626 j	12	0.21	1.16	<1	179	21	NA	<1	<0.2	**0.408**	NA	0.77
AW-02D	E of basins outside CB at property line	ee Dee Uppe	09/11/2018	**8.5**	**747**	170	24	**540**	0.351 j	0.488 j	11	0.094	0.744 j	<1	131	19	NA	<1	<0.2	**0.395**	NA	0.7
AW-03C IMP	E of basins outside CB at propety line	urficial Lowe	03/20/2018	**5.5**	164	12	27	57	<1	1.63	33	<0.025	<1	**7.32**	**2920**	**433**	NA	<1	<0.2	**0.382**	0.1929	<0.1
AW-03C	E of basins outside CB at propety line	urficial Lowe	03/20/2018	**5.5**	193	13	28	85	<1	1.59	38	NA	<1	**7.52**	NA	NA	NA	<1	<1	NA	0.655	<0.1
AW-03C	E of basins outside CB at propety line	urficial Lowe	06/20/2018	**5.4**	180	14	26	83	<1	2.19	39	<0.025	<1	**7.63**	**3370**	**442**	NA	<1	<0.2	**0.404**	0.6391	<0.1
AW-03C	E of basins outside CB at property line	urficial Lowe	10/23/2018	**4.2**	70	8.8	27	42	<1	3.3	37	<0.025	<1	**46.1**	**508**	**307**	NA	<1	**0.497**	**0.882**	-0.0142	<0.1
AW-03C IAP	E of basins outside CB at property line	urficial Lowe	10/23/2018	**4.2**	78	9.2	37	39	<1	3.63	39	NA	<1	**46.1**	NA	NA	NA	<1	**0.434 j**	NA	0.0231	<0.1
AW-04B	E of basins outside CB at propety line	urficial Uppe	03/21/2018	**4.2**	30.549 j	3.4	39	100	<1	<1	130	<0.025	0.754 j	0.829 j	**314**	31	NA	<1	<0.2	**0.407**	NA	0.27
AW-04C IMP	E of basins outside CB at propety line	urficial Lowe	03/21/2018	**5.0**	**1060**	44	120	260	<1	0.831 j	80	0.027	4.12	**12.5**	**6020**	**711**	NA	<1	0.109 j	**11.5**	-0.1467	<0.2
AW-04C	E of basins outside CB at propety line	urficial Lowe	03/21/2018	**5.0**	**1200**	45	130	260	<1	0.84 j	84	NA	4.03	**13.2**	NA	NA	NA	0.41 j	<1	NA	0.627	<0.5
AW-04C	E of basins outside CB at propety line	urficial Lowe	06/20/2018	**5.2**	**983**	40	110	210	<1	<1	30	<0.025	0.613 j	**10.1**	**596**	**572**	NA	<1	<0.2	**0.887**	0.904	<0.2
AW-04C	E of basins outside CB at property line	urficial Lowe	10/23/2018	**5.2**	470	19	59	100	<1	0.349 j	24	<0.025	0.441 j	**9.23**	**360**	**210**	NA	0.498 j	0.181 j	**1.01**	1.051	<0.2
AW-04C IAP	E of basins outside CB at property line	urficial Lowe	10/23/2018	**5.2**	52	9.9	30	48	<1	<1	42	NA	0.434 j	**3.18**	NA	NA	NA	<1	<1	NA	0.894	<0.2
AW-05C	E of basins outside CB at propety line	urficial Lowe	03/22/2018	**5.0**	<50	5.6	19	39	<1	<1	25	0.025	<1	<1	25	7	NA	0.754 j	<0.2	**0.342**	NA	<0.1
AW-05C	E of basins outside CB at propety line	urficial Lowe	06/20/2018	**5.0**	<50	5.5	18	30	<1	<1	24	0.026	0.431 j	<1	34	7	NA	0.747 j	0.119 j	**0.362**	NA	<0.1
AW-05C	E of basins outside CB at property line	urficial Lowe	09/11/2018	**4.7**	<50	6.4	18	55	<1	<1	25	<0.025	<1	<1	8.117 j	5	NA	0.726 j	<0.2	**0.335**	NA	<0.1
AW-05D	E of basins outside CB at propety line	ee Dee Uppe	03/22/2018	**10.6**	369	110	13	370	<1	0.769 j	9	0.18	<1	0.642 j	28	<5	NA	<1	<0.2	0.19 j	NA	0.4
AW-05D	E of basins outside CB at propety line	ee Dee Uppe	06/20/2018	**10.2**	367	110	14	340	<1	0.714 j	8	0.28	<1	0.481 j	20	<5	NA	<1	<0.2	0.169 j	NA	0.39
AW-05D	E of basins outside CB at property line	ee Dee Uppe	09/11/2018	**9.7**	363	110	15	360	<1	0.552 j	8	0.15	<1	0.411 j	17	1.745 j	NA	<1	<0.2	0.24 j	NA	0.39
AW-06RB	E of basins outside CB at propety line	urficial Uppe	03/21/2018	**4.1**	19.108 j	9.3	13	48	<1	<1	21	<0.025	0.944 j	**1.51**	**617**	**53**	NA	<1	<0.2	<0.3	NA	0.076 j
AW-06RD IMP	E of basins outside CB at propety line	ee Dee Uppe	03/21/2018	**9.5**	**713**	160	13	480	<1	<1	9	<0.025	0.376 j	<1	53	<5	NA	<1	<0.2	0.195 j	NA	0.59
AW-06RD	E of basins outside CB at propety line	ee Dee Uppe	03/21/2018	**9.5**	**796**	160	11	470	<1	<1	9	NA	0.346 j	<1	NA	NA	NA	<1	<1	NA	0.639	0.68
AW-06RD	E of basins outside CB at propety line	ee Dee Uppe	06/20/2018	**9.0**	**724**	160	11	480	<1	<1	8	0.13	<1	<1	27	<5	NA	<1	0.087 j	0.158 j	NA	0.76
AW-06RD	E of basins outside CB at property line	ee Dee Uppe	10/23/2018	8.5	**714**	160	9.2	420	<1	<1	8	0.034	<1	<1	39	2.22 j	NA	<1	<0.2	0.254 j	NA	0.94
AW-06RD IAP	E of basins outside CB at property line	ee Dee Uppe	10/23/2018	8.5	**776**	160	9	430	<1	<1	8	NA	<1	<1	NA	NA	NA	<1	<1	NA	0.475	0.88
AW-06RE	E of basins outside CB at propety line	ee Dee Lowe	03/21/2018	**8.6**	**2260**	**650**	54	**1300**	<1	1.22	4.035 j	0.2	1.84	<1	201	30	NA	<1	<0.2	**2.53**	NA	1.4
AW-06RE	E of basins outside CB at propety line	ee Dee Lowe	06/20/2018	8.3	**2410**	**490**	52	**1300**	<1	1.52	3.874 j	0.037	0.726 j	<1	169	27	NA	<1	<0.2	**1.71**	NA	1.9
AW-06RE	E of basins outside CB at property line	ee Dee Lowe	10/23/2018	8.5	**2300**	**570**	57	**1300**	<1	1.28	4.013 j	0.092	0.764 j	<1	151	25	NA	<1	<0.2	**1.7**	NA	1.7
AW-07RD IMP	E of basins outside CB at propety line	ee Dee Uppe	03/21/2018	**9.1**	699	130	11	460	0.475 j	0.656 j	4.419 j	0.1	0.458 j	<1	54	7	NA	<1	0.109 j	0.292 j	NA	0.87
AW-07RD	E of basins outside CB at propety line	ee Dee Uppe	03/21/2018	**9.1**	**769**	130	11	450	0.334 j	0.582 j	4.776 j	NA	0.431 j	<1	NA	NA	NA	<1	<1	NA	0.281	0.92
AW-07RD	E of basins outside CB at propety line	ee Dee Uppe	06/20/2018	8.3	**707**	130	9.5	450	<1	0.618 j	4.468 j	0.087	0.591 j	<1	79	7	NA	<1	<0.2	**0.305**	NA	0.77
AW-07RD	E of basins outside CB at property line	ee Dee Uppe	10/23/2018	8.2	699	130	7	400	<1	0.444 j	4.025 j	0.067	<1	<1	42	9	NA	<1	<0.2	0.293 j	NA	0.91
AW-07RD IAP	E of basins outside CB at property line	ee Dee Uppe	10/23/2018	8.2	**729**	130	6.8	410	<1	0.378 j	3.946 j	NA	0.359 j	<1	NA	NA	NA	<1	<1	NA	0.476	0.73
AW-08B	N of basins outside CB	urficial Uppe	03/22/2018	**4.7**	<50	2.3	17	<25	<1	<1	14	<0.025	<1	0.59 j	**395**	25	NA	<1	<0.2	0.117 j	NA	0.0534 j
AW-08C	N of basins outside CB	urficial Lowe	03/22/2018	**5.2**	61	17	23	60	<1	<1	88	0.11	<1	0.585 j	54	33	NA	<1	<0.2	0.17 j	NA	<0.1
AW-08C	N of basins outside CB	urficial Lowe	06/19/2018	**5.0**	64	16	23	60	<1	<1	85	0.17	0.396 j	0.44 j	39	40	NA	<1	<0.2	**0.312 B2**	NA	<0.1
AW-08C	N of basins outside CB	urficial Lowe	09/10/2018	**5.1**	61	14	23	47	<1	<1	75	0.13	0.524 j	0.569 j	215	37	NA	<1	<0.2	**0.528**	NA	<0.1
AW-09B	SE of basins outside CB	urficial Uppe	03/20/2018	**4.6**	<50	2.6	7.5	<25	<1	<1	13	<0.025	<1	<1	52	27	NA	<1	<0.2	0.201 j	NA	0.21
AW-09C	SE of basins outside CB	urficial Lowe	03/20/2018	**5.0**	237	19	42	88	<1	<1	54	0.041	<1	0.446 j	11	**60**	NA	<1	0.148 j	**0.31**	NA	<0.1
AW-09C	SE of basins outside CB	urficial Lowe	06/20/2018	**4.9**	281	20	53	110	<1	<1	68	0.04	<1	0.469 j	18	**75**	NA	<1	0.1 j	**0.401**	NA	0.049 j
AW-09C	SE of basins outside CB	urficial Lowe	10/23/2018	**4.9**	166	11	31	64	<1	<1	47	<0.025	<1	<1	18	45	NA	<1	<0.2	0.279 j	NA	<0.1
AW-09D	SE of basins outside CB	ee Dee Uppe	03/20/2018	8.1	684	**260**	47	**630**	<1	0.547 j	10	0.032	1.12	<1	**558**	**52**	NA	<1	<0.2	**0.483**	NA	0.35 j

	PARAME	D 40CFR257 APPENDIX III CONSTITUENT				INORGANIC PARAMETERS (TOTAL CONCENTRATION)													
Reporting Units	**S.U.**	**ug/L**	**mg/L**	**mg/L**	**mg/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**mg-N/L**	**ug/L**	**ug/L**	**ug/L**	**pCi/L**	**mg/L**
15A NCAC 02L Standard	**6.5-8.5**	**700**	**250**	**250**	**500**	**1***	**10**	**700**	**10**	**10**	**1***	**300**	**50**	**10**	**20**	**0.2***	**0.3***	**5^**	**2**
Provisional Background Threshold Values (Surficial Upper Unit)	**3.9-5.0**	**50**	**4.73**	**15.6**	**25**	**1**	**1**	**45**	**0.03**	**1**	**4**	**1494**	**38**	**NE**	**1**	**0.2**	**0.621**	**2.75**	**NE**
Provisional Background Threshold Values (Surficial Lower Unit)	**4.9-7.4**	**50**	**23.6**	**16**	**210**	**1**	**5**	**97**	**0.12**	**1**	**3**	**13416**	**746**	**NE**	**1**	**0.2**	**1.68**	**5.32**	**NE**
Provisional Background Threshold Values (Pee Dee Upper Unit)	**7.8-9.3**	**3010**	**1932**	**277**	**2442**	**1**	**2.78**	**18.7**	**0.118**	**1**	**1**	**305**	**118**	**NE**	**1**	**0.2**	**1.91**	**4**	**NE**
Provisional Background Threshold Values (Pee Dee Lower Unit)	**6.9-9.7**	**4730**	**2567**	**171**	**3400**	**1**	**3**	**70**	**0.2**	**1**	**1**	**1230**	**93.9**	**NE**	**1**	**0.2**	**0.693**	**2.06**	**NE**

				PARAME	D 40CFR257 APPENDIX III CONSTITUENT				INORGANIC PARAMETERS (TOTAL CONCENTRATION)													
Sample ID	**Location Description**	**Sample Location Aquifer Name**	**Sample Collection Date**	**pH**	**Boron**	**Chloride**	**Sulfate**	**Total Dissolved Solids**	**Antimony**	**Arsenic**	**Barium**	**Chromium (VI)**	**Chromium**	**Cobalt**	**Iron**	**Manganese**	**Nitrate (as N)**	**Selenium**	**Thallium**	**Vanadium**	**Total Radium**	**Fluoride**
AW-09D	SE of basins outside CB	ee Dee Uppe	06/20/2018	7.8	**716**	250	49	**660**	<1	0.527 j	11	<0.025	1.46	<1	**558**	**52**	NA	<1	0.168 j	**0.719**	NA	0.65
AW-09D	SE of basins outside CB	ee Dee Uppe	10/23/2018	7.9	687	**270**	52	**630**	<1	0.487 j	10	<0.025	0.632 j	<1	**367**	47	NA	<1	<0.2	**0.436**	NA	0.54
BMW-01 CCR	E of basins inside CB	urficial Uppe	02/21/2018	**4.5**	<50	11	58	160	<1	<1	165	NA	<1	<1	NA	NA	NA	1.58	<0.2	NA	1.265	0.13
BMW-01	E of basins inside CB	urficial Uppe	03/20/2018	**4.5**	23.747 j	10	31	140	<1	<1	164	NA	<5	0.334 j	8.534 j	23	**14**	1.14	<0.2	0.234 j	NA	0.064 j
BMW-01 CCR	E of basins inside CB	urficial Uppe	05/23/2018	**4.7**	20.447 j	10	29	170	<1	<1	147	NA	<1	<1	NA	NA	NA	0.596 j	<0.2	NA	1.674	0.077 j
BMW-01	E of basins inside CB	urficial Uppe	10/29/2018	**5.0**	34.5 j	4.07	22.3	44	NA	<1	65.6	NA	<5	NA	6.07 j	12.2	1.39	0.568 j	NA	NA	NA	<0.1
BMW-02 CCR	E of basins inside CB	urficial Uppe	02/21/2018	**6.0**	<50	14	15	140	<1	3.33	16	NA	3.48	<1	NA	NA	NA	<1	<0.2	NA	0.587	<0.1
BMW-02	E of basins inside CB	urficial Uppe	03/20/2018	**6.3**	22.688 j	14 M2	16 M2	150	<1	3.02	24	NA	8	0.878 j	**4990**	26	0.0108 j	<1	<0.2	**8.03**	NA	<0.1
BMW-02 CCR	E of basins inside CB	urficial Uppe	05/22/2018	**6.0**	28.57 j	3.2	14	130	<1	4.46	32	NA	7.95	0.94 j	NA	NA	NA	<1	<0.2	NA	1.29	0.0504 j
BMW-02	E of basins inside CB	urficial Uppe	10/30/2018	**6.3**	76	9.12	21.3	147	NA	**29.3**	91.2	NA	1.35 j	NA	**2980**	45.1	8.1E-03 j	0.458 j	NA	NA	NA	<0.1
BMW-03 CCR	E of basins inside CB	urficial Uppe	02/21/2018	**5.0**	<50	13	33	140	<1	<1	69	NA	<1	**2.4**	NA	NA	NA	<1	<0.2	NA	1.53	0.11
BMW-03 IAP	E of basins inside CB	urficial Uppe	03/20/2018	**5.2**	37.554 j	13	30	120	<1	<1	47	NA	<1	**1.78**	NA	NA	NA	<1	<1	NA	1.066	0.0942 j
BMW-03	E of basins inside CB	urficial Uppe	03/20/2018	**5.2**	35.019 j	12	30	110	<1	<1	52	NA	<5	**2.16**	15	20	7.6	<1	<0.2	0.244 j	NA	<0.1
BMW-03 CCR	E of basins inside CB	urficial Uppe	05/23/2018	**4.9**	19.178 j	8.9	24	110	<1	<1	28	NA	1.67	**2.1**	NA	NA	NA	<1	<0.2	NA	3.38	<0.1
BMW-03	E of basins inside CB	urficial Uppe	10/24/2018	**4.7**	43.954 j	4.3	53	110	<1	<1	31	NA	0.359 j	**1.49**	NA	NA	NA	<1	<1	NA	0.839	0.091 j
BMW-03	E of basins inside CB	urficial Uppe	10/29/2018	**4.8**	43.3 j	5.51	54	110	NA	<1	22.5	NA	<5	NA	7.91 j	4.84 j	1.83	0.354 j	NA	NA	NA	0.0435 j
BMW-04 CCR	E of basins inside CB	urficial Uppe	02/20/2018	7.1	<50	2.6	2.2	72	<1	<1	12	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	0.5092	<0.1
BMW-04 IAP	E of basins inside CB	urficial Uppe	03/20/2018	7.2	<50	2.2	2.7	88	<1	0.559 j	6	NA	<1	<1	NA	NA	NA	<1	<1	NA	0.43	0.0844 j
BMW-04	E of basins inside CB	urficial Uppe	03/20/2018	7.2	<50	2.2	2.7	87	<1	0.685 j	6	NA	<5	<1	176	49	0.0075 j	<1	0.094 j	**0.648**	NA	<0.1
BMW-04 CCR	E of basins inside CB	urficial Uppe	05/22/2018	7.2	<50	3.6	6.3	93	<1	<1	9	NA	0.364 j	<1	NA	NA	NA	<1	<0.2	NA	0.561	0.093 j
BMW-04	E of basins inside CB	urficial Uppe	10/24/2018	7.0	46.407 j	9	34	270	**1.38**	0.57 j	21	NA	0.732 j	<1	NA	NA	NA	2.09	<1	NA	0.761	0.051 j
BMW-04	E of basins inside CB	urficial Uppe	10/29/2018	6.9	52.9	9.41	42.1	256	NA	<1	21.2	NA	<5	NA	16.2	<5	0.72	2.67	NA	NA	NA	<0.1
CCR-109B	Toe of Dam, W of 1984	urficial Uppe	02/20/2018	6.8	537	28	64	230	<1	**77**	99	NA	1.45	**2.41**	NA	NA	NA	<1	<0.2	NA	0.049	0.41
CCR-109B	Toe of Dam, W of 1984	urficial Uppe	05/22/2018	6.6	663	26	140	380	<1	**44.9**	150	NA	1.05	**2.6**	NA	NA	NA	<1	<0.2	NA	0.7168	0.36
CCR-109C	Toe of Dam, W of 1984	urficial Lowe	02/20/2018	6.7	**1420**	41	120	430	<1	**122**	153	NA	<1	**11.9**	NA	NA	NA	<1	<0.2	NA	0.669	<0.2
CCR-109C	Toe of Dam, W of 1984	urficial Lowe	05/22/2018	6.6	**1100**	36	110	410	0.391 j	**105**	138	NA	1.32	**10.6**	NA	NA	NA	<1	<0.2	NA	0.634	0.26
CCR-109D	Toe of Dam, W of 1984	ee Dee Uppe	02/20/2018	8.3	**1270**	**290**	43	**760**	<1	<1	<5	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	0.2945	0.93
CCR-109D	Toe of Dam, W of 1984	ee Dee Uppe	05/22/2018	8.3	**1240**	250	45	**750**	<1	<1	3.553 j	NA	0.356 j	<1	NA	NA	NA	<1	<0.2	NA	0.44	1
CCR-110B	Toe of Dam, W of 1984	urficial Uppe	02/20/2018	6.5	**3320**	150	140	**530**	<1	**133**	149	NA	1.04	<1	NA	NA	NA	<1	<0.2	NA	1.959	<0.5
CCR-110B	Toe of Dam, W of 1984	urficial Uppe	05/22/2018	**6.4**	**3760**	100	130	**520**	<1	**80.5**	140	NA	1.43	0.368 j	NA	NA	NA	<1	<0.2	NA	2.18	0.086 j
CCR-110C	Toe of Dam, W of 1984	urficial Lowe	02/20/2018	6.8	**1980**	80	150	410	<1	**106**	66	NA	<1	**10.3**	NA	NA	NA	<1	<0.2	NA	0.6574	<0.5
CCR-110C	Toe of Dam, W of 1984	urficial Lowe	05/22/2018	6.9	**1890**	78	140	450	<1	**89.2**	64	NA	0.452 j	**12.1**	NA	NA	NA	<1	<0.2	NA	1.309	0.1926 j
CCR-110D	Toe of Dam, W of 1984	ee Dee Uppe	02/20/2018	**11.0**	**796**	190	38	**510**	<1	1.82	21	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	0.3223	0.55
CCR-110D	Toe of Dam, W of 1984	ee Dee Uppe	05/22/2018	**11.5**	639	150	34	460	0.377 j	1.21	27	NA	0.476 j	<1	NA	NA	NA	<1	<0.2	NA	0.627	0.59
CCR-111B	Toe of Dam, W of 1984	urficial Uppe	02/20/2018	6.7	**2670**	55	51	**510**	<1	**188**	53	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	0.5764	0.16 M1
CCR-111B	Toe of Dam, W of 1984	urficial Uppe	05/22/2018	6.7	**2490**	33	29	470	<1	**238**	53	NA	0.563 j	0.491 j	NA	NA	NA	<1	<0.2	NA	1.213	0.19
CCR-111C	Toe of Dam, W of 1984	urficial Lowe	02/20/2018	6.5	**1570**	55	120	320	<1	**66.2**	35	NA	<1	**14.8**	NA	NA	NA	<1	<0.2	NA	0.511	<0.2
CCR-111C	Toe of Dam, W of 1984	urficial Lowe	05/22/2018	6.6	**1740**	58	110	350	<1	**47.2**	35	NA	0.346 j	**9.48**	NA	NA	NA	<1	<0.2	NA	3.758	<0.2
CCR-111D	Toe of Dam, W of 1984	ee Dee Uppe	02/21/2018	8.4	**717**	150	66	**540**	<1	<1	9	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	0.1232	0.74
CCR-111D	Toe of Dam, W of 1984	ee Dee Uppe	05/22/2018	8.3	**715**	140	56	500	<1	0.414 j	4.745 j	NA	0.829 j	<1	NA	NA	NA	<1	<0.2	NA	0.8592	0.57
CCR-112B	Toe of Dam, W of 1984	urficial Uppe	02/20/2018	**6.2**	**1660**	85	73	330	<1	**122**	81	NA	<1	**1.48**	NA	NA	NA	<1	**0.282**	NA	0.5642	0.26
CCR-112B	Toe of Dam, W of 1984	urficial Uppe	05/22/2018	**6.3**	**1350**	70	51	290	<1	**142**	73	NA	0.814 j	**1.93**	NA	NA	NA	<1	**0.271**	NA	2.783	0.3
CCR-112C	Toe of Dam, W of 1984	urficial Lowe	02/20/2018	6.6	**1020**	23	52	220	<1	1.82	47	NA	<1	**1.14**	NA	NA	NA	<1	**0.652**	NA	0.2	<0.1
CCR-112C	Toe of Dam, W of 1984	urficial Lowe	05/22/2018	6.6	**914**	12	31	170	<1	8.2	52	NA	<1	0.881 j	NA	NA	NA	<1	**0.678**	NA	0.129	0.0784 j
CCR-112D	Toe of Dam, W of 1984	ee Dee Uppe	02/20/2018	8.1	661	180	18	**520**	<1	<1	<5	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	0.3545	<0.5
CCR-112D	Toe of Dam, W of 1984	ee Dee Uppe	05/22/2018	8.1	682	170	20	500	<1	0.714 j	6	NA	3.26	<1	NA	NA	NA	<1	<0.2	NA	0.896	0.49
CCR-113B	Toe of Dam, W of 1984	urficial Uppe	02/21/2018	**6.4**	564	55	69	260	<1	**133**	176	NA	<1	**3.33**	NA	NA	NA	<1	**1.5**	NA	0.361	0.31
CCR-113B	Toe of Dam, W of 1984	urficial Uppe	05/23/2018	**6.2**	470	70	130	360	0.664 j	**137**	361	NA	0.62 j	**4.27**	NA	NA	NA	<1	**1.98**	NA	1.536	0.31
CCR-113C	Toe of Dam, W of 1984	urficial Lowe	02/21/2018	6.6	359	16	37	130	<1	**10.7**	51	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	0.718	0.19
CCR-113C	Toe of Dam, W of 1984	urficial Lowe	05/23/2018	6.6	351	18	38	130	<1	**21.7**	52	NA	0.654 j	**1.08**	NA	NA	NA	<1	<0.2	NA	0.871	0.15
CCR-113D	Toe of Dam, W of 1984	ee Dee Uppe	02/21/2018	8.5	**979**	**300**	94	**890**	<1	<1	17	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	0.2416	0.74
CCR-113D	Toe of Dam, W of 1984	ee Dee Uppe	05/23/2018	8.1	**988**	**320**	110	**870**	<1	0.521 j	16	NA	0.368 j	<1	NA	NA	NA	<1	<0.2	NA	0.564	0.55

	PARAME	D 40CFR257 APPENDIX III CONSTITUENT				INORGANIC PARAMETERS (TOTAL CONCENTRATION)														
Reporting Units	**S.U.**	**ug/L**	**mg/L**	**mg/L**	**mg/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**mg-N/L**	**ug/L**	**ug/L**	**ug/L**	**pCi/L**	**mg/L**
15A NCAC 02L Standard	**6.5-8.5**	**700**	**250**	**250**	**500**	**1***	**10**	**700**	**10**	**10**	**1***	**300**	**50**	**10**	**20**	**0.2***	**0.3***	**5^**	**2**
Provisional Background Threshold Values (Surficial Upper Unit)	**3.9-5.0**	**50**	**4.73**	**15.6**	**25**	**1**	**1**	**45**	**0.03**	**1**	**4**	**1494**	**38**	**NE**	**1**	**0.2**	**0.621**	**2.75**	**NE**
Provisional Background Threshold Values (Surficial Lower Unit)	**4.9-7.4**	**50**	**23.6**	**16**	**210**	**1**	**5**	**97**	**0.12**	**1**	**3**	**13416**	**746**	**NE**	**1**	**0.2**	**1.68**	**5.32**	**NE**
Provisional Background Threshold Values (Pee Dee Upper Unit)	**7.8-9.3**	**3010**	**1932**	**277**	**2442**	**1**	**2.78**	**18.7**	**0.118**	**1**	**1**	**305**	**118**	**NE**	**1**	**0.2**	**1.91**	**4**	**NE**
Provisional Background Threshold Values (Pee Dee Lower Unit)	**6.9-9.7**	**4730**	**2567**	**171**	**3400**	**1**	**3**	**70**	**0.2**	**1**	**1**	**1230**	**93.9**	**NE**	**1**	**0.2**	**0.693**	**2.06**	**NE**

				PARAME	D 40CFR257 APPENDIX III CONSTITUENT				INORGANIC PARAMETERS (TOTAL CONCENTRATION)														
Sample ID	**Location Description**	**Sample Location Aquifer Name**	**Sample Collection Date**	**pH**	**Boron**	**Chloride**	**Sulfate**	**Total Dissolved Solids**	**Antimony**	**Arsenic**	**Barium**	**Chromium (VI)**	**Chromium**	**Cobalt**	**Iron**	**Manganese**	**Nitrate (as N)**	**Selenium**	**Thallium**	**Vanadium**	**Total Radium**	**Fluoride**
CCR-114B IMP	N of basins inside CB	urficial Uppe	02/21/2018	6.7	70	4.5	13	130	<1	<1	40	<0.025	<1	<1	50	<5	NA	<1	<0.2	**0.644**	NA	<0.1
CCR-114B	N of basins inside CB	urficial Uppe	02/21/2018	6.7	79	4.8	13	130	<1	<1	45	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	0.1368	<0.1
CCR-114B	N of basins inside CB	urficial Uppe	05/23/2018	6.9	72	5	15	120	0.683 j	0.346 j	54	NA	0.545 j	<1	NA	NA	NA	<1	0.125 j	NA	0.346	<0.1
CCR-114C IMP	N of basins inside CB	urficial Lowe	02/21/2018	6.8	130	4.1	13	55	**3.42**	<1	12	<0.025	<1	<1	28	<5	NA	**34.8**	**0.308**	**4.23**	NA	<0.1
CCR-114C	N of basins inside CB	urficial Lowe	02/21/2018	6.8	131	4.1	14	71	**3.7**	<1	13	NA	<1	<1	NA	NA	NA	**36.1**	**0.315**	NA	0.5899	<0.1
CCR-114C	N of basins inside CB	urficial Lowe	05/23/2018	6.6	134	3.2	12	63	**3.92**	0.466 j	14	NA	<1	<1	NA	NA	NA	**32.9**	**0.276**	NA	0.402	<0.1
CCR-114D IMP	N of basins inside CB	ee Dee Uppe	02/21/2018	**9.0**	**987**	**290**	19	**720**	<1	<1	6	0.051	<1	<1	17	<5	NA	<1	<0.2	<0.3	NA	0.71
CCR-114D	N of basins inside CB	ee Dee Uppe	02/21/2018	**9.0**	**1040**	**290**	11	**700**	<1	<1	7	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	0.0884	0.75
CCR-114D	N of basins inside CB	ee Dee Uppe	05/23/2018	**8.9**	**1050**	**280**	18	**710**	<1	<1	7	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	0.2169	0.68
CCR-115B IMP	N of basins inside CB	urficial Uppe	02/20/2018	6.8	<50	2	7.1	92	**3.73**	<1	30	0.04 M1	<1	<1	46	<5	NA	1.23	**0.272**	**0.498**	NA	<0.1
CCR-115B	N of basins inside CB	urficial Uppe	02/20/2018	6.8	<50	2	7	49	**3.76**	<1	32	NA	<1	<1	NA	NA	NA	1.3	**0.274**	NA	0.495	<0.1
CCR-115B	N of basins inside CB	urficial Uppe	05/23/2018	6.5	41.514 j	2.2	7.9	49	**3.5**	<1	45	NA	0.391 j	<1	NA	NA	NA	0.882 j	**0.268**	NA	1.069	0.086 j
CCR-115C IMP	N of basins inside CB	urficial Lowe	02/20/2018	**6.3**	432	40	86	220	<1	1.62	32	<0.025	4.1	**11**	**1130**	**148**	NA	20	<0.2	**2.04**	NA	<0.2
CCR-115C	N of basins inside CB	urficial Lowe	02/20/2018	**6.3**	450	40	88	200	<1	1.71	34	NA	4.01	**11.5**	NA	NA	NA	**21.2**	**0.224**	NA	0.674	<0.2
CCR-115C	N of basins inside CB	urficial Lowe	05/23/2018	**6.1**	389	34	74	170	<1	0.795 j	31	NA	0.48 j	**5.55**	NA	NA	NA	6.56	0.102 j	NA	0.4371	<0.1
CCR-115D IMP	N of basins inside CB	ee Dee Uppe	02/20/2018	8.3	**706**	240	20	**600**	<1	<1	<5	<0.025	<1	<1	174	15	NA	<1	<0.2	**0.389**	NA	0.62
CCR-115D	N of basins inside CB	ee Dee Uppe	02/20/2018	8.3	667	**270**	23	**610**	<1	<1	<5	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	0.0019	<0.5
CCR-115D	N of basins inside CB	ee Dee Uppe	05/23/2018	8.1	655	240	26	**570**	<1	0.581 j	4.082 j	NA	0.476 j	<1	NA	NA	NA	<1	<0.2	NA	0.473	0.33 j
CCR-116B	N of basins inside CB	urficial Uppe	02/20/2018	**6.4**	<50	4.9	1	42	<1	<1	9	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	0.667	<0.1
CCR-116B	N of basins inside CB	urficial Uppe	05/21/2018	**6.3**	<50	11	5.7	82	0.573 j	<1	12	NA	0.41 j	**3.93**	NA	NA	NA	1.22	<0.2	NA	0.642	0.0547 j
CCR-116C	N of basins inside CB	urficial Lowe	02/20/2018	**5.8**	279	19	59	110	<1	<1	38	NA	<1	**1.64**	NA	NA	NA	14.1	**0.202**	NA	-0.0494	<0.1
CCR-116C	N of basins inside CB	urficial Lowe	05/21/2018	**5.8**	300	21	58	140	0.839 j	0.473 j	51	NA	1.16	0.99 j	NA	NA	NA	8.8	**0.255**	NA	0.951	0.0593 j
CCR-117B	E of basins inside CB	urficial Uppe	02/20/2018	6.6	<50	3.5	2	34	<1	<1	<5	NA	1	<1	NA	NA	NA	2.08	<0.2	NA	0.0387	<0.1
CCR-117B	E of basins inside CB	urficial Uppe	05/22/2018	**6.4**	<50	7.5	10	140	0.449 j	<1	5	NA	0.334 j	<1	NA	NA	NA	2.72	<0.2	NA	1.15	0.0554 j
CCR-117C	E of basins inside CB	urficial Lowe	02/20/2018	**6.0**	200	16	41	99	**1.04**	<1	79	NA	<1	<1	NA	NA	NA	2.34	<0.2	NA	0.754	<0.1
CCR-117C	E of basins inside CB	urficial Lowe	05/22/2018	**5.9**	93	5.2	22	42	**1.09**	<1	40	NA	<1	**1.27**	NA	NA	NA	<1	0.094 j	NA	0.25838	<0.1
CCR-118B	E of basins inside CB	urficial Uppe	02/20/2018	6.8	<50	3.1	1.8	120	<1	<1	<5	NA	<1	<1	NA	NA	NA	1.09	<0.2	NA	0.375	<0.1
CCR-118B	E of basins inside CB	urficial Uppe	05/22/2018	6.5	21.382 j	9.5	33	150	<1	<1	7	NA	<1	<1	NA	NA	NA	7.21	<0.2	NA	0.489	<0.1
CCR-118C	E of basins inside CB	urficial Lowe	02/20/2018	6.6	161	3.6	6.8	<25	**1.92**	<1	20	NA	<1	<1	NA	NA	NA	6.1	**0.638**	NA	0.2385	<0.1
CCR-118C IAP	E of basins inside CB	urficial Lowe	03/21/2018	6.6	82	2.6	5.6	49	**3.13**	0.564 j	10	NA	<1	0.431 j	NA	NA	NA	9.58	**0.802 j**	NA	0.19	0.085 j
CCR-118C	E of basins inside CB	urficial Lowe	05/22/2018	6.6	76	2.5	4.9	<25	**2.79**	0.78 j	10	NA	<1	0.507 j	NA	NA	NA	3.64	**0.551**	NA	0.2094	0.0813 j
CCR-118C IAP	E of basins inside CB	urficial Lowe	10/24/2018	**6.1**	98	2.7	5.9	49	**2.02**	<1	17	NA	<1	<1	NA	NA	NA	14.6	**0.549 j**	NA	0.0612	0.054 j
CCR-119B	E of basins inside CB	urficial Uppe	02/20/2018	7.1	72	4.3	2	31	<1	<1	7	NA	<1	<1	NA	NA	NA	1.14	<0.2	NA	0.1528	<0.1
CCR-119B	E of basins inside CB	urficial Uppe	05/22/2018	7.2	83	4.8	1.9	<25	0.678 j	<1	7	NA	<1	<1	NA	NA	NA	1.62	<0.2	NA	0.163	0.0707 j
CCR-119C	E of basins inside CB	urficial Lowe	02/20/2018	**6.0**	**748**	43	62	190	<1	<1	39	NA	<1	**2.52**	NA	NA	NA	<1	<0.2	NA	1.571	<0.2
CCR-119C	E of basins inside CB	urficial Lowe	05/22/2018	**6.3**	553	30	41	170	<1	**21.9**	35	NA	<1	**3.26**	NA	NA	NA	<1	0.112 j	NA	0.2127	0.0576 j
CCR-120B	E of basins inside CB	urficial Uppe	02/20/2018	6.6	<50	6.7	69	170	<1	<1	38	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	-0.0727	<0.1
CCR-120B	E of basins inside CB	urficial Uppe	05/22/2018	6.6	38.843 j	7.3	60	180	<1	<1	29	NA	<1	0.453 j	NA	NA	NA	0.34 j	<0.2	NA	0.0778	0.0526 j
CCR-120C	E of basins inside CB	urficial Lowe	02/20/2018	**5.2**	**875**	73	120	280	<1	<1	75	NA	<1	**27.2**	NA	NA	NA	<1	<0.2	NA	0.932	<0.2
CCR-120C	E of basins inside CB	urficial Lowe	05/22/2018	**5.1**	**874**	70	120	290	<1	0.624 j	57	NA	<1	**35.1**	NA	NA	NA	<1	<0.2	NA	0.126	<0.2
CCR-121B	E of basins inside CB	urficial Uppe	02/20/2018	6.5	<50	4.1	4.2	60	<1	<1	<5	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	0.2302	<0.1
CCR-121B	E of basins inside CB	urficial Uppe	05/22/2018	6.5	<50	4.4	4.9	65	<1	<1	3.027 j	NA	0.545 j	<1	NA	NA	NA	0.751 j	<0.2	NA	0.1669	0.0512 j
CCR-121C	E of basins inside CB	urficial Lowe	02/20/2018	**6.3**	81	3.5	8	65	<1	1.49	37	NA	<1	<1	NA	NA	NA	1.3	<0.2	NA	0.1304	<0.1
CCR-121C	E of basins inside CB	urficial Lowe	05/22/2018	**6.3**	80	19	21	120	<1	1.41	43	NA	<1	<1	NA	NA	NA	11.1	0.088 j	NA	-0.07776	0.0427 j
CCR-122B	E of basins inside CB	urficial Uppe	02/20/2018	**6.3**	<50	2.7	39	160	<1	<1	57	NA	<1	<1	NA	NA	NA	5.53	<0.2	NA	0.016	<0.1
CCR-122B	E of basins inside CB	urficial Uppe	05/22/2018	**6.3**	30.164 j	2.4	45	140	<1	<1	34	NA	0.546 j	**1.22**	NA	NA	NA	4.31	<0.2	NA	1.379	<0.1
CCR-122C	E of basins inside CB	urficial Lowe	02/20/2018	**6.1**	**1530**	77	110	300	<1	<1	27	NA	<1	**5.82**	NA	NA	NA	<1	<0.2	NA	0.1223	<0.5
CCR-122C	E of basins inside CB	urficial Lowe	05/22/2018	**6.1**	**1430**	57	82	260	<1	<1	29	NA	<1	**5.58**	NA	NA	NA	<1	0.131 j	NA	0.4305	<0.2
CCR-123B	E of basins inside CB	urficial Uppe	02/20/2018	**6.2**	<50	4.2	14	72	<1	<1	5	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	-0.0648	<0.1
CCR-123B	E of basins inside CB	urficial Uppe	05/22/2018	**6.1**	18.21 j	4.2	13	65	0.471 j	0.42 j	5	NA	0.908 j	<1	NA	NA	NA	<1	<0.2	NA	0.771	0.0528 j
CCR-123C	E of basins inside CB	urficial Lowe	02/20/2018	**6.4**	325	5.7	30	100	<1	**79.9**	19	NA	<1	<1	NA	NA	NA	1.66	**0.213**	NA	0.2958	0.25
CCR-123C	E of basins inside CB	urficial Lowe	05/22/2018	**6.1**	154	5.3	73	170	<1	**64.9**	19	NA	<1	0.718 j	NA	NA	NA	<1	<0.2	NA	0.659	0.18

	PARAME	**D 40CFR257 APPENDIX III CONSTITUENT**				**INORGANIC PARAMETERS (TOTAL CONCENTRATION)**													
Reporting Units	**S.U.**	**ug/L**	**mg/L**	**mg/L**	**mg/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**mg-N/L**	**ug/L**	**ug/L**	**ug/L**	**pCi/L**	**mg/L**
15A NCAC 02L Standard	**6.5-8.5**	**700**	**250**	**250**	**500**	**1***	**10**	**700**	**10**	**10**	**1***	**300**	**50**	**10**	**20**	**0.2***	**0.3***	**5^**	**2**
Provisional Background Threshold Values (Surficial Upper Unit)	**3.9-5.0**	**50**	**4.73**	**15.6**	**25**	**1**	**1**	**45**	**0.03**	**1**	**4**	**1494**	**38**	**NE**	**1**	**0.2**	**0.621**	**2.75**	**NE**
Provisional Background Threshold Values (Surficial Lower Unit)	**4.9-7.4**	**50**	**23.6**	**16**	**210**	**1**	**5**	**97**	**0.12**	**1**	**3**	**13416**	**746**	**NE**	**1**	**0.2**	**1.68**	**5.32**	**NE**
Provisional Background Threshold Values (Pee Dee Upper Unit)	**7.8-9.3**	**3010**	**1932**	**277**	**2442**	**1**	**2.78**	**18.7**	**0.118**	**1**	**1**	**305**	**118**	**NE**	**1**	**0.2**	**1.91**	**4**	**NE**
Provisional Background Threshold Values (Pee Dee Lower Unit)	**6.9-9.7**	**4730**	**2567**	**171**	**3400**	**1**	**3**	**70**	**0.2**	**1**	**1**	**1230**	**93.9**	**NE**	**1**	**0.2**	**0.693**	**2.06**	**NE**

				PARAME	**D 40CFR257 APPENDIX III CONSTITUENT**				**INORGANIC PARAMETERS (TOTAL CONCENTRATION)**													
Sample ID	**Location Description**	**Sample Location Aquifer Name**	**Sample Collection Date**	**pH**	**Boron**	**Chloride**	**Sulfate**	**Total Dissolved Solids**	**Antimony**	**Arsenic**	**Barium**	**Chromium (VI)**	**Chromium**	**Cobalt**	**Iron**	**Manganese**	**Nitrate (as N)**	**Selenium**	**Thallium**	**Vanadium**	**Total Radium**	**Fluoride**
CCR-124B	E of basins inside CB	urficial Uppe	02/19/2018	**5.9**	<50	2.5	6.5	60	<1	<1	36	NA	<1	<1	NA	NA	NA	13.8	**0.482**	NA	0.465	<0.1
CCR-124B	E of basins inside CB	urficial Uppe	05/23/2018	**5.8**	30.923 j	2.7	6.2	35	0.858 j	<1	39	NA	1.09	<1	NA	NA	NA	15.5	**0.317**	NA	0.631	<0.1
CCR-124C	E of basins inside CB	urficial Lowe	02/19/2018	**6.2**	**1380**	51	120	360	<1	**83.5**	92	NA	<1	**6.41**	NA	NA	NA	<1	<0.2	NA	1.898	0.3
CCR-124C IAP	E of basins inside CB	urficial Lowe	03/21/2018	**6.0**	**1080**	38	120	310	<1	**51**	96	NA	0.346 j	**4.93**	NA	NA	NA	<1	<1	NA	1.395	0.23
CCR-124C	E of basins inside CB	urficial Lowe	05/23/2018	**6.2**	**1010**	37	100	280	<1	**49.5**	98	NA	0.422 j	**3.96**	NA	NA	NA	<1	**0.286**	NA	1.975	0.25
CCR-124C IAP	E of basins inside CB	urficial Lowe	10/24/2018	**5.9**	176	4.9	36	110	<1	8.54	28	NA	<1	**1.82**	NA	NA	NA	<1	<1	NA	0.1271	0.28
CCR-201C	E of basins inside CB	urficial Lowe	02/21/2018	**4.9**	<50	7.4	21	57	<1	<1	59	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	0.307	<0.1
CCR-201C	E of basins inside CB	urficial Lowe	05/23/2018	**5.8**	26.71 j	8.1	21	53	<1	<1	59	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	0.594	<0.1
CCR-201D	E of basins inside CB	ee Dee Uppe	02/21/2018	**11.4**	439	130	43	**540**	<1	3.56	39	NA	<1	<1	NA	NA	NA	1.37	<0.2	NA	0.384	0.7
CCR-201D	E of basins inside CB	ee Dee Uppe	05/23/2018	**11.4**	471	130	44	**520**	<1	3.14	39	NA	0.446 j	<1	NA	NA	NA	1.09	<0.2	NA	0.1569	0.66
CCR-202C	E of basins inside CB	urficial Lowe	02/21/2018	**5.8**	198	9.8	23	76	<1	1.75	27	NA	<1	**3.05**	NA	NA	NA	<1	<0.2	NA	0.424	<0.1
CCR-202C	E of basins inside CB	urficial Lowe	05/23/2018	**5.8**	136	6.6	18	58	<1	1.4	28	NA	<1	**1.58**	NA	NA	NA	<1	<0.2	NA	0.644	<0.1
CCR-202D	E of basins inside CB	ee Dee Uppe	02/21/2018	7.7	588	110	100	**590**	<1	5.51	22	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	0.3771	0.8
CCR-202D	E of basins inside CB	ee Dee Uppe	05/23/2018	7.6	599	110	93	**560**	<1	4.63	21	NA	0.803 j	<1	NA	NA	NA	<1	<0.2	NA	0.876	0.74
CCR-203C	E of basins inside CB	urficial Lowe	02/21/2018	**5.7**	**897**	56	77	240	<1	<1	24	NA	<1	**6.09**	NA	NA	NA	3.39	<0.2	NA	0.5	<0.2
CCR-203C	E of basins inside CB	urficial Lowe	05/23/2018	**5.6**	**1040**	71	88	260	<1	<1	38	NA	1.18	**6.98**	NA	NA	NA	3.39	<0.2	NA	0.333	<0.1
CCR-203D	E of basins inside CB	ee Dee Uppe	02/21/2018	7.6	574	100	81	**530**	<1	3.32	23	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	0.46	0.83
CCR-203D IAP	E of basins inside CB	ee Dee Uppe	03/20/2018	7.6	594	110	73	500	<1	2.94	22	NA	<1	<1	NA	NA	NA	<1	<1	NA	0.574	0.69
CCR-203D	E of basins inside CB	ee Dee Uppe	05/23/2018	7.7	590	100	65	500	<1	3.14	23	NA	0.566 j	<1	NA	NA	NA	<1	<0.2	NA	0.169	0.72
CCR-203D IAP	E of basins inside CB	ee Dee Uppe	10/24/2018	7.4	592	99	52	470	<1	2.61	22	NA	<1	<1	NA	NA	NA	<1	<1	NA	0.2768	0.71
CCR-204C	E of basins inside CB	urficial Lowe	02/21/2018	**6.2**	153	6.8	21	86	<1	<1	53	NA	2.98	<1	NA	NA	NA	<1	<0.2	NA	0.866	<0.1
CCR-204C	E of basins inside CB	urficial Lowe	05/23/2018	**6.0**	143	14	27	82	<1	<1	30	NA	0.929 j	<1	NA	NA	NA	<1	<0.2	NA	0.0678	<0.1
CCR-204D	E of basins inside CB	ee Dee Uppe	02/21/2018	7.6	463	96	52	450	<1	3.25	26	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	1.081	0.56
CCR-204D	E of basins inside CB	ee Dee Uppe	05/23/2018	7.5	461	91	46	480	<1	2.84	26	NA	0.408 j	<1	NA	NA	NA	<1	<0.2	NA	1.025	0.55
CCR-205C	E of basins inside CB	urficial Lowe	02/20/2018	6.7	**1120**	58	99	300	<1	2.24	70	NA	<1	**5.59**	NA	NA	NA	<1	<0.2	NA	0.1828	<0.2
CCR-205C IAP	E of basins inside CB	urficial Lowe	03/20/2018	6.9	**1230**	65	100	330	<1	1.7	76	NA	<1	**6.49**	NA	NA	NA	<1	<1	NA	0.3676	<0.5
CCR-205C	E of basins inside CB	urficial Lowe	05/22/2018	6.7	**1200**	55	90	280	<1	1.88	58	NA	0.516 j	**8.16**	NA	NA	NA	<1	0.163 j	NA	1.269	0.1118 j
CCR-205C IAP	E of basins inside CB	urficial Lowe	10/24/2018	**6.4**	**1010**	33	65	220	<1	1.85	36	NA	<1	**5.46**	NA	NA	NA	<1	<1	NA	0.4321	0.04 j
CCR-205D	E of basins inside CB	ee Dee Uppe	02/20/2018	7.9	**777**	130	67	**550**	<1	4.23	30	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	0.7621	0.74
CCR-205D IAP	E of basins inside CB	ee Dee Uppe	03/20/2018	8.0	**806**	130	61	**550**	<1	3.64	30	NA	0.371 j	<1	NA	NA	NA	<1	<1	NA	0.3434	0.87
CCR-205D	E of basins inside CB	ee Dee Uppe	05/22/2018	7.9	**770**	120	53	**510**	<1	3.82	30	NA	0.404 j	<1	NA	NA	NA	<1	<0.2	NA	1.584	0.71
CCR-205D IAP	E of basins inside CB	ee Dee Uppe	10/24/2018	7.7	**786**	120	53	**530**	<1	3.34	28	NA	<1	<1	NA	NA	NA	<1	<1	NA	0.501	0.8
CCR-206C	E of basins inside CB	urficial Lowe	02/21/2018	6.8	174	12	8.1	100	<1	2.19	32	NA	<1	**1.84**	NA	NA	NA	<1	<0.2	NA	0.5324	<0.1
CCR-206C	E of basins inside CB	urficial Lowe	05/22/2018	**6.4**	103	4.8	2	51	<1	1.71	25	NA	<1	0.965 j	NA	NA	NA	<1	<0.2	NA	0.104	0.0811 j
CCR-206D	E of basins inside CB	ee Dee Uppe	02/21/2018	7.7	**727**	120	70	**570**	<1	3.62	23	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	-0.457	0.75
CCR-206D	E of basins inside CB	ee Dee Uppe	05/22/2018	7.8	**743**	120	57	**540**	<1	3.1	23	NA	0.458 j	<1	NA	NA	NA	<1	<0.2	NA	0.893	0.72
CCR-207C	E of basins inside CB	urficial Lowe	02/21/2018	**5.8**	252	28	66	150	<1	<1	64	NA	<1	**23.8**	NA	NA	NA	<1	<0.2	NA	0.516	<0.1
CCR-207C	E of basins inside CB	urficial Lowe	05/22/2018	**5.2**	140	9.6	29	65	<1	<1	26	NA	0.565 j	**6.51**	NA	NA	NA	3.61	0.131 j	NA	1.221	<0.1
CCR-207D	E of basins inside CB	ee Dee Uppe	02/21/2018	**9.6**	551	150	64	**560**	<1	2.99	35	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	0.657	0.65
CCR-207D	E of basins inside CB	ee Dee Uppe	05/22/2018	**9.2**	543	140	55	**540**	0.481 j	3.37	35	NA	0.457 j	<1	NA	NA	NA	<1	<0.2	NA	1.518	0.6
CCR-208C	E of basins inside CB	urficial Lowe	02/20/2018	**5.1**	<50	2.9	8.7	<25	<1	<1	29	NA	<1	<1	NA	NA	NA	1.98	<0.2	NA	0.5616	<0.1
CCR-208C	E of basins inside CB	urficial Lowe	05/22/2018	**5.1**	33.55 j	3.2	12	<25	<1	<1	25	NA	<1	<1	NA	NA	NA	1.78	<0.2	NA	0.417	0.0569 j
CCR-208D	E of basins inside CB	ee Dee Uppe	02/20/2018	**9.4**	**779**	240	140	**860**	<1	5.06	24	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	0.55	0.52
CCR-208D	E of basins inside CB	ee Dee Uppe	05/22/2018	**9.5**	**776**	230	120	**830**	0.341 j	4.37	21	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	0.908	0.72
DMW-01 CCR	E of basins inside CB	urficial Uppe	02/20/2018	**4.7**	<50	13	8.6	88	<1	<1	363	NA	<1	**1.22**	NA	NA	NA	<1	<0.2	NA	**5.08**	<0.1
DMW-01	E of basins inside CB	urficial Uppe	03/20/2018	**4.5**	26.887 j	9.1	11	78	<1	<1	265	NA	<5	0.978 j	112	45	9.5	<1	<0.2	**0.305**	NA	0.054 j
DMW-01 CCR	E of basins inside CB	urficial Uppe	05/22/2018	**4.5**	31.674 j	5.5	4.7	49	<1	<1	153	NA	<1	0.435 j	NA	NA	NA	<1	<0.2	NA	3.259	0.0921 j
DMW-01	E of basins inside CB	urficial Uppe	10/29/2018	**4.8**	29.1 j	2.25	12.9	33	NA	<1	108	NA	<5	NA	8.23 j	22	1.03	<1	NA	NA	NA	<0.1
DMW-02 CCR	E of basins inside CB	urficial Uppe	02/21/2018	**4.4**	<50	36	6.5	260	<1	<1	253	NA	<1	<1	NA	NA	NA	<1	**0.375**	NA	**13.96**	0.2
DMW-02	E of basins inside CB	urficial Uppe	03/20/2018	**4.3**	40.365 j	34	3.2	170	<1	<1	165	NA	<5	0.584 j	152	**179**	**26**	<1	**0.264**	**0.495**	NA	0.14
DMW-02 CCR	E of basins inside CB	urficial Uppe	05/22/2018	**4.7**	28.243 j	14	20	120	<1	<1	95	NA	0.496 j	<1	NA	NA	NA	<1	0.111 j	NA	4.55	0.0949 j
DMW-02	E of basins inside CB	urficial Uppe	10/30/2018	**5.1**	32.5 j	5.54	11.6	78	NA	<1	28.3	NA	<5	NA	12.8	26.2	2.04	0.447 j	NA	NA	NA	<0.1

	PARAME	D 40CFR257 APPENDIX III CONSTITUENT				INORGANIC PARAMETERS (TOTAL CONCENTRATION)														
Reporting Units	**S.U.**	**ug/L**	**mg/L**	**mg/L**	**mg/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**mg-N/L**	**ug/L**	**ug/L**	**ug/L**	**pCi/L**	**mg/L**
15A NCAC 02L Standard	**6.5-8.5**	**700**	**250**	**250**	**500**	**1***	**10**	**700**	**10**	**10**	**1***	**300**	**50**	**10**	**20**	**0.2***	**0.3***	**5^**	**2**
Provisional Background Threshold Values (Surficial Upper Unit)	**3.9-5.0**	**50**	**4.73**	**15.6**	**25**	**1**	**1**	**45**	**0.03**	**1**	**4**	**1494**	**38**	**NE**	**1**	**0.2**	**0.621**	**2.75**	**NE**
Provisional Background Threshold Values (Surficial Lower Unit)	**4.9-7.4**	**50**	**23.6**	**16**	**210**	**1**	**5**	**97**	**0.12**	**1**	**3**	**13416**	**746**	**NE**	**1**	**0.2**	**1.68**	**5.32**	**NE**
Provisional Background Threshold Values (Pee Dee Upper Unit)	**7.8-9.3**	**3010**	**1932**	**277**	**2442**	**1**	**2.78**	**18.7**	**0.118**	**1**	**1**	**305**	**118**	**NE**	**1**	**0.2**	**1.91**	**4**	**NE**
Provisional Background Threshold Values (Pee Dee Lower Unit)	**6.9-9.7**	**4730**	**2567**	**171**	**3400**	**1**	**3**	**70**	**0.2**	**1**	**1**	**1230**	**93.9**	**NE**	**1**	**0.2**	**0.693**	**2.06**	**NE**

				PARAME	D 40CFR257 APPENDIX III CONSTITUENT				INORGANIC PARAMETERS (TOTAL CONCENTRATION)													
Sample ID	**Location Description**	**Sample Location Aquifer Name**	**Sample Collection Date**	**pH**	**Boron**	**Chloride**	**Sulfate**	**Total Dissolved Solids**	**Antimony**	**Arsenic**	**Barium**	**Chromium (VI)**	**Chromium**	**Cobalt**	**Iron**	**Manganese**	**Nitrate (as N)**	**Selenium**	**Thallium**	**Vanadium**	**Total Radium**	**Fluoride**
DMW-03 CCR	E of basins inside CB	urficial Uppe	02/21/2018	**4.8**	<50	6.4	47	100	<1	<1	29	NA	<1	<1	NA	NA	NA	4.08	<0.2	NA	1.355	<0.1
DMW-03 IAP	E of basins inside CB	urficial Uppe	03/20/2018	**4.9**	41.388 j	9.6	47	120	<1	<1	30	NA	<1	0.81 j	NA	NA	NA	4.4	<1	NA	0.659	0.11
DMW-03	E of basins inside CB	urficial Uppe	03/20/2018	**4.9**	39.9 j	9.5	43	120	<1	<1	28	NA	<5	0.815 j	12	<5	5.7	4.43	<0.2	0.217 j	NA	<0.1
DMW-03 CCR	E of basins inside CB	urficial Uppe	05/23/2018	**5.1**	39.878 j	12	36	110	<1	<1	41	NA	0.339 j	0.707 j	NA	NA	NA	3.2	<0.2	NA	2.149	<0.1
DMW-03	E of basins inside CB	urficial Uppe	10/24/2018	**5.3**	43.557 j	4.4	39	120	<1	<1	14	NA	<1	0.55 j	NA	NA	NA	3.51	<1	NA	0.425	0.067 j
DMW-03	E of basins inside CB	urficial Uppe	10/30/2018	**5.5**	41.6 j	6.76	40.8	139	NA	<1	11.1	NA	<5	NA	8.62 j	<5	1.34	3.9	NA	NA	NA	0.0811 j
DMW-04 CCR	E of basins inside CB	urficial Uppe	02/21/2018	**5.9**	<50	4.1	43	110	<1	<1	10	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	1.107	<0.1
DMW-04 IAP	E of basins inside CB	urficial Uppe	03/21/2018	**6.1**	49.765 j	2.8	38	110	<1	<1	6	NA	<1	<1	NA	NA	NA	<1	<1	NA	0.4661	0.0541 j
DMW-04	E of basins inside CB	urficial Uppe	03/21/2018	**6.1**	45.208 j	2.8	38	110	<1	<1	6	NA	<5	<1	4.065 j	13	2.9	<1	<0.2	0.295 j	NA	<0.1
DMW-04 CCR	E of basins inside CB	urficial Uppe	05/23/2018	**5.5**	29.713 j	4.6	36	85	<1	<1	22	NA	1.02	<1	NA	NA	NA	<1	<0.2	NA	0.563	<0.1
DMW-04	E of basins inside CB	urficial Uppe	10/24/2018	**5.0**	41.425 j	2.8	32	80	<1	<1	31	NA	<1	0.446 j	NA	NA	NA	<1	<1	NA	0.665	0.095 j
DMW-04	E of basins inside CB	urficial Uppe	10/29/2018	**5.4**	37.2 j	3.52	36.8	66	NA	<1	27.6	NA	<5	NA	6.97 j	4.3 j	0.761	<1	NA	NA	NA	0.0685 j
MW-05B CCR	N of basins outside CB	urficial Uppe	02/19/2018	**4.9**	<50	2.6	5.8	<25	<1	<1	40	NA	<1	**2.91**	NA	NA	NA	<1	<0.2	NA	1.245	<0.1
MW-05B CCR	N of basins outside CB	urficial Uppe	05/21/2018	**4.6**	<50	2.5	6.7	<25	<1	<1	40	NA	<1	**2.98**	NA	NA	NA	<1	<0.2	NA	1.673	0.0615 j
MW-05C CCR	N of basins outside CB	urficial Lowe	02/19/2018	**5.8**	<50	13	11	55	<1	<1	22	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	0.1027	<0.1
MW-05C	N of basins outside CB	urficial Lowe	03/19/2018	**5.8**	31.407 j	14	11	55	<1	<1	24	0.078	<1	0.449 j	15	21	NA	<1	<0.2	0.171 j	2.47	<0.1
MW-05C CCR	N of basins outside CB	urficial Lowe	05/21/2018	**5.6**	26.691 j	11	11	66	<1	<1	21	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	0.8089	0.0566 j
MW-05C	N of basins outside CB	urficial Lowe	06/18/2018	**5.2**	29.518 j	12	11	37	<1	<1	20	0.039	<1	<1	8.267 j	11	NA	<1	<0.2	**0.308 B2**	0.254	0.0536 j
MW-05C	N of basins outside CB	urficial Lowe	09/10/2018	**5.5**	33.573 j	15	13	38	<1	<1	25	0.09	<1	0.764 j	13	31	NA	<1	<0.2	0.121 j	0.466	<0.1
MW-05CD	N of basins outside CB	ee Dee Uppe	03/19/2018	**9.1**	**1200**	**290**	110	**880**	<1	1.11	10	0.039	0.345 j	<1	92	32	NA	<1	<0.2	**0.807**	0.2107	0.9
MW-05CD	N of basins outside CB	ee Dee Uppe	06/18/2018	**9.3**	**1190**	**300**	100	**860**	<1	1.19	9	0.043	0.408 j	<1	50	23	NA	<1	<0.2	**1 B2**	0 U	0.88
MW-05CD	N of basins outside CB	ee Dee Uppe	09/10/2018	**9.0**	**1140**	**290**	94	**860**	0.573 j	1.2	8	<0.025	1.23	<1	31	6	NA	<1	<0.2	**0.948**	0.578	0.72
MW-05D CCR	N of basins outside CB	ee Dee Uppe	02/19/2018	8.1	**2570**	**630**	94	**1500**	<1	<1	9	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	0.456	1.6
MW-05D	N of basins outside CB	ee Dee Uppe	03/19/2018	8.2	**2730**	**640**	91	**1500**	<1	0.931 j	8	<0.025	<1	<1	138	28	NA	<1	0.174 j	0.299 j	0.561	1.6
MW-05D CCR	N of basins outside CB	ee Dee Uppe	05/21/2018	8.0	**2540**	**600**	89	**1500**	<1	1	8	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	0.594	1.5
MW-05D	N of basins outside CB	ee Dee Uppe	06/18/2018	8.0	**2590**	**650**	94	**1500**	<1	1.02	8	<0.025	<1	<1	117	23	NA	<1	<0.2	**0.338 B2**	0.25056	1.5
MW-05D	N of basins outside CB	ee Dee Uppe	09/10/2018	7.8	**2570**	**650**	88	**1500**	<1	0.791 j	7	0.039	<1	<1	171	25	NA	<1	<0.2	**0.347**	0.501	1.4
MW-05RE	N of basins outside CB	ee Dee Lowe	03/19/2018	8.1	**3940**	**1300**	**260**	**2800**	<1	<1	16	0.038	<1	<1	153	27	NA	<1	<0.2	**0.472**	NA	**2.3**
MW-05RE	N of basins outside CB	ee Dee Lowe	06/18/2018	8.2	85	30	23	190	0.405 j	1.26	3.155 j	0.22	<1	<1	55	3.828 j	NA	<1	<0.2	**2.19 B2**	NA	0.17
MW-05RE	N of basins outside CB	ee Dee Lowe	09/10/2018	8.1	44.776 j	15	17	130	0.438 j	1.36	4.083 j	0.11 M1	0.501 j	<1	82	4.564 j	NA	0.339 j	0.143 j	**2.06**	NA	0.13
MW-07A	SE of basins at CB	urficial Uppe	03/20/2018	**4.7**	<50	1.2	2	<25	<1	<1	7	0.025	<1	0.483 j	238	1.992 j	NA	<1	<0.2	0.3	NA	0.049 j
MW-07B	SE of basins at CB	urficial Uppe	03/20/2018	**4.8**	<50	1.4	8.8	<25	<1	<1	13	<0.025	<1	<1	44	10	NA	<1	<0.2	**0.511**	NA	0.051 j
MW-07C	SE of basins at CB	urficial Lowe	03/20/2018	**5.0**	566	28	84	160	<1	<1	60	0.04	<1	**5.41**	43	**334**	NA	<1	<0.2	**0.409**	NA	<0.1
MW-07C	SE of basins at CB	urficial Lowe	06/20/2018	**4.7**	360	15	60	94	<1	<1	42	0.046	<1	0.986 j	8.176 j	**131**	NA	<1	<0.2	0.289 j	NA	0.1102 j
MW-07C	SE of basins at CB	urficial Lowe	09/11/2018	**5.1**	240	10	39	100	<1	<1	34	0.046	<1	0.542 j	6.673 j	**68**	NA	<1	<0.2	0.271 j	NA	0.0794 j
MW-08	NE of basins outside CB	urficial Lowe	03/20/2018	**5.6**	32.594 j	12	14	44	<1	<1	37	<0.025	<1	0.916 j	29	**164**	NA	<1	0.131 j	0.187 j	0.74	<0.1
MW-08	NE of basins outside CB	urficial Lowe	06/18/2018	**5.5**	29.937 j	14	15	52	<1	<1	40	<0.025	<1	0.665 j	.169001	**119**	NA	<1	<0.2	**0.4 B2**	0.37	0.0552 j
MW-08	NE of basins outside CB	urficial Lowe	09/10/2018	**5.7**	33.851 j	13	13	52	<1	<1	42	<0.025	<1	0.753 j	17	**222**	NA	<1	<0.2	0.276 j	0.1916	0.0469 j
MW-08B	NE of basins outside CB	urficial Uppe	09/10/2018	**6.3**	<50	4.1	4.2	47	<1	1.35	5	<0.025	0.788 j	**1.12**	**6780**	14	NA	<1	<0.2	**0.551**	-0.009	<0.1
MW-08D	NE of basins outside CB	ee Dee Uppe	09/10/2018	**9.4**	**2830**	**740**	87	**1800**	<1	1.36	23	0.094	<1	<1	24	<5	NA	<1	<0.2	**0.501**	0.8295	1.2
MW-08E	NE of basins outside CB	ee Dee Lowe	03/20/2018	8.3	**4210**	**1700**	120	**3300**	<1	0.673 j	10	<0.025	<1	<1	**546**	12	NA	<1	<0.2	<0.3	NA	<5
MW-08E	NE of basins outside CB	ee Dee Lowe	06/18/2018	8.0	**4320**	**1700**	97	**3100**	<1	<1	10	0.069	0.641 j	<1	**554**	13	NA	<1	<0.2	0.273 j,B2	NA	**3.4 j**
MW-08E	NE of basins outside CB	ee Dee Lowe	09/11/2018	**11.4**	**2710**	**1000**	75	**2500**	0.713 j	0.339 j	456	**24.6**	**21**	**2.4**	7.498 j	<5	NA	0.796 j	<0.2	0.28 j	4.17	**2.315 j**
MW-11	E of basins outside CB	urficial Lowe	03/20/2018	**4.5**	36.029 j	7.8	21	41	<1	<1	62	0.045	<1	0.475 j	146	**70**	NA	<1	<0.2	**0.516**	NA	<0.1
MW-11	E of basins outside CB	urficial Lowe	06/19/2018	**4.6**	31.901 j	8.3	26	42	<1	<1	64	0.05	<1	0.477 j	92	**60**	NA	<1	<0.2	**0.474 B2**	NA	0.0518 j
MW-11	E of basins outside CB	urficial Lowe	09/11/2018	**4.7**	38.36 j	7.9	31	62	<1	<1	60	0.04	<1	0.342 j	112	**71**	NA	<1	<0.2	**0.541**	NA	0.0479 j
MW-12R IMP	E of basins outside CB	urficial Lowe	03/21/2018	**5.2**	**838**	41	250	440	<1	0.64 j	65	<0.025	1.04	**4.43**	**2540**	**573**	NA	<1	0.106 j	**0.327**	NA	<0.2
MW-12R	E of basins outside CB	urficial Lowe	03/21/2018	**5.2**	**871**	41	230	430	<1	0.627 j	64	NA	0.939 j	**4.33**	NA	NA	NA	<1	<1	NA	0.964	<0.2
MW-12R	E of basins outside CB	urficial Lowe	06/20/2018	**5.9**	523	25	**290**	**620**	<1	0.859 j	52	<0.025 P4	0.582 j	**1.65**	**1240**	**345**	NA	0.56 j	0.134 j	**0.399**	NA	<0.5
MW-12R	E of basins outside CB	urficial Lowe	09/11/2018	**6.2**	509	25	**280**	**700**	<1	0.892 j	60	<0.025	0.44 j	**2.31**	**3330**	**648**	NA	0.523 j	0.098 j	**0.42**	NA	<0.5
MW-12R IAP	E of basins outside CB	urficial Lowe	09/11/2018	**6.2**	547	27	**270**	**660**	<1	0.889 j	61	NA	0.398 j	**2.17**	NA	NA	NA	0.531 j	<1	NA	NA	<0.5
MW-16D	NE corner of FADA	urficial Lowe	03/19/2018	**4.8**	585	98	100	310	<1	0.578 j	38	<0.025	<1	**4.52**	**1080**	**239**	NA	<1	<0.2	**2.33**	NA	0.1412 j

	PARAME	D 40CFR257 APPENDIX III CONSTITUENT				INORGANIC PARAMETERS (TOTAL CONCENTRATION)													
Reporting Units	**S.U.**	**ug/L**	**mg/L**	**mg/L**	**mg/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**mg-N/L**	**ug/L**	**ug/L**	**ug/L**	**pCi/L**	**mg/L**
15A NCAC 02L Standard	**6.5-8.5**	**700**	**250**	**250**	**500**	**1***	**10**	**700**	**10**	**10**	**1***	**300**	**50**	**10**	**20**	**0.2***	**0.3***	**5^**	**2**
Provisional Background Threshold Values (Surficial Upper Unit)	**3.9-5.0**	**50**	**4.73**	**15.6**	**25**	**1**	**1**	**45**	**0.03**	**1**	**4**	**1494**	**38**	**NE**	**1**	**0.2**	**0.621**	**2.75**	**NE**
Provisional Background Threshold Values (Surficial Lower Unit)	**4.9-7.4**	**50**	**23.6**	**16**	**210**	**1**	**5**	**97**	**0.12**	**1**	**3**	**13416**	**746**	**NE**	**1**	**0.2**	**1.68**	**5.32**	**NE**
Provisional Background Threshold Values (Pee Dee Upper Unit)	**7.8-9.3**	**3010**	**1932**	**277**	**2442**	**1**	**2.78**	**18.7**	**0.118**	**1**	**1**	**305**	**118**	**NE**	**1**	**0.2**	**1.91**	**4**	**NE**
Provisional Background Threshold Values (Pee Dee Lower Unit)	**6.9-9.7**	**4730**	**2567**	**171**	**3400**	**1**	**3**	**70**	**0.2**	**1**	**1**	**1230**	**93.9**	**NE**	**1**	**0.2**	**0.693**	**2.06**	**NE**

				PARAME	D 40CFR257 APPENDIX III CONSTITUENT				INORGANIC PARAMETERS (TOTAL CONCENTRATION)													
Sample ID	**Location Description**	**Sample Location Aquifer Name**	**Sample Collection Date**	**pH**	**Boron**	**Chloride**	**Sulfate**	**Total Dissolved Solids**	**Antimony**	**Arsenic**	**Barium**	**Chromium (VI)**	**Chromium**	**Cobalt**	**Iron**	**Manganese**	**Nitrate (as N)**	**Selenium**	**Thallium**	**Vanadium**	**Total Radium**	**Fluoride**
MW-16D	NE corner of FADA	urficial Lowe	06/20/2018	**4.7**	571	98	100	280	<1	0.596 j	39	<0.025 P4	<1	**4.43**	**1090**	**221**	NA	<1	0.136 j	**1.9**	NA	0.122 j
MW-16D	NE corner of FADA	urficial Lowe	10/23/2018	**5.1**	539	100	99	330	<1	0.449 j	42	<0.025	<1	**4.3**	**1020 B2**	**195**	NA	<1	<0.2	**1.64**	NA	0.036 j
MW-19	E of basins at CB	urficial Lowe	03/21/2018	**6.3**	**1140**	21	75	190	<1	1.34	53	0.033	<1	**1.92**	295	**331**	NA	<1	**0.26**	**1.11**	NA	<0.2
MW-19	E of basins at CB	urficial Lowe	06/19/2018	**6.2**	**1020**	21	69	170	<1	0.939 j	52	0.036	<1	**1.24**	179	**224**	NA	0.378 j	0.197 j	**1.3 B2**	NA	<0.2
MW-19	E of basins at CB	urficial Lowe	09/11/2018	**6.1**	**1030**	18	65	160	<1	1.19	51	0.041	<1	**1.47**	261	**294**	NA	<1	0.176 j	**1.47**	NA	0.0491 j
MW-20	South of FADA, old plant area	urficial Uppe	03/19/2018	7.0	33.305 j	5.3	110	370	<1	0.435 j	97	0.046	<1	**1.09**	**1560**	**74**	NA	<1	0.132 j	**18.6**	NA	0.3875 j
MW-20	South of FADA, old plant area	urficial Uppe	06/20/2018	6.8	32.552 j	6.8	250	**520**	<1	2.33	49	0.025 P4	0.361 j	**2.92**	**5870**	**51**	NA	2.06	0.151 j	**172**	NA	0.24
MW-20	South of FADA, old plant area	urficial Uppe	10/23/2018	6.7	96	8.4	**600**	**960**	<1	0.771 j	409	0.1	<1	0.434 j	**366 B2**	**192**	NA	<1	**0.303**	**14.9**	NA	0.115 j
MW-20D	South of FADA, old plant area	urficial Lowe	03/19/2018	7.2	330	62	64	300	<1	3.16	57	<0.025	<1	0.383 j	**1660**	**292**	NA	<1	0.081 j	0.243 j	NA	0.12
MW-20D	South of FADA, old plant area	urficial Lowe	06/20/2018	7.1	335	59	64	270	<1	4.44	57	<0.025	0.363 j	0.972 j	**607**	**344**	NA	<1	<0.2	0.286 j	NA	0.12
MW-20D	South of FADA, old plant area	urficial Lowe	10/23/2018	7.1	70	67	44	250	<1	<1	36	<0.025 M1	<1	<1	**831 B2**	**76**	NA	<1	<0.2	**0.324**	NA	0.055 j
MW-21C	E of basins at CB	urficial Lowe	03/21/2018	6.6	**748**	15	45	140	<1	**30.2**	39	<0.025	<1	**3.92**	**2550**	**316**	NA	<1	0.093 j	**0.906**	NA	0.039 j
MW-21C	E of basins at CB	urficial Lowe	06/19/2018	**6.2**	650	13	39	120	<1	**13.1**	44	<0.025	<1	**2.01**	**434**	**205**	NA	<1	0.134 j	**3.31 B2**	NA	0.141 j
MW-21C	E of basins at CB	urficial Lowe	09/11/2018	**6.2**	600	12	36	120	<1	**16**	53	<0.025	<1	**4.28**	**1130**	**358**	NA	<1	0.102 j	**0.985**	NA	0.0951 j
MW-22B	E of basins at CB	urficial Uppe	03/21/2018	**5.7**	<50	2.2	3.3	34	<1	<1	6	0.16	<1	<1	17	6	NA	<1	0.1 j	0.251 j	NA	<0.1
MW-22B	E of basins at CB	urficial Uppe	06/19/2018	**4.9**	<50	2.6	3.9	<25	<1	<1	7	0.18	<1	<1	8.91 j	6	NA	<1	<0.2	0.267 j,B2	NA	<0.1
MW-22B	E of basins at CB	urficial Uppe	09/11/2018	**5.2**	<50	3.4	3.2	<25	<1	<1	6	0.09	<1	<1	<10	6	NA	<1	<0.2	0.197 j	NA	<0.1
MW-22C	E of basins at CB	urficial Lowe	03/21/2018	6.8	**1000**	20	56	170	<1	<1	51	0.027	<1	**2.66**	79	**252**	NA	1.91	**0.231**	**0.357**	NA	<0.2
MW-22C	E of basins at CB	urficial Lowe	06/19/2018	**6.2**	**1130**	25	66	180	<1	<1	58	<0.025	<1	**2.78**	92	**281**	NA	1.24	**0.26**	**0.33 B2**	NA	<0.2
MW-22C	E of basins at CB	urficial Lowe	09/11/2018	**6.2**	**1020**	22	57	180	<1	<1	58	<0.025	<1	**3.48**	65	**327**	NA	1.54	0.186 j	0.266 j	NA	0.0447 j
MW-23B	E of basins at CB	urficial Uppe	03/21/2018	**6.3**	21.184 j	2.6	11	71	<1	<1	19	0.056 M1	<1	<1	5.404 j	3.278 j	NA	1.28	<0.2	**0.499**	NA	<0.1
MW-23B	E of basins at CB	urficial Uppe	06/20/2018	**6.2**	<50	2.3	11	58	<1	<1	17	0.074	<1	<1	16	2.193 j	NA	0.598 j	<0.2	**0.342**	NA	0.0606 j
MW-23B	E of basins at CB	urficial Uppe	10/22/2018	**5.8**	<50	5.3	20	100	<1	<1	29	0.079	<1	<1	8.276 j	2.073 j	NA	0.561 j	<0.2	**0.367**	NA	0.0399 j
MW-23C	E of basins at CB	urficial Lowe	03/21/2018	6.5	261	5.7	19	65	<1	<1	33	0.043	<1	**9.69**	26	20	NA	4.86	0.096 j	**0.497**	NA	<0.1
MW-23C	E of basins at CB	urficial Lowe	06/20/2018	**6.4**	146	3.4	13	54	<1	<1	26	0.06 M1,R1	<1	**5.92**	24	14	NA	4.4	<0.2	**0.429**	NA	0.0517 j
MW-23C	E of basins at CB	urficial Lowe	10/23/2018	**6.1**	134	3.1	21	65	<1	<1	44	0.047	0.394 j	**7.98**	244 B2	19	NA	4.44	<0.2	**0.76**	NA	<0.1
MW-23D	E of basins at CB	ee Dee Uppe	03/21/2018	**9.0**	**821**	160	20	**520**	<1	0.667 j	3.716 j	0.068	0.48 j	<1	45	8	NA	<1	<0.2	**0.41**	0.348	0.62
MW-23D	E of basins at CB	ee Dee Uppe	06/20/2018	8.3	**884**	160	19	**540**	<1	0.882 j	4.255 j	0.044	0.719 j	<1	63	11	NA	<1	0.112 j	**0.372**	0.495	0.76
MW-23D	E of basins at CB	ee Dee Uppe	10/22/2018	**9.2**	**880**	160	20	**520**	<1	0.667 j	4.002 j	0.044	<1	<1	56	13	NA	<1	<0.2	0.283 j	0.595	0.74
MW-23E	E of basins at CB	ee Dee Lowe	03/21/2018	**9.5**	**2420**	**700**	140	**1400**	<1	0.644 j	8	<0.025	0.367 j	<1	12	<5	NA	<1	<0.2	**0.331**	0.274	1.6
MW-23E	E of basins at CB	ee Dee Lowe	06/20/2018	**9.1**	**2400**	**510**	100	**1400**	<1	0.621 j	8	0.03	0.442 j	<1	16	<5	NA	<1	<0.2	**0.371**	0.2519	2
MW-23E	E of basins at CB	ee Dee Lowe	10/22/2018	**9.4**	**2450**	**500**	99	**1300**	<1	0.517 j	7	0.041	<1	<1	13	<5	NA	<1	<0.2	0.243 j	0.1046	1.8
MW-24RB	E of basins inside CB	urficial Uppe	03/22/2018	**5.6**	<50	2.9	4.2	<25	<1	<1	15	<0.025	<1	<1	195	13	NA	<1	<0.2	0.127 j	NA	<0.1
MW-24RB	E of basins inside CB	urficial Uppe	06/20/2018	**5.3**	<50	2.8	3.6	<25	<1	<1	25	<0.025	<1	<1	14	9	NA	<1	<0.2	0.111 j	NA	0.0417 j
MW-24RB	E of basins inside CB	urficial Uppe	09/11/2018	**4.9**	19.178 j	4.4	4.2	42	<1	<1	44	0.031	<1	<1	42	22	NA	<1	<0.2	0.128 j	NA	0.0647 j
MW-24RC	E of basins inside CB	urficial Lowe	03/22/2018	6.5	43.389 j	2.7	3.6	<25	0.641 j	<1	6	0.037	<1	0.513 j	**337**	9	NA	<1	**0.251**	**0.452**	NA	<0.1
MW-24RC	E of basins inside CB	urficial Lowe	06/20/2018	**6.3**	73	1.4	4	<25	0.548 j	0.391 j	7	<0.025	<1	0.634 j	**348**	8	NA	<1	**0.291**	**0.518**	NA	0.0414 j
MW-24RC	E of basins inside CB	urficial Lowe	09/11/2018	**6.2**	54	2.9	4.8	39	0.851 j	<1	7	<0.025	<1	0.855 j	211	3.023 j	NA	0.612 j	**0.284**	**0.576**	NA	<0.1
MW-27B	N of basins at CB	urficial Uppe	03/22/2018	**4.5**	39.434 j	3	15 M2	<25	<1	<1	44	0.083	<1	0.716 j	13	25	NA	5.01	0.118 j	0.176 j	NA	<0.1
MW-27B	N of basins at CB	urficial Uppe	06/20/2018	**4.6**	26.65 j	2.8	16	33	<1	<1	40	0.058	<1	0.615 j	5.313 j	23	NA	4.69	<0.2	0.226 j	NA	<0.1
MW-27B	N of basins at CB	urficial Uppe	09/10/2018	**4.8**	38.124 j	2.8	12	<25	<1	<1	40	0.061	<1	0.794 j	10	22	NA	4.33	0.1 j	0.144 j	NA	<0.1
MW-27C	N of basins at CB	urficial Lowe	03/22/2018	**4.4**	240	28	64	120	<1	<1	33	0.05	<1	**1.2**	38	**90**	NA	**21.6**	0.153 j	0.264 j	0.262	<0.1
MW-27C	N of basins at CB	urficial Lowe	06/20/2018	**4.8**	260	30	67	120	<1	<1	35	0.061	0.42 j	**1.42**	105	**93**	NA	**24.3**	0.124 j	**0.56**	0.933	<0.1
MW-27C	N of basins at CB	urficial Lowe	09/10/2018	**4.7**	248	28	64	110	<1	<1	31	0.082	<1	**1.36**	77	**78**	NA	**21.4**	0.156 j	**0.427**	0.928	<0.1
MW-28B	SE of basins beyond CB	urficial Uppe	03/21/2018	**5.9**	<50	3.4	9.6	61	<1	<1	45	0.072	1.11	<1	7.908 j	38	NA	<1	0.094 j	0.126 j	NA	<0.1
MW-28B	SE of basins beyond CB	urficial Uppe	06/19/2018	**5.3**	<50	4.1	11	34	<1	<1	43	0.081	0.369 j	<1	103	**75**	NA	<1	<0.2	**0.377**	NA	0.0844 j
MW-28B	SE of basins beyond CB	urficial Uppe	09/11/2018	**5.1**	<50	3.6	11	55	<1	<1	51	0.044	0.672 j	<1	4.225 j	42	NA	<1	<0.2	0.2 j	NA	0.12
MW-28C	SE of basins beyond CB	urficial Lowe	03/21/2018	**5.3**	22.904 j	3	12	53	<1	<1	44	0.2	0.363 j	<1	11	17	NA	<1	<0.2	**0.471**	NA	<0.1
MW-28C	SE of basins beyond CB	urficial Lowe	06/19/2018	**4.8**	<50	3.1	11	32	<1	<1	40	0.22 P4	0.437 j	<1	13	17	NA	<1	0.097 j	**0.506**	NA	0.053 j
MW-28C	SE of basins beyond CB	urficial Lowe	09/11/2018	**5.0**	<50	3.1	8.4	33	<1	<1	36	0.21	<1	<1	5.208 j	18	NA	<1	<0.2	**0.433**	NA	0.0466 j
MW-31RC IMP	E of basins outside CB at propety line	urficial Lowe	03/21/2018	**5.1**	**799**	78	82	250	<1	<1	30	<0.025	0.378 j	**69.6**	**5120**	**1100**	NA	<1	0.178 j	**0.32**	0.568	<0.5
MW-31RC	E of basins outside CB at propety line	urficial Lowe	03/21/2018	**5.1**	**847**	75	87	240	<1	<1	32	NA	<1	**61.9**	NA	NA	NA	<1	<1	NA	0.679	<0.5

	) PARAME	D 40CFR257 APPENDIX III CONSTITUENT				INORGANIC PARAMETERS (TOTAL CONCENTRATION)													
Reporting Units	S.U.	ug/L	mg/L	mg/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg-N/L	ug/L	ug/L	ug/L	pCi/L	mg/L
15A NCAC 02L Standard	6.5-8.5	700	250	250	500	1*	10	700	10	10	1*	300	50	10	20	0.2*	0.3*	5^	2
Provisional Background Threshold Values (Surficial Upper Unit)	3.9-5.0	50	4.73	15.6	25	1	1	45	0.03	1	4	1494	38	NE	1	0.2	0.621	2.75	NE
Provisional Background Threshold Values (Surficial Lower Unit)	4.9-7.4	50	23.6	16	210	1	5	97	0.12	1	3	13416	746	NE	1	0.2	1.68	5.32	NE
Provisional Background Threshold Values (Pee Dee Upper Unit)	7.8-9.3	3010	1932	277	2442	1	2.78	18.7	0.118	1	1	305	118	NE	1	0.2	1.91	4	NE
Provisional Background Threshold Values (Pee Dee Lower Unit)	6.9-9.7	4730	2567	171	3400	1	3	70	0.2	1	1	1230	93.9	NE	1	0.2	0.693	2.06	NE

				) PARAME	D 40CFR257 APPENDIX III CONSTITUENT				INORGANIC PARAMETERS (TOTAL CONCENTRATION)													
Sample ID	**Location Description**	**Sample Location Aquifer Name**	**Sample Collection Date**	**pH**	**Boron**	**Chloride**	**Sulfate**	**Total Dissolved Solids**	**Antimony**	**Arsenic**	**Barium**	**Chromium (VI)**	**Chromium**	**Cobalt**	**Iron**	**Manganese**	**Nitrate (as N)**	**Selenium**	**Thallium**	**Vanadium**	**Total Radium**	**Fluoride**
MW-31RC	E of basins outside CB at propety line	urficial Lowe	06/20/2018	**4.8**	634	55	81	200	<1	<1	26	<0.025	<1	**46.1**	**3910**	**887**	NA	<1	<0.2	**0.303**	0.407	<0.2
MW-31RC	E of basins outside CB at property line	urficial Lowe	10/23/2018	**5.4**	350	30	42	92	<1	<1	20	<0.025	<1	**25.1**	**2060**	**524**	NA	<1	<0.2	0.184 j	0.41033	<0.2
MW-31RC IAP	E of basins outside CB at property line	urficial Lowe	10/23/2018	**5.4**	345	31	51	88	<1	<1	20	NA	<1	**24.4**	NA	NA	NA	<1	<1	NA	0.333	<0.1
MW-32C	SE of basins oustside CB	urficial Lowe	03/20/2018	**4.2**	<50	3	6.7	<25	<1	<1	51	<0.025	<1	<1	4.687 j	33	NA	<1	0.107 j	0.238 j	1.431	<0.1
MW-32C	SE of basins oustside CB	urficial Lowe	06/19/2018	**4.2**	<50	3.2	7.9	<25	<1	<1	75	<0.025 P4	<1	<1	6.08 j	34	NA	0.399 j	<0.2	**0.326 B2**	0.976	0.0648 j
MW-32C	SE of basins oustside CB	urficial Lowe	09/11/2018	**4.8**	<50	2.8	8.5	29	<1	<1	66	<0.025	<1	<1	7.191 j	31	NA	<1	<0.2	0.238 j	1.103	0.0776 j
MW-33C	SE of basins oustside CB near property line	urficial Lowe	03/20/2018	**5.2**	<50	3.3	9.8	28	<1	<1	38	0.06	<1	<1	11	29	NA	<1	0.157 j	**0.325**	0.4597	<0.1
MW-33C	SE of basins oustside CB near property line	urficial Lowe	06/19/2018	**4.7**	<50	2.1	7.8	<25	<1	<1	27	0.043	<1	<1	18	16	NA	<1	<0.2	**0.394 B2**	0.238	<0.1
MW-33C	SE of basins oustside CB near property line	urficial Lowe	09/11/2018	**5.1**	<50	2.1	8.8	39	<1	<1	30	0.025	<1	<1	13	18	NA	<1	<0.2	**0.308**	0.086	0.0465 j
MW-36C	N of basins inside CB	urficial Lowe	03/22/2018	**5.5**	308	22	61	130	<1	<1	33	0.43	0.439 j	**1.2**	31	20	NA	**27.1**	**0.298**	**0.548**	0.2128	<0.1
MW-36C	N of basins inside CB	urficial Lowe	06/19/2018	**5.6**	297	22	60	110	<1	<1	34	0.27	0.439 j	**1.16**	54	21	NA	**26.7**	0.105 j	**0.492 B2**	0.253	<0.1
MW-36C	N of basins inside CB	urficial Lowe	09/10/2018	**5.5**	251	16	48	93	<1	0.397 j	33	0.22	1.48	**1.48**	**794**	18	NA	**20.1**	0.091 j	**2.85**	-0.067	<0.1
MW-37B CCR	SE of basins outside CB	urficial Uppe	02/19/2018	**4.8**	<50	4.7	3.5	<25	<1	<1	8	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	0.387	0.24
MW-37B	SE of basins outside CB	urficial Uppe	03/20/2018	**4.7**	<50	4.5	2.9	<25	<1	<1	8	<0.025	<1	<1	8.531 j	4.42 j	NA	<1	0.19 j	<0.3	0.81	0.14 j
MW-37B CCR	SE of basins outside CB	urficial Uppe	05/21/2018	**4.4**	<50	3.6	5.3	<25	<1	<1	8	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	0.761	0.24
MW-37B	SE of basins outside CB	urficial Uppe	06/19/2018	**4.5**	<50	4.2	4.8	<25	<1	<1	8	<0.025 P4	<1	<1	19	5	NA	<1	<0.2	**0.301**	0.722	0.23
MW-37B	SE of basins outside CB	urficial Uppe	09/11/2018	**4.4**	<50	3.4	6.6	<25	<1	<1	7	<0.025	<1	<1	.157001	3.586 j	NA	<1	<0.2	0.178 j	0.5829	0.19
MW-37C CCR	SE of basins outside CB	urficial Lowe	02/19/2018	**6.2**	<50	3.2	8.9	86	<1	2.24	27	NA	<1	**2.12**	NA	NA	NA	<1	<0.2	NA	0.599	<0.1
MW-37C	SE of basins outside CB	urficial Lowe	03/20/2018	**6.2**	<50	3.2	8.5	62	<1	2.56	27	<0.025	0.429 j	**2.48**	**8460**	**247**	NA	<1	0.115 j	**0.804**	0.1116	<0.1
MW-37C CCR	SE of basins outside CB	urficial Lowe	05/21/2018	**6.1**	<50	3.1	9	82	<1	2.92	30	NA	0.671 j	**2.9**	NA	NA	NA	<1	0.085 j	NA	0.518	<0.1
MW-37C	SE of basins outside CB	urficial Lowe	06/19/2018	**5.9**	<50	3	8.1	63	<1	2.29	25	<0.025	0.424 j	**1.81**	**8220**	**209**	NA	<1	0.09 j	**0.945**	0.841	<0.1
MW-37C	SE of basins outside CB	urficial Lowe	09/11/2018	**6.0**	<50	3	6.3	50	<1	2.48	19	<0.025	0.774 j	**1.91**	**6990**	**140**	NA	<1	0.096 j	**1.1**	0.429	<0.1
MW-37CD	SE of basins outside CB	ee Dee Uppe	03/19/2018	**10.1**	55	6.9	3.9	180	0.581 j	5.95	11	0.15	1.55	<1	**461**	4.717 j	NA	0.358 j	<0.2	**10.6**	0.959	0.23
MW-37CD	SE of basins outside CB	ee Dee Uppe	06/19/2018	**9.7**	47.743 j	6.8	7.1	150	0.737 j	6.87	12	<0.025 P4	1.86	<1	**377**	4.376 j	NA	0.416 j	<0.2	**12.8**	0.144	0.24
MW-37CD	SE of basins outside CB	ee Dee Uppe	09/11/2018	**9.7**	52	6.8	8.7	170	0.879 j	8.4	14	0.28	2.68	<1	**377**	4.439 j	NA	0.386 j	<0.2	**16.8**	0.0744	0.26
MW-37D CCR	SE of basins outside CB	ee Dee Uppe	02/19/2018	8.5	122	49	8	190	<1	1.24	6	NA	<1	<1	NA	NA	NA	<1	<0.2	NA	1.123	0.19
MW-37D	SE of basins outside CB	ee Dee Uppe	03/19/2018	**8.6**	131	49	8.2	200	<1	1.38	6	0.035	<1	<1	74	18	NA	<1	<0.2	**0.659**	0.408	0.2
MW-37D CCR	SE of basins outside CB	ee Dee Uppe	05/21/2018	8.5	126	47	8.1	200	<1	1.54	6	NA	0.383 j	<1	NA	NA	NA	<1	<0.2	NA	0.641	0.19
MW-37D	SE of basins outside CB	ee Dee Uppe	06/19/2018	**8.7**	122	50	8.6	190	<1	1.49	6	<0.025	<1	<1	68	15	NA	<1	<0.2	**0.902**	0.2629	0.18
MW-37D	SE of basins outside CB	ee Dee Uppe	09/11/2018	**8.6**	130	48	8.4	190	<1	1.08	6	0.031	0.444 j	<1	102	19	NA	<1	<0.2	**0.744**	0.431	0.17
MW-37E	SE of basins outside CB	ee Dee Lowe	03/20/2018	8.4	**1460**	**550**	81	**1100**	**2.73**	<1	5	0.13	**30.2**	<1	296	14	NA	<1	<0.2	**0.416**	0.447	0.803 j
MW-37E	SE of basins outside CB	ee Dee Lowe	06/19/2018	8.3	**1540**	**420**	95	**1100**	0.845 j	<1	4.27 j	0.056	2.78	<1	164	15	NA	<1	<0.2	**0.376**	0.4093	1.4
MW-37E	SE of basins outside CB	ee Dee Lowe	09/11/2018	**9.3**	**1500**	**400**	81	**1100**	**7.09**	<1	13	0.057	3.94	<1	132	7	NA	<1	<0.2	**0.336**	0.71	1.3
MW-38B	N of basins outside CB	urficial Uppe	03/22/2018	**4.6**	<50	5	18	26	<1	<1	22	<0.025	<1	0.42 j	6.982 j	26	NA	<1	<0.2	0.183 j	NA	0.0814 j
MW-38B	N of basins outside CB	urficial Uppe	06/18/2018	**4.6**	<50	4.1	19	<25	<1	<1	20	<0.025	<1	0.404 j	5.73 j	16	NA	<1	0.084 j	0.29 j,B2	NA	0.0954 j
MW-38B	N of basins outside CB	urficial Uppe	09/11/2018	**4.7**	<50	4.1	20	<25	<1	<1	21	<0.025	<1	0.396 j	24	17	NA	<1	<0.2	0.182 j	NA	0.0811 j
MW-38C	N of basins outside CB	urficial Lowe	03/22/2018	**5.3**	247	43	65	150	<1	<1	35	0.68	0.578 j	**1.28**	16	**300**	NA	14.7	<0.2	0.204 j	0.365	<0.1
MW-38C	N of basins outside CB	urficial Lowe	06/18/2018	**5.6**	251	47	62	160	<1	<1	37	0.64	0.574 j	**1.78**	15	**294**	NA	17.1	0.171 j	**0.343 B2**	0.112	<0.1
MW-38C	N of basins outside CB	urficial Lowe	09/11/2018	**5.5**	223	34	53	120	<1	<1	30	0.51	0.501 j	**1.04**	3.597 j	**217**	NA	14.2	<0.2	0.23 j	0.273	<0.1
MW-38D	N of basins outside CB	ee Dee Uppe	03/22/2018	**9.8**	**1370**	**380**	99	**950**	<1	0.398 j	48	0.16	<1	<1	70	14	NA	<1	<0.2	**0.793**	0.4945	0.802 j
MW-38D	N of basins outside CB	ee Dee Uppe	06/18/2018	**8.6**	**1560**	**500**	140	**1300**	<1	<1	6	0.074	<1	<1	94	12	NA	<1	0.136 j	**0.802 B2**	0.124	1.2
MW-38D	N of basins outside CB	ee Dee Uppe	09/11/2018	**11.2**	**776**	230	51	**780**	<1	<1	216	0.4 M1	0.342 j	<1	4.587 j	<5	NA	<1	<0.2	0.191 j	1.599	0.626 j
MW-39B	N of basins outside CB	urficial Uppe	03/22/2018	**5.9**	19.455 j	4.4	<0.1	35	<1	0.467 j	2.124 j	<0.025	1.5	0.393 j	**5150**	**94**	NA	<1	0.086 j	**1.25**	NA	<0.1
MW-39B	N of basins outside CB	urficial Uppe	06/19/2018	**5.7**	18.107 j	5.1	<0.1	41	<1	0.511 j	1.78 j	<0.025	1.68	0.379 j	**5970**	**84**	NA	<1	<0.2	**1.23**	NA	<0.1
MW-39B	N of basins outside CB	urficial Uppe	09/11/2018	**5.7**	<50	5	<0.1	58	<1	0.467 j	1.833 j	<0.025	1.28	0.376 j	**4760**	**85**	NA	<1	<0.2	**0.953**	NA	<0.1
MW-39C	N of basins outside CB	urficial Lowe	03/22/2018	**5.4**	<50	5.3	7.3	<25	<1	0.482 j	85	<0.025	0.634 j	**1.09**	**1330**	**57**	NA	<1	0.083 j	**2.42**	-0.3406	<0.1
MW-39C	N of basins outside CB	urficial Lowe	06/19/2018	**5.3**	<50	4.5	7.7	<25	<1	0.396 j	70	<0.025	0.461 j	0.626 j	**949**	**58**	NA	0.46 j	<0.2	**20.2**	0.568	<0.1
MW-39C	N of basins outside CB	urficial Lowe	09/11/2018	**5.3**	24.331 j	6.4	9.9	52	<1	0.485 j	76	<0.025	0.361 j	0.406 j	**759**	**67**	NA	0.819 j	<0.2	**13**	0.5035	<0.1
MW-39D	N of basins outside CB	ee Dee Uppe	03/22/2018	**10.5**	**1080**	**410**	41	**1100**	<1	0.913 j	8	0.066	0.385 j	<1	15	<5	NA	<1	<0.2	0.118 j	0.6731	0.694 j
MW-39D	N of basins outside CB	ee Dee Uppe	06/19/2018	**10.5**	**1070**	**440**	44	**1100**	<1	0.992 j	8	0.047	0.706 j	<1	22	<5	NA	<1	0.111 j	0.202 j	0.444	0.827 j
MW-39D	N of basins outside CB	ee Dee Uppe	09/11/2018	**10.3**	**1080**	**410**	47	**1200**	<1	0.859 j	7	0.046	<1	<1	6.734 j	<5	NA	<1	<0.2	0.196 j	0.08292	0.756 j
MW-40B	N of basins outside CB	urficial Uppe	03/22/2018	**5.2**	30.182 j	2.7	17	51	<1	<1	18	0.029 M1	0.432 j	0.993 j	**6020**	19	NA	<1	**0.244**	**0.551**	NA	<0.1

	PARAME	D 40CFR257 APPENDIX III CONSTITUENT				INORGANIC PARAMETERS (TOTAL CONCENTRATION)													
Reporting Units	S.U.	ug/L	mg/L	mg/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg-N/L	ug/L	ug/L	ug/L	pCi/L	mg/L
15A NCAC 02L Standard	6.5-8.5	700	250	250	500	1*	10	700	10	10	1*	300	50	10	20	0.2*	0.3*	5^	2
Provisional Background Threshold Values (Surficial Upper Unit)	3.9-5.0	50	4.73	15.6	25	1	1	45	0.03	1	4	1494	38	NE	1	0.2	0.621	2.75	NE
Provisional Background Threshold Values (Surficial Lower Unit)	4.9-7.4	50	23.6	16	210	1	5	97	0.12	1	3	13416	746	NE	1	0.2	1.68	5.32	NE
Provisional Background Threshold Values (Pee Dee Upper Unit)	7.8-9.3	3010	1932	277	2442	1	2.78	18.7	0.118	1	1	305	118	NE	1	0.2	1.91	4	NE
Provisional Background Threshold Values (Pee Dee Lower Unit)	6.9-9.7	4730	2567	171	3400	1	3	70	0.2	1	1	1230	93.9	NE	1	0.2	0.693	2.06	NE

				PARAME	D 40CFR257 APPENDIX III CONSTITUENT				INORGANIC PARAMETERS (TOTAL CONCENTRATION)													
Sample ID	**Location Description**	**Sample Location Aquifer Name**	**Sample Collection Date**	**pH**	**Boron**	**Chloride**	**Sulfate**	**Total Dissolved Solids**	**Antimony**	**Arsenic**	**Barium**	**Chromium (VI)**	**Chromium**	**Cobalt**	**Iron**	**Manganese**	**Nitrate (as N)**	**Selenium**	**Thallium**	**Vanadium**	**Total Radium**	**Fluoride**
MW-40B	N of basins outside CB	Surficial Uppe	06/19/2018	**5.8**	23.998 j	3.6	26	68	<1	<1	20	<0.025	0.449 j	**1.69**	**12200**	23	NA	<1	**0.207**	**0.442 B2**	NA	<0.1
MW-40B	N of basins outside CB	Surficial Uppe	09/10/2018	**5.5**	25.145 j	3.8	39	74	<1	<1	21	<0.025	0.556 j	**1.74**	**10900**	24	NA	<1	0.198 j	**0.436**	NA	<0.1
MW-40C	N of basins outside CB	Surficial Lowe	03/22/2018	**6.1**	432	43	85	220	<1	<1	26	<0.025	<1	**2.57**	6.517 j	**103**	NA	**40.9**	**0.232**	**0.502**	NA	<0.2
MW-40C	N of basins outside CB	Surficial Lowe	06/19/2018	**6.0**	450	44	82	200	<1	<1	27	<0.025	0.416 j	**3.61**	12	**177**	NA	**89.7**	**0.211**	**0.532 B2**	NA	<0.2
MW-40C	N of basins outside CB	Surficial Lowe	09/10/2018	**5.9**	427	45	82	210	<1	<1	27	<0.025	<1	**3.04**	7.526 j	39	NA	**51.9**	**0.205**	**0.442**	NA	<0.2
MW-40D	N of basins outside CB	Pee Dee Uppe	03/22/2018	**9.7**	**1200**	**360**	59	**960**	<1	0.605 j	7	0.088	0.701 j	<1	33	<5	NA	<1	<0.2	0.29 j	NA	0.8
MW-40D	N of basins outside CB	Pee Dee Uppe	06/19/2018	**9.4**	**1210**	**360**	66	**1000**	<1	0.629 j	8	<0.025	0.827 j	<1	51	<5	NA	<1	<0.2	**0.376 B2**	NA	1
MW-40D	N of basins outside CB	Pee Dee Uppe	09/10/2018	**9.3**	**1220**	**350**	64	**980**	<1	0.474 j	8	<0.025	0.36 j	<1	22	<5	NA	<1	<0.2	0.233 j	NA	0.912 j
MW-41B	N of basins outside CB	Surficial Uppe	09/10/2018	**4.9**	<50	2.1	11	<25	<1	<1	17	<0.025	0.364 j	**1.5**	**703**	17	NA	<1	<0.2	<0.3	0.037	0.0506 j
MW-41C	N of basins outside CB	Surficial Lowe	09/10/2018	**6.4**	<50	3.2	0.82	<25	<1	**12.2**	7	<0.025	0.623 j	**3.35**	**23300**	**180**	NA	<1	<0.2	**0.736**	0.1305	<0.1
MW-41D	N of basins outside CB	Pee Dee Uppe	09/10/2018	8.4	**2470**	**610**	64	**1400**	0.982 j	1.28	16	<0.025	0.709 j	<1	135	8	NA	<1	<0.2	**0.345**	0.397	1.2
MW-41E	N of basins outside CB	Pee Dee Lowe	03/20/2018	7.8	**4100**	**1400**	89	**2900**	<1	<1	30	<0.025 M1	0.397 j	<1	**749**	32	NA	<1	<0.2	0.253 j	NA	0.912 j
MW-41E	N of basins outside CB	Pee Dee Lowe	06/18/2018	7.7	**4220**	**1400**	94	**2900**	<1	<1	36	0.025	0.669 j	<1	**730**	30	NA	<1	<0.2	**0.356 B2**	NA	**2.2**
MW-41E	N of basins outside CB	Pee Dee Lowe	09/11/2018	7.9	**4110**	**1300**	110	**2800**	0.661 j	1.39	70	0.18	1.53	<1	75	27	NA	<1	<0.2	**0.838**	NA	1.772 j
MW-42B	E of basins outside CB	Surficial Uppe	10/23/2018	**6.2**	<50	4	9	33	<1	<1	29	<0.025	<1	<1	**1620**	**342**	NA	<1	<0.2	0.233 j	0.4689	<0.1
MW-42C	E of basins outside CB	Surficial Lowe	10/23/2018	**5.5**	213	6.8	29	89	<1	<1	37	<0.025	0.441 j	0.413 j	**712**	33	NA	2.6	<0.2	**0.331**	0.415	<0.1
MW-42D	E of basins outside CB	Pee Dee Uppe	10/23/2018	**8.8**	493	130	8.8	410	<1	0.362 j	4.897 j	<0.025	0.856 j	<1	206 B2	13	NA	<1	<0.2	**0.51**	0.034	0.61
MW-IAP-01D	E of basins outside CB at propety line	Pee Dee Uppe	03/21/2018	8.0	**874**	190	32	**560**	0.381 j	2.93	6	NA	0.631 j	<1	NA	NA	NA	<1	<1	NA	0.1541	0.89
MW-IAP-01D	E of basins outside CB at property line	Pee Dee Uppe	10/24/2018	7.8	**822**	190	29	**590**	0.374 j	2.56	7	NA	0.525 j	<1	NA	NA	NA	<1	<1	NA	0.873	0.84
SMW-01B IMP	E of basins outside CB on adjacent property	Surficial Uppe	03/21/2018	**4.8**	301	17	80	140	<1	<1	77	<0.025	0.436 j	<1	**913**	29	NA	<1	<0.2	0.285 j	NA	<0.2
SMW-01B	E of basins outside CB on adjacent property	Surficial Uppe	03/21/2018	**4.8**	333	17	89	140	<1	<1	79	NA	0.381 j	<1	NA	NA	NA	<1	<1	NA	1.376	0.1386 j
SMW-01B	E of basins outside CB on adjacent property	Surficial Uppe	10/24/2018	**3.8**	45.912 j	0.99	13	51	<1	<1	18	NA	0.392 j	<1	NA	NA	NA	<1	<1	NA	1.247	0.062 j
SMW-01C IMP	E of basins outside CB on adjacent property	Surficial Lowe	03/21/2018	**4.8**	**799**	44	130	250	<1	0.413 j	33	<0.025	0.445 j	**3.22**	**362**	**554**	NA	<1	<0.2	**1.03**	NA	<0.5
SMW-01C	E of basins outside CB on adjacent property	Surficial Lowe	03/21/2018	**4.8**	**898**	46	140	260	<1	0.432 j	35	NA	0.364 j	**3.35**	NA	NA	NA	<1	<1	NA	0.339	<0.5
SMW-01C	E of basins outside CB on adjacent property	Surficial Lowe	06/19/2018	**4.7**	**850**	44	140	240	<1	0.498 j	32	<0.025	<1	**2.96**	**328**	**578**	NA	<1	0.106 j	**0.813 B2**	NA	<0.5
SMW-01C	E of basins outside CB on adjacent property	Surficial Lowe	10/24/2018	**4.4**	**743**	36	120	200	<1	0.415 j	31	<0.025	<1	**2.28**	**408**	**492**	NA	<1	<0.2	**0.423**	NA	<0.5
SMW-01C IAP	E of basins outside CB on adjacent property	Surficial Lowe	10/24/2018	**4.4**	**710**	36	110	220	<1	0.376 j	30	NA	<1	**2.18**	NA	NA	NA	<1	<1	NA	0.914	<0.5
SMW-02C IMP	E of basins outside CB on adjacent property	Surficial Lowe	03/21/2018	**5.5**	322	26	60	150	<1	<1	41	<0.025	<1	**1.03**	**1120**	**422**	NA	<1	<0.2	**0.362**	0	<0.1
SMW-02C	E of basins outside CB on adjacent property	Surficial Lowe	03/21/2018	**5.5**	344	27	62	150	<1	<1	41	NA	<1	**1.05**	NA	NA	NA	<1	<1	NA	0.2681	<0.1
SMW-02C	E of basins outside CB on adjacent property	Surficial Lowe	06/19/2018	**5.2**	354	26	72	140	<1	<1	44	<0.025 M1	0.38 j	**2.69**	**962**	**452**	NA	<1	0.165 j	**0.564 B2**	NA	0.0425 j
SMW-02C	E of basins outside CB on adjacent property	Surficial Lowe	10/24/2018	**4.7**	288	18	62	110	<1	0.454 j	37	<0.025	<1	**5.04**	**1040**	**488**	NA	<1	<0.2	**0.566**	NA	<0.1
SMW-02C IAP	E of basins outside CB on adjacent property	Surficial Lowe	10/24/2018	**4.7**	274	18	58	140	<1	0.376 j	36	NA	0.373 j	**4.81**	NA	NA	NA	<1	<1	NA	0.383	<0.1
SMW-03C IMP	E of basins outside CB on adjacent property	Surficial Lowe	03/21/2018	**5.3**	295	32	78	180	<1	0.518 j	81	<0.025	<1	**3.33**	**1630**	**326**	NA	<1	<0.2	**0.377**	NA	<0.1
SMW-03C	E of basins outside CB on adjacent property	Surficial Lowe	03/21/2018	**5.3**	326	32	83	180	<1	0.528 j	85	NA	<1	**3.49**	NA	NA	NA	<1	<1	NA	0.0093	<0.2
SMW-03C	E of basins outside CB on adjacent property	Surficial Lowe	06/19/2018	**4.9**	349	36	92	160	<1	<1	74	<0.025	<1	**6.36**	262	**360**	NA	<1	<0.2	**0.644 B2**	NA	0.0424 j
SMW-03C	E of basins outside CB on adjacent property	Surficial Lowe	10/24/2018	**4.7**	195	17	85	140	<1	<1	64	<0.025	<1	**7.18**	75	**315**	NA	<1	<0.2	0.298 j	NA	<0.2
SMW-03C IAP	E of basins outside CB on adjacent property	Surficial Lowe	10/24/2018	**4.7**	190	17	74	160	<1	<1	62	NA	<1	**7**	NA	NA	NA	<1	<1	NA	1.315	<0.2
SMW-04C IMP	E of basins outside CB on adjacent property	Surficial Lowe	03/21/2018	**5.6**	44.21 j	9.3	26	58	<1	<1	28	<0.025	<1	**2.99**	39	24	NA	<1	<0.2	**0.643**	NA	<0.1
SMW-04C	E of basins outside CB on adjacent property	Surficial Lowe	03/21/2018	**5.6**	49.117 j	9.8	28	73	<1	0.376 j	29	NA	<1	**3.14**	NA	NA	NA	<1	<1	NA	-0.2083	0.0519 j
SMW-04C	E of basins outside CB on adjacent property	Surficial Lowe	06/19/2018	**5.3**	45.214 j	9.6	32	64	<1	<1	47	<0.025	<1	**3.3**	81	28	NA	<1	0.122 j	**0.466**	NA	0.0519 j
SMW-04C	E of basins outside CB on adjacent property	Surficial Lowe	10/23/2018	**5.6**	48.569 j	9.6	27	56	<1	<1	41	<0.025	<1	**3.11**	33	25	NA	<1	<0.2	**0.394**	NA	<0.1
SMW-04C IAP	E of basins outside CB on adjacent property	Surficial Lowe	10/23/2018	**5.6**	533	19	71	110	<1	<1	26	NA	0.337 j	**9.85**	NA	NA	NA	0.748 j	<1	NA	0.4397	<0.1
SMW-05B	E of basins outside CB on adjacent property	Surficial Uppe	03/22/2018	6.6	58 B2	7.3	32	120	<1	0.836 j	10	NA	<1	<1	NA	NA	NA	<1	<1	NA	0.726	0.0461 j
SMW-05B	E of basins outside CB on adjacent property	Surficial Uppe	10/24/2018	**6.4**	61	6.9	21	140	<1	0.833 j	12	NA	0.379 j	<1	NA	NA	NA	<1	<1	NA	1.41	<0.1
SMW-05C IMP	E of basins outside CB on adjacent property	Surficial Lowe	03/22/2018	**4.9**	243	19	57	83	<1	<1	53	0.074	0.393 j	0.752 j	35	48	NA	<1	<0.2	0.186 j	NA	<0.1
SMW-05C	E of basins outside CB on adjacent property	Surficial Lowe	03/22/2018	**4.9**	258 B2	20	38	76	<1	<1	54	NA	0.433 j	0.715 j	NA	NA	NA	<1	<1	NA	1.104	0.0453 j
SMW-05C	E of basins outside CB on adjacent property	Surficial Lowe	06/19/2018	**4.9**	229	19	44	79	<1	<1	58	<0.025	0.355 j	**1.45**	26	**59**	NA	<1	0.16 j	0.184 j	NA	0.0572 j
SMW-05C	E of basins outside CB on adjacent property	Surficial Lowe	10/24/2018	**4.9**	245	17	35	70	<1	<1	60	<0.025	<1	**1.24**	32	**75**	NA	<1	<0.2	0.176 j	NA	<0.1
SMW-05C IAP	E of basins outside CB on adjacent property	Surficial Lowe	10/24/2018	**4.9**	235	17	35	110	<1	<1	59	NA	0.366 j	**1.24**	NA	NA	NA	<1	<1	NA	0.447	0.0418 j
SMW-06B IMP	E of basins outside CB on adjacent property	Surficial Uppe	03/22/2018	**6.1**	47.912 j	7.2	33	91	<1	<1	27	<0.025	<1	<1	67	23	NA	<1	<0.2	**0.844**	NA	<0.1
SMW-06B	E of basins outside CB on adjacent property	Surficial Uppe	03/22/2018	**6.1**	66 B2	7.3	33	80	<1	<1	27	NA	<1	<1	NA	NA	NA	<1	<1	NA	1.565	<0.1
SMW-06B	E of basins outside CB on adjacent property	Surficial Uppe	10/24/2018	**5.8**	61	7	26	79	<1	<1	28	NA	<1	<1	NA	NA	NA	<1	<1	NA	1.05	<0.1

	PARAMED 40CFR257 APPENDIX III CONSTITUENT					INORGANIC PARAMETERS (TOTAL CONCENTRATION)													
Reporting Units	S.U.	ug/L	mg/L	mg/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg-N/L	ug/L	ug/L	ug/L	pCi/L	mg/L
15A NCAC 02L Standard	6.5-8.5	700	250	250	500	1*	10	700	10	10	1*	300	50	10	20	0.2*	0.3*	5^	2
Provisional Background Threshold Values (Surficial Upper Unit)	3.9-5.0	50	4.73	15.6	25	1	1	45	0.03	1	4	1494	38	NE	1	0.2	0.621	2.75	NE
Provisional Background Threshold Values (Surficial Lower Unit)	4.9-7.4	50	23.6	16	210	1	5	97	0.12	1	3	13416	746	NE	1	0.2	1.68	5.32	NE
Provisional Background Threshold Values (Pee Dee Upper Unit)	7.8-9.3	3010	1932	277	2442	1	2.78	18.7	0.118	1	1	305	118	NE	1	0.2	1.91	4	NE
Provisional Background Threshold Values (Pee Dee Lower Unit)	6.9-9.7	4730	2567	171	3400	1	3	70	0.2	1	1	1230	93.9	NE	1	0.2	0.693	2.06	NE

				PARAMED 40CFR257 APPENDIX III CONSTITUENT					INORGANIC PARAMETERS (TOTAL CONCENTRATION)													
Sample ID	**Location Description**	**Sample Location Aquifer Name**	**Sample Collection Date**	**pH**	**Boron**	**Chloride**	**Sulfate**	**Total Dissolved Solids**	**Antimony**	**Arsenic**	**Barium**	**Chromium (VI)**	**Chromium**	**Cobalt**	**Iron**	**Manganese**	**Nitrate (as N)**	**Selenium**	**Thallium**	**Vanadium**	**Total Radium**	**Fluoride**
SMW-06C IMP	E of basins outside CB on adjacent property	urficial Lowe	03/22/2018	**4.9**	251	20	72	120	<1	<1	56	<0.025	<1	**5.6**	249	**323**	NA	<1	<0.2	**0.43**	NA	0.0732 j
SMW-06C	E of basins outside CB on adjacent property	urficial Lowe	03/22/2018	**4.9**	267 B2	21	65	120	<1	<1	56	NA	<1	**5.09**	NA	NA	NA	<1	<1	NA	0.4097	0.0461 j
SMW-06C	E of basins outside CB on adjacent property	urficial Lowe	06/19/2018	**5.0**	195	16	61	100	<1	0.781 j	45	<0.025 P4	0.626 j	**4.29**	**1120**	**262**	NA	<1	0.094 j	**1.88**	NA	0.0498 j
SMW-06C	E of basins outside CB on adjacent property	urficial Lowe	10/24/2018	**4.9**	245	20	73	120	<1	<1	60	<0.025	<1	**4.64**	**325**	**322**	NA	<1	<0.2	**0.804**	NA	0.0398 j
SMW-06C IAP	E of basins outside CB on adjacent property	urficial Lowe	10/24/2018	**4.9**	235	21	63	160	<1	<1	57	NA	<1	**4.61**	NA	NA	NA	<1	<1	NA	0.564	<0.1
SMW-06D IMP	E of basins outside CB on adjacent property	ee Dee Uppe	03/22/2018	8.1	**1080**	190	11	**650**	<1	1.55	20	0.16	0.715 j	<1	148	35	NA	<1	<0.2	**1.23**	0	1.2
SMW-06D	E of basins outside CB on adjacent property	ee Dee Uppe	03/22/2018	8.1	**1110 B2**	190	8.9	**650**	<1	1.5	20	NA	0.555 j	<1	NA	NA	NA	<1	<1	NA	-0.397	1.2
SMW-06D	E of basins outside CB on adjacent property	ee Dee Uppe	06/19/2018	8.1	**1120**	200	1.8	**700**	<1	1.49	17	0.085	0.536 j	<1	141	27	NA	<1	0.138 j	**1.15**	NA	1.2
SMW-06D	E of basins outside CB on adjacent property	ee Dee Uppe	10/24/2018	8.3	**1160**	190	4.9	**670**	<1	1.35	17	0.055	0.451 j	<1	158	29	NA	<1	<0.2	**1.04**	NA	1
SMW-06D IAP	E of basins outside CB on adjacent property	ee Dee Uppe	10/24/2018	8.3	**1110**	190	3.2	**720**	<1	1.31	18	NA	0.441 j	<1	NA	NA	NA	<1	<1	NA	0.2925	1

COLOR NOTES

Bold highlighted concentration indicates exceedance of the 15A NCAC 02L .0202 Standard or the IMAC. (Effective date for 15A NCAC 02L .0202 Standard and IMAC is April 1, 2013)

Turbidity of Sample ≥ 10 NTUs

Provisional Background Concentrations updated with Background Results through September 2017.

Analytical data review has not been completed for this dataset.

ABBREVIATION NOTES	
BGS - below ground surface	ND - Not detected
BOD - Biologic Oxygen Demand	NE - Not established
CB - Compliance Boundary	NA - Not available or Not Applicable
COD - Chemical Oxygen Demand	ND - Not detected
Deg C - Degrees Celsius	NE - Not established
DMAs - dimethylarsinic acid	NM - Not measured
DUP - Duplicate	NTUs - Nephelometric Turbidity Units
Eh - Redox Potential	pCi/L - picocuries per liter
ft - Feet	PSRG - Primary Soil Remediation Goals
GPM - gallons per minute	RL - Reporting Limit
IMAC - Interim Maximum Allowable Concentrations . From the 15A NCAC	SeCN - selnocynante
MDC - Minimum Detectable Concentrati	SeMe (IV) - Selenomethionine
MeSe - Methylseleninic acid	SPLP - Synthetic Precipitation Leaching Procedure
mg/kg - milligrams per kilogram	S.U. - Standard Units
mg/L - milligrams per liter	TCLP - Toxicity Characteristic Leaching Procedure
mg-N/L - Milligram nitrogen per liter	ug/L - micrograms per liter
MMAs - monomethylarsonic acid	ug/mL - microgram per milliliter
mV - millivolts	umhos/cm - micromhos per centimeter
NA - Not available or Not Applicable	Well Locations referenced to NAD83 and elevations referenced to NAVD88

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Hart Exhibit 58
Docket No. E-2, Sub 1219

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Apr 13 2020

THE ELM CONSULTING GROUP INTERNATIONAL LLC

ENVIRONMENTAL AUDIT IN SUPPORT OF THE COURT APPOINTED MONITOR

W. H. Weatherspoon Power Plant
Lumberton, North Carolina
USA

April 2019

Final Report Issued to:

Duke Energy and the Court Appointed Monitor

Prepared By:

Advanced GeoServices Corp.
and
The Elm Consulting Group International LLC

TABLE OF CONTENTS

1.0 INTRODUCTION

Advanced GeoServices Corp. (AGC) and The Elm Consulting Group International LLC (Elm) (collectively, the Audit Team) are conducting environmental compliance audits (the Audits) of certain coal combustion residuals (CCR) management locations owned or operated by Duke Energy Business Services LLC, Duke Energy Carolinas, LLC, and Duke Energy Progress, Inc. (collectively, Duke Energy). The Audits are being conducted under the direction of Mr. Benjamin Wilson, the Court Appointed Monitor, pursuant to an Order issued by the U.S. District Court, Eastern District of North Carolina, in case numbers 5:15-CR-62-H, 5:15-CR-67-H, and 5:15-CR-68-H.

The scope of the Audits is set forth in the plea agreements entered into by Duke Energy and the United States in the above cases, the Court's judgments in these cases, and a written Audit scoping document agreed to by Duke Energy and the United States.

1.1 BACKGROUND INFORMATION FOR THE W. H. WEATHERSPOON AUDIT

The subject of this report is the Audit completed at Duke Energy's W. H. Weatherspoon Power Plant located in Lumberton, North Carolina (Weatherspoon Facility). The Audit was conducted on February 13-14, 2019 for a total of two days on-site. The Audit Team consisted of the following senior auditors:

• Mr. Christopher Reitman, P.E., AGC	Project Director, Audit Team Leader, Sr. Subject Matter Expert (on-site)
• Mr. Joseph Cotier, CPEA, Elm	Sr. Environmental Auditor (on-site)
• Mr. Bernie Beegle, P.G., AGC	Sr. Subject Matter Expert (off-site)

The Weatherspoon Facility was represented by:

- Mr. Tim Russell, CCP System Owner
- Mr. Issa Zarzar, General Manager, Carolinas East Region, CCP Operations and Maintenance
- Ms. Asha Sree, CCP Engineering & Closure Engineering
- Mr. Bobby Barnes, Manager, Engineering & Closure Engineering
- Mr. Steve Gordy, CCP Projects
- Mr. Steve Cahoon, EHS CCP Permitting and Compliance
- Ms. Anne Pifer, Manager, EHS CCP Permitting and Compliance
- Ms. Bryson Sheetz, EHS CCP Waste & Groundwater
- Ms. Tammy Jett, EHS CCP Waste & Groundwater (by phone)
- Mr. Randy Hart, Regulatory Affairs
- Mr. Shane Johnson, Environmental Rover, EHS CCP Compliance
- Mr. Mike Phillips, Manager, EHS CCP Compliance
- Mr. John Slothower, EHS CCP Environmental Field Support
- Mr. Kent Tyndall, Station Environmental Field Support
- Mr. Josh Schieffer, Station H&S Field Support
- Mr. Keith Higgins, EHS CCP Compliance

1.2 FACILITY OVERVIEW

The Duke Energy Weatherspoon Facility is located at 491 Power Plant Road, Lumberton, North Carolina. The Weatherspoon Facility is located along the east side of the Lumber River and according to Duke Energy personnel first began power generation in 1949. Duke personnel stated that three coal-fired power plants were operated during the facility's history with Units 1, 2, and 3 having been retired in 2011. No coal combustion has occurred since 2011. Four fast-start combustion turbines (CTs) were installed circa 1971-1972; the CTs operate on number 2 fuel oil.

The Weatherspoon Facility also continues to operate and maintain an approximately 225-acre Cooling Pond, and the infrastructure at the facility remained substantially the same as during the 2018 Audit. Since there was no coal combustion at the facility, there was no active ash generation observed by the Audit Team.

1.2.1 Ash Management Activities

Limited information is available regarding the early ash management activities on-site. These activities likely began with production of power, which Duke Energy personnel stated was in 1949. Duke Energy also reported that the existing Ash Basin was split into several discrete sections identified as Areas A through G on drawings provided by Duke Energy. The first available design drawings for the Ash Basin were reportedly from 1979, and it is sometimes referred to as the 1979 Ash Basin by Duke Energy.

Duke Energy has completed several upgrades to the 1979 Ash Basin over the last five years. These upgrades have included reshaping and regrading the slopes on the northern end of the basin, regrading the interior of the northern side of the basin to facilitate interior drainage, constructing an alternative overflow discharge area within the basin, constructing a reverse filter at the outlet of the basin, upgrading the toe drain on the south side of the basin, spraying a synthetic coating on portions of the basin to reduce erosion, and constructing an "Effluent Channel" to redirect seepage from Jacob Swamp towards the Cooling Pond. The 1979 Ash Basin modifications were completed either voluntarily by Duke Energy or in accordance with directives from the state of North Carolina to increase the integrity of the 1979 Ash Basin.

The Cooling Pond is an integral part of the on-site water management system. The Cooling Pond is used to treat CCR contact stormwater, CCR seepage, and CCR leachate.

Current plans call for the 1979 Ash Basin to be closed through removal of the 2,450,000 tons of CCR which were originally estimated to be present at the Weatherspoon Facility. Duke Energy is currently implementing an ash beneficiation project. This project includes excavation of the ash and off-site beneficial use of the CCR material in cement.

1.2.2 Environmental Permits and Programs

The portions of the Weatherspoon Facility subject to this Audit operate under the following environmental permits and programs:

- **National Pollutant Discharge Elimination System (NPDES) Wastewater Permitting** – The period of review included review of two separate NPDES permits for the Weatherspoon Facility, as follows:

  1. The North Carolina Department of Environmental Quality (NCDEQ) issued NPDES Permit No. NC0005363 with an effective date of January 1, 2010 and an expiration date of July 31, 2014. A timely permit renewal application package was submitted to NCDEQ on January 28, 2014. Permit renewal application amendments or updates were submitted to NCDEQ as follows:
     - October 10, 2014 – request for inclusion of seeps;
     - March 23, 2015 – submission of chemical characterization of water for dewatering of the 1979 Ash Basin; and
     - August 21, 2017 – request to construct an emergency spillway adjacent to Outfall 001 allowing discharge from the cooling pond to the Lumber River under emergency circumstances.

The permit covered the following ash management activities:

- Outfall 001 – This outfall discharges from the Cooling Pond to the Lumber River and includes recirculated cooling water, coal pile, stormwater runoff, ash sluice water, treated domestic wastewater, chemical metal cleaning, and low volume wastewater including reject water from operation of a reverse osmosis unit.

- Section B(1) addressed stormwater for the Weatherspoon Facility. However, NCDEQ sent a letter to Duke Energy on June 15, 2011 approving Duke Energy's request to remove all stormwater requirements from the Permit.

Part III.B of the NPDES Permit's Other Requirements requires groundwater monitoring if requested by NCDEQ. The Weatherspoon Facility operates an NPDES groundwater network of 4 wells: 3 compliance (down-gradient) wells and 1 background well, for determining compliance with groundwater limits pursuant to 15A NCAC 02L.0200. The NPDES groundwater network was sampled and reported tri-annually (March, June, and October). The last sampling event conducted under this permit was October 2018. As noted below, the new NDPES permit does not require groundwater monitoring.

2. The renewed NPDES Permit No. NC0005363 was issued on August 3, 2018 and became effective on November 1, 2018. The permit carries an expiration date of October 31, 2023. Changes to the NPDES permit included:

- <u>Increased number of parameters to monitor at Outfall 001 during discharge to the Lumber River</u>: During Hurricane Florence, there was an influx of stormwater to the Cooling Pond as well as the overtopping of water from Jacob's Creek into the Cooling Pond. Due to these events, Duke Energy opened the gate at Outfall 001 and discharged water to the Lumber River from September 15 to September 30, 2018. Required monitoring was completed on September 17, 2018.

- Inclusion of Internal Outfall 001A for monitoring ash pond dewatering at the immediate exit pipe of the ash pond (Pond 4): This outfall discharges to the Cooling Pond and ultimately to Outfall 001.
- Inclusion of Internal Outfall 115A for monitoring seven constructed seeps located at the eastern toe of the 1979 Ash Basin: The seeps included are S-11, S-12, S-13, S-14, S-25, S-26, and S-27. An additional 13 seeps have been identified at the Weatherspoon Facility. According to Duke Energy, these non-constructed seeps will be included in a Special Order by Consent (SOC) to be issued by NCDEQ at a date in the near future. This outfall discharges to the Cooling Pond and ultimately to Outfall 001.
- Inclusion of monthly In-Stream monitoring in the Lumber River: This monitoring must be conducted if Outfall 001 has a discharge within the previous 24 months. During Hurricane Florence, there was an influx of stormwater to the Cooling Pond as well as the overtopping of water from Jacob's Creek into the Cooling Pond. Due to these events, Duke Energy opened the gate at Outfall 001 and discharged water to the Lumber River from September 15 to September 30, 2018. In-stream monitoring commenced in November 2018 upon the renewed NPDES Permit becoming effective.
- Inclusion of annual fish tissue monitoring in the Lumber River: Fish tissue must be analyzed for arsenic, mercury, and selenium with the sampling results to be submitted to NCDEQ with the next permit renewal application.
- Removal of the requirement for conducting groundwater monitoring.

The renewed NPDES Permit has eliminated the groundwater monitoring requirements included in the earlier NPDES permit. However, Part I, Paragraph A(8) of the renewed NPDES Permit states an exceedance of groundwater standards at or beyond the compliance boundary is subject to remediation action according to 15A NCAC 02L.0106(c), (d), or (e), as well as enforcement actions in accordance with North Carolina General Statute 143-215.6A through 143-215.6C.

- **NPDES Stormwater Permitting** – NCDEQ issued an Individual Stormwater Permit, No. NCS000589, to Duke Energy on February 1, 2017, with an effective date of February 1, 2017 and an expiration date of January 31, 2022. Implementation of the monitoring and the Stormwater Pollution Prevention Plan (SWPPP) was required to be completed prior to removal and beneficial use of ash from the 1979 Ash Basin. Three stormwater outfalls described below must be monitored during ash hauling activities:
  - SW-1 – areas draining the access road and discharges to an unnamed tributary to the Lumber River;
  - SW-2 – areas draining the access road, ditches along the abandoned railroad line, the administration building, and a vegetated area adjacent to the power plant; and discharges to an unnamed tributary to the Lumber River; and
  - SW-3 – areas discharging along the western edge of the access road and picnic area adjacent to the power plant and discharges to an unnamed tributary to the Lumber River.

The SWPPP was developed and implemented on July 21, 2017. With ash hauling commencing on September 13, 2017, inspections and monitoring required by the stormwater permit and described in the SWPPP began during the third quarter of 2017.

On December 14, 2018, a stormwater sample was collected at Outfall SW-2. The total suspended solids (TSS) result was 110 mg/L. The permit states a benchmark value of 100mg/L for TSS. An exceedance of a benchmark value does not constitute a violation but does require specific actions to be taken by the permitted facility. The first exceedance of a benchmark value requires the facility to implement actions listed as Tier One. Based on review of available records, the Weatherspoon completed all Tier One actions related to the exceedance of the TSS benchmark value.

- **NPDES Stormwater Construction Permitting** – NCDEQ has issued three stormwater construction permits governing activities related to the ash basin and ash management under its General Permit for Construction Activities, No. NCG010000. The three permits, ROBES-2016-007, ROBES-2016-013, and ROBES-2018-001, were all closed based on a NCDEQ inspection that took place on November 29, 2018. There were no other stormwater construction permits in place at the Weatherspoon Facility at the time of the Audit.

- **Title V Permitting** – NCDEQ Title V Permit No. 06094T21 was issued and also became effective on April 4, 2017 and has an expiration date of March 31, 2022. Site-wide fugitive dust is covered under Section 3.MM of the Permit. Duke Energy calculated potential emissions for particulate matter from excavation and hauling activities to be approximately 3.5 tons per year, below the permitting threshold of 5 tons per year. The Annual Compliance Certification for 2017 was submitted to NCDEQ on February 24, 2018.

- **Spill Prevention, Control and Countermeasure (SPCC) Plan** – BHI, Inc. operates the basin excavation activities as a contractor to Duke Energy. Oil storage associated with those activities were addressed in the BHI, Inc. SPCC Tier I Qualified Plan which was last revised on April 16, 2018.

- **Tier II Reporting** – The Tier II hazardous chemicals inventory report for 2017 was submitted on February 24, 2018.

- **Coal Ash Management Act (CAMA)** – CAMA requirements include identification of drinking water supply wells within a half mile of the facility, submission of Groundwater Assessment Plans, installation and multiple rounds of sampling from assessment wells, submission of Groundwater Assessment Reports summarizing groundwater investigations, submission of an Annual Groundwater Protection and Restoration Report, submission of Discharge Assessment Plans to characterize seeps, submission of a Groundwater Corrective Action Plan, and 1979 Ash Basin closure/removal. CAMA identifies the Weatherspoon Facility as an intermediate risk facility and requires closure by December 31, 2024 unless the CCR is being beneficiated. Since CCR is being beneficiated, this closure deadline has been extended to December 31, 2029.

  On October 19, 2017, Duke Energy submitted Revised Interim Monitoring Plans (IMPs) to NCDEQ for groundwater at 14 Duke Energy facilities located in North Carolina, including the Weatherspoon Facility. The revised facility monitoring is required on a quarterly basis, commencing the fourth quarter of calendar year 2017 pursuant to 15A NCAC 02L.0110, until Corrective Action Plans are accepted for the individual facilities or as directed otherwise by NCDEQ. The quarterly sampling events will be conducted in conjunction with planned compliance monitoring sampling events for three quarters during the calendar year, supplemented with an additional sampling event conducted at each facility in order to provide four rounds of monitoring data to evaluate seasonal fluctuations during a year-long timeframe. The 2018 CAMA groundwater monitoring network at the Weatherspoon Facility consisted of 39 wells. On December 21, 2018, NCDEQ issued Duke Energy optimized Interim Monitoring Plans (IMPs) for all the 14 Duke Energy Facilities with groundwater sampling to begin in the first quarter of 2019.

Duke Energy submitted to NCDEQ the required 2018 Groundwater Protection and Restoration Annual Report on January 25, 2019 and the 2018 Surface Water Protection and Restoration Annual Report on January 21, 2019, both specific to the Weatherspoon Facility. Duke Energy plans to submit the CAMA Comprehensive Site Assessment Update for the Weatherspoon Facility to NCDEQ by June 2020.

- **Cooling Pond** – In a letter dated July 8, 2016, the NCDEQ requested that Duke Energy assess the distribution of CCR in the Cooling Pond. The purpose of the assessment is to determine if potential coal ash constituents in the Cooling Pond may be an additional contributing source to groundwater contamination. As part of the assessment, three new groundwater monitoring wells were installed on the Cooling Pond dike and were screened in the upper surficial unconfined aquifer. The Cooling Pond groundwater network consists of these three new wells (AW-04S, AW-05S, and AW-06S) and four existing piezometers (PZ-100 through PZ-103). Duke Energy submitted to the NCDEQ a Cooling Pond Assessment Report dated May 26, 2017. The Cooling Pond Assessment Report stated that visual inspections of 23 of 24 Cooling Pond sediment cores identified the presence of coal ash. The Report also noted that cobalt and manganese were the only two constituents in the Cooling Pond down-gradient groundwater samples with concentrations greater than the NCDEQ 2L standards. Duke Energy conducted a second groundwater sampling event during August 2017. Duke Energy has not received any comments from NCDEQ regarding the Cooling Pond Assessment Report and the Cooling Pond wells continue to be sampled as part of IMP activities.

- **CCR Rule** – The 1979 Ash Basin is subject to the CCR Rule because the Weatherspoon Facility currently produces electricity during periods of peak demand. A CCR groundwater monitoring well network of two background wells and 12 down-gradient wells has been established at the 1979 Ash Basin.

  In previous Audits, it was noted the Initial Structural Stability Assessment states the foundation abutments of the 1979 Ash Basin would not be stable during a seismic event. The Initial Factor of Safety Assessment states the seismic minimum factor of safety is not met and the dikes are constructed of soils that are susceptible to liquefaction. Duke Energy plans to address these issues once the CCR materials present in the 1979 Ash Basin have been excavated and removed.

  On April 3, 2018, Duke Energy provided notice on Duke Energy's public website that the 1979 Ash Basin is in the CCR assessment monitoring program due to statistically significant increases over the background values of the Appendix III parameters.

  On November 7, 2018, Duke Energy posted the required location restrictions for impoundments, which stated the 1979 Ash Basin did not meet the surface impoundment standard for placement above the uppermost aquifer (40 C.F.R. § 257.60(a)), wetlands (40 C.F.R. § 257.61(a)), unstable areas, (40 C.F.R. §257.64(a)), or seismic impact zones (40 C.F.R. § 257.63(a)).

  On December 14, 2018, Duke Energy provided notice on Duke Energy's public website that the following CCR Rule Appendix IV constituents were detected at levels above the applicable Groundwater Protection Standard (GWPS).

- Arsenic
- Radium 226 and 228 combined

On January 18, 2019, Duke Energy issued the CCR Annual Groundwater Monitoring and Corrective Action Report for the 1979 Ash Basin. Duke Energy has also developed numerous submittals required by the CCR Rule, as shown in Table 1.

Duke Energy was continuing to implement the groundwater assessment process prescribed by the CCR Rule at the time of the Audit.

1.2.3 Dam and Other Structural Permits and Approvals

The 1979 Ash Basin is identified by the state ID No. ROBES-009. The 2018 Annual Ash Basin Inspection Report indicates the 1979 Ash Basin has a maximum structural height of 28 feet, a surface area of 56 acres, and contains 2,320,000 tons of ash. According to the 2014 Annual Inspection Report, the dam is classified as a small high-hazard dam. Since there are currently no ash generation activities at the facility, ash is no longer sluiced into the 1979 Ash Basin and the 1979 Ash Basin is considered inactive with regard to ash disposal activities.

The 2018 Annual Report notes a few areas were observed with vegetation which appeared to be sparse, particularly along the northern slope. However, overall, the vegetation appeared to be well-maintained. Portions of the slope are covered with an erosion-resistant covering called Posi-Shell®. Observations during the Audit indicated the Posi-Shell® was functioning well. A CCTV inspection of the principal spillway was completed on March 14, 2018. Based on the inspection, “no modifications or repairs were recommended” by the independent reviewing engineer working for Duke Energy.

The dam was grandfathered under North Carolina's Session Law 2009-390 (Senate Bill 1004, effective date January 1, 2010). Under this grandfathering, the original design of the 1979 Ash Basin dam is not subject to current design standards for new dam construction, although modifications after the effective date may be subject to these standards.

1.2.4 Update Since Last Audit

Current plans call for the 1979 Ash Basin to be closed through the removal of the originally estimated 2,450,000 tons of CCR which were present in the 1979 Ash Basin at the Weatherspoon Facility. On September 13, 2017, Duke Energy began ash removal from the 1979 Ash Basin for beneficial use off-site at two cement companies with plants located in Holly Hill and Harleyville, South Carolina. Duke Energy is currently dewatering the 1979 Ash Basin and utilizing equipment and methods on-site to excavate and move the CCR off-site. As of January 19, 2019, 344,109 tons of ash had been removed from the Weatherspoon Facility, including 261,432 tons since the 2018 Audit. Duke Energy estimates that all of the 1979 Ash Basin closure activities will be completed by 2029. To the extent that there is any remaining CCR in the 1979 Ash Basin after beneficiation operations have permanently ceased, Duke Energy plans on excavating the CCR and transferring it to a permitted disposal facility.

Duke Energy submitted an Excavation and Soil Sampling Plan to NCDEQ in December 2017 and is planning to submit the Weatherspoon 1979 Ash Basin Closure Plan on September 30, 2019.

2.0 AUDIT SCOPE AND SUBJECT MATTER

The Audit was completed in accordance with the court documents and the audit scoping document agreed to by Duke Energy and the United States. A description of the scope is provided as Attachment A. The Audit included a review of ash management activities, including aspects of generation that affect the nature of the waste streams from the point of generation into surface impoundments or ash management basins, landfills, and/or storage piles. The Audit focused on the activities at the Weatherspoon Facility since the date of the last Audit, which was February 14-15, 2018.

3.0 AUDIT FINDINGS

3.1 EXCEEDANCE OF THE STATE GROUNDWATER QUALITY STANDARDS

Requirement – The State groundwater rules establish maximum contaminant levels (MCLs) for groundwater at or beyond the compliance boundary for the Ash Basin. *See* 15A NCAC 02L.0202. 15A NCAC 02L.0103(d) provides that "[n]o person shall conduct or cause to be conducted, any activity which causes the concentration of any substance to exceed that specified" under the Class GA standards or the interim maximum acceptable concentrations (IMACs) established for groundwater quality pursuant to 15A NCAC 02L.0202. Further, under N.C.G.S.A. § 143-215.1(i), "[a]ny person … who is required to obtain an individual permit … for a disposal system under the authority of N.C.G.S.A. § 143-215.1 [water pollution control] … shall have a compliance boundary … beyond which groundwater quality standards may not be exceeded." *See also* 15A NCAC 02L.0102(3) (defining "compliance boundary" as "a boundary around a disposal system at and beyond which groundwater quality standards may not be exceeded").

In addition, under N.C.G.S.A. § 143-215.6A(a)(1), civil penalties may be assessed against any person who violates any standard established by the NCDEQ under the authority of N.C.G.S.A. § 143-214.1, which covers groundwater standards.

Finding – Constituents exceeding the standards for Class GA waters, established in 15A NCAC 2L.0202, were documented in monitoring wells located at or beyond the compliance boundary for the Weatherspoon Facility's 1979 Ash Basin. A review of the 2018 NPDES groundwater monitoring well data showed that pH and iron exceeded the 2L groundwater standards. Attachment B provides a summary of the 2018 NPDES groundwater data reviewed and a Figure showing the NPDES well locations.

The 2018 CAMA groundwater monitoring network consisted of 39 wells. Based on a review of the January 2018 CAMA groundwater monitoring analyses, cobalt, iron, and manganese exceeded the 2L groundwater standards or the NCDEQ-approved provisional background threshold values (PBTVs), if the PBTV was greater than the 02L, one or more times at or beyond the compliance boundary of the 1979 Ash Basin. These exceedances of cobalt, iron, and manganese were observed in wells located near the Cooling Pond. The Cooling Pond groundwater network consists of three wells identified as AW-04S, AW-05S, and AW-06S.

Duke has stated its opinion that, pursuant to a September 2015 Settlement Agreement with the NCDEQ, "Duke Energy is not subject to any further financial penalties for exceedances of groundwater standards" and "Duke Energy is not subject to any further enforcement action based on exceedances of groundwater standards as long as it remains in substantial compliance with CAMA groundwater requirements."

The CAM has advised the Audit Team that the Audit scope does not include an evaluation of compliance with the September 2015 Settlement Agreement, and therefore the Audit Team does not take a position on Duke Energy's opinion.

4.0 OPEN LINES OF INQUIRY

Open Lines of Inquiry are items identified by the Audit Team while on-site that, due to limited available information, an unsettled area of law, or the need for additional research, could not be determined as being in compliance or out of compliance.

4.1 CLEAN WATER ACT DISCHARGES THROUGH WETLANDS

Requirements – Sections 301 and 402 of the federal Clean Water Act (CWA) prohibit the discharge of any pollutant into the waters of the United States except in compliance with a permit issued pursuant to the CWA under the National Pollutant Discharge Elimination System (NPDES) by the U.S. EPA or a state with an approved program. 33 U.S.C. §§ 1311(a), 1342. NCDEQ implements an approved NPDES program in North Carolina under 15A NCAC 2H.0100 *et seq*. "Waters of the United States" is defined in part as including wetlands, i.e., "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation adapted for life in saturated soil conditions." 40 C.F.R. § 110.1 (defining "navigable waters" and "waters of the U.S."). The U.S. Army Corps of Engineers issues jurisdictional determinations, which determine whether a wetland qualifies as "waters of the United States." At other Duke Energy facilities, NCDEQ has taken the position that a seep discharging into a jurisdictional wetland can be subject to NPDES permitting.

Open Line of Inquiry

The following Open Line of Inquiry is similar to those in the 2017 and 2018 Audits. In 2017 and 2018, several seeps were observed with CCR impacts. During the 2019 Audit, only one seep, Area of Wetness S-16, contained a contaminant of concern (boron) and is believed to have been impacted by CCR residuals.

Existing Conditions

Contaminated seepage exists around the 1979 Ash Basin and is collected in channels at the base of the 1979 Ash Basin. There are two discrete channels that capture the contaminated seepage from the 1979 Ash Basin. Based on a data review, contaminated seepage discharges were identified during the 2017 Audit at seeps identified as S-04, S-11, S-12, S-13, S-14, S-15, S-23, and S-24 on the western and southern sides of the basin. The flows are combined with discharges S-02, S-03, and S-05 from the eastern side of the basin, which are conveyed in a recently constructed effluent channel. Preliminary wetlands drawings completed by consultants for Duke Energy, and included as Attachment C to this report, show these flows discharge to wetlands prior to entering the Cooling Pond. The area of wetlands shown on the preliminary mapping provided in Attachment C was not certified as a jurisdictional wetland at the time of the Audit. None of these seeps were sampled during 2018. This may have been due to dewatering activities within the 1979 Ash Basin, which has reduced seepage pressure.

On the western side of the 1979 Ash Basin, contaminated seepage discharges from S-9 and S-16 flow in a discrete channel. The flow in the discrete channel discharges through an area shown as wetlands on the preliminary wetlands drawings, prior to entering the Cooling Pond. Discharges from S-9 and S-16 did not pass through an outfall prior to entering the wetlands. During the 2019 Audit, many of the seeps were not flowing and only location S-16 was found to have CCR related compounds.

Any water which enters the Cooling Pond from the 1979 Ash Basin may discharge through Outfall 001 into the Lumber River. However, due to the unique hydrogeological conditions in the area, water discharged to the Cooling Pond either infiltrates or evaporates, and Duke Energy personnel reported that there is rarely a discharge through Outfall 001 into the Lumber River.

During the 2017, 2018, and 2019 Audits, only preliminary wetlands mapping completed by Duke Energy's consultants was available and it was not clear whether seepage from the 1979 Ash Basin was entering a jurisdictional wetland area. As of the date of the 2019 Audit, Duke Energy had not yet received a jurisdictional determination from the Army Corps of Engineers.

At the time of the 2019 Audit, NCDEQ had issued the renewed NPDES permit for the Weatherspoon Facility, which included coverage for the engineered seeps. Duke Energy personnel also expected a Special Order by Consent (SOC) to address the remaining non-engineered seeps in the near future, although a specific schedule has not yet been established.

Open Line of Inquiry

The available information suggests the seepage from the 1979 Ash Basin may be entering a jurisdictional wetland area, which would make the wetland a water of the State and the United States, prior to reaching the approved NPDES outfall. In the absence of information on whether the discharges from the channels is to a jurisdictional wetlands area, the Audit Team cannot conclude whether there is a violation of Sections 301 and 402 of the Clean Water Act. For this reason, this is considered to be an Open Line of Inquiry.

5.0 AUDIT APPROACH

5.1 ON-SITE ACTIVITIES

During its time on-site, the Audit Team conducted an opening conference with facility personnel to discuss the scope of work and the plan for accomplishing necessary tasks while at the Weatherspoon Facility. A site tour of the coal ash management and program support areas was subsequently completed. Following the tour, the Audit Team conducted a review of pertinent files, interviews with facility representatives, and verification of facility activities related to the Environmental Compliance Plans (ECPs), written programs, and permits. A debrief was conducted each Audit day to advise the facility representatives of Audit progress, Open Lines of Inquiry, possible Audit Findings, and needs for the next day. At the completion of the Audit, the Audit Team led a verbal discussion of draft Audit findings with facility representatives.

5.2 STANDARDS OF PRACTICE

The fieldwork portion of the Audit was conducted on February 13-14, 2019, with compliance reporting commencing May 14, 2015, the date of the court's judgments. The Audit focused on the activities at the facility since the date of the last Audit, which was February 14-15, 2018. The Audit was based on:

- Physical inspections of the facility;
- Examination of selected administrative and operating records made available by facility staff at the Audit Team's request;
- Interviews and discussions with key facility management and staff; and
- Verification procedures designed to assess the facility's application of, and adherence to, terms of the probation, environmental laws and regulations, and site policies and procedures. In addition, the Audit Team reviewed the facility's adherence to good management practices.

The Audit followed established audit protocols and procedures. It should be understood that the Audit consisted of evaluating a sample of practices and was conducted over a short period of time. Efforts were made toward sampling major facets of environmental performance during the period under review. This method is intended to uncover major system deficiencies and the Audit may not have identified all potential problems.

To support the overall independence of the Audit process, the Audit included an auditing professional certified by the Board of Environmental, Health and Safety Auditor Certifications (BEAC). BEAC is an accredited professional certification board that issues the Certified Professional Environmental Auditor (CPEA) designation to qualified auditors. Under BEAC, auditor independence is a key criterion for the implementation of an effective third-party audit program. The Audit was implemented in accordance with the standards related to auditor independence.

The process by which the Audit was conducted was consistent with the general state of the art of environment auditing and the best professional judgment of the Audit Team. To conduct the Audit, the team implemented a formal approach, drawing on process guidance from both BEAC and the Auditing Roundtable (AR) guidance documents. Guidance documents included:

- *Standards for the Professional Practice of Environmental, Health and Safety Auditing*. Prepared by the Board of Environmental, Health and Safety Auditor Certifications, 2008.

- ISO 19011:2002 – Guidelines for Quality and/or Environmental Management Systems Auditing. Prepared by the International Organization for Standardization, 2002.

- Standard for the Design and Implementation of an Environmental, Health and Safety Audit Program. Prepared by The Auditing Roundtable, Inc., 1995.

- Minimum Criteria for the Conduct of Environmental, Health and Safety Audits. Prepared by The Auditing Roundtable, Inc.

5.3 REPRESENTATIVE SAMPLING

When confronted with a large population of data to review or equipment to inspect, the Audit Team employed representative sampling techniques to evaluate records over the Audit period requested, and as necessary, for physical inspection of some types of common equipment. The sample size for record reviews or equipment inspections required professional judgment.

The Audit Team's judgement considered the following:

- The outcome of the evaluation of the records sampled. If problems are found in the representative sample, more records may need to be examined to evaluate compliance status.
- Potential for or severity of non-compliance.
- The general appearance and observed practices of certain operating areas.
- Information obtained during an interview that indicates a potential problem.
- Other specific information or guidance from the CAM.
- Time available during the Audit.

The Audit Team also employed the following types of sampling techniques, depending upon the characteristics of a specific population:

- Random sampling – every item has an equal chance of being selected.
- Interval sampling – select every nth item, (e.g., every third manifest in chronological order as contained in facility files).
- Block sampling – auditor uses his/her judgment to select a specific block of items, (e.g., petroleum storage tank inspections from April to October).
- Stratified sampling – population is divided into groups, which are then sampled through random or judgmental techniques.

TABLE

TABLE 1
1979 ASH BASIN - Plans and Reports Posted by Duke Energy Under the CCR Rule

DOCUMENT NAME	CATEGORY	RELEASE DATE
CCR Annual Groundwater Monitoring and Corrective Action Report 2018	Groundwater Monitoring and Corrective Action	03/01/2019
Notice of Initiation of Assessment of Corrective Measures	Groundwater Monitoring and Corrective Action	02/19/2019
Notice of Groundwater Protection Standard Exceedance 2018	Groundwater Monitoring and Corrective Action	12/14/2018
Annual Fugitive Dust Control Report 2018	Operating Criteria	12/05/2018
Wetlands	Location Restriction	11/07/2018
Unstable Areas	Location Restriction	11/07/2018
Seismic Impact Zones	Location Restriction	11/07/2018
Fault Areas	Location Restriction	11/07/2018
Placement Above Uppermost Aquifer	Location Restriction	11/07/2018
Emergency Action Plan for Weatherspoon 1979 Ash Basin	Design Criteria	10/01/2018
CCR Annual Surface Impoundment Inspection Report 2018	Operating Criteria	07/17/2018
Annual Meeting with Local Emergency Responders 2018	Design Criteria	05/23/2018
Notice of Establishment of an Assessment Monitoring Program	Groundwater Monitoring and Corrective Action	04/03/2018
CCR Annual Groundwater Monitoring and Corrective Action Report	Groundwater Monitoring and Corrective Action	02/06/2018
Emergency Action Plan for Weatherspoon 1979 Ash Basin Revision 007A	Design Criteria	01/25/2018
Weatherspoon Inundation Plan	Design Criteria	01/25/2018
Notice of Intent to Close Weatherspoon 1979 Ash Basin R1	Closure and Post Closure Care	12/13/2017
2017 Annual CCR Fugitive Dust Control Report-Weatherspoon	Operating Criteria	11/29/2017

TABLE 1
(Continued)

DOCUMENT NAME	CATEGORY	RELEASE DATE
Groundwater Sampling and Analysis Program Selection of Statistical Method Certification-Weatherspoon 1979 Ash Basin	Groundwater Monitoring and Corrective Action	11/06/2017
Groundwater Monitoring System Certification-Weatherspoon 1979 Ash Basin	Groundwater Monitoring and Corrective Action	11/06/2017
CCR Fugitive Dust Control Plan Revision 1	Operating Criteria	07/11/2017
CCR Annual Surface Impoundment Inspection Report 2017	Operating Criteria	07/11/2017
Annual Meeting with Local Emergency Responders 2017	Design Criteria	06/21/2017
Annual Fugitive Dust Control Report 2016	Operating Criteria	12/05/2016
Initial Structural Stability Assessment Revision 1	Design Criteria	11/16/2016
Initial Structural Stability Assessment Revision 0	Design Criteria	11/16/2016
Initial Factor of Safety Assessment	Design Criteria	11/15/2016
Closure Plan for Impoundments	Closure and Post Closure Care	11/11/2016
Inflow Design Flood Control System	Operating Criteria	11/03/2016
History of Construction	Design Criteria	10/25/2016
Initial Hazard Classification Assessment Certification	Design Criteria	10/12/2016
Existing Liner Design Criteria	Design Criteria	10/11/2016
Notification of Intent to Initiate Closure - Inactive CCR Surface Impoundments	Closure and Post Closure Care	01/12/2016
Annual Surface Impoundment Report (Initial)	Operating Criteria	02/12/2016
Annual Surface Impoundment Report Revision 1	Operating Criteria	02/19/2016
Annual Surface Impoundment Report 2016	Operating Criteria	06/23/2016

*This summary of reports was downloaded on March 7, 2019

ATTACHMENT A

ATTACHMENT A
AUDIT SCOPE

A-1 GENERAL AUDIT SCOPE ITEMS

The general Audit scope items included:

- Review and evaluation of documentation for maintenance and repair of structures and equipment used for coal ash disposal.
- Review and evaluation of documentation of modifications, failures, leaks, damage, disrepair and other problems at the coal ash management units.
- Review and evaluation of documentation of efforts to correct failures, leaks, damage, disrepair and other problems where they determine that employee/contractor actions were likely a primary or contributing cause to a compliance finding.
- Review and evaluation of documentation of communication of the items above within the organization.
- Review and evaluation of documentation associated with the specific environmental compliance items described below and laws, regulations, and policies associated these items.
- Review of compliance with administrative aspects and regulatory submissions related to coal ash management-specific regulations, including the Coal Combustion Residuals Rule found in 40 CFR Part 257, Subpart D.

More specific items which were addressed in the audits to comply with the general Audit scope are described below.

A-2 SPECIFIC COMPLIANCE WITH OTHER PROVISIONS OF THE PLEA AGREEMENTS

The following items related to specific items in the plea agreements were reviewed as part of the Audit:

1. Determine whether Defendants have opened, expanded, or reopened any coal ash or coal ash wastewater impoundment and, if so, verify that they are lined and do not allow unpermitted discharges of coal ash or coal ash wastewater to waters of the United States.

2. Review citations/notices of violation/notices of deficiency related to violations of federal, state, or local law to assure that they have been properly relayed to the court and, as appropriate under the plea agreements, determine their materiality.

3. Note any observations made during the audit that cause concern regarding the assets and/or security available to the Defendants to meet the obligations imposed by the court's judgment.

A-3 GENERAL ENVIRONMENTAL COMPLIANCE SUBJECT AREAS

The following items related to general environmental compliance were reviewed as part of the Audit:

1. Assess all waste streams from Duke Energy facilities with coal ash impoundments. Review Duke Energy's processes, procedures, and practices, as well as compliance with those processes, procedures, and practices, for:

a. identifying waste streams (especially, but not limited to, waste streams with discharge points into bodies of water);
b. identifying and communicating any modifications or changes, or potential modifications or changes, to waste streams;
c. ensuring proper handling/disposal of waste streams;
d. identifying, preventing, and mitigating any risks or hazards that could affect waste streams and/or the disposal of waste streams; and,
e. ensuring proper permitting for waste streams.

For Item 1.d., the Audit Team evaluated such risk/hazard issues where there were compliance findings associated with waste streams.

2. Review and evaluate documentation of:

a. maintenance and repair of structures and equipment related to coal ash disposal;
b. modification of the coal ash impoundments and related pollution prevention equipment and structures;
c. failures, leaks, damage, disrepair, and other problems;
d. communication of the information described in a-c within the organization; and,
e. efforts to correct failures, leaks, damage, disrepair, and other problems.

3. Assess the employees responsible for inspection, maintenance, and repair of coal ash basins and related structures and equipment. The assessment included an assessment of the workloads of such employees to assure that Duke Energy's facilities are adequately staffed. These assessments were made where the Audit Team determined that employee/contractor actions were likely a primary or contributing cause to a compliance finding.

4. Review the results and recommendations of any other audits (internal or external/state-mandated) and assess Duke Energy's implementation of those recommendations.

5. Review and assess Duke Energy's processes, procedures, and practices for identifying, communicating, and addressing problems and potential problems at its coal ash basins (leaks, unpermitted discharges, etc.).

6. Review and assess Duke Energy's policies, procedures, practices, and equipment for handling emergency releases from its coal ash basins and evaluate the personnel with duties in such situations.

7. Verify that Duke Energy is complying with its NPDES wastewater and stormwater permits, as well as other relevant environmental permits. This would include verifying Duke Energy's timely submission of permit applications, permit renewal applications, and responses to requests for additional information from the relevant regulatory authority.

8. Review and assess any actions or measures Duke Energy has undertaken to assure accountability and prevent recurrences when problems and/or failures occur (e.g., disciplinary actions, re-training, revision to policies and procedures, etc.). This review was conducted where the Audit Team determined that employee/contractor actions were likely a primary or contributing cause to a compliance finding.

9. Review and assess compliance with the following environmental regulations, as applicable to the management of coal ash:

a. Wastewater Discharges	40 CFR 122; 15A NCAC 2H.0100 *et seq*
b. Stormwater Discharges	40 CFR 122.26; 15A NCAC 2H.1000 *et seq;* NC General Permit (Construction) No. NCG010000
c. NC Groundwater Standards	15A NCAC 02L.0202(h)
d. Hazardous Waste Management	15A NCAC 13A.0100 to 13A.0107
e. Oil Pollution Prevention	40 CFR Part 112
f. Air Pollution (Title V)	15A NCAC 2Q, and
g. Hazardous Chemicals (Tier II)	40 CFR Part 370.

Reviews also included an analysis of overall compliance and the status and security of the asset. Subsequent reviews of individual facilities will evaluate the movement towards compliance. The Audit scope did not include an evaluation of compliance with the September 2015 Settlement Agreement with NCDEQ.

A-4 LIST OF PERMITS AND PROGRAMS DEEMED TO BE EITHER DIRECTLY OR INDIRECTLY IN SUPPORT OF ASH MANAGEMENT

During the Audit, the Audit Team reviewed a variety of written programs developed and implemented by Duke Energy and facility staff. State-issued permits and supporting documentation relative to environmental programs and geotechnical aspects of ash basin management were also requested and reviewed.

Requested documents, pertinent to management of ash in basins, landfills, ponds, etc., were outlined in the pre-Audit questionnaire for the facility and included, but were not limited to:

1. The Compliance Register developed for eTRAC for the facility.

2. The Duke Energy Operations Manual for the facility.

3. A site plan, site map, or aerial photo which shows the entire facility and key features of the facility, including NPDES outfalls associated environmental monitoring locations, storage tanks, etc.

4. Most recent two (2) years of maintenance, monitoring, and inspection records for each coal ash/CCR basin (just the physical inspections, not the groundwater records).

5. A "Phase 1 and Phase 2" summary of ash basin conditions prepared by an outside consultant.

6. Duke Energy's permitting plans for addressing ash impoundments and landfills at the facility.

7. Applicable pages from the Duke Energy basin-by-basin coal ash/CCR project tracking document for the facility.

8. Original basin/landfill/coal ash management unit construction records.

9. Documentation of changes to these units.

10. Coal ash unit construction permit application and approval.

11. State-issued permits and application materials for permits associated with coal ash/CCR management (including, e.g., dam permits).

12. Any currently effective state order, consent order, or similar state directive that addresses coal ash/CCR management at the facility.

13. Records required to be maintained in the facility's operating record under the federal CCR regulation and/or any state CCR regulatory program.

14. Records of off-site ash shipments from May 2015 forward.

15. Stormwater permit application and approval for all outfalls.

16. Industrial wastewater (NPDES/POTW) permit application and approval for all outfalls/discharges.

17. Industrial stormwater permit, sampling and monitoring records, and any corrective action plans (last two (2) years).

18. Stormwater Pollution Prevention Plan(s).

19. Landfill operating permit(s) with maintenance and monitoring requirements.

20. Landfill leak detection and groundwater monitoring records from the last two (2) years along with any workplans that describe the rationale for the monitoring system at the facility.

21. Air permits and applications for coal ash units and ancillary operations.

22. Testing and monitoring records completed to comply with air permits.

23. Any notices of violation associated with the coal ash/CCR management activities received over the last two (2) years.

24. Spill Prevention Control and Countermeasure Plan.

25. Community Right-to-Know:
    a. Lists of hazardous chemicals and/or MSDSs submitted;
    b. Tier I or II reports; and
    c. Form R (toxic release inventory) reports.

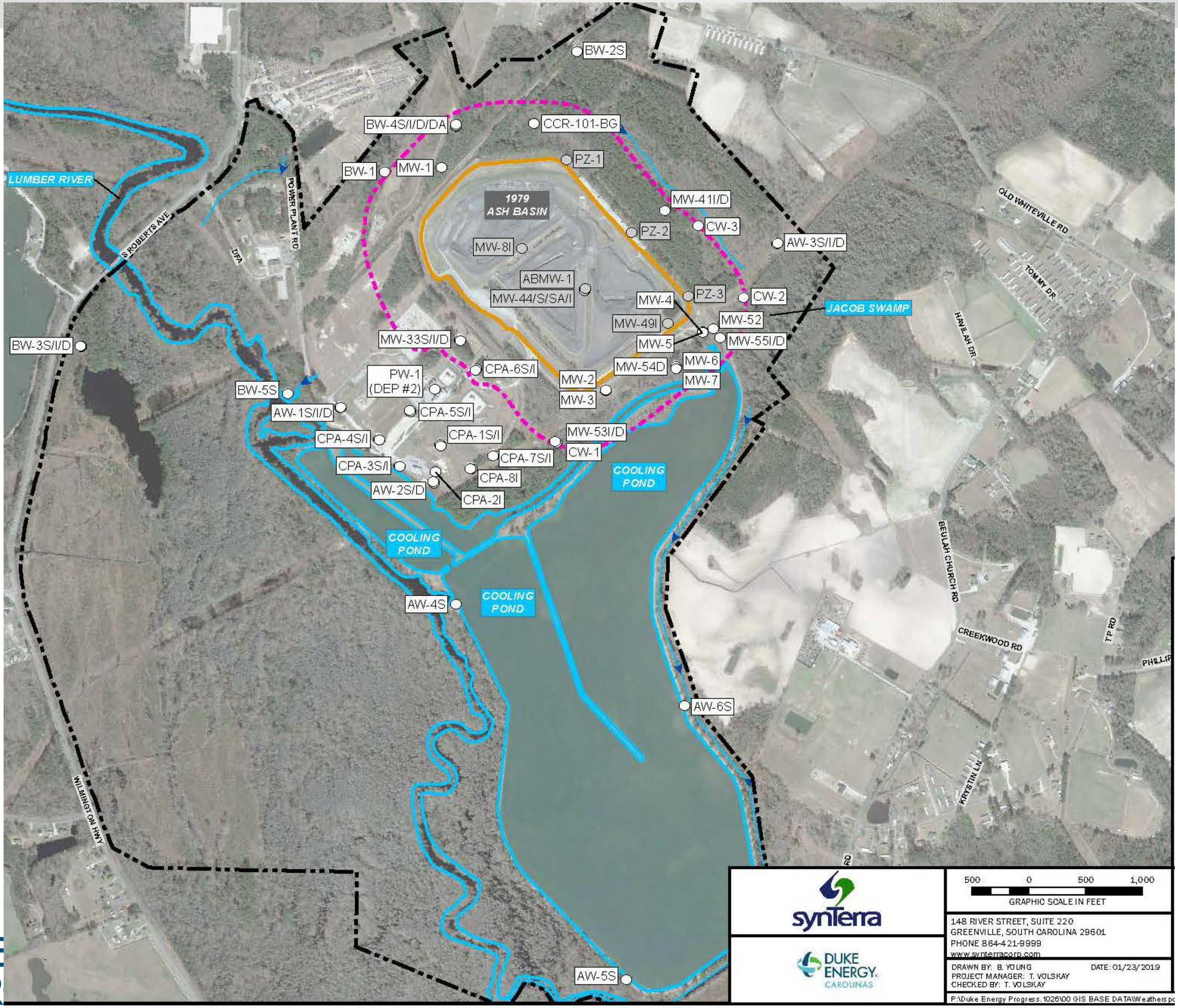
26. Copies of communications with employees and the public regarding availability of toll-free hotline and electronic mail inbox for reporting suspected environmental violations.

27. Management Systems:
    a. List of responsible party(ies) for each environmental activity.
    b. All environmental-related training records.
    c. All environmental policies and procedures.
    d. Organization chart.
    e. Site diagram identifying storage areas, tanks, etc.

ATTACHMENT B

2017 CAMA Groundwater Exceedances and Figure Showing the CAMA Well Locations

Weatherspoon Ash Basin – NPDES/CAMA Wells



synTerra

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DRAWN BY: B. YOUNG
DATE: 01/23/2019
PROJECT MANAGER: T. VOLSKAY
CHECKED BY: T. VOLSKAY

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WEATHERSPOON
12/05/2018
BRANDON RUSSO
TED VOLSKAY

	PARAM	**CFR257 APPENDIX III CONSTITU**			**INORGANIC PARAMETERS (TOTAL CONCENTRATION)**								**IONUCLI**
Reporting Units	**S.U.**	**ug/L**	**mg/L**	**mg/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**pCi/L**
15A NCAC 02L Standard	**6.5-8.5**	**700**	**250**	**500**	**1***	**10**	**4***	**1***	**300**	**50**	**0.2***	**0.3***	**5^**
Provisional Background (Surficial Unit)	**3.2-6.9**	**50**	**13.7**	**90.3**	**1**	**1.35**	**1**	**1**	**9422**	**39**	**0.2**	**4.2**	**6.463**
Provisional Background (Lower Yorktown Unit)	**5.5-5.7**	**50**	**1.3**	**75**	**1**	**1**	**1**	**1**	**2070**	**20**	**0.2**	**2.61**	**5.4**
Provisional Background (Pee Dee Unit)	**6.9-8.3**	**50**	**0.24**	**130**	**1**	**1**	**1**	**1**	**1550**	**41**	**0.2**	**0.32**	**3.55**

					PARAM	**CFR257 APPENDIX III CONSTITU**			**INORGANIC PARAMETERS (TOTAL CONCENTRATION)**								**IONUCLI**
Sample ID	**Location Description**	**Associated Unit**	**Sample Location Aquifer Name**	**Sample Collection Date**	**pH**	**Boron**	**Sulfate**	**Total Dissolved Solids**	**Antimony**	**Arsenic**	**Beryllium**	**Cobalt**	**Iron**	**Manganese**	**Thallium**	**Vanadium**	**Total Radium**
AW-01D	W of plant	Ash Basin	Pee Dee	02/26/2018	7.2	<50	27	110	<1	<1	<1	<1	**1840**	30	<0.2	<0.3	NA
AW-01D	W of plant	Ash Basin	Pee Dee	05/22/2018	7.1	19.867 j	26	110	<1	<1	<1	<1	**1860**	27	<0.2	**0.356**	NA
AW-01D	W of plant	Ash Basin	Pee Dee	08/09/2018	6.9	18.6 j	26	120	<1	<1	<1	<1	**807**	15	<0.2	0.236 j	NA
AW-01D	W of plant	Ash Basin	Pee Dee	10/16/2018	6.7	19.571 j	28	120	<1	<1	<1	<1	**1050**	17	<0.2	<0.3	NA
AW-01I	W of plant	Ash Basin	Lower Yorktown	02/26/2018	**5.0**	<50	6.5	29	<1	<1	<1	<1	**2520**	37	<0.2	**0.388**	NA
AW-01I	W of plant	Ash Basin	Lower Yorktown	05/22/2018	**4.9**	38.657 j	6.8	31	<1	1.02	<1	0.484 j	**1540**	32	<0.2	**0.475**	NA
AW-01I	W of plant	Ash Basin	Lower Yorktown	08/09/2018	**4.6**	46.103 j	6.3	<25	<1	0.621 j	<1	0.561 j	**1460**	35	0.131 j	**0.313**	NA
AW-01I	W of plant	Ash Basin	Lower Yorktown	10/16/2018	**5.2**	41.539 j	6.2	27	<1	0.768 j	<1	0.549 j	**1590**	32	<0.2	0.186 j	NA
AW-01S	W of plant	Ash Basin	Surficial	02/26/2018	**4.7**	<50	3.4 M2	<25	<1	<1	<1	<1	**405**	<5	<0.2	**0.885**	NA
AW-01S	W of plant	Ash Basin	Surficial	05/22/2018	**5.0**	<50	3.1	<25	<1	<1	<1	<1	100	1.876 j	<0.2	**0.389**	NA
AW-01S	W of plant	Ash Basin	Surficial	08/09/2018	**4.2**	22.176 j	3.5	30	<1	<1	<1	<1	**385**	3.269 j	0.1 j	**0.67**	NA
AW-01S	W of plant	Ash Basin	Surficial	10/16/2018	**4.7**	30.303 j	3.4	<25	<1	<1	<1	<1	95	3.08 j	<0.2	0.112 j	NA
AW-02D	SW of plant	Ash Basin	Pee Dee	02/26/2018	7.3	<50	4.1	160	<1	<1	<1	<1	**424**	18	<0.2	<0.3	NA
AW-02D	SW of plant	Ash Basin	Pee Dee	05/21/2018	7.1	20.668 j	13	170	<1	<1	<1	<1	**353**	16	<0.2	0.267 j	NA
AW-02D	SW of plant	Ash Basin	Pee Dee	08/09/2018	7.3	17.904 j	10	160	<1	<1	<1	<1	191	13	<0.2	**0.353**	NA
AW-02D	SW of plant	Ash Basin	Pee Dee	10/16/2018	7.2	23.927 j	6.6	160	<1	<1	<1	<1	70	3.344 j	0.105 j	0.167 j	NA
AW-02S	SW of plant	Ash Basin	Surficial	02/26/2018	**3.6**	68	**260**	240	<1	<1	**6.3**	**37.8**	**974**	**353**	**0.208**	<0.3	NA
AW-02S	SW of plant	Ash Basin	Surficial	05/21/2018	**3.5**	52	150	160	<1	<1	**5.96**	**26.9**	286	**185**	0.134 j	0.217 j	NA
AW-02S	SW of plant	Ash Basin	Surficial	08/09/2018	**3.4**	105	**290**	220	<1	0.411 j	**6.89**	**23.3**	**471**	**221**	**0.452**	0.295 j	NA
AW-02S	SW of plant	Ash Basin	Surficial	10/16/2018	**3.7**	105	230	180	<1	<1	**5.78**	**17.7**	195	**142**	**0.454**	<0.3	NA
AW-03D	Wetlands E of AB	Ash Basin	Pee Dee	02/27/2018	7.1	<50	1.2	140	<1	<1	<1	<1	**1040**	32	<0.2	<0.3	NA
AW-03D	Wetlands E of AB	Ash Basin	Pee Dee	05/22/2018	6.9	<50	1.3	130	<1	<1	<1	<1	**974**	30	<0.2	0.256 j	NA
AW-03D	Wetlands E of AB	Ash Basin	Pee Dee	08/07/2018	6.5	<50	1.3	130	<1	<1	<1	<1	**992**	31	<0.2	0.233 j	NA
AW-03D	Wetlands E of AB	Ash Basin	Pee Dee	10/17/2018	6.9	<50	1.4	140	<1	<1	<1	<1	**907**	29	<0.2	<0.3	NA
AW-03I	Wetlands E of AB	Ash Basin	Lower Yorktown	02/27/2018	**6.4**	<50	6	60	<1	<1	<1	<1	**341**	**100**	<0.2	<0.3	NA
AW-03I	Wetlands E of AB	Ash Basin	Lower Yorktown	05/22/2018	**5.8**	<50	3.8	53	<1	0.711 j	<1	0.992 j	**542**	**183**	<0.2	**0.337**	NA
AW-03I	Wetlands E of AB	Ash Basin	Lower Yorktown	08/07/2018	**5.8**	<50	3.3	40	<1	0.517 j	<1	0.73 j	259	**100**	<0.2	0.215 j	NA
AW-03I	Wetlands E of AB	Ash Basin	Lower Yorktown	10/17/2018	**6.1**	<50	3.3	71	<1	1.35	<1	0.894 j	**728**	**162**	<0.2	<0.3	NA
AW-03S	Wetlands E of AB	Ash Basin	Surficial	02/27/2018	**5.0**	<50	1.5	29	<1	<1	<1	<1	207	14	<0.2	<0.3	NA
AW-03S	Wetlands E of AB	Ash Basin	Surficial	05/22/2018	**4.7**	<50	1.6	26	<1	<1	<1	0.792 j	**406**	13	0.083 j	**0.369**	NA
AW-03S	Wetlands E of AB	Ash Basin	Surficial	08/07/2018	**4.4**	18.832 j	2.1	<25	<1	<1	<1	0.568 j	**2300**	12	<0.2	0.249 j	NA
AW-03S	Wetlands E of AB	Ash Basin	Surficial	10/17/2018	**5.0**	31.174 j	2.4	48	<1	0.883 j	<1	0.621 j	**4600**	13	0.153 j	**1.49**	NA
AW-04S	On NW Dike at Cooling Pond	Cooling Pond	Surficial	08/07/2018	**4.4**	209	230	310	<1	1.09	3.12	**4.19**	**19000**	**482**	<0.2	**0.849**	1.336
AW-04S	On NW Dike at Cooling Pond	Cooling Pond	Surficial	10/17/2018	**4.6**	226	240	240	<1	0.761 j	2.62	**2.71**	**12500**	**335**	<0.2	**0.642**	1.311
AW-05S	On SW Dike at Cooling Pond	Cooling Pond	Surficial	08/07/2018	**5.6**	405	0.79	110	<1	0.786 j	<1	<1	145	11	<0.2	**1.62**	0.983
AW-05S	On SW Dike at Cooling Pond	Cooling Pond	Surficial	10/17/2018	**5.7**	415	1	110	<1	0.83 j	<1	<1	115	11	<0.2	**1.65**	0.636
AW-06S	On SE Dike at Cooling Pond	Cooling Pond	Surficial	08/07/2018	**6.4**	61	11	220	<1	9.6	<1	**3.15**	**15700**	38	<0.2	**0.398**	3.5
AW-06S	On SE Dike at Cooling Pond	Cooling Pond	Surficial	10/17/2018	6.5	42.931 j	7.7	180	<1	7.6	<1	**2.19**	**11300**	30	<0.2	<0.3	2.557
BW-01 IMP	N of Plant and AB	Background	Surficial	03/01/2018	**4.1**	51	61	140	<1	<1	<1	<1	**707**	11	<0.2	**7.36**	NA
BW-01	N of Plant and AB	Background	Surficial	03/01/2018	**4.1**	51	46	140	<1	<1	<1	<1	**898**	11	<0.2	**9.05**	NA
BW-01	N of Plant and AB	Background	Surficial	05/21/2018	**4.2**	71	43	91	<1	1.01	<1	0.433 j	**1800**	17	<0.2	**16.8**	NA
BW-01	N of Plant and AB	Background	Surficial	06/18/2018	**4.3**	76	45 M2	86	<1	<1	<1	<1	**321**	18	<0.2	**5.18**	NA
BW-01	N of Plant and AB	Background	Surficial	08/08/2018	**3.6**	72	39	61	<1	0.419 j	<1	0.526 j	275	19	<0.2	**5**	NA
BW-02D	Old Whiteville Rd	Background	Pee Dee	02/27/2018	**11.5**	<50	17	120	**1.48**	1.44	<1	**1.14**	32	<5	<0.2	**28.6**	NA
BW-02I	Old Whiteville Rd	Background	Lower Yorktown	02/27/2018	7.5	<50	0.13	140	<1	<1	<1	<1	**1160**	21	<0.2	**1.82**	NA
BW-02S	Old Whiteville Rd	Background	Surficial	02/27/2018	**4.5**	<50	8.8	26	<1	<1	<1	<1	**1030**	13	<0.2	**0.875**	**6.62**
BW-02S	Old Whiteville Rd	Background	Surficial	05/22/2018	**4.4**	<50	7.9	31	<1	0.438 j	<1	0.352 j	**1760**	11	<0.2	**1.96**	1.64
BW-02S	Old Whiteville Rd	Background	Surficial	08/08/2018	**4.6**	25.621 j	9	350	<1	1.47	0.425 j	0.491 j	**5120**	14	<0.2	**19.3**	**5.57**
BW-02S	Old Whiteville Rd	Background	Surficial	10/17/2018	**4.5**	22.437 j	9.1	130	<1	0.892 j	<1	0.432 j	**3340**	14	<0.2	**6.09**	2.64
BW-03D	NC Hwy 721	Background	Pee Dee	02/27/2018	6.8	<50	0.17	78	<1	<1	<1	<1	**947**	24	<0.2	<0.3	4.425
BW-03D	NC Hwy 721	Background	Pee Dee	05/21/2018	6.8	23.485 j	0.16	100	<1	<1	<1	<1	**1010**	26	<0.2	0.251 j	1.188

WEATHERSPOON
12/05/2018
BRANDON RUSSO
TED VOLSKAY

	PARAM	**CFR257 APPENDIX III CONSTITU**			**INORGANIC PARAMETERS (TOTAL CONCENTRATION)**								**IONUCLI**
Reporting Units	**S.U.**	**ug/L**	**mg/L**	**mg/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**pCi/L**
15A NCAC 02L Standard	**6.5-8.5**	**700**	**250**	**500**	**1***	**10**	**4***	**1***	**300**	**50**	**0.2***	**0.3***	**5^**
Provisional Background (Surficial Unit)	**3.2-6.9**	**50**	**13.7**	**90.3**	**1**	**1.35**	**1**	**1**	**9422**	**39**	**0.2**	**4.2**	**6.463**
Provisional Background (Lower Yorktown Unit)	**5.5-5.7**	**50**	**1.3**	**75**	**1**	**1**	**1**	**1**	**2070**	**20**	**0.2**	**2.61**	**5.4**
Provisional Background (Pee Dee Unit)	**6.9-8.3**	**50**	**0.24**	**130**	**1**	**1**	**1**	**1**	**1550**	**41**	**0.2**	**0.32**	**3.55**

					PARAM	**CFR257 APPENDIX III CONSTITU**			**INORGANIC PARAMETERS (TOTAL CONCENTRATION)**								**IONUCLI**
Sample ID	**Location Description**	**Associated Unit**	**Sample Location Aquifer Name**	**Sample Collection Date**	**pH**	**Boron**	**Sulfate**	**Total Dissolved Solids**	**Antimony**	**Arsenic**	**Beryllium**	**Cobalt**	**Iron**	**Manganese**	**Thallium**	**Vanadium**	**Total Radium**
BW-03D	NC Hwy 721	Background	Pee Dee	08/08/2018	6.7	21.91 j	0.48	100	<1	<1	<1	**2.15**	**613**	24	<0.2	0.224 j	1.618
BW-03D	NC Hwy 721	Background	Pee Dee	10/17/2018	6.6	23.738 j	0.25	110	<1	<1	<1	0.46 j	**672**	22	<0.2	<0.3	1.252
BW-03I	NC Hwy 721	Background	Lower Yorktown	02/27/2018	**5.5**	<50	0.34	37	<1	<1	<1	<1	**1540**	14	<0.2	**3.41**	2.847
BW-03I	NC Hwy 721	Background	Lower Yorktown	05/21/2018	**5.3**	18.484 j	0.0934 j	58	<1	0.464 j	<1	<1	**1790**	14	<0.2	**3.03**	1.204
BW-03I	NC Hwy 721	Background	Lower Yorktown	08/08/2018	**5.0**	<50	<0.1	45	<1	<1	<1	<1	**1260**	12	<0.2	**1.55**	1.251
BW-03I	NC Hwy 721	Background	Lower Yorktown	10/17/2018	**5.2**	<50	0.23	50	<1	<1	0.482 j	<1	**1520**	14	<0.2	**2.74**	2.068
BW-03S	NC Hwy 721	Background	Surficial	02/27/2018	**5.2**	<50	0.47	42	<1	<1	<1	<1	**2860**	18	<0.2	**3.78**	1.497
BW-03S	NC Hwy 721	Background	Surficial	05/21/2018	**5.1**	20.089 j	0.18	50	<1	0.487 j	<1	0.818 j	**2530**	19	0.122 j	**4.48**	0.7938
BW-03S	NC Hwy 721	Background	Surficial	08/08/2018	**4.7**	<50	0.98	34	<1	0.653 j	0.755 j	0.947 j	**2480**	20	0.152 j	**3.84**	0.456
BW-03S	NC Hwy 721	Background	Surficial	10/17/2018	**5.0**	22.062 j	0.21	51	<1	0.47 j	<1	0.757 j	**2610**	20	<0.2	**3.56**	0.597
BW-04D	N of AB	Background	Black Creek	02/26/2018	7.4	<50	1.2	140	<1	<1	<1	<1	**579**	25	<0.2	**0.406**	NA
BW-04D	N of AB	Background	Black Creek	05/21/2018	7.1	19.985 j	1.4	150	<1	<1	<1	<1	**448**	23	<0.2	**0.431**	1.516
BW-04D	N of AB	Background	Black Creek	08/08/2018	7.3	<50	1.3	140	<1	<1	<1	<1	**373**	21	<0.2	0.19 j	1.243
BW-04D	N of AB	Background	Black Creek	10/17/2018	7.3	19.415 j	1.4	140	<1	<1	<1	<1	**697**	23	<0.2	**0.302**	1.227
BW-04I	N of AB	Background	Lower Yorktown	02/26/2018	7.7	<50	0.44	130	<1	<1	<1	<1	**899**	50	<0.2	**0.408**	0.425
BW-04I	N of AB	Background	Lower Yorktown	05/21/2018	7.3	<50	0.16	140	<1	<1	<1	<1	**766**	40	<0.2	**0.348**	0.369
BW-04I	N of AB	Background	Lower Yorktown	08/08/2018	7.6	<50	<0.1	140	<1	<1	<1	<1	**1220**	**61**	<0.2	0.18 j	0.78
BW-04I	N of AB	Background	Lower Yorktown	10/17/2018	7.5	<50	<0.1	150	<1	<1	<1	<1	**957**	45	<0.2	<0.3	0.554
BW-04S	N of AB	Background	Surficial	02/26/2018	**4.7**	<50	1.6	33	<1	<1	<1	<1	100	13	<0.2	<0.3	3.2
BW-04S	N of AB	Background	Surficial	05/21/2018	**4.6**	<50	0.6	31	<1	<1	0.397 j	0.542 j	244	7	<0.2	**0.815**	3.117
BW-04S	N of AB	Background	Surficial	08/08/2018	**5.1**	<50	0.9	<25	<1	<1	<1	0.484 j	224	3.361 j	<0.2	**0.654**	0.691
BW-04S	N of AB	Background	Surficial	10/17/2018	**4.6**	<50	1.1	<25	<1	<1	<1	<1	101	3.481 j	<0.2	0.2 j	0.573
BW-05S	SW of AB	Background	Surficial	02/26/2018	**5.5**	<50	0.86	66	<1	<1	<1	<1	**6520**	**70**	<0.2	**1.88**	NA
BW-05S	SW of AB	Background	Surficial	08/08/2018	**5.3**	29.017 j	0.17	49	<1	<1	<1	<1	**5150**	48	<0.2	**2.23**	1.131
BW-05S	SW of AB	Background	Surficial	10/16/2018	6.6	28.324 j	0.72	120	<1	<1	<1	<1	**10000**	**110**	<0.2	**0.677**	0.11
CCR-101-BG IMP	N of AB	Background	Lower Yorktown	02/28/2018	**6.0**	<50	1.4	56	<1	<1	<1	<1	56	9	<0.2	**0.596**	1.807
CCR-101-BG	N of AB	Background	Lower Yorktown	02/28/2018	**6.0**	<50	1.5	47	<1	<1	<1	<1	NA	NA	<0.2	NA	4.893
CCR-101-BG IMP	N of AB	Background	Lower Yorktown	05/23/2018	**5.7**	<50	1.7	53	<1	0.525 j	<1	<1	177	9	0.084 j	**0.947**	2.192
CCR-101-BG	N of AB	Background	Lower Yorktown	05/23/2018	**5.7**	<50	1.7	57	<1	0.567 j	<1	<1	NA	NA	<0.2	NA	1.518
CCR-101-BG IMP	N of AB	Background	Lower Yorktown	08/07/2018	**5.5**	<50	1.1	35	<1	0.477 j	<1	<1	200	10	<0.2	**0.432**	2.3683
CCR-101-BG IMP	N of AB	Background	Lower Yorktown	10/17/2018	**5.9**	<50	1.5	57	<1	0.631 j	<1	<1	130	9	<0.2	**0.858**	1.173
CCR-102	W of AB	Ash Basin	Surficial	02/28/2018	**4.7**	305	**320**	490	<1	<1	<1	**2.06**	NA	NA	<0.2	NA	**10.57**
CCR-102	W of AB	Ash Basin	Surficial	05/21/2018	**4.7**	321	**450**	**510**	<1	1.01	<1	**1.9**	NA	NA	0.124 j	NA	**14.56**
CCR-103	W of AB	Ash Basin	Surficial	02/28/2018	**5.3**	<50	73	120	<1	1.16	<1	<1	NA	NA	<0.2	NA	2.188
CCR-103	W of AB	Ash Basin	Surficial	05/21/2018	**4.8**	<50	80	130	<1	1.67	<1	0.746 j	NA	NA	0.158 j	NA	3.184
CCR-104	W of AB	Ash Basin	Surficial	02/28/2018	7.4	<50	37	180	<1	<1	<1	<1	NA	NA	<0.2	NA	2.775
CCR-104	W of AB	Ash Basin	Surficial	05/23/2018	7.0	<50	37	200	<1	<1	<1	<1	NA	NA	<0.2	NA	2.146
CCR-105	W of AB	Ash Basin	Surficial	02/28/2018	**6.0**	54	46	160	<1	2.89	<1	<1	NA	NA	<0.2	NA	3.15
CCR-105	W of AB	Ash Basin	Surficial	05/23/2018	**5.8**	55	44	140	<1	2.61	<1	0.729 j	NA	NA	<0.2	NA	1.12
CCR-106	W of AB	Ash Basin	Surficial	02/28/2018	7.2	179	130	380	<1	<1	<1	<1	NA	NA	<0.2	NA	2.4
CCR-106	W of AB	Ash Basin	Surficial	05/23/2018	6.9	199	130	400	<1	<1	<1	<1	NA	NA	<0.2	NA	3.263
CCR-107	S of AB	Ash Basin	Surficial	02/28/2018	7.1	**2070**	190	**560**	<1	<1	<1	<1	NA	NA	<0.2	NA	0.67
CCR-107	S of AB	Ash Basin	Surficial	05/23/2018	6.9	**2070**	180	**600**	<1	0.435 j	<1	<1	NA	NA	<0.2	NA	1.884
CCR-108	E of AB	Ash Basin	Surficial	02/28/2018	6.6	**1500**	99	340	<1	1.6	<1	**2.61**	NA	NA	<0.2	NA	**6.47**
CCR-108	E of AB	Ash Basin	Surficial	05/23/2018	**6.3**	**1490**	84	330	<1	2.62	<1	**2.52**	NA	NA	<0.2	NA	3.83
CCR-109	E of AB	Ash Basin	Surficial	02/28/2018	7.2	463	160	**510**	<1	<1	<1	<1	NA	NA	<0.2	NA	3.08
CCR-109	E of AB	Ash Basin	Surficial	05/23/2018	7.0	458	150	500	<1	0.347 j	<1	<1	NA	NA	<0.2	NA	2.353
CCR-110	E of AB	Ash Basin	Surficial	02/28/2018	**6.1**	631	160	360	<1	<1	<1	<1	NA	NA	<0.2	NA	2.54
CCR-110	E of AB	Ash Basin	Surficial	05/23/2018	**5.9**	609	150	370	<1	<1	<1	<1	NA	NA	<0.2	NA	2.153
CCR-111	E of AB	Ash Basin	Surficial	02/28/2018	6.8	334	34	**560**	<1	<1	<1	<1	NA	NA	**0.246**	NA	4.723
CCR-111	E of AB	Ash Basin	Surficial	05/23/2018	6.5	350	34	**580**	<1	0.512 j	<1	<1	NA	NA	0.186 j	NA	1.43
CW-01 IMP	SW of AB	Ash Basin	Surficial	03/01/2018	**5.6**	<50	14	62	<1	1.19	<1	<1	**1840**	39	<0.2	**0.975**	NA
CW-01	SW of AB	Ash Basin	Surficial	03/01/2018	**5.6**	<50	14	72	<1	1.21	<1	<1	**1880**	41	<0.2	**0.953**	NA

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	PARAM	CFR257 APPENDIX III CONSTITU			INORGANIC PARAMETERS (TOTAL CONCENTRATION)								IONUCLI
Reporting Units	**S.U.**	**ug/L**	**mg/L**	**mg/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**pCi/L**
15A NCAC 02L Standard	**6.5-8.5**	**700**	**250**	**500**	**1***	**10**	**4***	**1***	**300**	**50**	**0.2***	**0.3***	**5^**
Provisional Background (Surficial Unit)	**3.2-6.9**	**50**	**13.7**	**90.3**	**1**	**1.35**	**1**	**1**	**9422**	**39**	**0.2**	**4.2**	**6.463**
Provisional Background (Lower Yorktown Unit)	**5.5-5.7**	**50**	**1.3**	**75**	**1**	**1**	**1**	**1**	**2070**	**20**	**0.2**	**2.61**	**5.4**
Provisional Background (Pee Dee Unit)	**6.9-8.3**	**50**	**0.24**	**130**	**1**	**1**	**1**	**1**	**1550**	**41**	**0.2**	**0.32**	**3.55**

					PARAM	CFR257 APPENDIX III CONSTITU			INORGANIC PARAMETERS (TOTAL CONCENTRATION)								IONUCLI
Sample ID	**Location Description**	**Associated Unit**	**Sample Location Aquifer Name**	**Sample Collection Date**	**pH**	**Boron**	**Sulfate**	**Total Dissolved Solids**	**Antimony**	**Arsenic**	**Beryllium**	**Cobalt**	**Iron**	**Manganese**	**Thallium**	**Vanadium**	**Total Radium**
CW-01	SW of AB	Ash Basin	Surficial	05/22/2018	**5.4**	20.291 j	9.1	53	<1	1.34	<1	<1	**1440**	35	<0.2	**1.23**	NA
CW-01	SW of AB	Ash Basin	Surficial	06/18/2018	**6.0**	<50	12	86	<1	<1	<1	<1	**2110**	40	<0.2	**0.652**	NA
CW-01	SW of AB	Ash Basin	Surficial	08/09/2018	**5.2**	24.255 j	5.5	39	<1	1.67	<1	<1	**1490**	32	<0.2	**1.19**	NA
CW-01 IMP	SW of AB	Ash Basin	Surficial	10/16/2018	**5.7**	21.327 j	7.2	57	<1	1.14	<1	<1	**1310**	30	<0.2	**0.823**	NA
CW-01	SW of AB	Ash Basin	Surficial	10/16/2018	**5.7**	<50	<0.1	57	<1	1.18	<1	<1	**1350**	31	<0.2	**0.911**	NA
CW-02 IMP	SE of AB	Ash Basin	Surficial	03/01/2018	7.5	<50	8.4	150	<1	1.42	<1	<1	**1110**	15	<0.2	**1.09**	NA
CW-02	SE of AB	Ash Basin	Surficial	03/01/2018	7.5	<50	7.9	160	<1	1.44	<1	<1	**1190**	16	<0.2	**1.08**	NA
CW-02	SE of AB	Ash Basin	Surficial	05/22/2018	7.3	<50	9.6	140	<1	1.06	<1	<1	**862**	20	<0.2	**0.312**	NA
CW-02	SE of AB	Ash Basin	Surficial	06/18/2018	7.3	<50	9.6	160	<1	<1	<1	<1	237	15	<0.2	**0.462**	NA
CW-02	SE of AB	Ash Basin	Surficial	08/07/2018	7.1	<50	8.8	160	<1	<1	<1	<1	112	12	<0.2	**0.4**	NA
CW-02 IMP	SE of AB	Ash Basin	Surficial	10/16/2018	7.3	<50	10	150	<1	0.856 j	<1	<1	**610**	12	<0.2	0.104 j	NA
CW-02	SE of AB	Ash Basin	Surficial	10/16/2018	7.3	<50	10	140	<1	<1	<1	<1	**763**	11	<0.2	<0.3	NA
CW-03 IMP	E of AB	Ash Basin	Surficial	03/01/2018	6.6	71	57	210	<1	<1	<1	<1	**537**	35	<0.2	**0.533**	2.1214
CW-03	E of AB	Ash Basin	Surficial	03/01/2018	6.6	73	55	220	<1	<1	<1	<1	**562**	38	<0.2	**0.546**	NA
CW-03	E of AB	Ash Basin	Surficial	05/22/2018	6.5	37.623 j	30	140	<1	<1	<1	0.35 j	**675**	36	<0.2	**0.623**	3.909
CW-03	E of AB	Ash Basin	Surficial	06/18/2018	6.5	<50	12	120	<1	<1	<1	<1	**859**	30	<0.2	**0.556**	NA
CW-03	E of AB	Ash Basin	Surficial	08/07/2018	6.8	<50	4.3	110	<1	<1	<1	<1	**876**	26	<0.2	**0.419**	1.254
CW-03 IMP	E of AB	Ash Basin	Surficial	10/16/2018	6.6	78	38	160	<1	0.508 j	<1	<1	**540**	30	<0.2	**0.804**	1.036
CW-03	E of AB	Ash Basin	Surficial	10/16/2018	6.6	<50	9.9	100	<1	<1	<1	<1	289	23	<0.2	**0.672**	NA
MW-01	NW of AB	Background	Surficial	02/26/2018	**4.7**	<50	3.8	25	<1	<1	<1	<1	100	11	<0.2	<0.3	2.83
MW-01 CCR	NW of AB	Background	Surficial	02/26/2018	**4.7**	<50	4.6	36	<1	<1	<1	<1	NA	NA	<0.2	NA	2.7543
MW-01	NW of AB	Background	Surficial	05/21/2018	**4.4**	<50	3	<25	<1	<1	0.436 j	0.454 j	125	10	<0.2	**0.322**	1.4882
MW-01 CCR	NW of AB	Background	Surficial	05/21/2018	**4.4**	<50	2.3	<25	<1	<1	<1	0.353 j	NA	NA	<0.2	NA	**5.91**
MW-01	NW of AB	Background	Surficial	08/08/2018	**3.6**	<50	3	<25	<1	<1	<1	0.363 j	119	9	<0.2	0.137 j	2.58
MW-01	NW of AB	Background	Surficial	10/17/2018	**4.5**	<50	5.9 M2	27	<1	<1	<1	0.43 j	52	10	<0.2	<0.3	3.63
MW-02	S of AB	Ash Basin	Lower Yorktown	03/01/2018	7.4	<50	32	200	<1	<1	<1	<1	259	47	<0.2	**0.85**	3.057
MW-02	S of AB	Ash Basin	Lower Yorktown	05/23/2018	7.1	<50	29	180	<1	<1	<1	<1	**1240**	33	<0.2	**0.408**	1.172
MW-02	S of AB	Ash Basin	Lower Yorktown	08/08/2018	7.0	<50	30	180	<1	<1	<1	<1	**438**	25	<0.2	0.232 j	3.624
MW-02	S of AB	Ash Basin	Lower Yorktown	10/17/2018	7.1	<50	31	190	<1	<1	<1	<1	**593**	27	<0.2	<0.3	2.55
MW-03	S of AB	Ash Basin	Surficial	03/01/2018	**6.4**	**1400**	7.2	330	<1	6.16	<1	<1	**1460**	**83**	<0.2	**4.79**	1.709
MW-03 CCR	S of AB	Ash Basin	Surficial	03/01/2018	**6.4**	**1470**	7.3	340	<1	6.28	<1	<1	NA	NA	<0.2	NA	4.506
MW-03	S of AB	Ash Basin	Surficial	05/23/2018	**6.4**	**1460**	10	320	<1	**13.8**	<1	<1	**4790**	**111**	<0.2	**0.582**	1.067
MW-03 CCR	S of AB	Ash Basin	Surficial	05/23/2018	**6.4**	**1410**	11	330	<1	**14.8**	<1	<1	NA	NA	<0.2	NA	1.587
MW-03	S of AB	Ash Basin	Surficial	08/08/2018	**6.2**	**1690**	11	320	<1	**18**	<1	<1	**4190**	**111**	<0.2	**0.687**	2.104
MW-03	S of AB	Ash Basin	Surficial	10/18/2018	**6.3**	**1910**	8.7	310	<1	**16**	<1	<1	**3870**	**118**	<0.2	**0.597**	1.326
MW-04	S of AB	Ash Basin	Lower Yorktown	02/27/2018	**6.4**	**2040**	170	410	<1	<1	<1	**4.15**	27	**648**	**0.46**	<0.3	**5.111**
MW-04 CCR	S of AB	Ash Basin	Lower Yorktown	02/27/2018	**6.4**	**2000**	140	410	<1	<1	<1	**4.54**	NA	NA	**0.456**	NA	**5.521**
MW-04	S of AB	Ash Basin	Lower Yorktown	05/23/2018	**6.3**	**1940**	130	400	<1	<1	<1	**4.38**	61	**696**	**0.4**	0.243 j	2.445
MW-04 CCR	S of AB	Ash Basin	Lower Yorktown	05/23/2018	**6.3**	**1940**	130	410	<1	<1	<1	**4.65**	NA	NA	**0.497**	NA	2.301
MW-04	S of AB	Ash Basin	Lower Yorktown	08/06/2018	**6.0**	**2320**	140	430	<1	<1	<1	**3.45**	19	**715**	**0.452**	0.158 j	1.935
MW-04	S of AB	Ash Basin	Lower Yorktown	10/17/2018	**6.3**	**2110**	140	400	<1	0.798 j	<1	**6.63**	**1310**	**736**	**0.385**	**0.416**	2.072
MW-05	S of AB	Ash Basin	Surficial	02/27/2018	**5.2**	155	63	120	<1	2.7	<1	**1.8**	**21000**	35	<0.2	**1.58**	2.474
MW-05	S of AB	Ash Basin	Surficial	05/23/2018	**4.9**	299	61	140	<1	2.63	<1	**1.02**	**11700**	22	0.11 j	**0.448**	1.644
MW-05	S of AB	Ash Basin	Surficial	08/06/2018	**4.1**	209	55	100	<1	2.53	<1	**1.21**	**12400**	24	0.174 j	**0.69**	2.568
MW-05	S of AB	Ash Basin	Surficial	10/17/2018	**4.9**	258	56	110	<1	2.68	<1	**1.18**	**11200**	21	<0.2	**2.42**	2.074
MW-06	SE of AB	Ash Basin	Surficial	02/27/2018	**6.0**	617	140	300	<1	<1	<1	**1.3**	**8640**	40	<0.2	**0.34**	2.93
MW-06	SE of AB	Ash Basin	Surficial	05/23/2018	6.7	134	55	240	<1	1.14	<1	<1	**9820**	39	<0.2	0.226 j	2.106
MW-06	SE of AB	Ash Basin	Surficial	08/07/2018	**6.2**	443	88	280	<1	0.787 j	<1	<1	**2360**	31	<0.2	0.287 j	2.406
MW-06	SE of AB	Ash Basin	Surficial	10/16/2018	**6.2**	594	110	310	<1	1.09	<1	0.444 j	**4750**	50	<0.2	0.259 j	2.112
MW-07	SE of AB	Ash Basin	Lower Yorktown	02/27/2018	7.5	<50	13	160	<1	<1	<1	<1	**533**	17	<0.2	<0.3	1.202
MW-07	SE of AB	Ash Basin	Lower Yorktown	05/23/2018	6.8	25.177 j	12	170	<1	<1	<1	<1	195	19	0.105 j	<0.3	0.22925
MW-07	SE of AB	Ash Basin	Lower Yorktown	08/07/2018	7.1	25.456 j	12	170	<1	<1	<1	<1	**1690**	**62**	<0.2	0.172 j	0.651
MW-07	SE of AB	Ash Basin	Lower Yorktown	10/16/2018	7.1	21.357 j	12	170	<1	<1	<1	<1	**1120**	**52**	<0.2	<0.3	0.499

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	PARAM	CFR257 APPENDIX III CONSTITU			INORGANIC PARAMETERS (TOTAL CONCENTRATION)								IONUCLI
Reporting Units	**S.U.**	**ug/L**	**mg/L**	**mg/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**pCi/L**
15A NCAC 02L Standard	**6.5-8.5**	**700**	**250**	**500**	**1***	**10**	**4***	**1***	**300**	**50**	**0.2***	**0.3***	**5^**
Provisional Background (Surficial Unit)	**3.2-6.9**	**50**	**13.7**	**90.3**	**1**	**1.35**	**1**	**1**	**9422**	**39**	**0.2**	**4.2**	**6.463**
Provisional Background (Lower Yorktown Unit)	**5.5-5.7**	**50**	**1.3**	**75**	**1**	**1**	**1**	**1**	**2070**	**20**	**0.2**	**2.61**	**5.4**
Provisional Background (Pee Dee Unit)	**6.9-8.3**	**50**	**0.24**	**130**	**1**	**1**	**1**	**1**	**1550**	**41**	**0.2**	**0.32**	**3.55**

					PARAM	CFR257 APPENDIX III CONSTITU			INORGANIC PARAMETERS (TOTAL CONCENTRATION)								IONUCLI
Sample ID	**Location Description**	**Associated Unit**	**Sample Location Aquifer Name**	**Sample Collection Date**	**pH**	**Boron**	**Sulfate**	**Total Dissolved Solids**	**Antimony**	**Arsenic**	**Beryllium**	**Cobalt**	**Iron**	**Manganese**	**Thallium**	**Vanadium**	**Total Radium**
MW-33D	In AB	Ash Basin	Pee Dee	02/26/2018	7.0	<50	**260**	**580**	<1	<1	<1	<1	**9000**	**113**	<0.2	<0.3	NA
MW-33D	In AB	Ash Basin	Pee Dee	05/22/2018	6.7	<50	250	**600**	<1	<1	<1	<1	**10300**	**117**	<0.2	0.134 j	NA
MW-33D	In AB	Ash Basin	Pee Dee	08/08/2018	6.8	<50	250	**580**	<1	<1	<1	<1	**9710**	**113**	<0.2	0.254 j	NA
MW-33D	In AB	Ash Basin	Pee Dee	10/16/2018	7.0	<50	230	**570**	<1	<1	<1	<1	**8610**	**112**	<0.2	<0.3	NA
MW-33I	W of AB	Ash Basin	Lower Yorktown	02/26/2018	6.8	<50	220	**620**	<1	<1	<1	<1	**8930**	**126**	<0.2	<0.3	NA
MW-33I	W of AB	Ash Basin	Lower Yorktown	05/22/2018	6.7	<50	210	**640**	<1	<1	<1	<1	**8680**	**113**	<0.2	**0.376 B2**	NA
MW-33I	W of AB	Ash Basin	Lower Yorktown	08/08/2018	6.7	<50	220	**640**	<1	<1	<1	<1	**11300**	**136**	<0.2	0.204 j	NA
MW-33I	W of AB	Ash Basin	Lower Yorktown	10/16/2018	6.7	<50	210	**620**	<1	<1	<1	<1	**9490**	**125**	<0.2	0.129 j	NA
MW-33S	W of AB	Ash Basin	Surficial	02/26/2018	**5.0**	<50	52	110	<1	<1	<1	**1.62**	**4480**	**70**	<0.2	**1.56**	NA
MW-33S	W of AB	Ash Basin	Surficial	05/22/2018	**4.7**	40.338 j	98	190	<1	0.52 j	<1	**2.78**	**11500**	**115**	<0.2	**1.07**	NA
MW-33S	W of AB	Ash Basin	Surficial	08/08/2018	**4.9**	47.105 j	54	120	<1	0.66 j	<1	**1.5**	**4760**	**61**	<0.2	**2.76**	NA
MW-33S	W of AB	Ash Basin	Surficial	10/16/2018	**5.0**	37.923 j	45	110	<1	0.701 j	<1	**1.63**	**5460**	**71**	<0.2	**1.69**	NA
MW-41D	E of AB	Ash Basin	Pee Dee	02/27/2018	6.9	<50	<0.1	150	<1	<1	<1	<1	**1710**	34	<0.2	<0.3	NA
MW-41D	E of AB	Ash Basin	Pee Dee	05/22/2018	6.7	<50	<0.1	140	<1	<1	<1	<1	**1740**	34	0.169 j	**0.396**	NA
MW-41D	E of AB	Ash Basin	Pee Dee	08/07/2018	**6.5**	<50	<0.1	150	<1	<1	<1	<1	**1620**	34	<0.2	0.21 j	NA
MW-41D	E of AB	Ash Basin	Pee Dee	10/18/2018	7.0	<50	<0.1	150	<1	<1	<1	<1	**1450**	35	<0.2	<0.3	NA
MW-41I	E of AB	Ash Basin	Lower Yorktown	02/27/2018	7.3	<50	22	190	<1	<1	<1	<1	**1290**	23	<0.2	<0.3	NA
MW-41I	E of AB	Ash Basin	Lower Yorktown	05/22/2018	7.2	<50	22	190	<1	<1	<1	<1	**878**	22	<0.2	**0.342**	NA
MW-41I	E of AB	Ash Basin	Lower Yorktown	08/07/2018	6.9	<50	22	180	<1	<1	<1	<1	**384**	23	<0.2	0.209 j	NA
MW-41I	E of AB	Ash Basin	Lower Yorktown	10/18/2018	7.4	<50	21	180	<1	<1	<1	<1	**403**	23	<0.2	0.122 j	NA
MW-52	S of AB	Ash Basin	Surficial	02/28/2018	**5.0**	255	35	120	<1	<1	<1	**1.3**	**1710**	26	<0.2	**0.433**	3.961
MW-52	S of AB	Ash Basin	Surficial	05/23/2018	**4.9**	338	46	130	<1	0.476 j	<1	**1.97**	**1990**	**51**	0.09 j	**0.344**	1.915
MW-52	S of AB	Ash Basin	Surficial	08/06/2018	**4.4**	347	43	120	<1	0.379 j	<1	0.907 j	**573**	12	0.112 j	**0.346**	2.649
MW-52	S of AB	Ash Basin	Surficial	10/16/2018	**4.6**	384	37	110	<1	<1	<1	**1.03**	**400**	32	<0.2	0.2 j	4.647
MW-53D	SW of AB	Ash Basin	Pee Dee	03/01/2018	7.3	<50	19	160	<1	<1	<1	<1	139	<5	<0.2	<0.3	NA
MW-53D	SW of AB	Ash Basin	Pee Dee	05/22/2018	7.0	<50	16	150	<1	<1	<1	<1	**310**	31	<0.2	0.211 j	NA
MW-53D	SW of AB	Ash Basin	Pee Dee	08/09/2018	6.7	<50	15	150	<1	<1	<1	<1	**1180**	38	<0.2	0.213 j	NA
MW-53D	SW of AB	Ash Basin	Pee Dee	10/16/2018	7.2	<50	20	150	<1	<1	<1	<1	**977**	29	<0.2	<0.3	NA
MW-53I	SW of AB	Ash Basin	Lower Yorktown	03/01/2018	7.0	<50	25	170	<1	<1	<1	<1	**906**	24	<0.2	<0.3	NA
MW-53I	SW of AB	Ash Basin	Lower Yorktown	05/22/2018	6.7	<50	24	150	<1	<1	<1	<1	**656**	24	0.081 j	**0.387**	NA
MW-53I	SW of AB	Ash Basin	Lower Yorktown	08/09/2018	6.8	<50	24	160	<1	<1	<1	<1	**636**	24	<0.2	0.239 j	NA
MW-53I	SW of AB	Ash Basin	Lower Yorktown	10/16/2018	7.2	<50	26	170	<1	<1	<1	<1	**648**	25	<0.2	<0.3	NA
MW-54D	SE of AB	Ash Basin	Pee Dee	02/27/2018	7.1	<50	<0.1	130	<1	<1	<1	<1	217	23	<0.2	<0.3	NA
MW-54D	SE of AB	Ash Basin	Pee Dee	05/23/2018	6.9	<50	<0.1	150	<1	<1	<1	<1	230	24	<0.2	<0.3	NA
MW-54D	SE of AB	Ash Basin	Pee Dee	08/07/2018	6.6	<50	<0.1	130	<1	<1	<1	<1	251	25	<0.2	0.16 j	NA
MW-54D	SE of AB	Ash Basin	Pee Dee	10/16/2018	7.0	<50	<0.1	140	<1	<1	<1	<1	222	25	<0.2	0.129 j	NA
MW-55D	SE of AB	Ash Basin	Pee Dee	02/27/2018	7.1	<50	<0.1	110	<1	<1	<1	<1	**1090**	34	<0.2	<0.3	1.001
MW-55D	SE of AB	Ash Basin	Pee Dee	05/22/2018	6.8	<50	<0.1	150	<1	<1	0.34 j	<1	**1030**	32	<0.2	**0.303**	0.382
MW-55D	SE of AB	Ash Basin	Pee Dee	08/06/2018	**6.4**	<50	<0.1	140	<1	<1	<1	<1	**1010**	33	<0.2	0.116 j	0.34
MW-55D	SE of AB	Ash Basin	Pee Dee	10/16/2018	7.0	<50	0.0798 j	140	<1	<1	<1	<1	**1040**	34	<0.2	<0.3	0.092
MW-55I	SE of AB	Ash Basin	Lower Yorktown	02/27/2018	**6.4**	**1100**	67	360	<1	<1	<1	**1.54**	35	**57**	<0.2	<0.3	4.177
MW-55I	SE of AB	Ash Basin	Lower Yorktown	05/22/2018	**6.4**	**1080**	67	390	<1	<1	<1	**1.44**	30	49	0.165 j	0.287 j,B2	1.34
MW-55I	SE of AB	Ash Basin	Lower Yorktown	08/06/2018	**6.3**	**1160**	67	380	<1	<1	<1	**1.37**	35	**55**	**0.217**	0.144 j	1.572
MW-55I	SE of AB	Ash Basin	Lower Yorktown	10/16/2018	**6.4**	**1230**	65	380	<1	<1	<1	**1.31**	43	**58**	**0.211**	0.114 j	0.761
PW-01	Plant Production Well	Ash Basin	Black Creek	02/28/2018	7.5	<50	0.81	120	<1	<1	<1	<1	**2100**	39	<0.2	<0.3	NA
PW-01	Plant Production Well	Ash Basin	Black Creek	05/23/2018	6.7	22.989 j	1.3	130	<1	<1	<1	<1	**816**	43	0.125 j	0.153 j	NA
PW-01	Plant Production Well	Ash Basin	Black Creek	08/08/2018	6.8	24.621 j	1.2	120	<1	<1	<1	<1	**2280**	**51**	<0.2	0.278 j	NA
PW-01	Plant Production Well	Ash Basin	Black Creek	10/18/2018	7.5	22.839 j	0.27	130	<1	<1	<1	<1	**3820**	**52**	<0.2	<0.3	NA

COLOR NOTES
Bold highlighted concentration indicates exceedance of the 15A NCAC 02L .0202 Standard or the IMAC. (Effective date for 15A NCAC 02L .0202 Standard and IMAC is April 1, 2013)
Turbidity of Sample ≥ 10 NTUs
Provisional Background Threshold Values reflect the values represented in the NCDEQ letter dated 10/11/2017.

WEATHERSPOON
12/05/2018
BRANDON RUSSO
TED VOLSKAY

	PARAM	CFR257 APPENDIX III CONSTIT			INORGANIC PARAMETERS (TOTAL CONCENTRATION)								IONUCLI
Reporting Units	S.U.	ug/L	mg/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	pCi/L
15A NCAC 02L Standard	6.5-8.5	700	250	500	1*	10	4*	1*	300	50	0.2*	0.3*	5^
Provisional Background (Surficial Unit)	3.2-6.9	50	13.7	90.3	1	1.35	1	1	9422	39	0.2	4.2	6.463
Provisional Background (Lower Yorktown Unit)	5.5-5.7	50	1.3	75	1	1	1	1	2070	20	0.2	2.61	5.4
Provisional Background (Pee Dee Unit)	6.9-8.3	50	0.24	130	1	1	1	1	1550	41	0.2	0.32	3.55

					PARAM	CFR257 APPENDIX III CONSTIT			INORGANIC PARAMETERS (TOTAL CONCENTRATION)								IONUCLI
Sample ID	**Location Description**	**Associated Unit**	**Sample Location Aquifer Name**	**Sample Collection Date**	**pH**	**Boron**	**Sulfate**	**Total Dissolved Solids**	**Antimony**	**Arsenic**	**Beryllium**	**Cobalt**	**Iron**	**Manganese**	**Thallium**	**Vanadium**	**Total Radium**

Analytical data review has not been completed for this dataset.

ABBREVIATION NOTES

BGS - below ground surface
BOD - Biologic Oxygen Demand
CB - Compliance Boundary
COD - Chemical Oxygen Demand
Deg C - Degrees Celsius
DMAs - dimethylarsinic acid
DUP - Duplicate
Eh - Redox Potential
ft - Feet
GPM - gallons per minute
IMAC - Interim Maximum Allowable Concentrations. From the 15A NCAC 02L Standard, Appendix 1, April, 1, 2013.
meq/100g - millequivalents per 100 grams
MDC - Minimum Detectable Concentration
MeSe - Methylseleninic acid
mg/kg - milligrams per kilogram
mg/L - milligrams per liter
mg-N/L - Milligram nitrogen per liter
MMAs - monomethylarsonic acid

mV - millivolts
NA - Not available or Not Applicable
ND - Not detected
NE - Not established
NM - Not measured
NTUs - Nephelometric Turbidity Units
pCi/L - picocuries per liter
PSRG - Primary Soil Remediation Goals
RL - Reporting Limit
SeCN - selnocynanate
SeMe (IV) - Selenomethionine
SPLP - Synthetic Precipitation Leaching Procedure
S.U. - Standard Units
TCLP - Toxicity Characteristic Leaching Procedure
ug/L - micrograms per liter
ug/mL - microgram per milliliter
umhos/cm - micromhos per centimenter
Well Locations referenced to NAD83 and elevations referenced to NAVD88

From: Sheetz, Bryson
To: "White, Kenneth B"
Cc: Lanter, Steven (Steven.Lanter@ncdenr.gov); eric.g.smith@ncdenr.gov; Sullivan, Ed M; Toepfer, John R; Czop, Ryan; Ogallo, LeToya Fields; Hanchey, Matthew F.; Tyndall, Kent; "Allen, Trent"
Subject: Duke Energy - Weatherspoon NPDES GW Monitoring Report - June 2018
Date: Thursday, July 19, 2018 12:10:00 PM
Attachments: Weatherspoon GW Monitoring Report for 2018.06.18.pdf

---

Kent,

Please find attached the Weatherspoon June 2018 Groundwater Monitoring Report that has been submitted via certified mail to the NCDEQ-DWQ Information Processing Unit. Duke Energy sampled three ash basin compliance wells (CW-1, CW-2, and CW-3) and one background well (BW-1) on June 18, 2018. The following is a summary of the 2L exceedances from this event:

- BW-1, CW-1, and CW-3 below pH of 6.5
- BW-1, CW-1, and CW-3 above iron standard.

Please let me know of any questions you have regarding these results.

Thanks,

Bryson Sheetz

Engineer II
EHS CCP Waste & Groundwater Programs
O: 980-373-6636 C: 706-910-9638
bryson.sheetz@duke-energy.com

ESTIMATED SUBMITTAL DATE **November 26, 2018**	**MUST BE SUBMITTED BEFORE** **November 30, 2018**

W. H. WEATHERSPOON PLANT
GROUNDWATER MONITORING REPORT SUBMITTAL
File: WSPN 12520-Q

☒ Date Mailed ☐ Date Hand Delivered 11/27/2018

this REVIEWER page only goes with FILE copy

October 2018 Sampling Event

REVIEWER, TITLE	**REVIEW TYPE**	**REVIEW DATE**	**INITIAL and DATE**
R. K. Tyndall, Environmental Specialist	Reviewer	November 26, 2018	11/26/2018
T. A. Hanes, Station Manager	Cover Letter/Report	November 21, 2018	

RETURN TO :	**R. K. Tyndall**	o:	**910-341-4775**
		f:	**910-341-4791**
		c:	**910-409-9430**

This report provides Groundwater Monitoring reporting data

MAILING INSTRUCTIONS:

Mail the original and one (1) copies CERTIFIED to:

Division of Water Quality
Information Processing Unit
1617 Mail Service Center
Raleigh, NC 27699-1617

DUKE ENERGY
PROGRESS

W. H. Weatherspoon Plant
491 Power Plant Rd
Lumberton, NC 28358

Mailing Address:
Sherwood Smith Jr. Energy Complex
198 Energy Way
Hamlet, NC 28345

o: 910.205.2101
f: 910.205.2047

November 26, 2018

Certified Mail # 7017 2680 0000 1260 9003 (2 copies)
NCDEQ-DWQ, Information Processing Unit
1617 Mail Service Center
Raleigh, NC 27699-1621

Subject: Weatherspoon October 2018 Groundwater Monitoring Report Submittal

Dear Aquifer Protection Supervisor:

Duke Energy Progress, LLC (DEP) sampled three ash basin compliance wells (CW-1, CW-2, and CW-3) at the Weatherspoon Steam Electric Plant (NPDES Permit #NC0005363) on October 16, 2018. The background well (BW-1) was inaccessible due to local flooding resulting from Hurricane Florence. Please find attached two copies of the results on the DEQ approved electronic version of the Groundwater Compliance Report Form (GW-59CCR).

All values reported on the attached reports are dependent on the accuracy of approved analytical methods used to measure parameters.

The NPDES permit (NC0005363) was re-issued on August 3, 2018, and became effective November 1, 2018. This is the last groundwater compliance event per the prior permit requirements.

If there are any questions, please contact either:

- R. Kent Tyndall, Environmental Professional for the W. H. Weatherspoon Plant; phone (910) 341-4775 or e-mail Kent.Tyndall@duke-energy.com; or
- Bryson Sheetz, Waste and Groundwater Engineer at our Corporate Headquarters (South Church Street Building), phone (980) 373-6636 or email Bryson.Sheetz@duke-energy.com.

I, certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Sincerely,

Danny Faile for Thomas A. Hanes
Station Manager

GROUNDWATER QUALITY MONITORING COMPLIANCE REPORT FORM

Mail original and 1 copy to:
DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER QUALITY - INFORMATION PROCESSING UNIT
1617 MAIL SERVICE CENTER, RALEIGH, NC 27699-1617 Phone: (919) 733-3221

FACILITY INFORMATION

Please Print Clearly or Type

Facility Name: Weatherspoon Power Plant
Permit Name (if different): Duke Energy Progress, LLC
Facility Address: 491 Power Plant Road (Street)
Lumberton (City) NC (State) 28358 (Zip) County Robeson

Permit Type: NPDES
PERMIT Number: NC0005363
Expiration Date: 07/31/2014
TYPE OF PERMITTED OPERATION BEING MONITORED: Ash Impoundment Groundwater

Contact Person: Bryson Sheetz
Telephone# 980-373-6636
Well Location/Site Name: Weatherspoon Ash Pond Wells
No. of wells to be sampled: 4 (from Permit)

Monitoring Well Construction Information

			Well ID Number (From Permit)																
		Units	BW-1	CW-1	CW-2	CW-3	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-
Well Depth [ft below land surface]		ft	20.00	14.00	14.50	14.50														
Measuring Point (toc) [ft above land surface]		ft	3.36	3.13	2.72	3.12														
Well Diameter		in	2.0	2.0	2.0	2.0														
Screen Top [ft below land surface]		ft	5.00	4.00	4.50	4.50														
Screen Bottom [ft below land surface]		ft	20.00	14.00	14.50	14.50														
Relative Measuring Point Elevation		ft	142.82	116.84	113.41	119.08														

Sampling Information and Field Analysis

CHECK IF DRY WELL AT TIME OF SAMPLING			☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY
	15A-2L	Units	BW-1	CW-1	CW-2	CW-3	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-
Sample Date			NS	10/16/2018	10/16/2018	10/16/2018														
Volume of Water pumped/bailed		gal	NS	1.66	0.37	1.06														
Temperature (00010)		deg. C	NS	23	23	23														
Odor (00085)			NS	Minor Musty	None	None														
Appearance			NS	Brown Tint	Clear	Clear														
Turbidity (82078)		NTU	NS	9.3	5.4	2.1														
Dissolved Oxygen (00300)		mg/L	NS	0.40	0.37	1.26														
Oxidation Reduction Potential (00090)		mV	NS	207	73	217														
Specific Cond - field (00094)		umhos/cm	NS	89	285	217														
Water Level [ft below measuring pt.] (82546)		ft	NS	4.29	4.50	4.80														
pH - field (00400)	6.5 - 8.5	SU	**NS**	**5.68**	7.27	6.55														

Laboratory Information

Laboratory Name: Duke Energy Analytical Laboratory[2]
Sample Analysis Date: October 17 - 23, 2018
Certification #: NC DENR # 248
Samples for metals were collected unfiltered: ☑ Yes ☐ No
and field acidified: ☑ Yes ☐ No

	IMAC[1]	15A-2L	Units	BW-1	CW-1	CW-2	CW-3	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-	MW-
TDS - Total Diss. Solids (70300)	---	500	mg/l	NS	57	140	100														
Cl - Chloride (00940)	---	250	mg/l	NS	3.9	5.5	7.5														
As - Arsenic (01002)	---	10	ug/l	NS	1.18	<1	<1														
SO4 - Sulfate (00945)	---	250	mg/l	NS	<0.1	10	9.9														
Nitrate (NO3) as N (00620)	---	10	mg/l	NS	0.09	0.17	0.02														
Cd - Cadmium (01027)	---	2	ug/l	NS	<1	<1	<1														
Cr - Chromium (01034)	---	10	ug/l	NS	<5	<5	<5														
Cu - Copper (01042)	---	1	mg/l	NS	<0.005	<0.005	<0.005														
Fe - Iron (01045)	---	300	ug/l	NS	**1350**	**763**	289														
Hg - Mercury (71900)	---	1	ug/l	NS	<0.05	<0.05	<0.05														
Mn - Manganese (01055)	---	50	ug/l	NS	31	11	23														
Ni - Nickel (01067)	---	100	ug/l	NS	<5	<5	<5														
Pb - Lead (01051)	---	15	ug/l	NS	<1	<1	<1														
Zn - Zinc (01092)	---	1	mg/l	NS	<0.005	<0.005	<0.005														
Ba - Barium (01007)	---	700	ug/l	NS	25	24	35														
B - Boron (01022)	---	700	ug/l	NS	<50	<50	<50														
Tl - Thallium (01059)	0.2	NE	ug/l	NS	<0.2	<0.2	<0.2														
Sb - Antimony (01097)	1	NE	ug/l	NS	<1	<1	<1														
Se - Selenium (01147)	---	20	ug/l	NS	<1	<1	<1														
Alkalinity - (00410)	---	NE	mg/l	NS	26.4	124	88.8														
Al - Aluminum (01105)	---	NE	ug/l	NS	516	7	103														
Be - Beryllium (01012)	4	NE	ug/l	NS	<1	<1	<1														
HCO3 - Bicarbonate (00440)	---	NE	mg/l	NS	26.4	124	88.8														
Ca - Calcium (00916)	---	NE	mg/l	NS	8.37	48.9	34.6														
CO3 - Carbonate (00445)	---	NE	mg/l	NS	<5	<5	<5														
Co - Cobalt (01037)	1	NE	ug/l	NS	<1	<1	<1														
Mg - Magnesium (00927)	---	NE	mg/l	NS	0.623	1.17	1.06														
Mo - Molybdenum (01062)	---	NE	ug/l	NS	<1	1.07	<1														
K - Potassium (00937)	---	NE	mg/l	NS	1.29	0.613	0.81														
Na - Sodium (82035)	---	NE	mg/l	NS	6.67	3.60	5.44														
TSS - Total Susp. Solids (70031)	---	NE	mg/l	NS	<5	<5	<5														
V - Vanadium (01087)	0.3	NE	ug/l	NS	**0.911**	<0.3	**0.672**														
Sr - Strontium (01082)	---	NE	mg/l	NS	0.056	0.209	0.192														

Notes:
Turbidity is field analyzed for information use only.
NE = Not Established
NS = Not Sampled (inaccessible due to local flooding)

BOLD values equal or exceed the corresponding 2L standard

Qualifiers: None

I certify that, to the best of my knowledge and belief, the information submitted in this report is true, accurate, and complete, and that the laboratory analytical data was produced using approved methods of analysis by a DWQ-certified laboratory. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Danny Faile for Thomas A. Hanes, Station Manager
Permittee (or Authorized Agent) Name and Title - Please print or type

Signature of Permittee (or Authorized Agent)

11/26/18
Date

GW-59CCR 09/2015

1 -The IMACs were issued in 2010, 2011, and 2012; however NCDEQ has not established a 2L for these constituents as described in 15A NCAD 02L.0202 (c). For this reason, IMAC's noted on the report are for reference only.

2 -Alkalinity, Bicarbonate, and Carbonate were subcontracted by Duke Energy Analytical Laboratory to Pace Analytical Services, LLC in Huntersville, NC.

ESTIMATED SUBMITTAL DATE **November 26, 2018**	**MUST BE SUBMITTED BEFORE** **November 30, 2018**

W. H. WEATHERSPOON PLANT
GROUNDWATER MONITORING REPORT SUBMITTAL
File: WSPN 12520-Q

☒ Date Mailed ☐ Date Hand Delivered 11/27/2018

this REVIEWER page only goes with FILE copy

October 2018 Sampling Event

REVIEWER, TITLE	**REVIEW TYPE**	**REVIEW DATE**	**INITIAL and DATE**
R. K. Tyndall, Environmental Specialist	Reviewer	November 26, 2018	RKT 11/26/2018
T. A. Hanes, Station Manager	Cover Letter/Report	November 21, 2018	
RETURN TO :	**R. K. Tyndall**	o: f: c:	**910-341-4775** **910-341-4791** **910-409-9430**

This report provides Groundwater Monitoring reporting data

MAILING INSTRUCTIONS:
Mail the original and one (1) copies CERTIFIED to:

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Information Processing Unit
1617 Mail Service Center
Raleigh, NC 27699-1617

DUKE ENERGY
PROGRESS

W. H. Weatherspoon Plant
491 Power Plant Rd
Lumberton, NC 28358

Mailing Address:
Sherwood Smith Jr. Energy Complex
198 Energy Way
Hamlet, NC 28345

o: 910.205.2101
f: 910.205.2047

November 26, 2018

Certified Mail # 7017 2680 0000 1260 9003 (2 copies)
NCDEQ-DWQ, Information Processing Unit
1617 Mail Service Center
Raleigh, NC 27699-1621

Subject: Weatherspoon October 2018 Groundwater Monitoring Report Submittal

Dear Aquifer Protection Supervisor:

Duke Energy Progress, LLC (DEP) sampled three ash basin compliance wells (CW-1, CW-2, and CW-3) at the Weatherspoon Steam Electric Plant (NPDES Permit #NC0005363) on October 16, 2018. The background well (BW-1) was inaccessible due to local flooding resulting from Hurricane Florence. Please find attached two copies of the results on the DEQ approved electronic version of the Groundwater Compliance Report Form (GW-59CCR).

All values reported on the attached reports are dependent on the accuracy of approved analytical methods used to measure parameters.

The NPDES permit (NC0005363) was re-issued on August 3, 2018, and became effective November 1, 2018. This is the last groundwater compliance event per the prior permit requirements.

If there are any questions, please contact either:

- R. Kent Tyndall, Environmental Professional for the W. H. Weatherspoon Plant; phone (910) 341-4775 or e-mail Kent.Tyndall@duke-energy.com; or
- Bryson Sheetz, Waste and Groundwater Engineer at our Corporate Headquarters (South Church Street Building), phone (980) 373-6636 or email Bryson.Sheetz@duke-energy.com.

I, certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Sincerely,

Danny Faile for Thomas A. Hanes
Station Manager

GROUNDWATER QUALITY MONITORING
COMPLIANCE REPORT FORM

Mail original and 1 copy to:
DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER QUALITY - INFORMATION PROCESSING UNIT
1617 MAIL SERVICE CENTER, RALEIGH, NC 27699-1617 Phone: (919) 733-3221

FACILITY INFORMATION

Please Print Clearly or Type

Facility Name: Weatherspoon Power Plant
Permit Name (if different): Duke Energy Progress, LLC
Facility Address: 491 Power Plant Road (Street)
Lumberton (City) NC (State) 28358 (Zip) **County** Robeson

Permit Type: NPDES **Expiration Date:** 07/31/2014
PERMIT Number: NC0005363

TYPE OF PERMITTED OPERATION BEING MONITORED Ash Impoundment Groundwater

Contact Person: Bryson Sheetz **Telephone#** 980-373-6636
Well Location/Site Name: Weatherspoon Ash Pond Wells **No. of wells to be sampled:** 4 (from Permit)

Monitoring Well Construction Information

		Well ID Number (From Permit)																	
	Units	**BW-1**	**CW-1**	**CW-2**	**CW-3**	**MW-**	**MW-**	**MW-**	**MW-**	**MW-**	**MW-**	**MW-**	**MW-**	**MW-**	**MW-**	**MW-**	**MW-**	**MW-**	**MW-**
Well Depth [ft below land surface]	ft	20.00	14.00	14.50	14.50														
Measuring Point (toc) [ft above land surface]	ft	3.36	3.13	2.72	3.12														
Well Diameter	in	2.0	2.0	2.0	2.0														
Screen Top [ft below land surface]	ft	5.00	4.00	4.50	4.50														
Screen Bottom [ft below land surface]	ft	20.00	14.00	14.50	14.50														
Relative Measuring Point Elevation	ft	142.82	116.84	113.41	119.08														

Sampling Information and Field Analysis

CHECK IF DRY WELL AT TIME OF SAMPLING			☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY	☐ DRY
	15A-2L	**Units**	**BW-1**	**CW-1**	**CW-2**	**CW-3**	**MW-**	**MW-**	**MW-**	**MW-**	**MW-**	**MW-**	**MW-**	**MW-**	**MW-**	**MW-**	**MW-**	**MW-**	**MW-**	**MW-**
Sample Date			NS	10/16/2018	10/16/2018	10/16/2018														
Volume of Water pumped/bailed		gal	NS	1.66	0.37	1.06														
Temperature (00010)		deg. C	NS	23	23	23														
Odor (00085)			NS	Minor Musty	None	None														
Appearance			NS	Brown Tint	Clear	Clear														
Turbidity (82078)		NTU	NS	9.3	5.4	2.1														
Dissolved Oxygen (00300)		mg/L	NS	0.40	0.37	1.26														
Oxidation Reduction Potential (00090)		mV	NS	207	73	217														
Specific Cond - field (00094)		umhos/cm	NS	89	285	217														
Water Level [ft below measuring pt.] (82546)		ft	NS	4.29	4.50	4.80														
pH - field (00400)	6.5 - 8.5	SU	NS	**5.68**	7.27	6.55														

Laboratory Information

Laboratory Name Duke Energy Analytical Laboratory[2]
Sample Analysis Date October 17 - 23, 2018

Certification # NC DENR # 248

Samples for metals were collected unfiltered: ☑ Yes ☐ No
and field acidified: ☑ Yes ☐ No

	IMAC[1]	**15A-2L**	**Units**	**BW-1**	**CW-1**	**CW-2**	**CW-3**	**MW-**	**MW-**	**MW-**	**MW-**	**MW-**	**MW-**	**MW-**	**MW-**	**MW-**	**MW-**	**MW-**	**MW-**	**MW-**	**MW-**
TDS - Total Diss. Solids (70300)	---	500	mg/l	NS	57	140	100														
Cl - Chloride (00940)	---	250	mg/l	NS	3.9	5.5	7.5														
As - Arsenic (01002)	---	10	ug/l	NS	1.18	<1	<1														
SO4 - Sulfate (00945)	---	250	mg/l	NS	<0.1	10	9.9														
Nitrate (NO3) as N (00620)	---	10	mg/l	NS	0.09	0.17	0.02														
Cd - Cadmium (01027)	---	2	ug/l	NS	<1	<1	<1														
Cr - Chromium (01034)	---	10	ug/l	NS	<5	<5	<5														
Cu - Copper (01042)	---	1	mg/l	NS	<0.005	<0.005	<0.005														
Fe - Iron (01045)	---	300	ug/l	NS	**1350**	**763**	289														
Hg - Mercury (71900)	---	1	ug/l	NS	<0.05	<0.05	<0.05														
Mn - Manganese (01055)	---	50	ug/l	NS	31	11	23														
Ni - Nickel (01067)	---	100	ug/l	NS	<5	<5	<5														
Pb - Lead (01051)	---	15	ug/l	NS	<1	<1	<1														
Zn - Zinc (01092)	---	1	mg/l	NS	<0.005	<0.005	<0.005														
Ba - Barium (01007)	---	700	ug/l	NS	25	24	35														
B - Boron (01022)	---	700	ug/l	NS	<50	<50	<50														
Tl - Thallium (01059)	0.2	NE	ug/l	NS	<0.2	<0.2	<0.2														
Sb - Antimony (01097)	1	NE	ug/l	NS	<1	<1	<1														
Se - Selenium (01147)	---	20	ug/l	NS	<1	<1	<1														
Alkalinity - (00410)	---	NE	mg/l	NS	26.4	124	88.8														
Al - Aluminum (01105)	---	NE	ug/l	NS	516	7	103														
Be - Beryllium (01012)	4	NE	ug/l	NS	<1	<1	<1														
HCO3 - Bicarbonate (00440)	---	NE	mg/l	NS	26.4	124	88.8														
Ca - Calcium (00916)	---	NE	mg/l	NS	8.37	48.9	34.6														
CO3 - Carbonate (00445)	---	NE	mg/l	NS	<5	<5	<5														
Co - Cobalt (01037)	1	NE	ug/l	NS	<1	<1	<1														
Mg - Magnesium (00927)	---	NE	mg/l	NS	0.623	1.17	1.06														
Mo - Molybdenum (01062)	---	NE	ug/l	NS	<1	1.07	<1														
K - Potassium (00937)	---	NE	mg/l	NS	1.29	0.613	0.81														
Na - Sodium (82035)	---	NE	mg/l	NS	6.67	3.60	5.44														
TSS - Total Susp. Solids (70031)	---	NE	mg/l	NS	<5	<5	<5														
V - Vanadium (01087)	0.3	NE	ug/l	NS	**0.911**	<0.3	**0.672**														
Sr - Strontium (01082)	---	NE	mg/l	NS	0.056	0.209	0.192														

Notes:
Turbidity is field analyzed for information use only.
NE = Not Established
NS = Not Sampled (inaccessible due to local flooding)

BOLD values equal or exceed the corresponding 2L standard

Qualifiers: None

I certify that, to the best of my knowledge and belief, the information submitted in this report is true, accurate, and complete, and that the laboratory analytical data was produced using approved methods of analysis by a DWQ-certified laboratory. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Danny Faile for Thomas A. Hanes, Station Manager
Permittee (or Authorized Agent) Name and Title - Please print or type

Signature of Permittee (or Authorized Agent)

11/26/18
Date

GW-59CCR 09/2015

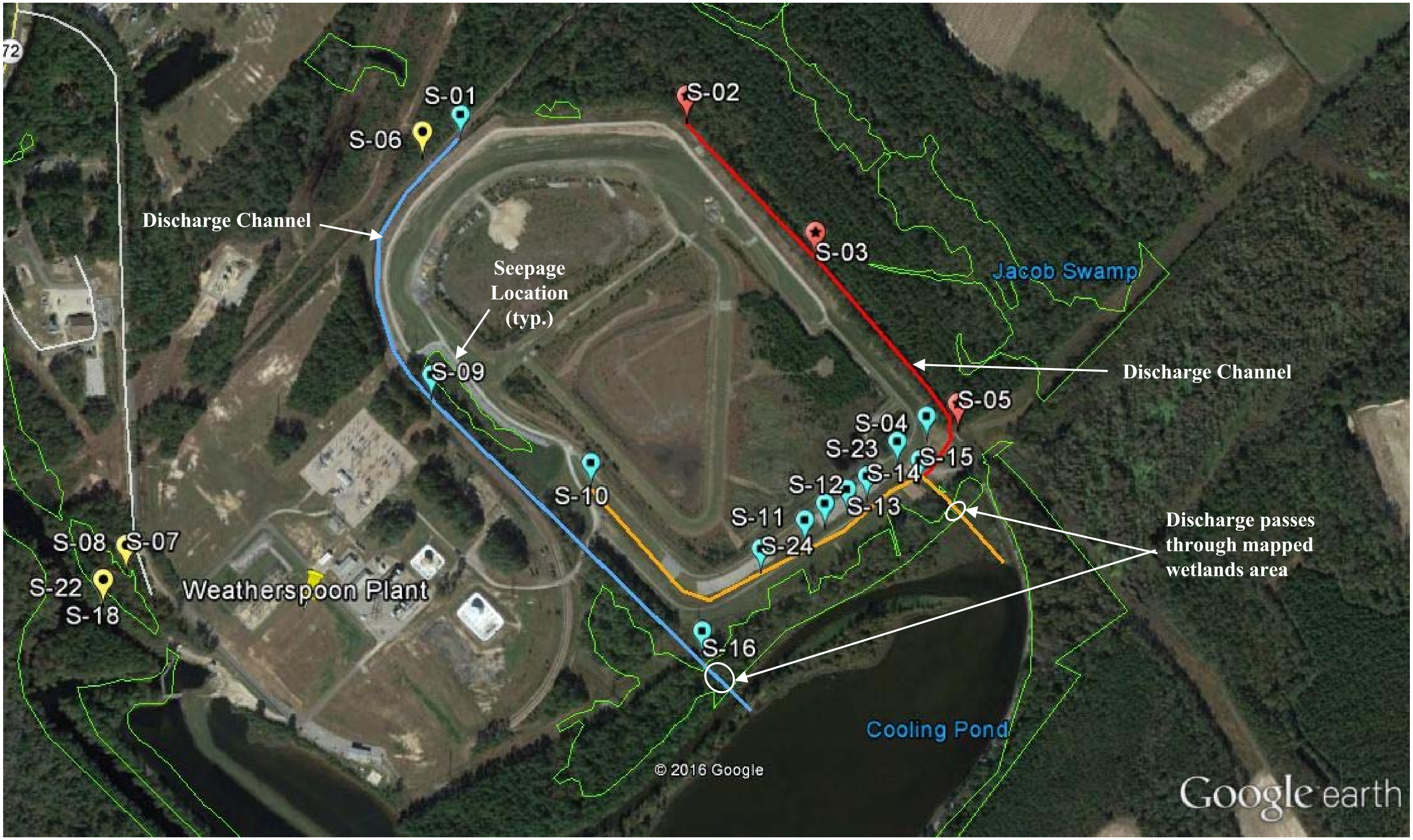
1 -The IMACs were issued in 2010, 2011, and 2012; however NCDEQ has not established a 2L for these constituents as described in 15A NCAD 02L.0202 (c). For this reason, IMAC's noted on the report are for reference only.

2 -Alkalinity, Bicarbonate, and Carbonate were subcontracted by Duke Energy Analytical Laboratory to Pace Analytical Services, LLC in Huntersville, NC.

ATTACHMENT C

Seepage Channels and Wetlands

ATTACHMENT C
Seepage Channels and Wetlands



Note: December 2015 Wetlands delineation map compliled by AMEC