December 30, 2019

Ms. Sheila Holman  
Assistant Secretary for Environment  
North Carolina Department of Environmental Quality  
1611 Mail Service Center  
Raleigh, North Carolina 27699-1611

Subject: Submittal of Ash Basin Closure Plan and Corrective Action Plan Update  
Allen Steam Station

Dear Ms. Holman:

In accordance with the requirements of N.C.G.S. §§ 130A-309.211(b) and .214(a)(4), Duke Energy provides the following documents: (1) a plan for basin closure by excavation, and (2) a corrective action plan (CAP) for the Allen site, which will address groundwater impacts within 9 years of full-scale operation, regardless of the specific closure method.

**Closure by Excavation**  
The enclosed excavation plan is in response to NCDEQ’s April 1 order requiring excavation of the Allen coal ash basins. After regulatory approval, excavating the basin ash would require 14 years to move the ash to a new lined landfill within plant property. The landfill would be located within the prior footprint of the ash basin, rising about 110 feet above South Point Road.

**Continuing to Protect Water Resources**  
Robust scientific study, conducted under the direction of NCDEQ, demonstrates that drinking and recreational water supplies around the Allen facility are well-protected from coal ash impacts and will only continue to improve during and after closure. Ongoing research and monitoring also provide a detailed understanding of groundwater conditions at the site that will be remedied through the planned CAP approach. The CAP designed for Allen will achieve groundwater remediation through a combination of strategically placed groundwater extraction wells coupled with clean water infiltration wells.

Prior to submission, the closure plan was reviewed by the National Ash Management Advisory Board (NAMAB), which consists of nationally and internationally recognized and published experts with practical experience working with and for the private sector, federal government, and academia. NAMAB helped develop the guiding principles for safe basin closure and their feedback is incorporated herein.

Duke Energy remains committed to safely and permanently closing basins in ways that continue to protect people and the environment and welcomes the opportunity to work constructively with NCDEQ to move forward.
Ms. Sheila Holman
December 30, 2019
Submittal of Ash Basin Closure Plan and Corrective Action Plan Update
Allen Steam Station
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Sincerely,

Paul Draovitch
Senior Vice President
Environmental, Health & Safety

Enclosure:
- Corrective Action Plan Update
- Closure by Excavation Closure Plan
DUKE ENERGY
ALLEN STEAM STATION
COAL COMBUSTION RESIDUALS SURFACE IMPOUNDMENT CLOSURE PLAN

CLOSURE BY EXCAVATION

RETIRIED ASH BASIN AND ACTIVE ASH BASIN

Prepared for:

DUKE ENERGY

Duke Energy (Duke)
400 South Tryon Street
Charlotte, North Carolina 28202

December 18, 2019

Prepared by:

AECOM

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Morrisville, North Carolina 27560
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EXECUTIVE SUMMARY

As required by the North Carolina Department of Environmental Quality’s (NCDEQ) April 1, 2019 “Coal Combustion Residuals Surface Impoundment Closure Determination,” (Closure Determination) Duke Energy has prepared this Closure Plan to describe the closure of the Retired Ash Basin (RAB) and Active Ash Basin (AAB) at the Allen Steam Station (Allen Station). This plan details closure-by-excavation of the RAB and AAB (collectively, Basins), and placement of the excavated coal combustion residuals (CCR) in a new permitted on-site lined landfill within the existing footprint of the AAB. The excavation of CCR and the closure of the RAB and AAB will be in accordance with applicable provisions of the North Carolina Coal Ash Management Act of 2014, as amended (CAMA), (codified at N.C.G.S. § 130A-309.200 et seq.), and the federal Disposal of Coal Combustion Residuals from Electric Utilities rule (CCR Rule) (codified at 40 C.F.R. § 257.50 et seq.).

The Allen Station is owned and operated by Duke Energy Carolinas, LLC (Duke Energy) and is located in Gaston County, North Carolina along the west shore of Lake Wylie (Catawba River), near the town of Belmont, North Carolina. Allen Station began operations in 1957 as a coal-fired electric generating station and is currently in active operation.

The RAB was operational from 1957 until 1973 when it reached capacity and was retired. The RAB is estimated to contain approximately 5.75 million tons of CCR (or an estimated 4.79 million cubic yards) that are subject to this Closure Plan. The RAB includes two embankment structures functioning as dams – RAB-North Dike and East Dike (regulated by NCDEQ as Gasto-016).

The AAB was commissioned in 1973 to divert wet sluiced CCR from the RAB after it was retired and operated as a wet sluiced pond until flows were discontinued in February 2019. Based on topographic and bathymetric surveys performed in July 2014 and February 2015, the AAB is estimated to contain approximately 10.48 million tons of CCR (an estimated 8.73 million cubic yards). The AAB includes two embankment structures functioning as dams – AAB-East Dike and AAB-North Dike (regulated by NCDEQ as Gasto-061).

Based on CCR inventory data provided by Duke Energy as of July 31, 2019, the RAB and AAB are estimated to contain a total of approximately 16.23 million tons of CCR (an estimated 13.53 million cubic yards). This approximate total excludes the CCR contained within the RAB Landfill footprint (both above and below the RAB Landfill’s bottom liner system), which is approximately 3.13 million tons of CCR (an estimated 2.80 million cubic yards), but includes the unlined Distribution of Residual Solids (DORS) facilities located to the west that were constructed over the RAB. Closure of the permitted RAB Landfill (NCDEQ Permit No. 3612) will be conducted separately from the Basins and is not subject to this Closure Plan.

Under this plan, the basin ash would be removed to a new lined landfill within plant property, located partially within the prior footprint of the ash basin. The landfill would rise approximately 110 feet above South Point Road. Post-excavation, the basin site will restore some of the land’s valley shape before the basin was created. Soil will be graded to restore contours for stormwater flows, then planted with native grasses for erosion control. Portions of the existing ash basin dams will be removed, allowing stormwater flows to Lake Wylie. The existing RAB Landfill will remain in place, with structural features added to provide long-term stability against areas of excavation.
Closure activities for the Basins have already begun with the initiation of decanting under the Special Order by Consent (SOC). Upon approval of a Closure Plan by NCDEQ additional actions will commence, including finalization of detailed designs, dewatering and removal of interstitial water, contracting and detailed planning for the closure work, stabilization of the existing RAB Landfill, development of the new lined landfill within the AAB footprint in conjunction with excavation of the CCR, final grading of the site and landfill, and development of stormwater features and vegetative covers.

Figures ES-1 and ES-2 illustrate the current state, and post-closure state of the RAB and AAB as detailed by this Closure Plan.

AAB and RAB CCR will be removed to a new lined landfill, located partially within the prior footprint of the ash basin. The landfill would rise approximately 110 feet above South Point Road. Post-excavation, the AAB and RAB sites will restore some of the land’s valley shape before the basin was created. Soil will be graded to restore contours for stormwater flows, then planted with native grasses for erosion control. Portions of the existing ash basin dams will be removed, allowing stormwater flows to Lake Wylie. The existing RAB Landfill will remain in place, with structural features added to ensure long-term stability against areas of excavation.

This document also includes a description of the Post-Closure Plan, which provides a description of the inspection, monitoring, and maintenance activities required to be performed throughout the 30-year post-closure care period for the closed Basins at the Allen Station.

This document provides a summary of properties of the site, as well as geotechnical properties of CCR and natural soils to support engineering analyses of the closure design. These analyses indicate that closure by excavation, as detailed in the Closure Plan, meets regulatory requirements for the stability of the site, management of stormwater run-off, and access for effective maintenance over the post-closure care period.

In accordance with the requirements of N.C.G.S. § 130A-309.211(b)(1), Duke Energy separately submitted an updated Corrective Action Plan (CAP) in parallel with this Closure Plan; the updated CAP is herein incorporated in its entirety by this reference. Neither the updated CAP nor its content is the work product of AECOM. Although the Closure Plan contains references to the updated CAP, all specific relevant details to groundwater and related actions are found in the updated CAP itself and not in this Closure Plan.
The updated CAP evaluates the extent of, and remedies for, constituents of interest (COIs) in groundwater associated with the ash basins and coal pile area, focusing on constituent concentrations detected above the applicable 02L Standards, Interim Maximum Allowable Concentrations, or approved background threshold values at or beyond the compliance boundary to north and north-northeast of the Retired Ash Basin and coal pile, and east of the Active Ash Basin. In addition, the updated CAP considers the federal groundwater corrective action requirements at 40 C.F.R. §§ 257.96-.98.

As detailed in the updated CAP, Duke Energy has begun to implement, and will continue implementing, source control measures at the site, including (i) complete decanting of the Basins to remove the hydraulic head, thereby reducing hydraulic gradients, groundwater seepage velocities, and COI transport potential; and (ii) complete closure of the Basins. In addition, Duke Energy intends to implement a robust groundwater remediation program that includes actively addressing COI in groundwater above applicable standards at or beyond the compliance boundary using groundwater extraction combined with clean water infiltration and removal of the low pH area source proximate to the coal pile area. The CAP provides that these corrective action measures will most effectively achieve remediation of the groundwater through the use of extraction wells to the north, northeast, and east of the Basins and coal piles, and strategically located clean water infiltration wells. The CAP further provides that groundwater modeling simulations indicate (i) these measures will control COI at or beyond the compliance boundary; and (ii) at such time the site-specific considerations detailed within the CAP have been satisfied, including, but not limited to, securing all required state approvals, installing the necessary equipment, and commencing full-scale system operation, COI at or beyond the compliance boundary will meet the remedial objectives in nine years.
1. INTRODUCTION

1.1 Background

Allen Station is located at 253 Plant Allen Road in Gaston County, North Carolina. Allen Station is a five-unit, 1,140-megawatt, coal-fired power generation facility that began commercial operation in 1957 with Units 1 and 2. Unit 3 began operation in 1959, Unit 4 in 1960, and Unit 5 in 1961. Allen Station historically wet sluiced CCR into two surface impoundments located on the property known as the RAB and the AAB. The RAB received CCR from initial operation for approximately 16 years beginning in 1957 until 1973, when it reached capacity and was retired. Allen Station then commissioned the AAB and began wet sluicing CCR into this new basin. In 2009, when Allen Station replaced its wet fly ash sluicing operation with a flue gas desulfurization (FGD) facility, the RAB Landfill was constructed over the southeastern portion of the RAB for placement of dry fly ash (Permit No. 3612) (NCDEQ, 2009; S&ME, 2014). Although Allen Station previously wet sluiced bottom ash into the AAB, a dry bottom ash system is now operational and sluicing of bottom ash and all process water to the AAB ceased in February 2019.

Figure 1-1 presents a Vicinity Map and Site Plan of Allen Station.

Duke Energy uses two facilities to manage CCR at the Allen Station that include dams and dikes regulated by NCDEQ:

1. The AAB-North Dike and East Dike (NCDEQ ID: GASTO-061); and
2. The RAB-North Dike and East Dike (NCDEQ ID: GASTO-016).

As further discussed in Section 2 below, the closure method mandated by order of NCDEQ for the AAB and RAB is closure by excavation.

1.2 Closure Plan Objectives

The objective of this Closure Plan is to address the closure by excavation of CCR from the RAB and AAB as directed by order of NCDEQ. AECOM understands Duke Energy does so without prejudice of its position that closure by excavation is not necessary for either the RAB or AAB. Duke Energy also notes that approval from NCDEQ is required to proceed and develop the additional details as described further within this Closure Plan to complete the necessary working documents to complete the closure actions. Duke Energy submits this Closure Plan with the knowledge that other details will follow, as necessary. This Closure Plan describes and communicates the key actions and activities necessary to close the Basins in accordance with the requirements for written Closure Plans for CCR surface impoundments presented in N.C.G.S. §130A-309.214(a)(4). Planned closure activities include:

- Decanting of the AAB;
- Construction and operation of a temporary water management system (WMS) to manage all discharges in compliance with the NPDES permit during closure;
- Dewatering to support safe excavation of CCR from the Basins;
- Excavation of the CCR and establishing post-excavation final grades using soils where required;
• Stabilization of northern and western perimeter of RAB Landfill;
• Breaching of the Basin dams;
• Construction of an on-site CCR landfill to permanently store the excavated CCR; and
• Restoration of disturbed areas.

1.3 Report Organization

This document is structured to follow the requirements provided in N.C.G.S. §130A-309.214(a)(4).

2. GOVERNING LAWS

In August 2014, the North Carolina General Assembly enacted CAMA, which contains specific statutory requirements applicable to the Basins. Subsequently, in July 2016, the North Carolina General Assembly enacted H.B. 630, Session Law 2016-95, which provides that impoundments be classified as “low-risk” if, by certain deadlines, the owner has established permanent alternative water supplies, as required, and has rectified any deficiencies identified by, and has otherwise complied with requirements of, any dam safety order. NCDEQ determined that Duke Energy met these criteria on November 13, 2018, and officially classified the RAB and AAB at Allen Station as “low-risk.”

On April 1, 2019, NCDEQ issued its Closure Determination mandating that the RAB and AAB be closed by excavation pursuant to N.C.G.S. § 130A-309.214(a)(3)a. A closure plan is required for each CCR surface impoundment regardless of the risk classification. CAMA’s closure plan requirements and cross-referenced sections of this Closure Plan are summarized in Table 2-1. On April 26, 2019, Duke Energy filed a Petition for Contested Case Hearing before the North Carolina Office of Administrative Hearings appealing this determination and on May 24, 2019 Duke Energy filed amended petitions in the case. The petitions allege that in issuing its Closure Determination, NCDEQ failed to (i) follow the mandatory process and procedure outlined in CAMA and (ii) consider or apply the scientific and engineering evidence submitted and available to it in reaching its decision to require the most expensive closure method available despite scientific and engineering evidence demonstrating the availability of less expensive and more rapid closure options that would continue to fully protect human health and the environment. Certain decisions by the administrative law judge in that case are currently under appeal to the North Carolina Superior Court.

In addition to the closure plan requirements, CAMA sets out groundwater assessment and corrective action requirements. A Comprehensive Site Assessment report was submitted to NCDEQ in August 2015 with supplemental reports submitted August 2016 and January 2018. Duke Energy intends that an updated CAP will be submitted in parallel with this Closure Plan.

In addition to the above requirements, National Pollutant Discharge Elimination System (NPDES) permit program compliance, SOC (which commits Duke Energy to initiate and complete decanting of the Basins by dates certain) compliance, dam safety approvals for modifications to regulated
CCR basin dams, and environmental permitting requirements must be considered as part of closure.

3. FACILITY DESCRIPTION AND EXISTING SITE FEATURES

3.1 Surface Impoundment Description

This section provides details on the CCR-related features at Allen Station.

3.1.1 Site History and Operations

Allen Station is located near the town of Belmont in Gaston County, North Carolina and is situated along the west shore of Lake Wylie, a man-made reservoir created by the impoundment of the Catawba River. A layout plan of the site is shown in Figure 1-1. The facility, which is owned and operated by Duke Energy, is approximately 1,009 acres. CCR facilities located on-site include the RAB, AAB and additional facilities as described in more detail below.

Retired Ash Basin (NC ID GASTO-016)

The RAB is located south of the Allen Station plant and adjacent to Lake Wylie/the Catawba River. It is situated along Plant Allen Road to the north, Lake Wylie/the Catawba River to the east, and the Duke Energy property boundary to the west. The natural topography at the site generally slopes downward from the western property line to the RAB and subsequently toward Lake Wylie/the Catawba River. The RAB includes three dams – RAB-North Dike, RAB-East Dike (collectively GASTO-016), and RAB-South Dike (now referred to as the AAB-North Dike) – that were constructed to form a U-shaped basin. The RAB is comprised of dikes that impound CCR and several active and inactive CCR fill areas, which are described later in this section. The RAB CCR boundary currently occupies an area of approximately 123 acres. The RAB received sluiced CCR from initial operation in 1957 until 1973 when it reached capacity and was retired. The facility no longer retains sluiced process water or free water.

Stormwater from the RAB and the RAB Landfill discharges through the primary spillway via a headwall structure (Outfall SW015) located in the ditch in the southeast corner of the basin. The primary spillway was constructed in 2016 as a replacement to the prior reinforced concrete riser structure and associated reinforced concrete piping (RCP). The discharge flow is currently conveyed through a 54-inch and 42-inch diameter high-density polyethylene HDPE pipe system. The primary spillway ties into the existing 36-inch diameter RCP near the downstream toe-of-slope via a reinforced concrete manhole structure (NPDES Outfall SW015). In addition to the primary spillway, an emergency spillway was installed for the RAB in 2015 (NPDES Outfall 008).

Active Ash Basin (NC ID GASTO-061)

The AAB is located south of the Allen Station plant and adjacent to Lake Wylie/the Catawba River. The AAB is located immediately south of the RAB and the two Basins share a dike (the AAB-North Dike). The natural topography at the site generally slopes downward from the property line in the west to the AAB and subsequently toward Lake Wylie/the Catawba River. The AAB includes two
dams – AAB-East Dike and AAB-North Dike (collectively GASTO-061) – that were constructed to form an L-shaped basin. The AAB is comprised of deposited CCR and the AAB CCR boundary currently occupies an area of approximately 170 acres. The AAB formerly received flows from the ash removal system, coal pile runoff, landfill leachate, FGD wastewater, the station yard drain sump, and site stormwater. Bottom ash sluicing and all other process flows to the AAB ceased in February 2019.

Until decanting began in 2019, storm and process water from the AAB discharged through a weir box outlet structure (Outfall 002) located in the southeast corner of the basin, which is permitted by NCDEQ under NPDES Permit NC0004979 (NCDEQ, 2018). The weir box and spillway system were constructed in 2016 as a replacement to the prior reinforced concrete riser structure and associated RCP. The discharge flow is currently conveyed through a 48-inch HDPE pipe system which ties into the pre-existing 42-inch diameter RCP near the downstream toe-of-slope via a reinforced concrete manhole structure.

Additional Facilities

Other CCR facilities within the RAB and AAB areas are shown in the attached Figure 3-1, and are described in more detail below.

The DORS areas (DORS 1 through DORS 4) are retired CCR stacks/fills located above the western portion of the RAB footprint. The DORS areas, the closures of which are addressed in this Closure Plan, will be closed by excavation in conjunction with the remainder of the RAB. CCR was removed from the AAB and placed in the DORS fills at various times over a 10-year period under permit W00003255. These dry CCR stacks/fills are unlined with a vegetated cover soil.

The 25-acre RAB Landfill is an active overfill landfill (NCDEQ Permit No. 3612) wholly contained within the limits of the RAB and is constructed over the southeastern portion of the RAB. Its permit also includes a strip of the RAB immediately south of the landfill for management of stormwater. (NCDEQ, 2009, S&ME, 2008). The landfill is permitted to receive residual waste, including fly ash, bottom ash, FGD residual, boiler slag, mill rejects, and other non-CCR wastes generated at Allen Station. The RAB Landfill, which was permitted pursuant to the authority of N.C.G.S. § 130A-295.4 (combustion products landfills constructed partially or entirely within areas formerly used for the storage or disposal of CCR) and in accordance with North Carolina’s rules governing the siting, design, and construction of sanitary landfills, includes a double-liner system with a leak detection system between the liners. It is Duke Energy’s position that at such time the areas of the former basin underlying the RAB Landfill were permitted under NCDEQ Permit No. 3612, they became an intrinsic part of the landfill’s base and ceased being “surface impoundment” under North Carolina law. Accordingly, closure of the permitted RAB Landfill is not subject to CAMA’s CCR surface impoundment closure requirements and, thus, is not addressed under this Closure Plan. Instead, closure of the RAB Landfill will be conducted pursuant to a separate regulatory process in accordance with 15A N.C.A.C. 13B § .0500. Any potential groundwater impacts from these additional facilities will be fully addressed in the CAP.
3.1.2 Estimated Volume of CCR in Surface Impoundments

Based on CCR inventory data provided by Duke as of July 31, 2019 and upon a surface comparison calculation, performed within AutoCAD Civil 3D, comparing the approximate pre-development topography to the existing topographic and bathymetric survey, the approximate volume of CCR in the basins is listed in the table below. To compute the estimated mass of CCR in place an assumed density of 1.2 tons per CY was used, which is the Duke Energy fleet wide assumption. See Appendix A for the Estimated Volume of CCR in Impoundment calculation.

<table>
<thead>
<tr>
<th>Impoundment</th>
<th>Estimated CCR Weight (Tons)</th>
<th>Estimated CCR Volume (CY)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAB</td>
<td>10,480,000</td>
<td>8,733,333</td>
</tr>
<tr>
<td>RAB¹</td>
<td>4,760,300</td>
<td>3,966,917</td>
</tr>
<tr>
<td>DORS No. 1</td>
<td>562,800</td>
<td>469,000</td>
</tr>
<tr>
<td>DORS No. 2</td>
<td>428,400</td>
<td>357,000</td>
</tr>
<tr>
<td>Total CCR Subject to Closure Plan</td>
<td>16,231,500</td>
<td>13,526,250</td>
</tr>
</tbody>
</table>

¹ This excludes CCR within the footprint of the RAB Landfill.

3.1.3 Description of Surface Impoundment Structural Integrity

The purpose of this section is to summarize the Basins’ structural integrity evaluations based on current existing information. This section includes the geotechnical, and hydrology and hydraulics capacity analyses results. In summary, the structural integrity of the Basins and subsequent dam inspection reports meets the regulatory requirements of EPA’s CCR Rule (40 § CFR 257.73). Duke Energy’s certifications of these requirements are available on Duke Energy’s publicly-accessible CCR Rule Compliance Data and Information website.

- **Slope stability**
  For the AAB and RAB embankments, slope stability analysis results for the existing conditions global factors of safety for static long-term maximum storage pool, static maximum surcharge pool, sudden drawdown conditions, and pseudo-static seismic conditions meet regulatory and programmatic criteria. Slope stability results for the RAB at two selected sections and for the AAB at six selected sections under the loading conditions mentioned above meet regulatory requirements.

- **Liquefaction conditions (where susceptible) and Liquefaction potential**
Data from the PSHA and QUAD4M analyses indicate that the foundation and embankment soils for the RAB and AAB embankments meet liquefaction screening programmatic criteria for minimum factor of safety (FS ≥ 1.20). It is concluded that these soils are not subject to liquefaction during the 2,500-year return period seismic event. Liquefaction data for the fill material placed for the railroad tracks at the toe of the RAB east dike and the CCR in the AAB suggested that these materials have limited susceptibility to liquefaction.

- **Hydrology and Hydraulics (H&H) Capacity Analyses**

The existing RAB outlet structure passes the required SDF (i.e., full Probable Maximum Precipitation (PMP) based on NCDEQ and 1,000-year storm based on the federal CCR Rule) without the embankment overtopping. The existing AAB outlet structure can safely pass the required SDF (i.e., full PMP based on NCDEQ and full PMP based on the federal CCR Rule) without the embankment overtopping. Also, time-to-drain analysis indicates that the existing spillway systems for the RAB and AAB are capable of removing at least 80% of the water temporarily detained in the reservoir within 15 days following the design storm event, as required by the North Carolina Dam Safety Regulations.

3.1.4 **Sources of Discharges into Surface Impoundments**

Process flows no longer discharge into the Basins. Process flows are directed toward the newly constructed holding basin and lined retention basin. The Allen Station currently employs a dry ash handling system. Since 2009, fly ash has been dry-handled and disposed of in the RAB Landfill, which is constructed on the eastern portion of the RAB (described in Section 3.1.1). In addition, the dry bottom ash system became operational in 2019.

Historically, runoff and process water streams from two yard-drain sumps, the ash removal system, the RAB Landfill leachate collection system, low volume wastes, and stormwater runoff were discharged into the Basins.

3.1.5 **Existing Surface Impoundment Liner Systems**

The RAB and AAB located at the Allen Station are unlined surface impoundments and were constructed over natural existing ground.

3.1.6 **Inspection and Monitoring Summary**

Weekly inspections of the AAB and RAB have been on-going since 2014, and include observation of upstream slopes and shorelines, crest, downstream slopes, toes, abutment contacts, adjacent drainage way(s), spillway(s), and associated structure(s), and other structures and features of the dams.

Monthly inspections of the AAB and RAB include the weekly monitoring elements with the addition of piezometer and observation well readings, water level gauges/sensors, and visual observations and documentation of slopes of the dry CCR stacks.

Daily inspections of basins are not routinely required; however, on a case-by-case basis, the basins may be inspected daily beginning at such times and continued for the duration as specified.
by plant management. Such daily inspections might be initiated during a repair activity on the dam or in response to a specific imposed regulatory agency requirement.

The Basins are inspected annually by an independent third-party consultant. In a letter dated August 13, 2014, NCDEQ requires these inspections to be conducted annually at all of Duke Energy’s CCR impoundments in North Carolina. These inspections are intended to confirm adequacy of the design, operation, and maintenance of the surface impoundments in accordance with accepted engineering standards. Reports are to be submitted to NCDEQ within 30 days of the completion of the inspection.

The results of the annual inspections are used to identify needed repairs, repair schedules, to assess the safety and operational adequacy of the dam, and to assess compliance activities regarding applicable permits, environmental, and dam regulations. Annual inspections are also performed to evaluate previous repairs.

The 2015 through 2019 annual inspections did not identify features or conditions in the Basin dams, or their outlet structures or spillways, that indicate an imminent threat of impending failure hazard. Review of critical analyses indicated the design conforms to current engineering state of practice to a degree that no immediate actions are required other than the recent and ongoing surveillance and monitoring activities already underway.

Special, episodic inspections of the Basins may be performed during episodes of earthquake, emergency, or other extraordinary events. Visual inspections are performed after a heavy precipitation event when accumulation of four inches of rainfall or greater occurs within a 24-hour period. An internal inspection will be performed if an earthquake is felt locally or detected by the US Geological Survey measuring greater than a Magnitude 3 and with an epicenter within 50 miles of the dams. A special inspection would also be performed during an emergency, such as when a potential dam breach condition might be identified or when construction activities (e.g., basin cleanout) are planned on or near the dams. Special inspections are also conducted when the ongoing surveillance program identifies a condition or a trend that warrants special evaluation.

3.2 Site Maps

3.2.1 Existing Surface Impoundment-Related Structures

A site map showing property boundary, location of the Allen Station, Basins with their boundaries and topographic and bathymetric contours is shown on Figure 3-1.

3.2.2 Receptor Survey

This information is included as part of the CAP being prepared separately by SynTerra for Duke Energy and is being submitted in parallel to this Closure Plan. The CAP is herein incorporated by this reference but its content is not the work product of AECOM.
3.2.3 Existing On-Site Landfills

There is one existing on-site landfill at the Allen Station as identified in the table below, along with the status (active/closed). The existing RAB Landfill is shown on the attached Figure 3-1, and is described in more detail in Section 3.1.1. The CCR contained within the landfill is not subject to this Closure Plan.

<table>
<thead>
<tr>
<th>Landfill</th>
<th>Permit Number</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAB Landfill</td>
<td>NCDEQ Permit No. 3612</td>
<td>Active</td>
</tr>
</tbody>
</table>

3.3 Monitoring and Sampling Location Plan

This information is included as part of the CAP being prepared separately by SynTerra for Duke Energy and is being submitted in parallel with this Closure Plan. The CAP is herein incorporated by this reference but its content is not the work product of AECOM.

4. RESULTS OF HYDROGEOLOGIC, GEOLOGIC, AND GEOTECHNICAL INVESTIGATIONS

4.1 Background

An overall boring and existing monitoring well location plan indicating the locations of recent and historical borings, monitoring wells, piezometers, and Cone Penetration Test (CPT) locations is shown on Drawing ALN_C999.001.017 and ALN_C999.001.018 included in Appendix D.

This section summarizes the site geology and hydrogeology, site stratigraphy of the geologic units underlying the surface impoundments, geotechnical properties of the CCR, and the uppermost stratigraphic unit under the surface impoundment.

4.2 Hydrogeology and Geologic Descriptions

This information is included as part of the CAP being prepared separately by SynTerra for Duke Energy and is being submitted in parallel to this Closure Plan. The CAP is herein incorporated by this reference but its content is not the work product of AECOM.

4.3 Stratigraphy of the Geologic Units Underlying Surface Impoundments

This information is included as part of the CAP being prepared separately by SynTerra for Duke Energy and is being submitted in parallel to this Closure Plan. The CAP is herein incorporated by this reference but its content is not the work product of AECOM.
4.4 Geotechnical Properties

This section provides a summary of geotechnical conditions and properties found from investigations performed within the RAB and AAB and dam areas. The presented information was obtained from previous geotechnical investigations at the site and recent investigation activities conducted to support the Closure Plan development. The geotechnical conditions within the Basins generally consist of CCR (interbedded layers of fly ash and bottom ash) placed in the basin primarily by hydraulic sluicing underlain by residual soil, saprolite, partially weathered rock (PWR), and bedrock.

For purposes of discussion of the geotechnical properties of the materials, the saprolite material is described as residual material. General properties of the various materials encountered within and surrounding the Basin are described below. A range of measured material properties of laboratory tests performed by AECOM, SynTerra, and MACTEC for the subsurface explorations completed within the Basin is presented in Table 4.1. A summary of laboratory tests data performed in support of the closure design is presented in Appendix B-3.

4.4.1 CCR Within the RAB and AAB

The CCR encountered within the AAB complex generally consisted of dry to wet, dark gray to gray fly ash as sandy non-plastic silt (ML), and dark blueish gray fly ash as silty sand (SM). In recent years, bottom ash has been sluiced to the AAB area in addition to fly ash. Consequently, samples of bottom ash were intermittently observed and collected during the AECOM investigation.

Both stacked and sluiced CCR are present within RAB. In the DORS 1 and 2 areas, stacked ash primarily consists of dry to wet, dark gray to gray bottom ash as silty sand (SM), and lesser quantities of fly ash as silt (ML), with varying quantities of sand, gravel, and slag. This stacked CCR is underlain by sluiced CCR primarily consisting of moist to wet, dark gray to gray bottom ash as silty sand (SM), and fly ash as silt (ML). Elsewhere in the RAB, stacked CCR within the DORS 3 and 4 areas was classified as dry, gray and dark gray, fly ash as sandy silt (ML), and silty sand (SM). Sluiced CCR within these areas is generally classified as dry to wet, gray and dark gray, fly ash as sandy silt (ML), and silty sand (SM).

4.4.2 Liner Material Properties

The AAB and RAB are unlined so there are no associated material properties.

4.4.3 Subsurface Soil Properties

**Alluvium:** Alluvial soils were encountered in seven borings within the AAB. The alluvium generally consisted of wet, orange or yellow silty sand (SM), and brown or red sandy clay (CL/CH), with quartz rock fragments.

**Residual Soils (Residuum and Saprolite):** Residual soils within the AAB were encountered in multiple borings. This stratum generally consisted of moist to wet, reddish brown to light brown mottled, light gray and greenish gray silty sand (SM), sand with silt (SW-SM), poorly-graded sand...
(SP), and sandy non-plastic silt (ML), with varying quantities of mica and gravel. Occasionally, soils in this stratum were classified as sandy lean clay (CL), clayey elastic silt (ML), and sandy fat clay (CH).

Within the RAB in DORS 1 and 2, residual soils primarily consisted of wet, reddish brown to light brown and light gray, silty sand (SM), sandy non-plastic silt (ML), and clayey sand (SC), with varying quantities of quartz and mica. Occasionally, soils in this stratum were classified as lean clay (CL) and sandy fat clay (CH). Within DORS 3 and 4, the residual soils can be divided into two distinct strata: the upper 10 to 17 ft of the residual soil stratum generally consisted of moist, brownish yellow, reddish gray, and dark gray, native lean clay (CL) and fat clay (CH) soils, underlain by up to 37 ft of moist to wet, yellowish brown, orange, and olive gray coarse-grained sand with silt (SP-SM), well graded sand (SW), silty sand (SM), sand with clay (SP-SC), and non-plastic silt (ML).

**PWR**: PWR was encountered within several borings in the AAB. In these locations, PWR primarily consists of wet, light gray to reddish brown to light brown mottled sand (SP), silty sand (SM), sandy non-plastic silt (ML), sand with clay (SP-SC), lean clay (CL), and weathered meta-quartz diorite, meta-granodiorite, and meta-diabase bedrock.

In the RAB within DORS 1 and 2, the PWR below the residual soils primarily consists of wet, light gray to light brown mottled coarse-grained sand (SM), greenish gray non-plastic silt (ML), and meta-quartz diorite. Within DORS 3 and 4, PWR consisted of moist to wet, yellowish brown, grayish brown and olive brown, silty sand (SM), well graded sand with gravel (SW), clayey sand (SC), sandy clay with gravel (CL), sandy silt with gravel (ML), sand with clay (SP-SC) and minor layers of fat clay (CH).

**Bedrock**: Bedrock was cored in four of the soil borings conducted in the interior of the AAB. The bedrock primarily consisted of dark greenish gray, very strong, coarse grained, massive Meta-Quartz diorite, and black and white, strong, fine to coarse grained Meta-Diabase bedrock. In the RAB, bedrock was cored in two borings within DORS 1 and 2. The bedrock encountered in the borings primarily consisted of light gray to dark gray, strong, massive, Meta-Quartz diorite bedrock. Bedrock was also encountered within DORS 3 and 4 consisted of black and white to dark gray and white, very strong, massive, moderately to slightly fractured, fresh Meta-Quartz diorite bedrock.

### 4.4.4 AAB and RAB Dam Soil Properties

The RAB and AAB dam embankments consist primarily of loose to medium dense clayey to silty sand (SC and SM), sandy silt (ML) and stiff to very stiff elastic silt with sand (MH), and sandy lean clay to fat clay (CL and CH). The dam embankment fill was described as moist, red, and reddish brown to brown, with varying quantities of sand and gravel.

### 4.5 Chemical Analysis of Impoundment Water, CCR, and CCR-Affected Soil

This information is included as part of the CAP being prepared separately by SynTerra for Duke Energy and is being submitted in parallel to this Closure Plan. The CAP is herein incorporated by this reference but its content is not the work product of AECOM.
4.6 Historical Groundwater Sampling Results

This information is included as part of the CAP being prepared separately by SynTerra for Duke Energy and is being submitted in parallel to this Closure Plan. The CAP is herein incorporated by this reference but its content is not the work product of AECOM.

4.7 Groundwater Potentiometric Contour Maps

This information is included as part of the CAP being prepared separately by SynTerra for Duke Energy and is being submitted in parallel to this Closure Plan. The CAP is herein incorporated by this reference but its content is not the work product of AECOM.

4.8 Estimated Vertical and Horizontal Extent of CCR Within the Impoundments

This information is included as part of the CAP being prepared separately by SynTerra for Duke Energy and is being submitted in parallel to this Closure Plan. The CAP is herein incorporated by this reference but its content is not the work product of AECOM.

5. GROUNDWATER MODELING ANALYSIS

In accordance with the requirements of N.C.G.S. § 130A-309.211(b)(1), Duke Energy separately submitted an updated Corrective Action Plan (CAP) in parallel with this Closure Plan; the updated CAP is herein incorporated in its entirety by this reference. Neither the updated CAP nor its content is the work product of AECOM. Although the Closure Plan contains references to the updated CAP, all specific relevant details to groundwater and related actions are found in the updated CAP itself and not in this Closure Plan.

The updated CAP evaluates the extent of, and remedies for, constituents of interest (COIs) in groundwater associated with the ash basins and coal pile area, focusing on constituent concentrations detected above the applicable 02L Standards, Interim Maximum Allowable Concentrations, or approved background threshold values at or beyond the compliance boundary to north and north-northeast of the Retired Ash Basin and coal pile, and east of the Active Ash Basin. In addition, the updated CAP considers the federal groundwater corrective action requirements at 40 C.F.R. §§ 257.96-98.

As detailed in the updated CAP, Duke Energy has begun to implement, and will continue implementing, source control measures at the site, including (i) complete decanting of the Basins to remove the hydraulic head, thereby reducing hydraulic gradients, groundwater seepage velocities, and COI transport potential; and (ii) complete closure of the Basins. In addition, Duke Energy intends to implement a robust groundwater remediation program that includes actively addressing COI in groundwater above applicable standards at or beyond the compliance boundary using groundwater extraction combined with clean water infiltration and removal of the low pH area source proximate to the coal pile area. The CAP provides that these corrective action measures will most effectively achieve remediation of the groundwater through the use of extraction wells to the north, northeast, and east of the Basins and coal piles, and strategically
located clean water infiltration wells. The CAP further provides that groundwater modeling simulations indicate (i) these measures will control COI at or beyond the compliance boundary; and (ii) at such time the site-specific considerations detailed within the CAP have been satisfied, including, but not limited to, securing all required state approvals, installing the necessary equipment, and commencing full-scale system operation, COI at or beyond the compliance boundary will meet the remedial objectives in nine years.

5.1 Site Conceptual Model Predictions

This information is included as part of the CAP being prepared separately by SynTerra for Duke Energy and is being submitted in parallel to this Closure Plan. The CAP is herein incorporated by this reference but its content is not the work product of AECOM.

5.2 Groundwater Chemistry Effects

This information is included as part of the CAP being prepared separately by SynTerra for Duke Energy and is being submitted in parallel to this Closure Plan. The CAP is herein incorporated by this reference but its content is not the work product of AECOM.

5.3 Groundwater Trend Analysis Methods

This information is included as part of the CAP being prepared separately by SynTerra for Duke Energy and is being submitted in parallel to this Closure Plan. The CAP is herein incorporated by this reference but its content is not the work product of AECOM.

6. BENEFICIAL AND FUTURE USE

6.1 CCR Use

At this time, Duke Energy has not identified a beneficial use of CCR from the Basins at Allen Station.

6.2 Site Future Use

At this time, Duke Energy has not identified any future use of the land reclaimed by the dewatering and excavation of the AAB and RAB, except that a new CCR landfill is proposed to be built within the footprint of the excavated AAB.

7. CLOSURE DESIGN DOCUMENTS

7.1 Engineering Evaluations and Analyses

Engineering evaluations and analyses to support closure of the AAB and RAB at the Allen Station, as detailed in this Closure Plan, are provided in Appendix C.
Geotechnical calculations for the proposed CCR landfill design will be performed separately as part of its permit application, which will follow NCDEQ approval of this Closure Plan. Dam removal-related calculations will be included in the dam modification permit applications, which will follow NCDEQ approval of this Closure Plan.

Safe and effective access to the Basin is critical to CCR excavation and the completion of closure. Access road locations into or across the Basins cannot be reliably established until detailed phasing of closure is developed and a contractor is selected to complete the work. A variety of mitigation techniques can be applied, such as installation of a geogrid and crushed stone aggregate, placement and spreading of dry CCR over the basin surface to establish access, and use of low ground pressure or light weight construction equipment.

For closure by excavation of the RAB, all CCR subject to closure under CAMA (i.e., all CCR located to the north and west of the RAB Landfill footprint) will be removed. To accomplish this, a slope stabilization system will be constructed using methods that may include, but are not limited to, the deep mixing method (DMM). The slope stabilization system is proposed to be constructed at the permitted limits of the northern and western perimeters of the RAB Landfill footprint. A conceptual-level analysis has been performed to determine approximate locations, dimensions and characteristics of the slope stabilization system to support the northern and western slopes of the RAB landfill. A summary of the evaluation that supports the conceptual-level design, as well as a description of the proposed slope stabilization system, is provided in Appendix C2-1. Further evaluation will be conducted during subsequent stages of the design to refine this analysis, following NCDEQ approval of this Closure Plan.

Areas for stockpiling or conditioning of CCR are generally needed. These areas must be established within the limits of the CCR unit and require placement or stacking of CCR excavated from other areas of the basin. They can be established in areas where all or most of the CCR has been removed, or on areas where a significant depth of CCR remains in place. Sluiced CCR forming the foundation of stockpiles or conditioning areas may be subject to bearing capacity or slope failures from the additional vertical compressive stress imparted by the stacked CCR and hauling equipment.

During excavation of CCR, interim or temporary excavated CCR slopes are commonly created. These slopes vary in height and the duration they will have to stand. Some slopes are subject to potential loading from hauling or stockpiling operations. The location and geometry of such slopes cannot be established during design. These elements depend on the means and methods employed by the construction contractor, site conditions, schedule and other site conditions. Excavation in a deep valley fill creates safety risks that need further evaluation and will require the means and methods inputs from a contractor to fully address before closure excavation work commences. A detailed phasing and excavation plan will be developed after this Closure Plan is approved by NCDEQ.

7.2 Closure Plan Activities

The primary activities associated with closure by excavation are as follows:

- Reduce free/surface water volume via discharge to existing NPDES-permitted Outfall 002.
• Decant by using floating pumps, screened intakes, and pumping.
• Construction and operation of a temporary WMS to manage all discharges in compliance with the NPDES permit during closure.
• Dewater the CCR to allow for access, CCR excavation and conditioning (drying) prior to placement in the proposed on-site landfill.
• Start CCR excavation from the basins, with sequencing determined for optimal progression. Manage and control dust-generating activities through specific site planning and mitigation. Construct landfill cells in coordination with CCR excavation. Place the excavated CCR in the on-site landfill and compact. Instrumentation and monitoring requirements to be developed prior to construction will be followed to verify construction phase stability. Construction dewatering to be used as needed to provide stable work areas and slopes. Maintain required hydraulic storage capacity though the excavation process and progressively breach the AAB and RAB dams as excavation advances.
• Complete closure by excavation verification. Grade the area to promote positive drainage and seed for vegetative growth.
• Sequence final dam breaches with construction of proposed stormwater detention basins and inflow design flood management.

Additional information and details pertaining to the closure design are provided in the Closure Plan drawings, which can be found in Appendix D.

7.3 Design Drawings

The Closure Plan drawings found in Appendix D include the following:

• Cover sheet
• General notes
• Existing conditions plan with aerial photograph
• Existing conditions plans with topography
• Subsurface exploration location plans
• Estimated bottom of CCR contour plans
• Demolition plans
• Final closure grading plans
• Final surface water management plan
• Final closure grading cross section layout plan
• Final closure grading cross sections
• Final closure grading details
• On-site landfill schematic plans
• On-site landfill schematic cross sections

These Closure Plan drawings will be further developed and refined to develop construction-level drawings during subsequent stages following NCDEQ approval of the Closure Plan. In addition, supplemental drawing sets will be prepared on an as-needed basis to support dam modification and/or decommissioning permits, erosion and sediment control permits, NPDES permit modifications, and other related permits.

Once the excavation grades shown on the Closure Plan drawings have been achieved, the procedures described in the Duke Energy Excavation Soil Sampling Plan (Appendix E) will be followed to confirm that closure by excavation has been achieved.

7.4 Description of the Construction Quality Assurance Plan

A Construction Quality Assurance (CQA) Plan will be developed following NCDEQ approval of the Closure Plan for closure of the Basins at the Allen Station. The CQA Plan will be prepared to address N.C.G.S. §130A-309.214(a)(4)(g). Its purpose is to provide a description of the CQA program to be adhered to in execution of closure activities. The CQA Plan will present a description of the roles and responsibilities for monitoring and testing activities and provides guidance on the methodology to be used for evaluating whether the construction has been performed in accordance with the approved Closure Plan. The CQA Plan will also detail the material properties and specifications; methods for transportation, handling, and storage of materials; test methods and verifications; manufacturer, field, and laboratory testing; field activities for construction monitoring and oversight; and reporting and documentation requirements. Technical specifications to be developed as part of the construction-level design packages for contractor bidding will present specific material properties and specifications.

The CQA Plan will address materials and CQA activities associated with the following components:

• Earthwork
  o CCR Excavation
  o Structural Soil Fill
• HDPE Piping
• Vegetation
• DMM Stabilization System
• As-Built Conditions
• Record Documentation Report
8. MANAGEMENT OF WASTEWATER AND STORMWATER

The Allen Station manages wastewater and stormwater under two NPDES permits issued by NCDEQ. Permit number NC0004979, issued on July 13, 2018 (NCDEQ, 2018), permits the discharge of various process-related wastewaters in accordance with specified limits and monitoring requirements. Permit number NCS000546, issued May 15, 2015 (NCDEQ, 2015), provides monitoring and best management practice requirements for industrial stormwater discharges from the Allen Station. Discharges of stormwater and treated process-related wastewaters flow directly or indirectly to Lake Wylie/the Catawba River.

Plant discharges to the AAB have stopped as of February 2019. The AAB will continue to operate during closure to meet the NPDES permit discharge requirements as it goes through the phases of decanting and dewatering. The AAB must continue to safely pass the SDF to meet dam safety requirements.

As previously noted, decanting of the AAB has started. Once the free water is completely drawn down, discharges from the basin via the passive weir box outlet gravity discharge system are not expected to occur. The pumping system is expected to draw down the stored water after storm events, route it through the WMS, and discharge the water via the permitted outfall. When dewatering of the CCR begins, all discharge flows are anticipated to be routed through the water management process and meet the permitted discharge limits.

The AAB currently has the capacity to contain the PMP storm event by maintaining the water surface level elevation at or below El. 641.63 ft (given a starting elevation of 634.8 ft), which provides a minimum freeboard of 2.6 ft. As part of closure, a new, deeper stormwater outfall channel will be created to Lake Wylie/the Catawba River, but the final connection to the stormwater outlet channeling will be timed to avoid exposure to contact wastewater leaving the AAB work site.

Dewatering is performed to remove the interstitial or pore water from the CCR to facilitate excavation, to access in-place CCR and to establish safe slopes prior to and after CCR excavation. It is anticipated that performance criteria will be established in the construction-level documentation to identify required vertical and horizontal limits of interstitial water removal at critical locations and for critical conditions during closure.

Wastewater from the Basins will be pumped, treated as needed and discharged in two phases: the decanting phase and dewatering phase. In the decanting phase, free water above the settled CCR layer will be removed from the basins without the mechanical disturbance of the CCR. The Allen WMS includes equipment that has a designed flow rate of 650 gpm. Following the decanting phase and as the Closure schedule dictates, the Allen site will advance into the dewatering phase to remove interstitial water from the Basins. During this phase, additional physical-chemical treatment processes may be added to the WMS as necessary to maintain compliance with the requirements of the discharge permit. During dewatering phase, the designed flow rate may drop to 250-500 gpm.

The post-closure grades restore the historical flows from the surrounding landscape and route that flow toward the detention basins. The detention basins will be designed with a culvert to
restrict releases under a large rain event that will result in a slower discharge release to Lake Wylie/the Catawba River. Up to and including the last phase of closure before the AAB and RAB dams are breached, the Basins will maintain the capacity to contain the required storm size/flows.

The detention basin design criteria will be further refined for the construction-level documents based on actual field elevations reached in the excavated areas and discussions with NCDEQ with regards to the embankment heights, which will follow NCDEQ approval of this Closure Plan. The designs for the detention basins are limited to conceptual level at this time. These concept designs for the detention basin are based conservatively on 100-year storms. Appendix C1 presents the results of the post-closure stormwater management calculations. Detailed stormwater design for the proposed CCR on-site landfill will be developed as part of its permit design and is not covered herein.

8.1 Anticipated Changes in Wastewater and Stormwater Management

All CCR and wastewater flows to the AAB have been diverted to the holding basin and lined retention basin in the coal pile area and to the north of the station.

A temporary WMS will be utilized such that the NPDES Outfall 002 effluent discharge limits will be met throughout the duration of dewatering and closure.

Erosion and sediment control plans for different phases of the construction will be developed as part of the construction-level packages and formal erosion and sediment control plan permit submittal. The details for the erosion and sediment control measures depicted on the drawings in this Closure Plan submittal will be re-evaluated after the specific construction phasing is established, which will follow NCDEQ approval of this Closure Plan. In addition, erosion and sediment control measures may be installed and removed in phases as stabilization is achieved.

8.2 Wastewater and Stormwater Permitting Requirements

Additional information on required permits is described in Section 10.

9. DESCRIPTION OF FINAL DISPOSITION OF CCR

CCR will be dispositioned by placement into a new, approved and permitted, lined on-site CCR landfill. Duke Energy intends to construct a new on-site landfill to accommodate CCR dispositioned in completion of the NCDEQ-mandated closure by excavation. A permit application for construction of the on-site landfill will be prepared and submitted to NCDEQ Division of Waste Management following approval of this Closure Plan.

Vegetation encountered or removed during the progression of the work will be managed in accordance with state regulations for handling and disposal.
10. APPLICABLE PERMITS FOR CLOSURE

Refer to Table 10-1 for detailed information on the potential and applicable permitting/approval needed to implement this Closure Plan. Development of permitting package submittals and/or regulatory approval requests would follow NCDEQ approval of the Closure Plan.

11. DESCRIPTION OF POST-CLOSURE MONITORING AND CARE

A post-closure plan will be developed following NCDEQ approval of the Closure Plan for closure of the AAB and RAB. The purpose of the post-closure plan will be to provide a description of the inspection, monitoring, and maintenance activities required to be performed throughout the 30-year post-closure care period for the closed AAB and RAB.

The post-closure care plan will be developed to meet the requirements of N.C.G.S. §130A-309.214(a)(4)(k). The items that will be in the post-closure plan for the Allen site include:

- Name, address, phone number, and email address of the responsible office or person;
- Means and methods of managing affected groundwater and stormwater;
- Maintenance of the groundwater monitoring systems;
- Regular inspection and maintenance of the final cover system of the on-site landfill;
- Groundwater and surface water monitoring and assessment program (included as a part of the CAP);
- Post-closure inspection checklist to guide post-closure inspections;
- Description of planned post-closure uses; and
- Financial assurance estimates for post-closure operations and maintenance and remedial action.

11.1 Groundwater Monitoring Program

This information is included as part of the CAP being prepared separately by SynTerra for Duke Energy and is being submitted in parallel to this Closure Plan. The CAP is herein incorporated by this reference but its content is not the work product of AECOM.

12. PROJECT MILESTONES AND COST ESTIMATES

12.1 Project Schedule

A Closure project high-level milestone schedule has been prepared by Duke Energy and is provided below. The schedule defines the following anticipated activities and milestones:
<table>
<thead>
<tr>
<th>Activity</th>
<th>Timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering, decanting, dewatering</td>
<td>Ongoing</td>
</tr>
<tr>
<td>Submit plan and design for landfill construction permit</td>
<td>Q4-2020</td>
</tr>
<tr>
<td>Start CCR excavation to create space for a starter cell</td>
<td>Q1-2021</td>
</tr>
<tr>
<td>Landfill Permit Approval</td>
<td>Q4-2021</td>
</tr>
<tr>
<td>Start new landfill construction</td>
<td>Q4-2021</td>
</tr>
<tr>
<td>First Landfill Cell in Service</td>
<td>Q1-2023</td>
</tr>
<tr>
<td>Complete CCR excavation</td>
<td>Q4-2034</td>
</tr>
<tr>
<td>Complete final closure and cover system of new landfill</td>
<td>Q4-2035</td>
</tr>
<tr>
<td>Site final grading and vegetative cover</td>
<td>Q4-2036</td>
</tr>
</tbody>
</table>

A detailed construction schedule will be developed following NCDEQ approval of this Closure Plan.

### 12.2 Closure and Post-Closure Cost Estimate

Cost estimates for closure and post-closure of the Basins at Allen Station were developed by Duke Energy and provided to AECOM. These cost estimates are not a work product of AECOM. These are Class 5 estimates as the detailed and final design is not developed at this stage of the closure project. Following approval of this Closure Plan by NCDEQ and further development of the project plans and engineering designs the cost estimate will be refined and updated.

The cost to complete closure by excavation, including the new CCR landfill, is estimated to be $639 million.

The cost to perform the 30-year post-closure activities and monitoring is estimated to be $141 million.

The cost estimates prepared by Duke Energy includes the following major activities:

- Mobilization and Site Preparation
- Dewatering, earthwork, and subgrade preparation
- CCR excavation
- Stormwater management, erosion and sediment control, and site restoration
- Engineering support (design and CQA)
- Post closure – groundwater monitoring
- Post closure – operations and maintenance
- Contingency

Corrective action costs are included as part of the CAP being prepared separately by SynTerra for Duke Energy and are being submitted in parallel to this Closure Plan. The CAP is herein incorporated by this reference, but its content is not the work product of AECOM.
13. REFERENCED DOCUMENTS


PROFESSIONAL ENGINEER CERTIFICATION

I, Jay Mokotoff, being a registered Professional Engineer in the state of North Carolina, do hereby certify to the best of my knowledge, information, and belief, that the information contained in this Closure Plan dated December 18, 2019, was developed pursuant to the requirements of N.C.G.S. § 130A-309-214(a)(4) and has been prepared pursuant to recognized and generally accepted good engineering practices.

SIGNATURE ______________________ DATE _______ 12/18/2019 _______

AECOM Technical Services of North Carolina, Inc. (License: F-0342)
Figures
TABLES
<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Corresponding Closure Plan Section</th>
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<tbody>
<tr>
<td>Part II. Provisions for Comprehensive Management of Coal Combustion Residues</td>
<td>§ 130A-309.214(a)(4) Closure Plans for all impoundments shall include all of the following:</td>
<td></td>
</tr>
<tr>
<td>a.</td>
<td>Facility and coal combustion residuals surface impoundment description. – A description of the operation of the site that shall include, at a minimum, all of the following:</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Site history and history of site operations, including details on the manner in which coal combustion residuals have been stored and disposed of historically.</td>
<td>3.1.1</td>
</tr>
<tr>
<td>2</td>
<td>Estimated volume of material contained in the impoundment.</td>
<td>3.1.2</td>
</tr>
<tr>
<td>3</td>
<td>Analysis of the structural integrity of dikes or dams associated with impoundment.</td>
<td>3.1.3</td>
</tr>
<tr>
<td>4</td>
<td>All sources of discharge into the impoundment, including volume and characteristics of each discharge.</td>
<td>3.1.4</td>
</tr>
<tr>
<td>5</td>
<td>Whether the impoundment is lined, and, if so, the composition thereof.</td>
<td>7.1</td>
</tr>
<tr>
<td>6</td>
<td>A summary of all information available concerning the impoundment as a result of inspections and monitoring conducted pursuant to this Part and otherwise available.</td>
<td>3.1.6</td>
</tr>
<tr>
<td>b.</td>
<td>Site maps, which, at a minimum, illustrate all of the following:</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>All structures associated with the operation of any coal combustion residuals surface impoundment located on the site. For purposes of this sub-subdivision, the term &quot;site&quot; means the land or waters within the property boundary of the applicable electric generating station.</td>
<td>3.2.1</td>
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<tr>
<td>2</td>
<td>All current and former coal combustion residuals disposal and storage areas on the site, including details concerning coal combustion residuals produced historically by the electric generating station and disposed of through transfer to structural fills.</td>
<td>3.3</td>
</tr>
<tr>
<td>3</td>
<td>The property boundary for the applicable site, including established compliance boundaries within the site.</td>
<td>3.3</td>
</tr>
<tr>
<td>4</td>
<td>All potential receptors within 2,640 feet from established compliance boundaries.</td>
<td>3.2.2</td>
</tr>
<tr>
<td>5</td>
<td>Topographic contour intervals of the site shall be selected to enable an accurate representation of site features and terrain and in most cases should be less than 20-foot intervals.</td>
<td>3.3</td>
</tr>
<tr>
<td>6</td>
<td>Locations of all sanitary landfills permitted pursuant to this Article on the site that are actively receiving waste or are closed, as well as the established compliance boundaries and components of associated groundwater and surface water monitoring systems.</td>
<td>3.2.3</td>
</tr>
<tr>
<td>7</td>
<td>All existing and proposed groundwater monitoring wells associated with any coal combustion residuals surface impoundment on the site.</td>
<td>3.3</td>
</tr>
<tr>
<td>8</td>
<td>All existing and proposed surface water sample collection locations associated with any coal combustion residuals surface impoundment on the site.</td>
<td>3.3</td>
</tr>
<tr>
<td>c.</td>
<td>The results of a hydrogeologic, geologic, and geotechnical investigation of the site, including, at a minimum, all of the following:</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>A description of the hydrogeology and geology of the site.</td>
<td>4.1</td>
</tr>
<tr>
<td>2</td>
<td>A description of the stratigraphy of the geologic units underlying each coal combustion residuals surface impoundment located on the site.</td>
<td>4.2</td>
</tr>
<tr>
<td>3</td>
<td>The saturated hydraulic conductivity for (i) the coal combustion residuals within any coal combustion residuals surface impoundment located on the site and (ii) the saturated hydraulic conductivity of any existing liner installed at an impoundment, if any.</td>
<td>4.3</td>
</tr>
<tr>
<td>4</td>
<td>The geotechnical properties for (i) the coal combustion residuals within any coal combustion residuals surface impoundment located on the site, (ii) the geotechnical properties of any existing liner installed at an impoundment, if any, and (iii) the uppermost identified stratigraphic unit underlying the impoundment, including the soil classification based upon the Unified Soil Classification System, in-place moisture content, particle size distribution, Atterberg limits, specific gravity, effective friction angle, maximum dry density, optimum moisture content, and permeability.</td>
<td>4.4</td>
</tr>
<tr>
<td>5</td>
<td>A chemical analysis of the coal combustion residuals surface impoundment, including water, coal combustion residuals, and coal combustion residuals-affected soil.</td>
<td>4.5</td>
</tr>
<tr>
<td>6</td>
<td>Identification of all substances with concentrations determined to be in excess of the groundwater quality standards for the substance established by Subchapter L of Chapter 2 of Title 15A of the North Carolina Administrative Code, including all laboratory results for these analyses.</td>
<td>4.6</td>
</tr>
<tr>
<td>7</td>
<td>Summary tables of historical records of groundwater sampling results.</td>
<td>4.6</td>
</tr>
<tr>
<td>8</td>
<td>A map that illustrates the potentiometric contours and flow directions for all identified aquifers underlying impoundments (shallow, intermediate, and deep) and the horizontal extent of areas where groundwater quality standards established by Subchapter L of Chapter 2 of Title 15A of the North Carolina Administrative Code for a substance are exceeded.</td>
<td>4.7</td>
</tr>
<tr>
<td>9</td>
<td>Cross-sections that illustrate the following: the vertical and horizontal extent of the coal combustion residuals within an impoundment: stratigraphy of the geologic units underlying an impoundment; and the vertical extent of areas where groundwater quality standards established by Subchapter L of Chapter 2 of Title 15A of the North Carolina Administrative Code for a substance are exceeded.</td>
<td>4.8</td>
</tr>
</tbody>
</table>
Table 2-1: NC CAMA Closure Plan Requirements
Summary and Cross Reference Table
Duke Energy, Allen Steam Station

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Corresponding Closure Plan Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>d.</td>
<td>The results of groundwater modeling of the site that shall include, at a minimum, all of the following:</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>An account of the design of the proposed Closure Plan that is based on the site hydrogeologic conceptual model developed and includes (i) predictions on post-closure groundwater elevations and groundwater flow directions and velocities, including the effects on and from the potential receptors and (ii) predictions at the compliance boundary for substances with concentrations determined to be in excess of the groundwater quality standards for the substance established by Subchapter L of Chapter 2 of Title 15A of the North Carolina Administrative Code.</td>
<td>5.1</td>
</tr>
<tr>
<td>2</td>
<td>Predictions that include the effects on the groundwater chemistry and should describe migration, concentration, mobilization, and fate for substances with concentrations determined to be in excess of the groundwater quality standards for the substance established by Subchapter L of Chapter 2 of Title 15A of the North Carolina Administrative Code pre- and post-closure, including the effects on and from potential receptors.</td>
<td>5.2</td>
</tr>
<tr>
<td>3</td>
<td>A description of the groundwater trend analysis methods used to demonstrate compliance with groundwater quality standards for the substance established by Subchapter L of Chapter 2 of Title 15A of the North Carolina Administrative Code and requirements for corrective action of groundwater contamination established by Subchapter L of Chapter 2 of Title 15A of the North Carolina Administrative Code.</td>
<td>5.3</td>
</tr>
<tr>
<td>e.</td>
<td>A description of any plans for beneficial use of the coal combustion residuals in compliance with the requirements of Section .1700 of Subchapter B of Chapter 13 of Title 15A of the North Carolina Administrative Code (Requirements for Beneficial Use of Coal Combustion By-Products) and Section .1205 of Subchapter T of Chapter 2 of Title 15A of the North Carolina Administrative Code (Coal Combustion Products Management).</td>
<td>6.1</td>
</tr>
<tr>
<td>f.</td>
<td>All engineering drawings, schematics, and specifications for the proposed Closure Plan. If required by Chapter 89C of the General Statutes, engineering design documents should be prepared, signed, and sealed by a professional engineer.</td>
<td>7.1, 7.2</td>
</tr>
<tr>
<td>g.</td>
<td>A description of the construction quality assurance and quality control program to be implemented in conjunction with the Closure Plan, including the responsibilities and authorities for monitoring and testing activities, sampling strategies, and reporting requirements.</td>
<td>7.3</td>
</tr>
<tr>
<td>h.</td>
<td>A description of the provisions for disposal of wastewater and management of stormwater and the plan for obtaining all required permits.</td>
<td>8</td>
</tr>
<tr>
<td>i.</td>
<td>A description of the provisions for the final disposition of the coal combustion residuals. If the coal combustion residuals are to be removed, the owner must identify (i) the location and permit number for the coal combustion residuals landfills, industrial landfills, or municipal solid waste landfills in which the coal combustion residuals will be disposed and (ii) in the case where the coal combustion residuals are planned for beneficial use, the location and manner in which the residuals will be temporarily stored. If the coal combustion residuals are to be left in the impoundment, the owner must (i) in the case of closure pursuant to sub-subdivision (a)(1)a. of this section, provide a description of how the ash will be stabilized prior to completion of closure in accordance with closure and post-closure requirements established by Section .1627 of Subchapter B of Chapter 13 of Title 15A of the North Carolina Administrative Code and (ii) in the case of closure pursuant to sub-subdivision (a)(1)b. of this section, provide a description of how the ash will be stabilized pre- and post-closure. If the coal combustion residuals are to be left in the impoundment, the owner must provide an estimate of the volume of coal combustion residuals remaining.</td>
<td>9</td>
</tr>
<tr>
<td>j.</td>
<td>A list of all permits that will need to be acquired or modified to complete closure activities.</td>
<td>10</td>
</tr>
<tr>
<td>k.</td>
<td>A description of the plan for post-closure monitoring and care for an impoundment for a minimum of 30 years. The length of the post-closure care period may be (i) proposed to be decreased or the frequency and parameter list modified if the owner demonstrates that the reduced period or modifications are sufficient to protect public health, safety, and welfare; the environment; and natural resources and (ii) increased by the Department at the end of the post-closure monitoring and care period if there are statistically significant increasing groundwater quality trends or if contaminant concentrations have not decreased to a level protective of public health, safety, and welfare; the environment; and natural resources. If the owner determines that the post-closure care monitoring and care period is no longer needed and the Department agrees, the owner shall provide a certification, signed and sealed by a professional engineer, verifying that post-closure monitoring and care has been completed in accordance with the post-closure plan. If required by Chapter 89C of the General Statutes, the proposed plan for post-closure monitoring and care should be signed and sealed by a professional engineer. The plan shall include, at a minimum, all of the following:</td>
<td>11</td>
</tr>
<tr>
<td>1</td>
<td>A demonstration of the long-term control of all leachate, affected groundwater, and stormwater.</td>
<td>11.1</td>
</tr>
<tr>
<td>2</td>
<td>A description of a groundwater monitoring program that includes (i) post-closure groundwater monitoring, including parameters to be sampled and sampling schedules; (ii) any additional monitoring well installations, including a map with the proposed locations and well construction details; and (iii) the actions proposed to mitigate statistically significant increasing groundwater quality trends.</td>
<td>11.2</td>
</tr>
<tr>
<td>l.</td>
<td>An estimate of the milestone dates for all activities related to closure and post-closure.</td>
<td>12.1</td>
</tr>
<tr>
<td>m.</td>
<td>Projected costs of assessment, corrective action, closure, and post-closure care for each coal combustion residuals surface impoundment.</td>
<td>12.2</td>
</tr>
<tr>
<td>n.</td>
<td>A description of the anticipated future use of the site and the necessity for the implementation of institutional controls following closure, including property use restrictions, and requirements for recordation of notices documenting the presence of contamination, if applicable, or historical site use.</td>
<td>6.2</td>
</tr>
<tr>
<td>No.</td>
<td>Description</td>
<td>Corresponding Closure Plan Section</td>
</tr>
<tr>
<td>-----</td>
<td>------------------------------------------------------</td>
<td>------------------------------------</td>
</tr>
<tr>
<td></td>
<td>§ 130A-309.214(b)(3) No later than 60 days after receipt of a proposed Closure Plan, the Department shall conduct a public meeting in the county or counties proposed Closure Plan and alternatives to the public.</td>
<td></td>
</tr>
</tbody>
</table>

Note 1

Reports Prepared by Other Consultants Include:

1. Synterra Groundwater Assessment Work Plan
2. HDR Groundwater Assessment Work Plan
3. 

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Page 3
### Table 4-1 - Summary of Geotechnical Index Properties

<table>
<thead>
<tr>
<th>Properties</th>
<th>Ash Within Ash Basin (RAB and AAB)</th>
<th>Foundation Soil below Ash Basin</th>
<th>Embankment Fill Soil</th>
<th>Foundation Soil below Embankment Dam</th>
<th>Partially Weathered Rock (PWR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soil Type</td>
<td>Silty Clay (ML), Silty Sandy Silt (ML), and Clay (CH)</td>
<td>Silty Clay (ML), Silty Sandy Silt (ML), and Clay (CH)</td>
<td>Silty Sand (SM), Silty Clay (CL), Silty Sandy Silt (ML), and Clayey Sandy Silt (SC)</td>
<td>Silty Sand (SM), Silty Sandy Silt (ML), and Clayey Sandy Silt (SC)</td>
<td>Silty Sand (SM), Silty Sandy Silt (ML), and Clayey Sandy Silt (SC)</td>
</tr>
<tr>
<td>Liquid Limit</td>
<td>Non-Plastic</td>
<td>Non-Plastic</td>
<td>Non-Plastic</td>
<td>Non-Plastic</td>
<td>Non-Plastic</td>
</tr>
<tr>
<td>Plasticity Index</td>
<td>Representative Range</td>
<td>Geometric Mean</td>
<td>Range</td>
<td>Geometric Mean</td>
<td>Range</td>
</tr>
<tr>
<td>Natural Moisture Content (%)</td>
<td>18 - 66</td>
<td>39</td>
<td>11 - 69</td>
<td>29</td>
<td>12 - 69</td>
</tr>
<tr>
<td>Fines Content</td>
<td>15 - 98</td>
<td>69</td>
<td>17 - 89</td>
<td>50</td>
<td>13 - 61</td>
</tr>
<tr>
<td>Moist Unit Weight ((\gamma_m) (pcf))</td>
<td>72 - 120</td>
<td>92</td>
<td>74 - 113</td>
<td>98</td>
<td>115 - 149</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.95 - 2.81</td>
<td>2.25</td>
<td>2.03 - 2.95</td>
<td>2.75</td>
<td>2.09 - 2.79</td>
</tr>
</tbody>
</table>

**Notes:**
- NP: Classification of Non-Plastic
- 1: Data obtained from lab tests performed on material obtained from within the Ash Basins for the Closure Design, Phase 2 Reconstrustion of Ash Pond Designs Report (AECOM, 2016a), Allen Geotechnical and Design Services Report (S&ME, 2010), Site Suitability Study Retired Ash Basin (S&ME, 2007), Comprehensive Site Assessment Study by (HDR, 2015a), and Historical geotechnical data provided by Duke Energy.
- *Only one lab test data available*
### Table 10-1
Allen Steam Station Regulatory Permits, Approvals, or Requirements for Ash Basin Closure by Excavation

<table>
<thead>
<tr>
<th>General Permit Name or Subject</th>
<th>Regulating Agency</th>
<th>Existing Permit No. (if applicable)</th>
<th>Permit/Approval Type of Regulatory Approval</th>
<th>Mechanism or Not Required</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Quality</td>
<td>NCDEQ</td>
<td>Permit modification likely</td>
<td>Permit modification likely due to the increased heavy equipment vehicle traffic and potential dust generated during closure activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Building Permit</td>
<td>Gaston County</td>
<td>New Permit</td>
<td>A local building permit is required for installation of construction trailers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAMA Monitoring Plan</td>
<td>NCDEQ</td>
<td>Written NCDEQ DWR approval</td>
<td>Modification or abandonment of CAMA program monitoring wells require the approval of the Division of Water Resources (DWR)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCR Impoundment Closure</td>
<td>US EPA CCR Rule</td>
<td>Self-Regulating</td>
<td>Required postings to Public Record</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCR Impoundment Monitoring Network</td>
<td>US EPA CCR Rule</td>
<td>Self-Regulating</td>
<td>Maintain CCR GW monitoring network and requirements as stated in 257.90 - 257.98</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clean Water Act 401</td>
<td>USACE and NCDEQ DWR 401 Water Quality Permitting Section</td>
<td>Individual Permit</td>
<td>It is anticipated that an individual permit will be required in relation to dam breaching and associated downstream impacts.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clean Water Act 404</td>
<td>USACE</td>
<td>Individual Permit</td>
<td>It is anticipated that an individual permit will be required in relation to dam breaching and associated downstream impacts.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cutting Trees</td>
<td></td>
<td>Applicable and to be covered as part of other permits</td>
<td>Erosion and sediment controls, natural habitat, and endangered species considerations.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Permit Type</td>
<td>Agency</td>
<td>Reference</td>
<td>Description</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------------------------------</td>
<td>-----------------</td>
<td>-----------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dam Safety</td>
<td>NCDEQ</td>
<td>GASTO-061</td>
<td>Certificate of Approval to Modify</td>
<td>AAB Dam - Permitting is required to modify the dam in accordance with the Dam Safety Law of 1967, 15A NCAS 02K.0201 (b)(2); an application must be filed with the Division of Energy, Mineral, and Land Resources (DEMLR)</td>
<td></td>
</tr>
<tr>
<td>Dam Safety</td>
<td>NCDEQ</td>
<td>GASTO-016</td>
<td>Certificate of Approval to Modify</td>
<td>RAB Dam - Permitting is required to modify/remove the dam in accordance with the Dam Safety Law of 1967, 15A NCAS 02K.0201 (b)(2); an application must be filed with the Division of Energy, Mineral, and Land Resources (DEMLR)</td>
<td></td>
</tr>
<tr>
<td>DOT - General</td>
<td></td>
<td></td>
<td>Not anticipated at this time</td>
<td>Utilization of or modification to state or federal highways to transport CCR will require consultation or notification to relevant DOT agency</td>
<td></td>
</tr>
<tr>
<td>Driveway Permit</td>
<td>NCDOT</td>
<td></td>
<td>Potential</td>
<td>Temporary access or driveway permits as needed</td>
<td></td>
</tr>
<tr>
<td>Erosion and Sediment Control (E&amp;SC)</td>
<td>NCDEQ</td>
<td></td>
<td>New Permit</td>
<td>Land disturbance activities outside of the ash basin will exceed one acre, therefore in conformance with 15A NCAC 04, an E&amp;SC Permit is required from Land Quality prior to commencement of construction in those areas. Note that land disturbance includes tree clearing and grubbing and vehicular wheel or tracking as disturbance.</td>
<td></td>
</tr>
<tr>
<td>Fire Ants</td>
<td></td>
<td></td>
<td>Restriction not likely</td>
<td>Removal from or import of material could be restricted dependent on the potential for fire ants and geographic regions involved</td>
<td></td>
</tr>
<tr>
<td>Floodplain Development</td>
<td>Gaston County</td>
<td></td>
<td>New Permit</td>
<td>Gaston County Floodplain Development Regulations Section 16.3.3 require a Floodplain Development Permit prior to the start of construction within FEMA-mapped Special Flood Hazard Areas indicated on Flood Insurance Rate Maps.</td>
<td></td>
</tr>
<tr>
<td>Large Capacity Water Supply Well</td>
<td>NCDEQ</td>
<td></td>
<td>New Permit possible</td>
<td>Permits are required to construct any water supply well or water well system with a design capacity equal to or greater than 100,00 gallons per day - for dewatering outside of the ash basin</td>
<td></td>
</tr>
<tr>
<td>Multi-State Agreement</td>
<td></td>
<td></td>
<td>Not required</td>
<td>If movement of CCR will cross state lines, multi-state regulations might apply</td>
<td></td>
</tr>
<tr>
<td>Permit Type</td>
<td>Issuing Agency</td>
<td>Permit Number</td>
<td>Required Action</td>
<td>Additional Information</td>
<td></td>
</tr>
<tr>
<td>-------------</td>
<td>----------------</td>
<td>---------------</td>
<td>-----------------</td>
<td>------------------------</td>
<td></td>
</tr>
<tr>
<td>NPDES (National Pollution Discharge Elimination System)</td>
<td>NCDEQ</td>
<td>NC0004 979</td>
<td>Permit modification likely</td>
<td>Modification of NPDES may be necessary if new source or outfall is created.</td>
<td></td>
</tr>
<tr>
<td>NPDES (National Pollution Discharge Elimination System) Industrial Stormwater</td>
<td>NCDEQ</td>
<td>NCS000546</td>
<td>Permit revision likely</td>
<td>Revision to existing sitewide permit or new permit may be required for access roads, staging areas, etc.</td>
<td></td>
</tr>
<tr>
<td>NPDES (National Pollution Discharge Elimination System) Stormwater</td>
<td>NCDEQ</td>
<td></td>
<td>New Permit possible</td>
<td>Permit required for temporary and permanent stormwater rerouting.</td>
<td></td>
</tr>
<tr>
<td>Noxious Weeds</td>
<td></td>
<td></td>
<td>Not anticipated at this time</td>
<td>Removal from or import of vegetated material could be restricted dependent on the vegetation and geographic regions involved.</td>
<td></td>
</tr>
<tr>
<td>Railroad Easement, Access, or Crossing Permit</td>
<td></td>
<td></td>
<td>Not anticipated at this time</td>
<td>Construction activities adjacent to tracks/ballast or a new railroad crossing require an agreement or permit.</td>
<td></td>
</tr>
<tr>
<td>SPCC (Spill Prevention Control and Countermeasure) Plan</td>
<td>EPA</td>
<td></td>
<td>Modification of existing plan</td>
<td>In accordance with the Federal Water Pollution Control Act (Clean Water Act) of 1974, Title 40, Code of Federal Regulations, Part 112.</td>
<td></td>
</tr>
<tr>
<td>Threatened or Endangered Species: Candidate Conservation Agreement Avian Protection Plan(s) Bird and Bat Conservation Strategies Eagle Conservation Plan Eagle Take Permit</td>
<td>NCDEQ and EPA</td>
<td></td>
<td>It will be done as part of 401/404 process</td>
<td>Federal and/or state regulations may apply including agency consultation and performing site-specific surveys within the proper survey period (e.g., flowering period for listed plant) to determine if Threatened or Endangered Species or their habitat exist within the limits of disturbance.</td>
<td></td>
</tr>
<tr>
<td>Solid Waste Site Suitability</td>
<td>NCDEQ</td>
<td>Approval by Letter</td>
<td></td>
<td>New CCR Landfill</td>
<td></td>
</tr>
<tr>
<td>Solid Waste Permit to Construct</td>
<td>NCDEQ</td>
<td>Permit</td>
<td>New CCR Landfill</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solid Waste Permit to Operate</td>
<td>NCDEQ</td>
<td>Permit</td>
<td>New CCR Landfill</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>