

# CLOSURE PLAN

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## PLANT MCINTOSH EXISTING ASH POND 1 (AP-1) COAL COMBUSTION RESIDUAL (CCR) SURFACE IMPOUNDMENT EFFINGHAM COUNTY, GEORGIA

FOR



# Georgia Power

July 2022

Rev. 1



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### Revisions

Revision 1 – Added additional text describing the proposed photovoltaic module ground mount system to the introduction (page 1) and section 1.17 – Ongoing Plant Operations and Maintenance.

# 1. CLOSURE PLAN

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As required by Rule 391-3-4-.10(3), Georgia Power placed documentation to address the Location Restrictions referenced in 40 CFR 257.60 – 40 CFR 257.64, in the Plant McIntosh AP-1 Operating Record on October 17, 2018. McIntosh AP-1 does not meet the location restrictions for Placement above the uppermost aquifer (40 CFR 257.60) and for Unstable areas (40 CFR 257.64). Therefore, AP-1 ceased receipt of waste on April 17, 2019, and will proceed with closure as required by Rule 391-3-4-.10(7), through reference to 40 CFR 257.101 (Closure or retrofit of CCR units) and 40 CFR 257.102 (Criteria for conducting the closure or retrofit of CCR units).

This closure plan has been prepared to be compliant with Rule 391-3-4-.10(7)(c). Georgia Power will close AP-1 through removal of all visible CCR and a minimum 6-inches of soil in accordance with the CCR removal criteria included in the CQA Plan. Following the removal of all visible CCR and soil, AP-1 will be regraded to prevent the ponding of water, and all areas disturbed during construction will be vegetated and restored. Georgia Power proposes to monitor groundwater for a period of five (5) years after the CCR has been removed from the AP-1 footprint to confirm that groundwater constituent concentrations are not detected at statistically significant levels above the groundwater protection standards established in Rule 391-3-4.10(6)(b) which reference the constituents listed in 40 CFR 257, Subpart D, Appendix III and IV of the Federal Rules. After the five years of monitoring and provided the site is in detection monitoring, groundwater monitoring will cease, and the site will no longer be a CCR unit.

As part of Georgia Power's continued commitment to renewable energy generation, after the closure by removal is complete, the former AP-1 area restored and vegetated in accordance with this Closure Plan, Georgia Power will be installing a photovoltaic module ground mount system consisting of five solar arrays (solar arrays) and associated equipment for renewable energy generation within the permit boundary of the former AP-1. The solar arrays will not impact the closure schedule, stormwater management, or groundwater monitoring plan for the site.

## 1.1 Notification

As required by Rule 391-3-4-.10(8), Georgia Power placed a Notice of Intent to initiate closure of AP-1 into the Plant McIntosh AP-1 Operating Record on April 17, 2019. Closure activities will commence according to the closure schedule presented in Section 1.8 of this Closure Plan. Depending on the actual CCR excavation rate achieved during closure activities, complete CCR removal and final restoration of the pond in accordance with this Closure Plan will be accomplished within approximately 2 years following the beginning of closure activities.

## 1.2 Boundary Survey and Legal Description

In accordance with State CCR Rule 391-3-4-.10(9)(b)3, a sealed permit boundary survey and legal description are included on Sheet 8 of 11 of the closure drawings. The total area bounded by the CCR permit boundary is 39.55 acres (referred to as the Site hereafter).

## 1.3 Closure Requirements

The closure requirements for an existing CCR unit are described in Rule 391-3-4-.10(7)(b) through (f). AP-1 will be dewatered and closed by the removal of the CCR in accordance with 40 CFR 257.102(c). A professional engineer registered in the State of Georgia will observe and document that the CCR and a minimum 6-inch of residual soil have been removed from the impoundment. In addition to the closure

requirements, Georgia Power will fulfill the recordkeeping, notification, and internet requirements as specified in Rule 391-3-4-.10(8)(a).

As information becomes available, the following items will be placed in the facility's operating record:

1. Notification of intent to initiate closure of AP-1 [Rule 391-3-4-.10(7)(d)].
2. Notification of closure completion [Rule 391-3-4-.10(7)(e)].

#### **1.4 Closure Plan**

The purpose of this Closure Plan is to describe the steps and procedures required to remove the Plant McIntosh AP-1 surface impoundment consistent with recognized and generally accepted engineering practices. Georgia Power will close AP-1 by removal of all visible CCR. The permit drawings are included in Section 8.

The steps to remove AP-1 include dewatering, excavating and transporting the CCR to a permitted landfill disposal or off-site for beneficial reuse, removing perimeter soil berms (dikes), placing earthen fill and backfilling the excavated ash pond with earthen fill to promote drainage and accommodate the surrounding grades.

Decontamination of the CCR unit will be conducted in a three-step process:

1. All visible CCR shall be removed from the unit and placed in an appropriately permitted solid waste facility. Visual observations and use of the Munsell Soil Color Chart will be used to confirm that all ash has been excavated from the former CCR footprint.
2. A minimum of 6 inches of soil beneath the CCR footprint will be excavated and placed in an appropriately permitted solid waste facility.
3. Groundwater monitoring of the former CCR unit will be conducted for a minimum period of 5 years or continue until groundwater monitoring concentrations do not exceed the groundwater protection standard established pursuant to 40 CFR 257.95(h) for Appendix IV constituents.

#### **1.5 Estimate of Maximum Inventory of CCR Ever On-site**

Historically, the operation of AP-1 consisted of alternately dewatering and excavation of CCR for disposal in a permitted landfill. The volume of CCR in the storage cells varies based on site operations. Based on the October 2017 Annual Inspection, AP-1 had an estimate of 42,500 cubic yards of CCR in the ponds.

#### **1.6 Largest Area of CCR Unit Ever Requiring Final Cover**

Since the closure of AP-1 will be by closure-by-removal of CCR, a final cover will not be required.

#### **1.7 Inspections**

Surface impoundment inspections during closure activities will continue to be performed in accordance with 40 CFR 257.83 until CCR removal has been completed. All current instrumentation for the McIntosh AP1 dike shall be inspected on a monthly basis by a qualified person. A report shall be placed in the operating record indicating the location and type of existing instrumentation and the maximum recorded readings of each instrument since the previous annual inspection.

### 7-day Inspections

Georgia Power currently inspects the AP-1 at intervals not exceeding seven (7) days. The 7-day inspections are conducted by a Qualified Person and include observation and documentation of any appearance of actual or potential structural weakness and other conditions which are disrupting or have the potential to disrupt the closure activities or the safety of the surface impoundment.

Additionally, the discharge structure of AP-1 is inspected for abnormal discoloration, flow, or discharge of debris or sediment.

### Monthly Inspections

Monthly inspections are performed by a Qualified Person and include monitoring of all instrumentation. Monthly water level readings from piezometers MM-1, MM-2, MM-6 and MM-7 are recorded and placed in the Operating Record. Monitoring of the instrumentation will be discontinued when removed during the closure by removal of the pond.

If a potential deficiency or release is identified during an inspection, Georgia Power will remedy the deficiency or release as soon as feasible. Inspection reports and documentation are placed in the facility's operating record.

### Annual Inspections

As required by Chapter 391-3-4-.10(5)(b), which incorporates the operating criteria listed in 40 CFR 257.80, 40 CFR 257.82, and 257.84 of the Federal CCR Rules, a Professional Engineer registered in Georgia inspects AP-1 on an annual basis. The inspection includes, at a minimum:

- a. A visual inspection of AP-1 to identify signs of distress or malfunction of the compacted soil embankment and/or discharge structure.
- b. A review of available information regarding the status and condition of AP-1, including, but not limited to, files available in the facility's operating record such as:
  - i. The results of weekly inspections and the results of previous annual inspections,
  - ii. Files available in the operating record and other conditions which have disrupted or have the potential to disrupt the closure activities or safety of AP-1.

### Annual Reporting

At the completion of each annual inspection per 40 CFR 257.83(b), the Professional Engineer who completed the inspection will prepare an annual report that includes the following:

- a. Any changes in geometry of the impounding structure since the previous annual inspection.
- b. The location and type of existing instrumentation and the maximum recorded readings of each instrument since the previous annual inspection.
- c. The approximate minimum, maximum, and present depth and elevation of the impounded water and CCR since the previous annual inspection.

- d. The storage capacity of the impounding structure at the time of the inspection.
- e. Summary of the instrumentation readings completed throughout the year indicating the maximum water elevation reading in the piezometers and maximum measured flow rate from each sump since the previous annual inspection.
- f. The approximate volume of the impounded water and CCR at the time of the inspection.
- g. Any appearances of an actual or potential structural weakness of the CCR unit, in addition to any existing conditions that are disrupting or have the potential to disrupt the operation and safety of the CCR unit and appurtenant structures.
- h. Any other change(s) which may have affected the stability or operation of the impounding structure since the previous annual inspection.

### **1.8 Closure Schedule**

The milestones and the associated timeframes are initial estimates. Some of the activities associated with the milestones will overlap. Milestones reflect approximate total time to complete the specified tasks and do not represent a construction schedule.

Milestones:

Waste receipt in Ash Pond 1 shall cease by April 17, 2019

Dewatering – 6 months

Excavation & removal – 11 months

CCR Removal Verification – 1 month

Backfilling and Stabilization – 6 months

Post-Construction De-Mobilization & Certification – 6 months

Estimate of Year in which all closure activities will be completed – 2022

### **1.9 Dewatering**

Dewatering will include removing water using a variety of methods, including but not limited to passive, gravity-based methods (e.g., rim ditches) and/or active dewatering methods (e.g. pumps and well points) as needed to allow for CCR excavation and transportation. CCR contact water and legacy wastewater from the ash ponds will be further treated by an on-site wastewater treatment system (WWTS). Water will be managed and discharged in accordance with the site's approved NPDES Wastewater Discharge Permit. Consistent with the NPDES Industrial Wastewater Discharge Permit requirements, Georgia Power will develop a Dewatering Plan to describe treatment processes, monitoring and best management practices necessary to comply with the NPDES Industrial Wastewater Discharge Permit requirements. The Dewatering Plan will be submitted to the EPD Watershed Protection Branch for review and approval prior to commencing dewatering activities.

### 1.10 Contact Water and CCR Track-Out Management

During CCR removal, contact water (e.g., stormwater that has contacted CCR) will be controlled with best management practices such as channels, diversion berms, and pumps and managed in accordance with the NPDES Industrial Wastewater Discharge and, if needed Construction Storm Water permit. Georgia Power will prepare a phased erosion and sediment control plan that will be followed for closure construction activities, as needed.

CCR removal equipment shall be physically cleaned to the extent that is practically possible to remove all visible ash after use. Cleaning activities will take place within the footprint of AP-1. All solid material from the cleaning process will be consolidated and hauled to an appropriately permitted solid waste landfill and all liquid will be treated under the Plant McIntosh NPDES Permit GA0003883, or other permitted treatment facility.

### 1.11 Vegetative Plan

Prior to implementing the vegetative plan, the CCR will be excavated until native soils are encountered indicating that the CCR has been removed. In addition, a six-inch layer of soil will be removed below the verified CCR/soil interface. The CCR excavation and removal criteria will follow this procedure:

1. The Certifying Engineer will prepare an ash pond map using a 100-ft grid spacing. Grid points will be assigned a unique alphanumeric label for reference and documentation of CCR removal.
2. CCR will be excavated until there is no visible CCR present. This surface will be referred to as the CCR/soil interface.
3. CQA consultants will observe the CCR/soil interface at the working face to confirm that all visible CCR has been removed. Observations shall be made with reference to the ash pond grid map. Observations will include, but not be limited to, taking photographs, and describing soil color per use of the Munsell Soil Color Chart. CQA consultants will document observations in field logs or reports.
4. The CCR/soil interface surface will be surveyed.
5. The excavation will continue with the removal of a minimum of 6 inches below the CCR/soil interface. This surface will be referred to as the bottom of excavation. Excavated soil will be disposed of into a permitted landfill.
6. The bottom of excavation will be surveyed and confirmed to be a minimum of 6" below the CCR/soil interface.

Once these procedures have been completed, the intercell divider dikes will be removed and the soils used to re-shape and fill the excavation. The base of the former AP-1 will be removed, and the soils used to re-shape the pond excavation. The surficial soil layer shall be capable of supporting vegetation and may be evaluated through soil testing and amended as necessary to support a permanent vegetative cover. Vegetative cover should be established to meet the requirements in the *Manual for Erosion and Sediment Control in Georgia*. These areas will be stabilized after completion of the ash pond closure work for all areas disturbed by construction activities. Permanent covers which are slow to establish shall receive additional seeding. Planting dates, fertilizer rates, and seeding rates shall meet the requirements in the *Manual for Erosion and Sediment Control in Georgia*.

The erosion control measures shall remain in place until a satisfactory stand of grass is growing. A satisfactory stand of grass is defined as a full cover: 100 percent of the soil surface is uniformly covered in permanent vegetation with a density of 70 percent or greater.

### **1.12 CCR Fugitive Dust Control Plan**

This fugitive dust control plan identifies and describes the CCR fugitive dust control measures that Georgia Power will use to minimize CCR from becoming airborne at the facility, including CCR fugitive dust originating from ash ponds, roads, and material handling activities. Rule 391-3-4-.10(2)(a) defines “fugitive dust” as “solid airborne particulate matter that contains or is derived from CCR, emitted from any source other than through a stack, or chimney.”

Fugitive dust originating from the ash ponds and ash pond closure activities will be controlled using water suppression or polymer tackifiers. The control measures identified and described in this plan were adopted and implemented based upon an evaluation of site-specific conditions and determined to be applicable and appropriate for the Plant McIntosh ash pond closure. Evaluation included assessing the effectiveness of the fugitive dust control measures for the facility, taking into consideration various factors such as site conditions, weather conditions, and operating conditions.

CCR that is transported via truck for shipment off-site will be conditioned to appropriate moisture content to reduce the potential for fugitive dust.

Water suppression or polymer tackifiers will be used as needed to control fugitive dust on facility roads used to transport CCR and other CCR management areas. Speed limits will be utilized to reduce the potential for fugitive dust. Trucks used to transport CCR will be filled to or under capacity to reduce the potential for material spillage.

Georgia Power and construction personnel will assess the effectiveness of the control measures by performing visual observations of the ash ponds and surrounding areas and implementing appropriate corrective actions for fugitive dust, as necessary. Logs will be used to record the utilization of water suppression equipment. Any complaint received from a citizen regarding a CCR fugitive dust event at the facility will be documented and investigated. Appropriate steps will be taken, including any corrective action, if needed. An annual CCR fugitive dust control report that includes a description of the actions taken to control fugitive dust, a record of all citizen complaints, and a summary of any corrective measures will be prepared and placed in the McIntosh AP-1 Operating Record.

### **1.13 Inflow Design Flood Control System**

The inflow design flood consists primarily of the rainfall that lands within the limits of AP-1, along with a nominal amount of process flows. Stormwater is temporarily stored within AP-1, returned to the Plant via pumps located in Cell D, or discharged through a weir controlled concrete riser connected to a 48-inch discharge pipe.

The inflow design flood was calculated using the Natural Resources Conservation Service (NRCS) method, using the 100-year storm event required for a low hazard potential surface impoundment. Runoff curve number data was determined using Table 2-2A from the Urban Hydrology for Small Watersheds (TR-55). Appendix A and B from the TR-55 were used to determine the rainfall distribution methodology. Precipitation values were determined from National Oceanic and Atmospheric Administration (NOAA) Precipitation Frequency Data Server (Atlas-14). The NRCS provided information on the soil characteristics and hydrologic groups present at the site. It was determined that the hydrological group “A/D” should be used to best represent the characteristics of the soils on site. This information was placed into Hydraflow Hydrographs and used to generate precipitation curves, storm basin routing information, and resulting rating curves to evaluate surface impoundment capacity.



The calculations indicated that during operations AP-1 can safely store and pass the design inflow storm. This plan was supported by engineering calculations. The Inflow Design Flood Control System Certification was posted to the Georgia Power CCR Compliance website on October 17, 2016. A copy of this certification is included in Part B of the application.

#### **1.14 Groundwater Monitoring**

Georgia Power will monitor groundwater semi-annually pursuant to the requirements defined in the Groundwater Monitoring Plan included in the permit. Georgia Power proposes to monitor groundwater for a period of five (5) years after the CCR has been removed from the AP-1 footprint to confirm that groundwater constituent concentrations are not detected at statistically significant levels above the groundwater protection standards established in Rule 391-3-4.10(6)(b) which reference the constituents listed in 40 CFR 257, Subpart D, Appendix III and IV of the Federal Rules. A demonstration certified by a Qualified Groundwater Scientist will be submitted to EPD for approval documenting that groundwater constituent concentrations are not detected at statistically significant levels above the groundwater protection standards established in Rule 391-3-4.10(6)(b) for constituents listed in Appendix IV. Evaluation criteria may include but is not limited to additional sampling, analysis, calculations, and/or modeling to demonstrate compliance with 391-3-4.10(7)(b) as determined by the Qualified Groundwater Scientist and approved by EPD.

#### **1.15 Closure Cost/Financial Assurance Demonstration**

In compliance with applicable securities laws and regulations cost estimates for closure/construction/CCR removal/post CCR removal groundwater monitoring will be provided to EPD under separate cover. The total construction closure/removal costs include all items necessary for a third party to complete the project in accordance with the Closure Plan included herein. The cost estimates provided to EPD are based on an area of 22 acres and in 2022 dollars. The estimates will be adjusted annually for inflation.

**Table 1.15.1 – AP-1 Closure Cost Estimate**

Item Description		Quantity	Unit	Unit Cost	Cost
<b>Engineering &amp; Project Management</b>					
	Engineering & Field Support				
	Project Management & Support				
<b>Contractor Mobilization</b>					
	Mobilization				
	Demobilization				
<b>Surveying</b>					
	As-Built Topographic Survey				
<b>Site Preparation &amp; Construction</b>					
	Excavation and Haul of On-Site Borrow to the Closure Area				
	Ash Removal and Disposal				
	Windrow/Spread CCR for Moisture Removal				
	Dewatering and Monthly Water Treatment Plant Operation and Maintenance				
<b>Erosion Control</b>					
	Hydro-Seeding/Mulching				
	Dust Control				
	Erosion & Sediment Control				
	Silt Fencing				
<b>Quality Assurance/Quality Control</b>					
	3rd Party Quality Control				
	4th Party Quality Assurance				
	Final Certification Report				
				Subtotal Direct Costs	
				Subtotal Indirect Costs	
				Contingency	
				<b>Total Closure Cost Estimate</b>	

NOTES:

1. Contractor bonding and insurance costs are included in the Mobilization line item.
2. Project Management Support includes costs of construction documents.

**Table 1.15.2 – AP-1 Closure Cost Estimate**

Item Description	Quantity	Unit	Unit Cost	Cost
<b>Environmental Monitoring</b>				
Groundwater Monitoring Sampling/Analysis				
Groundwater Monitoring Reporting				
Groundwater Well Maintenance <sup>2</sup>				
<b>Site Maintenance/Site Security</b>				
Maintenance <sup>3</sup>				
Dike & Road Maintenance				
			Subtotal	
			Contingency	
<b>Annual Post Closure Cost Estimate</b>				
<b>5 Year Post Removal Care Cost Estimate</b>				
<b>Total Financial Assurance Required (Closure Cost + 5 Year Post Removal Care Cost)</b>				

**NOTES:**

1. No costs for project management are included for closure by removal.
2. Well Maintenance includes cost for abandonment at end of 5-yr Post Removal period.
3. Maintenance includes cost for re-seeding and mowing the site twice per year.

**1.16 Beneficiation for Re-use**

As an option to transporting the dewatered and excavated CCR to a permitted landfill, the ash may be sold to an ash marketer for beneficial re-use.

**1.17 On-going Plant Operations and Maintenance**

Activities needed to construct, maintain, operate, replace, or repair systems for electric power generation, or its delivery may be conducted at Georgia Power’s discretion within the permit boundary after removal activities have been completed. As part of Georgia Power’s continued commitment to renewable energy generation, after the closure by removal is complete, the former AP-1 area restored and vegetated in accordance with this Closure Plan, Georgia Power will be installing a photovoltaic module ground mount system consisting of five solar arrays and associated equipment within the permit boundary of the former AP-1. The proposed solar array and details of the proposed foundations are shown in Permit Drawing Sheet 5 of 12.

A stormwater hydrologic analysis was completed to evaluate the impact of the solar array installation on the former AP-1 area has been restored after closure. The evaluation concluded the solar arrays incorporating the shallow pier or pre-drilled and driven foundation would not significantly increase the stormwater runoff when compared to the vegetated AP-1 site. This is achieved through the low-impact solar panel/ground mount design which allows the vegetative cover to remain in-place with a relatively small addition of impervious area resulting from the shallow pier or pre-drilled and driven foundations. Construction of an access road is not planned so the total estimated land disturbance area is approximately 3,650 square feet. Soil erosion and sediment controls will consist of silt fence installed along southeast stormwater discharge area and temporarily mulching or seeding disturbed areas if left exposed greater than 14 days and permanent seeding of disturbed areas as soon as practical.

### **1.18 Amendments to the Written Closure Plan**

Pursuant to Rule 391-3-4-.10(7)(b) and 40 CFR 257.102(3)(ii), Georgia Power must amend the initial or any subsequent written closure plan whenever there is a change in operation of the CCR unit that would substantially affect the written closure plan in effect; or, before or after closure activities have commenced, unanticipated events necessitate a revision of the written closure plan. Georgia Power will amend the Plan at least 60 days prior to a planned change in the operation of the unit, or no later than 60 days after an unanticipated event requires the need to revise the Plan. If a written closure plan is revised after closure activities have commenced, Georgia Power will amend the current Plan no later than 30 days following the triggering event. Georgia Power will obtain a written certification from a qualified professional engineer that any amendment of the written closure plan meets the requirements of 40 CFR 257.102.

### **1.19 Certification of Closure/Reporting**

Upon completion of CCR removal, a professional engineer registered in Georgia will prepare and Georgia Power will submit a certification report documenting the removal to Georgia EPD. The certification report shall be submitted to EPD within 60 days of completion of closure by removal activities. Pursuant to State CCR Rule 391-3-4-.10(7)(e) once all CCR removal is complete and groundwater monitoring concentrations at the site have been demonstrated not to exceed groundwater protection standards for a period of 5 years, Georgia Power will submit a closure report to the EPD Director. The closure report will be completed on forms provided by Georgia EPD.