

CLOSURE PLAN FOR INACTIVE CCR LANDFILL

FORMER PLANT ARKWRIGHT – AP2-DAS LANDFILL
MACON-BIBB COUNTY, GEORGIA
FOR



Georgia Power

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JACOBS®

Table of Contents

1.	GENERAL	1
2.	NOTIFICATION	1
3.	SURVEY CONTROL	1
4.	LOCATION RESTRICTIONS	1
5.	FUGITIVE DUST CONTROL PLAN	1
6.	RUN-ON AND RUN-OFF CONTROL.....	2
7.	UPDATED CLOSURE PLAN	3
8.	CONSTRUCTION QUALITY ASSURANCE	5
9.	CERTIFICATION OF REMOVAL	6
10.	CERTIFICATION OF CLOSURE	6
11.	DIRECTIONAL INFORMATIONAL SIGNS.....	6
12.	VEGETATIVE PLAN	6
13.	SITE EQUIPMENT NEEDED	9
14.	SEDIMENT REMOVAL	9
15.	EROSION AND SEDIMENTATION CONTROL.....	9
16.	GROUNDWATER MONITORING	9
17.	SCHEDULE	9
18.	CLOSURE COST	10
19.	LEGAL DESCRIPTION	10

1. GENERAL

AP2-DAS Landfill is an inactive CCR unit located on the former Plant Arkwright property owned by Georgia Power. The unit was used as a disposal area for the plant's Coal Combustion Residuals (CCR). After completing a technical and administrative review of the closure documentation and inspection of the site, EPD issued a Closure Certificate for AP2-DAS Landfill in 2010. AP2-DAS Landfill is currently maintained in accordance with the Post-Closure Plan approved by EPD.

Although AP2-DAS Landfill has officially been closed, Georgia Power plans to remove the CCR waste from this unit and dispose of the waste into a permitted landfill; or alternatively, the CCR will be sold to an ash marketer for beneficial reuse. This removal plan has been included in this updated Closure Plan as part of the CCR unit solid waste handling permit application.

2. NOTIFICATION

The owner will complete all CCR removal activities in accordance with this Closure Plan and will commence activities in accordance with the included schedule. Upon completion of removal activities, a report documenting the CCR removal will be prepared by a Georgia-registered professional engineer and will be submitted to EPD.

3. SURVEY CONTROL

The permit boundary and legal description for AP2-DAS Landfill is provided in the Permit Boundary Survey and Legal Description section of the permit application.

4. LOCATION RESTRICTIONS

In accordance with Georgia Solid Waste Rule 391-3-4-.10(9), an Inactive CCR Landfill permit application must include the location restriction demonstration requirements in 40 CFR 257.64 for unstable areas. The AP2-DAS Landfill and surrounding area have been evaluated by a professional engineer for the presence of unstable areas. No unstable areas have been identified, and a certification by the Georgia-registered professional engineer is included in the Engineering Report.

5. FUGITIVE DUST CONTROL PLAN

The purpose of this fugitive dust plan is to demonstrate compliance with the fugitive dust requirements in EPD's Rule 391-3-4-.10(5). This fugitive dust plan identifies and describes the CCR fugitive dust control measures that will be used to minimize CCR from becoming airborne at the AP2-DAS Landfill, including CCR fugitive dust originating from CCR units, roads, and other CCR management and material handling activities.

EPA defines "CCR fugitive dust" as solid airborne particulate matter that contains or is derived from CCR, emitted from any source other than a stack or chimney.

Fugitive dust originating from the removal of AP2-DAS Landfill will be controlled using water suppression and compaction.

The fugitive dust control measures identified and described in this plan were adopted and implemented based upon an evaluation of site-specific conditions and are determined to be

applicable and appropriate for AP2-DAS Landfill at the former Plant Arkwright. 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 will be conditioned to appropriate moisture content to reduce the potential for fugitive dust. Water suppression 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 are filled to or under capacity to reduce the potential for material spillage.

Georgia Power and construction personnel shall assess the effectiveness of the control measures by performing visual observations of all CCR units and surrounding areas and implementing appropriate corrective actions for fugitive dust, as necessary. Logs will be used to record the utilization of water-spray equipment.

If a complaint is received from a citizen regarding a CCR fugitive dust event at the facility, the complaint shall be documented and investigated. Appropriate steps will be taken, including any corrective action, if needed.

6. RUN-ON AND RUN-OFF CONTROL

The run-on and run-off control plan for AP2-DAS Landfill describes the run-on and run-off control systems based on the current conceptual CCR removal plan. Additional controls will be provided during removal if changes are made by the contractor based on field conditions or changes to the sequence of excavation.

During CCR removal, run-on stormwater and run-off contact water (e.g. stormwater that has come into contact with CCR) will be controlled with best management practices such as ditches, diversion berms, equalization basin storage, pumps, and piping and will be managed in accordance with applicable NPDES Construction Stormwater, Industrial Stormwater, and Industrial Wastewater Discharge permits. Georgia Power will prepare a phased erosion and sediment control plan that will be followed for construction activities, as needed. Stormwater and contact water will be prevented from ponding as much as practicable to facilitate CCR removal.

Construction stormwater run-off for the AP2-DAS Landfill will be managed via an equalization basin that will be constructed and maintained during CCR removal. The phased excavation will create internal detention of the contact water. The equalization basin will be completely contained within the excavation area. The basin will provide a minimum volume equal to the 100-year run-off generated by the contributing disturbed drainage area. The collected water will be pumped from the equalization basin to onsite storage tanks or removed by tanker truck. This process will continue as needed until CCR removal is verified as complete. If needed, a dewatering plan will be developed, and procedures are described below.

Berms and drainage ditches will be used to minimize stormwater or non-contact water run-on from flowing into the excavation area from the undisturbed areas adjacent to the CCR excavation.

The run-on and run-off control plan is supported by appropriate engineering calculations presented in the Engineering Report included as part of this permit application.

7. UPDATED CLOSURE PLAN

A closure completion report was previously submitted to EPD for the in-place closure of AP2-DAS Landfill. This closure construction was approved by EPD and post-closure care was initiated after the Closure Certificate was issued in 2010. Although the CCR unit has been properly closed and is in stable condition, Georgia Power plans to remove the CCR waste from this unit. This updated Closure Plan has been prepared for the removal of the CCR waste from the unit.

The federal regulations in Subpart D – Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments do not apply to this CCR unit in accordance with 40 CFR § 257.50 since the facility ceased to produce electricity prior to October 19, 2015. However, AP2-DAS Landfill is subject to the Georgia Solid Waste Management Rules and, specifically, Rule 391-3-4-.10 for Coal Combustion Residuals, which became effective on November 22, 2016.

The CCR in AP2-DAS Landfill will be removed in accordance with this updated Closure Plan.

a) Description of CCR Unit

AP2-DAS Landfill is defined as an Inactive CCR Landfill by Rule 391-3-4-.10(2). Former Plant Arkwright was retired in 2002 and decommissioned in 2003. AP2-DAS Landfill is located adjacent to Beaverdam Creek and separated from the former plant area by Arkwright Road. The unit was issued a Closure Certificate by EPD on July 30, 2010 and assigned Solid Waste Handling Permit number 011-031D(LI). The existing site is covered with soil and a mature stand of trees and thick undergrowth vegetation. AP2-DAS Landfill has an existing groundwater monitoring network which is currently being monitored semi-annually.

b) Closure Plan Description

Per this updated Closure Plan for AP2-DAS Landfill, CCR waste within the unit will be removed along with six (6) inches of underlying soil within the CCR management boundary. The Closure Plan will be amended if there is a change that would substantially affect the written closure plan currently in place or if there are unanticipated events that necessitate a revision of the Closure Plan. The written Closure Plan will be amended 60 days prior to a planned change or no later than 60 days after an unanticipated event that requires a revision. If a written Closure Plan is revised after closure activities have commenced, the owner must amend the current Closure Plan no later than 30 days following the triggering event.

c) Methods and Procedures

“CCR removal” refers to the process of verifying and documenting that the CCR has been removed from the CCR unit. The removal of CCR from AP2-DAS Landfill will include removing visible CCR waste within the limits shown in the Closure Plan drawings. The site will be prepared and excavated in phases to minimize the area of CCR that is exposed at any one time. The excavation will be sequenced to internally contain contact water and to provide protection of the creek and nearby wetlands during the removal process.

Since the excavation area is adjacent to wetlands and an associated perennial stream, permits for potential wetland and stream impacts will be obtained through the United States Army Corps of Engineers (USACE) before excavation begins. A small wetland drainage feature will be relocated prior to excavation. A temporary water-filled cofferdam (or similar structure) will be placed within Beaverdam Creek to provide protection of the creek during removal of CCR along the bank. The area

will be backfilled with clean soil to reconstruct the stream bank, and the cofferdam will be removed once CCR removal is complete.

Erosion and sedimentation controls will be implemented before excavation begins. Best Management Practices (BMPs) will conform to the most recent version of the Manual for Erosion and Sediment Control in Georgia. An Erosion and Sediment Control Plan will be prepared prior to beginning closure construction.

Trees and stumps will be removed in phases just ahead of the excavation to minimize the area of CCR that is exposed at any one time. When encountered during clearing, trees will be cut and removed, and the tree stumps and root balls will be excavated. Any organic material that has been in contact with CCR will be transported to a permitted disposal facility that has been approved to accept CCR.

CCR will be excavated and sloped towards the middle of the site to provide internal detention of the collected contact water. Pumps and piping will be used to transport the collected water to onsite tanks. Alternatively, the collected water may also be removed by tanker truck. Procedures for dewatering are described below. The conceptual excavation sequence plan can be found in the Closure Plan drawings.

Once the visible CCR is removed, the CCR excavation area will then be further excavated a minimum of six additional inches into the subgrade soils. The excavated CCR and over-excavated soils will be transported by truck to a permitted disposal facility that has been approved to accept CCR. The verification procedure is presented in Section 8 of this plan for Construction Quality Assurance.

After the CCR and over-excavated soil has been removed, the AP2-DAS Landfill area will be regraded and vegetated immediately to prevent ponding and to minimize erosion. Additional groundwater monitoring wells will be added to the existing monitoring network as described in the Groundwater Monitoring Plan provided in this permit application. The existing and new wells will be monitored in accordance with the Groundwater Monitoring Plan.

A pre-existing beneficial reuse area will remain in place on-site to provide support for the existing power transmission line. This beneficial reuse area is located within the permit boundary and inside of the monitoring network and is identified in the Closure Plan drawings included in the permit application.

d) Dewatering

Dewatering, if required, may 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 from the CCR unit may be further treated by an onsite wastewater treatment system (WWTS). If a WWTS is utilized, 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 written "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.

In addition, and if needed, the excavated CCR may be removed to an onsite staging area where it will be placed in windrows and mechanically turned to allow the release of water. Onsite personnel will

monitor the moisture content of the windrows. Upon reaching a suitable moisture content, the CCR will be considered ready for transport and disposal.

e) Safety Practices During Excavation of CCR

No unusual chemical, explosive, corrosive, or asbestos-containing waste material is expected to be encountered. However, if unidentified material is encountered during excavation, proper identification will be made by a qualified individual. The material will then be disposed of in a manner that meets the appropriate regulations.

f) Estimate of the Maximum Inventory of CCR

AP2-DAS Landfill contains an estimated 296,517 cubic yards of CCR and impacted soils that will be removed. An estimated 39,669 cubic yards of beneficial reuse material will be left in place.

g) Estimate of the Area

The area of AP2-DAS Landfill where CCR will be removed covers an estimated 9.11 acres. A 0.36-acre pre-existing beneficial reuse area will be left in place.

8. CONSTRUCTION QUALITY ASSURANCE

Construction Quality Assurance (CQA) services will be required during removal of CCR from AP2-DAS Landfill and will be provided by a qualified consulting engineering firm. “CCR removal” refers to the process of verifying and documenting that CCR has been removed from the CCR unit. 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 are described below.

Visual Verification of CCR Removal Procedure:

GPC will engage the services of a Construction Quality Assurance (CQA) firm to monitor and document CCR removal according to the following procedure:

- 1) The CQA Engineer will prepare a 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 personnel will observe the CCR/soil interface at the working face to confirm that visible CCR has been removed. Observations shall be made with reference to the grid map. Observations will include, but not be limited to, taking photographs and describing soil color. CQA personnel will document observations in field logs or reports.
- 4) The CCR/soil interface surface will be surveyed.
- 5) The excavation will continue to a minimum 6-inches below the CCR/soil interface. This surface will be referred to as the bottom of excavation. Excavated soil will be disposed of at an off-site permitted landfill.
- 6) The bottom of excavation surface will be surveyed and confirmed to be a minimum of 6 inches below the CCR/soil interface.

Earthen fill will be placed after the CCR is removed to achieve final grades. Sources for earthen fill may include on-site or off-site soils. The fill will be placed and graded to promote positive drainage and support permanent vegetation to minimize erosion. 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.

As-built certification surveys of final grades after CCR removal shall be performed by a registered professional land surveyor licensed in Georgia.

9. CERTIFICATION OF REMOVAL

Upon completion of removal activities, a professional engineer registered in Georgia shall prepare a certification report documenting the removal activities. This report will be submitted to EPD.

10. CERTIFICATION OF CLOSURE

Pursuant to Solid Waste Management 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 the applicable state groundwater protection standards, Georgia Power will submit a closure report to EPD. The closure report will be completed on forms provided by EPD. Concurrently with the submittal of the closure report, and in accordance with Solid Waste Management Rule 391-3-4-.10(7)(f), Georgia Power will submit confirmation that a notation on the property deed has been recorded.

11. DIRECTIONAL INFORMATIONAL SIGNS

Signs shall be posted at the property entrance gate and shall include a telephone number for emergencies.

12. VEGETATIVE PLAN

All disturbed areas shall initially be grassed in accordance with the following schedules. Permanent covers which are slow to establish shall receive temporary seeding. The fertilizer requirements are suggested and will be adjusted based on site conditions. If needed, the owner will submit soil samples to the County Extension Agent for analysis and determination of proper soil conditioners, including lime. Planting dates, fertilizer rates, and seeding rates shall meet the requirements in the Manual for Erosion and Sediment Control in Georgia.

TABLE 1. SEEDING REQUIREMENTS

Seeds - Permanent	lbs/Acre	Depth of Cover	Date of Planting
Bermuda Grass-Hulled	10	¼" – ½"	3/15 – 5/31
Bermuda Grass – Unhulled	10	¼" – ½"	10/1 – 2/28
Bahia, Pensacola	30	¼" – ½"	3/1 – 6/15
Seeds - Temporary	lbs/Acre	Depth of Cover	Date of Planting
Annual Ryegrass	40	¼" – ½"	8/15 – 3/31
Pearl Millet	50	¼" – ½"	4/1 – 8/31
Weeping Lovegrass	4	¼" – ½"	3/1 – 6/1

Notes:

1. All seeding rates are pure live seed rates.
2. All seeding shall be mulched with clean dry hay at the rate of 2.5 tons per acre. Mulch shall be anchored by pressing the mulch into the soil immediately after the mulch is spread using a packer disk or disk harrow or equivalent piece of equipment.
3. Temporary seeding should also complement permanent seeding to produce a suitable cover while the permanent grasses germinate.
4. Annual ryegrass will not be used with perennial species due to its nature of out-competing perennial species.
5. Disturbed slopes greater than 3%, including soil stockpiles, are to be mulched upon reaching final grade.
6. D.O.T. or County Extension seed type, seed rates, fertilizer requirements, etc. may also be used in lieu of the table above.

TABLE 2. FERTILIZER REQUIREMENTS

Type of Species	Year	Analysis or Equivalent N-P-K	Rate	N Top Dressing Rate
Cool Season Grasses	First	6-12-12	1500 lbs./ac.	10-100 lbs.ac.(1)(2)
	Second	6-12-12	1000 lbs./ac.	-
	Maintenance	10-10-10	400 lbs./ac.	30
Cool Season Grasses and Legumes	First	6-12-12	1500 lbs./ac.	0-50 lbs./ac/(1)
	Second	0-10-10	1000 lbs./ac.	-
	Maintenance	0-10-10	400 lbs./ac.	-
Ground Covers	First	10-10-10	1300 lbs./ac.(3)	-
	Second	10-10-10	1300 lbs./ac.(3)	-
	Maintenance	10-10-10	1100 lbs./ac.	-
Pine Seedlings	First	20-10-5	One 21-gram pellet/seeding placed in closed hole	-
Shrub Lespedeza	First	0-10-10	700 lbs./ac.	-
	Maintenance	0-10-10	700 lbs./ac.(4)	-
Temporary Cover Crops Seeded Alone	First	10-10-10	500 lbs./ac.	30 lbs./ac.(5)
Warm Season grasses	First	6-12-12	1500 lbs./ac.	50-100 lbs./ac.(2)(6)
	Second	6-12-12	800 lbs./ac	50-100 lbs./ac.(2)
	Maintenance	10-10-10	400 lbs./ac.	30 lbs./ac.
Warm Season Grasses and Legumes	First	6-12-12	1500 lbs./ac.	50 lbs./ac.(6)
	Second	0-10-10	1000 lbs./ac	-
	Maintenance	0-10-10	400 lbs./ac.	-

Notes:

1. Apply in spring following seeding.
2. Apply in split applications when high rates are used.
3. Apply in 3 split applications.
4. Apply when plants are pruned.
5. Apply to grass species only.
6. Apply when plants grow to height of 2"-4".

13. SITE EQUIPMENT NEEDED

The owner shall make adequate equipment available to ensure that requirements are executed correctly and efficiently. Should said equipment not be available, backup equipment may be obtained from rental companies.

14. SEDIMENT REMOVAL

Accumulated sediment shall be removed from all drainage structures.

15. EROSION AND SEDIMENTATION CONTROL

Upon initiation of removal activities, all ditches, diversion berms, and other erosion control structures serving disturbed areas shall be constructed and placed according to the Closure Plan.

16. GROUNDWATER MONITORING

Pursuant to the Rules of Solid Waste Management, Chapter 391-3-4-.10(6), Georgia Power will install a groundwater monitoring system within the uppermost aquifer underlying AP2-DAS Landfill. This groundwater monitoring system will consist of 7 monitoring network wells. Groundwater monitoring will be performed in accordance with the AP2-DAS Landfill Groundwater Monitoring Plan dated November 2018.

Following CCR removal from AP2-DAS Landfill, Georgia Power proposes to conduct post-removal groundwater monitoring for five (5) years to demonstrate decontamination of AP2-DAS Landfill. This demonstration is required through Georgia Rule 391-3-4-.10(2)(a) which incorporates the definition of a closed CCR unit to meet the requirements of 40 CFR 257.102. CCR units that elect to close by removal are not subject to the criteria in 40 CFR 257.104 for post-closure care requirements.

The cost estimate for groundwater monitoring during the five-year period can be found below. Georgia Power will provide a demonstration of financial assurance in a separate submittal.

TABLE 3. FIVE-YEAR GROUNDWATER MONITORING COST ESTIMATE

Item Description	Quantity	Unit	Unit Cost	Cost
Groundwater Monitoring & Reporting	2	EA/YR	\$12,495.00	\$24,990.00
Annual Cost Estimate				\$24,990.00
Total Cost Estimate (5 years)				\$124,950.00

17. SCHEDULE

The following milestones are based on design and regulatory requirements. There is no specific date to initiate closure; therefore, the schedule contains an estimate of the total time to implement the removal of CCR.

Milestones:

- 1) Prepare accurate legal description of AP2-DAS Landfill permit boundary
- 2) Construct erosion and sediment control systems
- 3) Install dewatering and water treatment systems, if needed
- 4) Remove trees and stumps from CCR excavation area
- 5) Excavate, transport, and dispose of CCR waste
- 6) Over-excavate into subgrade
- 7) Regrade CCR excavation area
- 8) Initiate vegetative plan
- 9) Remove all accumulated sediments from drainage structures
- 10) Provide the CCR Removal and Closure Reports to the Director. The reports shall be prepared and stamped by a professional engineer registered in Georgia

The total estimated construction time is 8 months.

18. CLOSURE COST

In compliance with applicable securities laws and regulations, Georgia Power will provide specific cost estimates for closure during the permit application review process as estimates are developed and finalized. It is anticipated these estimates will be available to EPD in the first half of 2019. Georgia Power will provide a demonstration of financial assurance upon approval of the closure cost estimate by EPD.

19. LEGAL DESCRIPTION

The legal description representing the permit boundary for AP2-DAS Landfill was provided by a Georgia Registered Land Surveyor (RLS) and is included in the Permit Boundary and Legal Description section of this permit application.