

CLOSURE PLAN

PLANT BRANCH CCR LANDFILL

PUTNAM COUNTY, GEORGIA

FOR



**Georgia
Power**

OCTOBER 2022

REV. 0



Geosyntec
consultants



ENVIRONMENTAL PROTECTION DIVISION

Approved
Solid Waste Management Program

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LIST OF ACRONYMS

ACD	Air Curtain Destructor
CCR	Coal Combustion Residuals
CFR	Code of Federal Regulations
CQA	Construction Quality Assurance
GA EPD	Georgia Environmental Protection Division
GPC	Georgia Power Company
GSWCC	Georgia Soil and Water Conservation Commission
H:V	Horizontal : Vertical
HDPE	High Density Polyethylene
LCRS	Leachate Collection and Removal System
LLDPE	Linear-Low Density Polyethylene
No.	Number
NPDES	National Pollutant Discharge Elimination System
O&M	Operations and Maintenance
P.E.	Professional Engineer
USEPA	United States Environmental Protection Agency
WWTS	Wastewater Treatment System

1. INTRODUCTION

This Closure Plan was prepared in support of the design of a coal combustion residuals (CCR) landfill at Georgia Power Company's (GPC) Plant Branch (Site), located in Putnam County, Georgia. The Site formerly operated as a coal-fired power plant that commenced power generation in 1965, ceased generating electricity prior to April 2015, and was decommissioned in 2019. Over the course of power generation at the site, five ponds, identified as Ash Ponds A, B, C, D, and E, were utilized. Ash Pond A, the first pond constructed at the site, was taken out of service in the late 1960s and was closed in April 2016 by removal and relocation of its stored CCR to Ash Pond E. Ash Ponds B, C, D, and E are currently inactive and will also be closed by removal, specifically, by relocation of the CCR stored in these ponds to the proposed lined CCR landfill to be located on the Plant property.

This Closure Plan has been prepared for Georgia Power Company (GPC) pursuant to the United States Environmental Protection Agency (US EPA) CCR Rule in Title 40 of the Code of Federal Regulations (CFR) § 257 (40 CFR § 257) and the Georgia Environmental Protection Division (GA EPD) CCR Rule in Chapter 391-3-4-.10 of the Georgia Rules for Solid Waste Management, Coal Combustion Residuals.

2. GENERAL

GPC will close the CCR landfill in a manner that minimizes the need for further maintenance and the potential for post-closure releases of contaminants to groundwater or surface waters. The written closure plan presented subsequently in this document, and the Permit Drawings prepared to support permitting of the CCR landfill [Geosyntec, 2022a], present the closure design and provide guidance on the sequence of closure. These documents are supplemented by engineering analyses and calculations contained in the Engineering Report prepared to support the permitting of the landfill [Geosyntec, 2022b].

3. NOTIFICATION

In accordance with GA EPD CCR Rule 391-3-4-.10(7)(d) and 40 CFR § 257.102(g), GPC will submit a Notification of Intent to Close to the GA EPD Director no later than the date GPC initiates closure of the CCR landfill and will include the date of final waste receipt. Closure activities will commence within 30 days following final receipt of CCR and non-CCR waste streams at the CCR landfill.

4. WRITTEN CLOSURE PLAN

4.1 OVERVIEW

Pursuant to GA EPD CCR Rule 391-3-4-.10(7)(b) and (c), the newly constructed CCR landfill will be closed in accordance with 40 CFR § 257.102 and this Closure

Plan. This Closure Plan may be amended by GPC at any time. Moreover, as required by 40 CFR § 257.102(b)(3)(ii), this plan must be amended whenever: (i) there is a change in the operation of the CCR unit that would substantially affect the plan; or (ii) before or after closure activities have commenced, unanticipated events necessitate a revision of the plan. The timeframes for any amendment to the plan will be in accordance with those specified in 40 CFR § 257.102(b)(3)(iii).

The CCR landfill site consists of approximately 173 acres, with the landfill waste footprint covering approximately 115.2 acres (the remainder of the area is for the construction of perimeter berms and stormwater/contact water/leachate ponds) and containing ten individual landfill cells. The CCR landfill will be developed and closed in phases. A conceptual approach for the phasing is presented on the Phasing Plan, Drawing No. 19 of the Permit Drawings [Geosyntec, 2022a], and summarized in Section 4.2 of this Closure Plan. Closure will be performed in phases after a set of landfill cells have been filled to final grades. Material to be placed in the landfill cells will mainly consist of dewatered CCR from Ash Ponds B, C, D, and E, over-excavated foundation soils from the bottom of each pond after the CCR is removed, CCR-impacted debris and structures, and CCR water treatment filter cake materials. Note that, to the extent practical, organic materials will be segregated and processed through an organics management program including burning using an air curtain destructor (ACD), as described in the Organic Materials Management sections of the Closure Plans for Ash Ponds B, C, and D [Geosyntec, 2018a] and Closure Plan for Ash Pond E [Geosyntec, 2018b] submitted as part of the CCR permit application packages for closure of the referenced CCR units. CCR and associated materials from ash pond closure activities at other GPC facilities may also be placed in the Plant Branch CCR landfill, subject to the availability of disposal capacity within the permitted landfill footprint and GA EPD approval.

A final cover system will be installed over the filled CCR landfill cells. The final cover system will consist of either a soil-geosynthetic composite cover system or a ClosureTurf® (i.e., synthetic engineered turf) cover system. If a soil and geosynthetic cover system is used, the cover will be vegetated with native grass species and other suitable grasses to provide erosion protection, establish a diverse grassland habitat, and provide attractive aesthetics. If ClosureTurf® is used, a synthetic engineered turf material will be placed as the upper layer of the final cover system to provide erosion protection and an appearance similar to native vegetation. The final cover system is further described in Section 4.3.2 of this Closure Plan.

The final cover system will be graded to a general dome-shaped configuration to promote stormwater runoff, with a central ridgeline, a top deck that slopes at 5 percent towards 3 horizontal to 1 vertical (3H:1V) sideslopes (between drainage benches), that in turn slope to a perimeter channel. Both final cover system options would essentially eliminate infiltration of surface water into the closed CCR unit while promoting stormwater runoff to the stormwater management ponds that will be constructed beyond the perimeter of the CCR landfill footprint.

4.2 CONSTRUCTION AND CLOSURE PHASING

4.2.1 Overview

CCR landfill cell construction, placement of CCR, and final cover placement on the filled CCR landfill cells will generally occur in a phased manner. A conceptual phasing approach with four phases has been developed; the sequence of the conceptual phases and phase activities are summarized below. The phasing approach may be adjusted during the detailed design, upon approval by the Engineer of Record, and will be submitted to GA EPD for review, if applicable, with the requirement that design criteria related to stormwater and contact water management, described in the Stormwater and Contact Water Management Plan prepared to support the permitting of the CCR landfill [Geosyntec, 2022c], are met. Note that activities in any phase may be implemented in several sub-phases and not all at once. Significant modifications to the phasing approach, and associated stormwater and contact water management techniques, will require GA EPD approval.

4.2.2 Phase 1

Phase 1 activities consist of the construction of Cells 1, 2, 3, and 4 followed by CCR placement in Cells 1, 2, 3, and 4. In this phase, the North and Southwest Stormwater/Contact Water/Leachate Ponds and the portions of the perimeter dike, perimeter channels, and associated utility corridors that are required for operation of Cells 1 through 4 will be constructed. CCR placed during Phase 1 will include the CCR stored within Ash Pond D, to facilitate the future construction of Cells 7, 8, 9, and 10, which will encroach on the Ash Pond D footprint. Placed CCR will also include portions of the CCR stored within Ash Ponds B, C, and/or E based on the CCR removal schedules being developed for the ash ponds.

4.2.3 Phase 2

Phase 2 activities consist of construction of Cells 5 and 6, placement of CCR in Cells 3, 4, 5, and 6, and placement of final cover on Cells 1 and 2, and portions of Cells 3 and 4. CCR placed during Phase 2 will include portions of the CCR stored within Ash Ponds B, C, and/or E based on the CCR removal schedules for the ash ponds. Upon placement of final cover on Cells 1 and 2, and portions of Cells 3 and 4, the perimeter channel from the high point at Cell 1 to the Southwest Pond, and the stormwater pipes discharging to the Southwest Pond, will be transitioned from contact water management to stormwater management. Additionally, the Southwest Pond, subdivided into three chambers using divider dikes, will be transitioned to manage stormwater in one chamber (with liner removed) while the remaining chambers will continue to manage contact water and leachate (with liner in place). An underdrain pipe will also be installed within the former Ash Pond D footprint during Phase 2, upon acknowledgement of CCR removal from Ash Pond D by GA EPD; the groundwater conveyed by the underdrain pipe will be managed under the appropriate National Pollutant Discharge Elimination System (NPDES) permit.

4.2.4 Phase 3

Phase 3 activities consist of construction of Cells 7, 8, 9, and 10, placement of CCR in Cells 5, 6, 7, 8, 9, and 10, and placement of final cover on the remainder of Cells 3 and 4, and portions of Cells 5 and 6. During construction of Cells 7, 8, 9, and 10, the Southeast Stormwater/Contact Water Pond and the remainder of the perimeter dike, perimeter channels, and associated utility corridors will be constructed. Upon placement of final cover on the remainder of Cells 3 and 4 and portions of Cells 5 and 6, the perimeter channel from the high point at Cell 1 to the North Pond, and the stormwater pipes discharging to the North Pond, will be transitioned from contact water management to stormwater management. Additionally, the North Pond, subdivided into three chambers using divider dikes, will be transitioned to manage stormwater in one chamber (with liner removed) while the remaining chambers will continue to manage contact water and leachate (with liner in place).

4.2.5 Phase 4

Phase 4 activities consist of placement of final cover on the remainder of Cells 5 and 6, and Cells 7, 8, 9, and 10 and stabilizing the remainder of the Site. Upon placement of final cover on the uncovered areas of the landfill, the perimeter channels along the eastern half of the landfill (between the stormwater pipes discharging to the North and Southwest Ponds), the stormwater pipes discharging to the Southeast Pond, and the Southeast Pond itself, will be transitioned from contact water management to stormwater management. Additionally, the portion of the North and Southwest Ponds dedicated to contact water will be transitioned to stormwater management.

4.3 CLOSURE STEPS AND DESIGN FEATURES

4.3.1 Overview

40 CFR §257.102(b)(1)(iii) requires a description of the final cover system and the methods and procedures used to install the final cover for CCR units “leaving CCR in place”. Implementation of the CCR landfill closure will be completed in steps, consisting of the following general sequence of activities, and in accordance with the following subsections:

- The surface of the final lift of CCR and associated placed materials will be prepared in accordance with the final cover system configuration shown in the design documents and the material properties listed in the Construction Quality Assurance (CQA) Plan prepared to support the permitting of the Plant Branch CCR landfill [Geosyntec, 2022d].
- Closure will be accomplished by placing the final cover system over the prepared surface. The final cover system is further described in Section 4.3.2 of this Closure Plan.
 - For the soil and geosynthetic cover system, the top six inches of the final cover must be capable of supporting vegetation.
 - Soil used to construct the soil and geosynthetic cover system will most likely be obtained from on-site sources.

- Within two weeks of placement of vegetative soil layer of the cover system, the surface of the cover will be vegetated as described in Section 9 of this Closure Plan.
- For the alternate final cover system (ClosureTurf®), the system is composed of a geomembrane placed atop the prepared surface, overlain by an engineered synthetic turf and sand infill material. Therefore, vegetation will not be required.
- Stormwater management features above the final cover system (i.e., drainage benches, downchutes, and top deck diversion berms) will be constructed as described in Section 4.3.3 of this Closure Plan.
- Stormwater, contact water, and leachate management systems will be constructed, modified, and/or adjusted during CCR landfill construction and closure as described in Sections 4.2 and 4.3.4 of this Closure Plan.
- Inspections, operations and maintenance (O&M), and monitoring requirements described in the Post-Closure Plan prepared to support the permitting of the Plant Branch CCR landfill [Geosyntec, 2022e] will be implemented for a minimum post-closure period of 30 years.

4.3.2 Final Cover System

The final cover system has been designed and will be installed over the final CCR grades to minimize infiltration and erosion in accordance with the criteria of 40 CFR § 257.102(d)(3). Two alternative final cover system options are proposed for the landfill. The first option would consist of, from bottom to top, a 40-mil (minimum) thick textured high-density polyethylene (HDPE) or linear-low density polyethylene (LLDPE) geomembrane, a double-sided geocomposite drainage layer, an 18-inch thick protective soil layer, and a 6-inch thick vegetative soil layer. The second option would consist of ClosureTurf® [i.e., a 50-mil thick HDPE or LLDPE geomembrane (either Super Gripnet® or MicroDrain®), engineered turf adhered to a woven geotextile backing, and a minimum ½-inch thickness of sand infill.

The final cover system is designed to meet the following design standards of 40 CFR § 257.102(d) (incorporated by reference in GA EPD CCR Rule 391-3-4-.10(7)(b)):

- a. Control, minimize or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste and releases of CCR, leachate, or contaminated runoff to the ground or surface waters or to the atmosphere;
- b. Preclude the probability of future impoundment of water, sediment, or slurry;
- c. Include measures that provide for major slope stability to prevent the sloughing or movement of the final cover system during the closure and post-closure care periods;
- d. Minimize the need for further maintenance of the CCR unit; and
- e. Be completed in the shortest amount of time consistent with recognized and generally accepted good engineering practices.

A construction quality control and assurance program will be implemented during placement of the final cover system to provide verification that the final cover system is constructed in accordance with the project plans and specifications. Final cover system material property requirements and quality control and assurance testing methods and frequencies are provided in the CQA Plan [Geosyntec, 2022d]. Final cover system soil will most likely be secured from on-site borrow sources, stockpiles, or other GA EPD-approved borrow sources as necessary.

As previously described, final cover design grades range from 5 percent (minimum) to 3H:1V (maximum) except for stormwater drainage conveyance features on the final cover system (i.e., top deck diversion berms, drainage benches, downchutes, and perimeter channels) which will have slopes generally ranging from 1 to 3 percent, with the exception of the downchutes at 3H:1V (except at bench crossings).

4.3.3 Stormwater Management System

The stormwater management features presented on Drawing 20 of the Permit Drawings prepared to support the permitting of the Plant Branch CCR landfill [Geosyntec, 2022a] depict the system that will be constructed to manage stormwater runoff during both closure and the post-closure care period. Under the closure condition, stormwater runoff flows down the 5 percent top deck and 3H:1V side slopes of the final cover system

through conveyances periodically spaced along the final cover surface. Conveyances consist of top deck diversion berms and side-slope drainage benches that convey flow to downchutes. The downchutes discharge to channels located along the perimeter of the CCR landfill. The perimeter channels convey flow to pipes installed at three low points which discharge to one of the three stormwater ponds, located near the northern (North Stormwater Pond), southwestern (Southwest Stormwater Pond) and southeastern (Southeast Stormwater Pond) boundaries of the Project Site.

A diversion berm will be constructed around the eastern side of the Southeast Stormwater Pond to prevent non-contact run-on from entering the pond, conveying the flows eventually to Lake Sinclair.

The design criteria, narrative descriptions, and calculations for the stormwater management system during the closure and post-closure care periods are provided in the Final Cover Stormwater Management System Design, which is included in the Engineering Report prepared to support the permitting of the Plant Branch CCR Landfill [Geosyntec, 2022b].

4.3.4 Stormwater, Contact Water, and Leachate Management

Placement of material in the CCR landfill and construction of the final cover system will result in the generation of stormwater, contact water, and leachate. Throughout closure construction, these liquids will be managed in accordance with the Stormwater and Contact Water Management Plan [Geosyntec, 2022c] and the Operations Plan [Geosyntec, 2022f] prepared to support the permitting of the Plant Branch CCR landfill. The management of these liquids is summarized as follows:

- The management strategy for contact water is to convey runoff from exposed CCR surfaces via lined perimeter channels and stormwater pipes, and/or via interim channels, pipes, and sumps constructed within the waste limit that will drain by gravity or pumping, to dedicated lined contact water/leachate storage areas within the North, Southwest, or Southeast Ponds. The dedicated contact water/leachate storage areas will be separated from stormwater storage areas within the ponds by lined divider dikes. Contact

water/leachate collected in the ponds will be promptly conveyed by pumps and forcemains to the on-site wastewater treatment system (WWTS) or to a loading station for off-site disposal.

- The management strategy for stormwater, once the final cover system is installed on areas of the landfill that reached final grades, is to convey and store stormwater via stormwater management infrastructure (i.e., perimeter channels, pipes, and stormwater ponds). Stormwater management infrastructure will not be used for the conveyance of contact water unless Engineer-approved measures to contain contact water, such as liners, are installed, and the infrastructure is cleaned and/or liners are removed upon completion of contact water conveyance.
- If stormwater and contact water co-mingle, the entire volume of water will be considered contact water. Because contact water requires treatment, measures will be taken to minimize the amount of stormwater that co-mingles with contact water. Minimization techniques may include: construction of additional berms or channels situated upgradient of active CCR working areas or contact water features to divert stormwater away from and around the areas, perimeter dikes and intercell berms that will divide the lined landfill cells, and temporary rain flaps within the landfill cells.
- Perimeter channels, interim channels, stormwater pipes, and ponds with interim or permanent liners will be used for both contact water and stormwater management during landfill construction, operation, and closure. The transition from contact water to stormwater management will consist of removing the liner and/or cleaning the liner and pipes. At locations where separate portions of the perimeter channels are used for stormwater and contact water management, lined interim berms constructed across the channels will be used to segregate different types of flow.
- Stormwater does not require treatment by the WWTS and may be discharged directly to receiving water bodies after conveyance through appropriate stormwater management features and erosion and sediment controls in accordance with applicable regulations. Stormwater discharges associated with CCR landfill construction activities will be included for coverage under the applicable NPDES

construction stormwater discharge general permit, NPDES industrial stormwater discharge general permit, and/or the site's NPDES industrial wastewater discharge individual permit (NPDES Permit No. GA0026051).

- Leachate is water that percolates through the CCR waste mass and drains into the leachate collection and removal system (LCRS) granular drainage layer. Leachate flows by gravity through the LCRS to leachate collection sumps (i.e., low points) located in each cell at the perimeter of the landfill. Each sump will be equipped with two self-priming electric motor-driven pumps housed in riser pipes. The pumps will convey leachate to dual-contained leachate transmission system (LTS) pipes as shown on the Permit Drawings [Geosyntec, 2022a]. The pumps are designed specifically for horizontal service, and will operate in an alternating lead-lag mode when flows are low, but can operate together in parallel during high flows. The LTS pipes will direct leachate to dedicated lined leachate storage areas within the North and Southwest Ponds. From the ponds, leachate will be removed via centrifugal, self-priming pumps located on pump pads to dual-contained leachate forcemains (LFMs), which will then discharge the leachate to either an on-site WWTS or loading station for off-site disposal. Both the LTS pipes and LFMs are HDPE pipes, with manholes placed at periodic locations along the alignment for cleanout, air release, inspection, maintenance/access, or locating other valving or equipment. Leachate treated in the WWTS will be discharged through the Site's permitted NPDES Outfall No. 03 in accordance with the approved Georgia Power Plant Branch, NPDES Permit No. GA0026051, Ash Pond Dewatering Plan [GPC, 2021].
- LCRS monitoring and operation will commence in a given cell when CCR placement begins in that cell. LCRS monitoring and operation will continue throughout the active life of the cell. Monitoring will be continued beyond cell closure through the post-closure care period and the system will be operated to the extent that leachate generation occurs during this period. The leachate management system has been designed according to the criteria described in the Engineering Report [Geosyntec, 2022b]. Associated leachate management system calculations are also included in the Engineering Report.

4.3.5 Equipment Decontamination

Before allowing a piece of equipment that has been in contact with CCR during CCR landfill closure construction to be removed from the Site, the equipment will be appropriately cleaned. Wastewater generated during this activity will be managed as contact water. Cleaning and decontamination procedures will be conducted in accordance with the current version of the *Field Equipment Cleaning and Decontamination Operating Procedure* as issued by United States Environmental Protection Agency (USEPA) Laboratory Services and Applied Science Division [USEPA, 2020].

4.3.6 Inspections

Inspections will be conducted during landfill construction, CCR placement, and landfill closure in accordance with the Operations Plan [Geosyntec, 2022f]. Inspections will be conducted during the post-closure care period in accordance with the Post-Closure Plan [Geosyntec, 2022e].

4.3.7 Limited Access

The CCR landfill will be for exclusive use by GPC for CCR disposal and will be located entirely within the Plant Branch property boundary guarded by GPC security personnel. Only authorized personnel will be allowed on the facility property. Access to the CCR landfill will also be restricted with a security fence and locking gates during the post-closure period.

4.4 MAXIMUM INVENTORY OF CCR

As required in 40 CFR § 257.102(b)(1)(iv), the CCR landfill has been designed with a maximum waste storage capacity of 17,321,000 cubic yards [assuming use of the alternative ClosureTurf® cover system and a 3.75 foot thick liner system (1-ft fine sand filter layer, 0.75 ft gravel drainage layer, and 2-ft thick compacted clay liner or compacted soil layer)]. This volume is adequate to store the CCR and associated materials (described in Section 4.1) that will be removed from Ash Ponds B, C, D, and E. CCR and associated materials from ash pond closure activities at other GPC facilities may also be placed in the Plant Branch CCR landfill, subject to the availability of disposal capacity within the permitted landfill footprint and GA EPD approval.

4.5 LARGEST AREA REQUIRING FINAL COVER

As required in 40 CFR § 257.102(b)(1)(v), the entire CCR landfill waste limit will receive final cover, with final cover system extending slightly beyond the waste limit. Thus, the largest area ever requiring final cover under the proposed closure is just over 115.2 acres. The installation of the final cover will occur in three phases (i.e., end of Phases 2, 3, and 4), with the largest area of cover installation at the end of Phase 4, totaling approximately 53.1 acres.

4.6 SCHEDULE FOR COMPLETING CLOSURE ACTIVITIES

As required by 40 CFR § 257.102(b)(1)(vi), it is estimated that the activities necessary to satisfy the applicable regulatory closure criteria will occur over a duration of approximately 10-15 years. A list of closure activities/milestones and schedule with estimated approximate timeframes are provided below. The closure schedule and milestones are based on estimates of the approximate timeframes to implement each specific closure activity. Closure will be conducted in sequential steps consistent with the phases discussed in Section 4.2 of this Closure Plan, but it should be recognized that not all activities on the closure schedule will occur on a continuous basis throughout their scheduled durations.

- Install final cover system and stormwater management features on cells as capacity is reached – implemented in phases over the approximately 10 to 15-year period.
- Notify GA EPD of the intent to close the CCR landfill – within 30 days following final receipt of CCR and associated materials at the CCR landfill.
- Complete final cover system and stormwater management features installation and maintenance (e.g., remove accumulated sediments) on entire CCR landfill, within six months following final receipt of CCR and associated materials at the CCR landfill.
- Submit closure report to GA EPD, including actual final limits of CCR and legal description of CCR landfill permit boundary (described further in Sections 5 and 6 of this Closure Plan) – upon completion of closure activities, and within six months following final receipt of CCR and associated materials at the CCR landfill.

5. CERTIFICATION OF CLOSURE AND DEED NOTIFICATION

In accordance with GA EPD CCR Rule 391-3-4-.10(7)(e) and 40 CFR § 257.102(f)(3), upon completion of closure activities, a Professional Engineer (P.E.) registered in Georgia will prepare and GPC will submit a closure report to the GA EPD Director. The closure report will be completed on forms provided by GA EPD. Once the GA EPD Director concurs with the closure report, closure will be deemed complete and the site will begin the post-closure care period.

GPC will also submit to GA EPD confirmation that a notation on the property deed, inclusive of the CCR landfill permit boundary, has been recorded in accordance with GA EPD CCR Rule 391-3-4-.10(7)(f) and 40 CFR § 257.102(i), stating that the land has been used as a CCR unit and its use is restricted under post-closure care requirements described in the Post-Closure Plan [Geosyntec, 2022e]. Confirmation will be provided within 30 days of recording.

6. LEGAL DESCRIPTION

A survey drawing and legal description of the proposed permit boundary, prepared by a Registered Professional Surveyor, is provided on Drawing No. 3 in the Permit Drawings [Geosyntec, 2022a]. The as-designed final limit of CCR is defined on the Closure Drawings as the CCR landfill Waste Limit. Upon completion of closure, the actual final limit of CCR will be confirmed and a Registered Surveyor will provide a legal description of the CCR landfill permit boundary as part of closure report.

7. DIRECTIONAL INFORMATIONAL SIGNS

Signs will be posted at the entrance gate notifying users of the closed CCR landfill and a telephone number for emergencies will be printed on the sign.

8. REMOVAL OF CCR OR MODIFICATION TO THE CLOSURE DESIGN

There is a potential for CCR to be reclaimed from the CCR landfill during the closure period for beneficial re-use. If CCR is reclaimed during the landfill construction and/or closure period, the CCR landfill closure footprint may be revised to a smaller footprint, or soil fill may be utilized to replace the CCR volume removed and to achieve the original permit grades for the final cover system. Additional design measures will be implemented to address civil, geotechnical, surface water, groundwater, and environmental components of reclaiming CCR from the CCR landfill. If the consolidated footprint is reduced, or it is not feasible to utilize soil fill to achieve the original permit grades, the closure design will be revised to develop new closure grades. In either case, GPC will prepare a CCR Removal Plan and request written approval from GA EPD prior to conducting any such activity.

Additionally, should the CCR landfill close prior to reaching final permitted elevations or waste limit, GPC will revise the closure design to develop new closure grades, and will request written approval from GA EPD.

9. VEGETATIVE PLAN

The CCR landfill will be closed with either a soil-geosynthetic final cover system with a vegetative soil layer on the surface, or a synthetic engineered turf final cover system. Additionally, graded areas within the project limit of disturbance but outside of the final cover system will have a vegetated soil surface (with the exception of lined channels, gravel roads, etc.). To promote growth of vegetation, the vegetative soil layer of the final cover system and the soil ground surface of disturbed project areas will be seeded, limed, and fertilized within two weeks of the layer's installation. The types of vegetation to be seeded, the applicable planting dates, and the associated seed and fertilizer specifications, application rates, and application methods will comply with the Disturbed Area Stabilization (With Permanent Vegetation) details in the Manual for Erosion and Sediment Control in Georgia [GSWCC, 2016]. Soil samples will be submitted to the County Extension Agent for analysis and determination of proper soil conditioners, including lime. This analysis will become part of the operating record for the landfill.

Seedbed preparation, consisting of tillage (or pitting or trenching for steep slopes) and lime and fertilizer incorporation will occur prior to conventional seed planting methods. Although not required, seedbed preparation will be used, if judged beneficial, for hydraulic seed planting methods (in this case, lime and fertilizer would be incorporated into the slurry mix). Upon planting, mulching will be required for permanent vegetation applications.

During temporary lapses in construction activity, temporary stabilization measures will be installed on exposed areas within 14 days of disturbance and in accordance with the Disturbed Area Stabilization (With Mulching Only) or Disturbed Area Stabilization (With Temporary Seeding) details in the Manual for Erosion and Sediment Control in Georgia [GSWCC, 2016].

For the ClosureTurf® final cover system option, the system is composed of a geomembrane overlain by an engineered synthetic turf and sand infill material. Vegetation will not be required for areas final covered with ClosureTurf®.

10. GROUNDWATER MONITORING

Pursuant to the Rules of Solid Waste Management, Chapter 391-3-4-.10(6), groundwater monitoring, sampling, and corrective action (if applicable) will be conducted through the closure of the CCR landfill in accordance with the Groundwater Monitoring Plan prepared to support the permitting of the Plant Branch CCR Landfill [Geosyntec, 2022g].

11. SITE EQUIPMENT NEEDED

GPC or its contractors will make adequate equipment available to ensure that closure requirements are executed correctly and efficiently. Should said equipment not be available, backup equipment may be obtained from rental companies.

12. EROSION AND SEDIMENT CONTROL

Erosion and sediment control measures will be designed, permitted, installed, and maintained in accordance with the Manual for Erosion and Sediment Control in Georgia [GSWCC, 2016], the permit drawings, and the detailed design drawings prepared in accordance with the GA EPD CCR Rule. A phased Erosion, Sedimentation, and Pollution Control Plan will be prepared as part of the detailed design, depicting erosion and sediment control and stormwater and contact water management strategies during the construction, operation, and closure, of the CCR landfill.

On a periodic basis during closure, accumulated sediment will be removed as necessary from CCR landfill perimeter channels, stormwater channels (e.g., channels not constructed as part of the landfill perimeter dike), stormwater pipes, manholes, and stormwater ponds with associated inlet and outlet structures and appurtenances. The frequency of sediment removal will be based on the requirements and recommendations contained in the Manual for Erosion and Sediment Control in Georgia [GSWCC, 2016] and the Best Management Practices Operations & Maintenance Guidance Document, Appendix E of Volume 2 of the Georgia Stormwater Management Manual, 2016 Edition [AECOM, 2015].

13. COST OF CLOSURE AND FINANCIAL ASSURANCE

The closure cost estimate is provided in Table 1 at the end of this document. In compliance with applicable securities laws and regulations, GPC will provide unredacted cost estimate for closure to GA EPD under separate cover. The 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 GA EPD will be based on an area of 115.2 acres, in current year dollars, and adjusted annually for inflation.

14. RECORDKEEPING/NOTIFICATION/INTERNET REQUIREMENTS

GPC will comply with the requirements of GA EPD CCR Rule 391-3-4-.10(8), which references the recordkeeping requirements of 40 CFR § 257.105(i), the closure notification requirements specified in 40 CFR § 257.106(i), and the closure internet posting requirements in 40 CFR § 257.107(i).

15. REFERENCES

AECOM (2015). "Operations & Maintenance Guidance Document," Georgia Stormwater Management Manual, Volume 2, Appendix E. September 2015.

Georgia Power Company (2021). "Georgia Power Plant Branch, NPDES Permit No. GA0026051, Ash Pond Dewatering Plan."

Georgia Soil and Water Conservation Commission (GSWCC) (2016). "Manual for Erosion and Sediment Control in Georgia." 2016.

Geosyntec Consultants. (2018a). "Closure Plan for Ash Ponds B, C, and D, Plant Branch" Prepared for Georgia Power Company, November 2018.

Geosyntec Consultants. (2018b). "Closure Plan for Ash Pond E, Plant Branch" Prepared for Georgia Power Company, November 2018.

Geosyntec Consultants. (2022a). "Permit Drawings, Plant Branch CCR Landfill." Prepared for Georgia Power Company, October 2022.

Geosyntec Consultants. (2022b). "Engineering Report, Plant Branch CCR Landfill." Prepared for Georgia Power Company, May 2022.

Geosyntec Consultants. (2022c). "Stormwater and Contact Water Management Plan, Plant Branch CCR Landfill." Prepared for Georgia Power Company, October 2022.

Geosyntec Consultants. (2022d). "Construction Quality Assurance Plan, Plant Branch CCR Landfill." Prepared for Georgia Power Company, October 2022.

Geosyntec Consultants. (2022e). "Post-Closure Plan, Plant Branch CCR Landfill." Prepared for Georgia Power Company, October 2022.

Geosyntec Consultants. (2022f). "Operations Plan, Plant Branch CCR Landfill." Prepared for Georgia Power Company, October 2022.

Geosyntec Consultants. (2022g). "Groundwater Monitoring Plan, Plant Branch CCR Landfill." Prepared for Georgia Power Company, October 2022.

United States Environmental Protection Agency (USEPA). (2020). "Field Equipment Cleaning and Decontamination Operating Procedure." USEPA Laboratory Services and Applied Science Division. June 22, 2020.

Table 1. Branch Landfill Closure in Place Estimate

Item Description	Quantity	Unit	Unit Cost	Cost
Program Management				
Regulatory Compliance, Fees & Reporting				
Groundwater Sampling & Reporting, Compliance Evaluations ¹				
Landfill Closure Construction				
<u>Construction Management, Construction Support</u>				
Construction Management				
Bonds & Insurance				
Support Facilities				
Engineering and CQA Construction Support				
Mobilization/Site Preparation and Demobilization				
<u>Landfill Construction and Operation</u>				
CCR Excavation and Stacking				
Onsite/Offsite Borrow Area				
<u>Landfill Liner System</u>				
Landfill Liner System				
<u>Landfill Cover System</u>				
Topsoil Layer (Supply and Install) ²				
Cover Soil (Supply and Install) ²				
GeoComposite Drainage Net				
Geomembrane ⁶				
Seeding				
Erosion/Sediment Control BMPs				
Miscellaneous Piping and Appurtenances				
Maintenance ³				
Water Management ^{4,5}				
<u>Contractor's Overhead & Profit</u>				
Quoted Overhead & Profit				
			Subtotal	
			Contingency	
			Total Closure Cost Estimate	

Notes:

1. Groundwater monitoring includes costs for conducting routine monitoring of App III & IV during the construction period.
2. Includes fill material from on-site and off-site sources, borrow evaluation, procurement, transportation, and placement.
3. Maintenance includes costs associated with final cover system, access roads, and sediment ponds.
4. Includes costs related to down drains, leachate transport, Stormwater Controls, treatment, etc.
5. Leachate treatment is included within the Water Management total.
6. The difference between the Geomembrane quantity and the Geocomposite quantity is due to some ditches and ponds being lined with Geomembrane.