

COAL COMBUSTION RESIDUALS (CCR) CLOSURE PLAN

CHOCTAW GENERATION LIMITED PARTNERSHIP, L.L.L.P.
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CCR Closure Plan

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1.0 INTRODUCTION AND CERTIFICATION

1.1 SITE DESCRIPTION AND REGULATORY APPLICABILITY

The Choctaw Generation Limited Partnership, L.L.P. – Red Hills Operations (Red Hills) is located near the City of Ackerman in Choctaw County, Mississippi. Red Hills is in north central Mississippi on a 170-acre site. Red Hills is bounded on the south by Pensacola Road, and is about ½ mile west of US Highway 9. Figure 1 shows the location of the site. Red Hills operates a single unit electrical generation facility designed to generate electricity for dispatch to the Tennessee Valley Authority (TVA) electrical system. The primary boiler fuel is lignite coal. As a result of combusting lignite coal, ash is created and must be disposed or re-purposed. Red Hills owns and operates an existing Ash Management Unit (AMU) for the placement and disposal of ash. The AMU is considered a Coal Combustion Residuals (CCR) Unit in accordance with 40 CFR Part 257, Subpart D. The AMU is located in the northeastern portion of property and consists of three (3) cells encompassing a total of approximately 90 acres of the Red Hills site. Figure 2 shows an aerial view of the site, and Figure 3 shows a diagram of the AMU.

The ash generated at the site has been approved by the Mississippi Department of Environmental Quality (MDEQ) for beneficial use as a road construction stabilizer. The approval of the ash for beneficial use has reduced the amount of ash stored in the AMU annually and will extend the life of the AMU. The majority of the ash generated is transported to the adjacent North American Coal – Red Hills Mine to be used for road stabilization and construction.

This site is required to comply with the Coal Combustion Residue Rule (40 CFR Part 257, Subpart D). As an existing CCR unit, Red Hills must be in compliance with the requirements to prepare a written Closure Plan by October 17, 2016. The Closure Plan must contain the following information regarding closure:

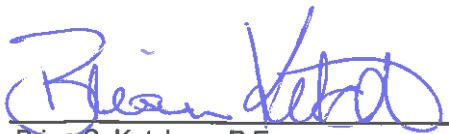
- ☐ Closure narrative;
- ☐ Description of final cover system;
- ☐ Methods and procedures to be used to install the final cover;
- ☐ Maximum inventory of CCR ever on-site;
- ☐ An estimate of the largest area of the CCR unit ever requiring final cover; and
- ☐ A schedule for completing all activities necessary to satisfy the closure criteria in §257.102.

In addition to the 40 CFR Part 257, Subpart D closure requirements, §257.102, the site is also regulated by the MDEQ Solid Waste Regulations and operates under Solid Waste Permit No. SW0100040462. The closure requirements addressed within this plan are consistent with or more stringent than the closure requirements approved by MDEQ for the Solid Waste Permit and supporting application. The purpose of the Closure Plan is to ensure a final closure system that will be effective in encapsulating the underlying

CCR landfill unit to avoid potential releases of CCR.

1.2 PROFESSIONAL ENGINEER CERTIFICATION

After a review of the Closure Plan, it is believed that the plan has been designed and developed to meet the requirements of 40 CFR 257, Subpart D (§257.102). I hereby certify that I am familiar with the provisions of the CCR regulatory requirements, and I also attest that I have reviewed the prepared Closure Plan. The plan is consistent with recognized and generally accepted good engineering practices, and the contents of the plan, if implemented, will be effective in the encapsulation of the underlying CCR landfill unit to avoid potential releases of CCR.



Brian S. Ketchum, P.E.
Senior Engineer
Environmental Compliance & Safety, Inc.

10/14/16
Date

State of Mississippi
Registration No. 13372
(Seal) BSK

2.0 SITE CLOSURE ACTIVITIES

2.1 FINAL CLOSURE SYSTEM DESIGN

Closure activities at the CCR Unit are not anticipated to begin for many years. Due to the ash beneficial use approval, the life of the landfill has been significantly extended and may be active for greater than 30 years. Upon site closure, the closure activities will proceed in accordance with all requisite notifications and consistent with the closure schedule discussed in Section 2.2 of this Plan. Closure of the CCR Unit will be achieved by leaving the unit in-place and constructing a CCR Final Rule compliant cover system. Key steps of the closure process include, but are not limited to, collection and interpretation of geotechnical data as necessary to support design activities; development of conceptual and final designs; disabling operational infrastructure; installation of storm water diversion and outlet structures; preparation of a suitable subgrade for the final cover system; construction of final cover system; and seeding, mulching, and maintenance and repair until the vegetative layer of the cover system is established. Subsequent completion of all construction and verification activities, notification and engineering certification of closure will be performed. The design of the final closure system must meet the performance standards listed below in accordance with 257.102(d)(1):

- ☐ Control, minimize or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste and releases of CCR, leachate, or contaminated run-off to the ground or surface waters or to the atmosphere;
- ☐ Preclude the probability of future impoundment of water, sediment, or slurry;
- ☐ 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 period;
- ☐ Minimize the need for further maintenance of the CCR Unit; and
- ☐ Be completed in the shortest amount of time consistent with recognized and generally accepted good engineering practices.

In accordance with §257.102(d)(3), the final cover system will be designed with a minimum 18-inch infiltration layer consisting of compacted soils, and a 6-inch erosion layer to support cover vegetation. The permeability of the infiltration layer must be less than or equal to the permeability of any bottom liner system or natural subsoils present, or a permeability no greater than 1×10^{-5} cm/sec, whichever is less. Prior to closure, a Construction Quality Assurance Plan (CQAP) will be developed and submitted with the Notice of Intent to close the facility. The CQAP will address the steps required and planned to achieve closure, which will include liner placement methods and testing. The CQAP will detail methods and testing for the clay borrow source (e.g., grain size, moisture content, Atterberg Limits, permeability, etc.), cover placement, and testing of the cover lining during construction.

The cover system will minimize the exposure of CCR to the environment. With the exception of drainage channels and gravel access roads, the closed CCR Unit will be covered with a vegetative soil layer to minimize runoff volume released from the site. Storm water runoff from the closed CCR Unit will not come in contact with or contain CCR material. Components of the final closure system are described below:

2.1.1 Infiltration Layer

The infiltration layer will serve as a barrier to prevent moisture from penetrating into the CCR. The infiltration layer will consist of 18 inches of compacted soil with a maximum permeability less than or equal to the bottom liner materials. Bottom liner materials were designed with a maximum hydraulic conductivity of 1×10^{-7} cm/s. Therefore, the infiltration layer for the Red Hills CCR unit will be constructed to a permeability less than or equal to 1×10^{-7} cm/s. The infiltration layer will be placed in lifts and compacted as necessary to produce the desired permeability. Horizontal lifts will not exceed six inches in compacted thickness.

2.1.2 Erosion Layer

The erosion control layer will consist of a minimum of six (6) inches of topsoil capable of sustaining vegetative cover in accordance with §257.102. The soil will be placed in a single six-inch lift with no compaction beyond that which occurs during placement. The topsoil will be seeded with an appropriate indigenous grass or legume. Seeding will be scheduled during the appropriate growing season for the selected vegetative cover, and soil supplements will be applied to the erosion layer, if necessary, in preparation for the planting of perennial grasses. Compost and/or fertilizer may be used to restore the erosion layer when necessary.

This erosion layer serves several purposes including:

- ❑ To impede erosion while facilitating storm water runoff;
- ❑ To support vegetation which will not extend into the infiltration layer;
- ❑ To reduce long-term maintenance by supporting diverse species of grasses, which reproduce voluntarily, and are low maintenance; and
- ❑ To encourage evapo-transpiration as a means of controlling liquid migration to the infiltration layer.

Appropriate vegetative cover will be established and maintained as soon as practical after final grading. Permanent seeding will be used to provide a long-term, low maintenance vegetative cover. All permanent seed shall be certified seed that meets published US Department of Agriculture, Federal Seed Act standards and bears an official "Certified Seed" label.

2.1.3 Final Cover Erosion Control Features

The final cover will include slopes, grades, and diversion swales designed to facilitate surface water run-off in such a way that minimizes both erosion of the final cover and infiltration into the CCR unit. The final surface of this cover system will be graded in a manner that:

- ❑ Minimizes precipitation run-on from adjacent areas onto the disposal facility;
- ❑ Minimizes erosion of cover material (e.g., no slopes steeper than 4:1);
- ❑ Minimizes the pooling of precipitation that falls directly on the disposal facility (e.g., a minimum slope of 4 percent on all surfaces);
- ❑ Provides a surface drainage system which is consistent with the surrounding area and in no way adversely affects proper drainage from adjacent lands.

Side slope diversion swales will be constructed on the final cap of each cell to collect and divert run-off to the AMU Basin by covering temporary swales with the cap. Slopes will be of optimum grade to minimize erosion while preventing discharge from pooling. Vegetation will serve to minimize erosion of the final cover while dissipating energy from run-off.

2.1.4 Storm Water/Drainage System

Storm water controls, run-on and run-off, for the unit are provided to minimize the storm water contact with the CCR unit. Storm water run-on collected by the diversion dike will be routed around the areas where ash has been placed to a discharge point down-gradient of the CCR unit. Run-off contacting the CCR unit will be managed and routed to the Ash Management Unit Basin (AMU Basin). Run-off collected in the basin will be managed through the facility's NPDES permit. The run-on and run-off features of the facility are further detailed in the CCR Run-On and Run-Off Control System Plan, which is maintained in the site operating record.

2.1.5 Leachate Collection System

Red Hills anticipates that little or no leachate will accumulate in the leachate collection system after closure. Generation of leachate will be monitored during routine post-closure inspection. Any leachate generated will ultimately be managed in the AMU Basin.

2.2 SCHEDULE OF ACTIVITIES

Within 30 days after the last receipt of CCR for disposal, the Closure Plan must be implemented. Closure activities will be completed in accordance with the closure plan within six (6) months after initial closure date, unless an approved extension has been received from MDEQ in accordance with §257.102(f)(2). The schedule for completing all activities necessary to satisfy the closure criteria in §257.102(f) includes the following anticipated key activities and milestones, along with estimated timeframes to complete each step.

Closure Activities	Estimated Schedule
Notification of intent for closure.	No later than date of initiating closure
Hire a consultant or design engineer, identify final closure design features and final cover system materials, survey current conditions of CCR landfill, and develop bid documents (e.g., CQAP).	4-5 months (prior to initiating closure)
Acquire source(s) for cover materials.	2-3 months (prior to initiating closure)
Bidding project and selecting construction contractor.	3 months (prior to initiating closure)
Re-survey after last receipt of CCR.	1-2 weeks
Adjust design if necessary.	1-2 weeks
Commence closure.	No later than 30 days after the date of final receipt of CCR
Establish temporary erosion controls.	Less than 1 week
Reshaping CCR side slopes and top surface, where necessary, to meet permitted grades and address any irregularities.	1-2 months
Install the final cover infiltration layer.	2-3 months
Install the erosion layer.	1 month
Construct erosion control features.	1 month
Complete final vegetation (seeding, fertilizer, and mulching).	Less than 1 month
Complete closure.	Within 6 months of commencing closure activities
Notification of completion of closure.	Within 30 days of completion
Deed notation.	Within 90 days after completion of final cover
Notification that deed notation has been recorded.	Within 30 days of recording a notation on the deed

Closure activities at the CCR Unit are not anticipated to begin for many years. Due to the ash beneficial use approval, the life of the landfill has been significantly extended and may be active for greater than 30 years. Upon site closure, the closure activities will proceed in accordance with all requisite notifications and consistent with the closure schedule above.

2.3 INITIATION OF CLOSURE ACTIVITIES

Prior to closure, Red Hills will issue a Notice of Intent to close the facility and place it in the operating record. The Notice of Intent must include the certification by a qualified professional engineer for the design of the final cover system as required by §257.102(d)(3)(iii). Along with the Notice of Intent, Red Hills will submit the following to the Mississippi Department of Environmental Quality (MDEQ): contours, drainage, final cover depth, and material requirements. Closure activities will begin no later than 30 days after the known final receipt of ash. Closure of the CCR unit has commenced if the owner or operator has ceased placing waste and completes any of the following actions or activities:

- ☐ Taken any steps necessary to implement the Closure Plan;
- ☐ Submitted a completed application for any required agency permit or permit modification; or
- ☐ Taken any steps necessary to comply with any state or other agency standards that are a prerequisite, or are otherwise applicable, to initiating or completing the closure of a CCR unit.

Upon initiation of closure, permanent signs will be posted at all access points to the facility. These signs will be located, and be of sufficient size, to be readily visible and readable. After installation, the signs will be inspected periodically throughout the post-closure period and will be repaired or replaced as necessary.

2.4 COMPLETION OF CLOSURE ACTIVITIES

Completion of closure must be achieved within six (6) months of commencing closure activities in accordance with §257.102(f). Within 30 days of completion of the closure of the CCR unit, a Notification of Closure must be placed in the operating record. As required in §257.102(f)(3), the notification must include certification from a qualified professional engineer verifying that closure has been completed in accordance with this Plan. Upon completion of closure of the CCR unit, the facility will conduct post-closure related activities as specified in the facility's Post-Closure Plan, which has been developed in accordance with §257.104.

2.5 DEED NOTATION

In accordance with the Mississippi Nonhazardous Waste Management Regulations (11 Miss. Admin. Code Pt. 4, R. 1.4.E.(2)(g)), within ninety (90) days after completion of the final cover, Red Hills will submit to the Office of the Chancery Clerk of Choctaw County a survey plat for recording into the land deed and permanent land records. A certified copy of the survey plat will be obtained from the Chancery Clerk's Office of Choctaw County and will be filed with the MDEQ. The information on the plat will include:

- ☐ Name(s) of the property owner(s) on which the AMU is located;
- ☐ A statement that the land has been used as an AMU

- ❑ The year that ash management began and ended; and
- ❑ A statement that the use of the land is restricted during the post-closure period.

Within 30 days of recording a notation on the deed to the property, Red Hills must prepare a notification stating that the notation has been recorded. The notification has been completed when it has been placed in the facility's operating record.

2.6 FUTURE USE

Currently, there are no specific plans to use the closed AMU.

3.0 ESTIMATED MAXIMUM INVENTORY OF CCR

The CCR unit is design to accommodate only ash generated from the lignite coal combustion process, fly ash and bed ash. The final design contours provide for a maximum inventory of CCR of approximately 8,926,984 cubic yards of ash at its greatest capacity.

4.0 ESTIMATED MAXIMUM AREA OF COVER

The CCR unit consists of three (3) cells which, if completely utilized, will bring the CCR unit to a final crowned configuration. The cells will be filled to an interim grade of approximately 580 feet mean sea level (msl). When the Cells are filled to an elevation of approximately 580 msl, then additional fill will be added to the entire footprint of all cells to bring final grades to approximately 640 msl, which is the CCR unit closure final grades. It is estimated that the largest portion of the CCR unit requiring final cover will be approximately 90 acres.

5.0 TRAINING

Personnel responsible for conducting closure activities, maintenance, inspections, monitoring, and notifications will be competent and qualified individuals trained to perform their assigned tasks. Employee and contractor experience and training will be assured prior to performing closure tasks.

6.0 RECORDKEEPING AND NOTIFICATIONS

6.1 RECORDKEEPING

The Closure Plan must comply with the recordkeeping, notification, and website requirements described in §257.105(i), §257.106(i), and §257.107(i), respectively. The site must maintain the Plan, Plan Amendments, closure design documents, Notice of Intent, and the Notification of Closure in the site operating record. The CQAP will also be preserved in the records once developed.

In addition to the records and notifications required in this Plan, the Owner/Operator of the CCR Unit is required to **provide notifications to the MDEQ**. The site must maintain the most current Closure Plan on their publicly accessible internet site.

6.2 AMENDMENT OF THE PLAN

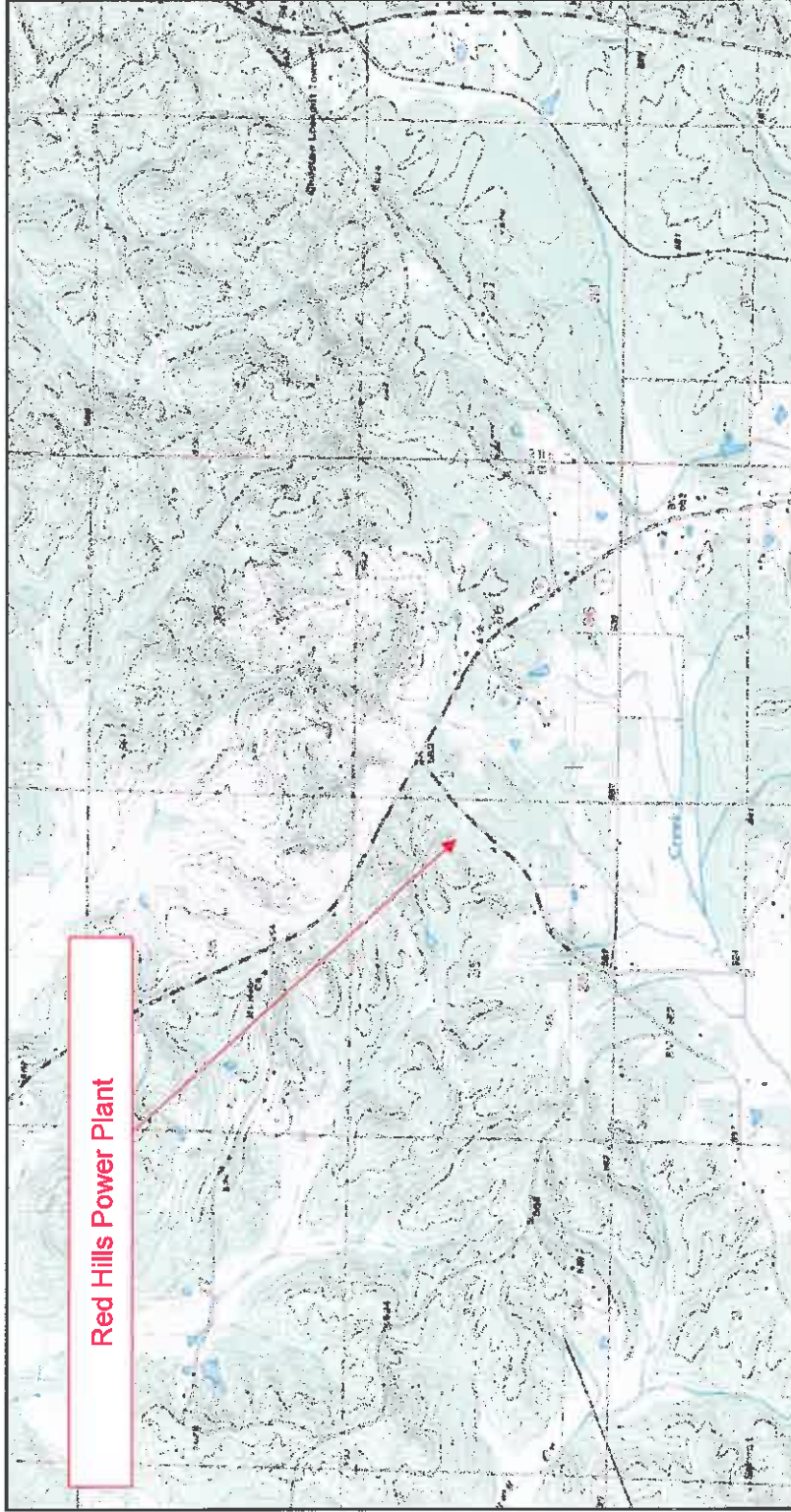
The Plan can be amended at any time; however, in accordance with §257.102(b)(3), this Plan will be amended if there is a change in the operation of the CCR unit that would substantially affect the written closure plan in effect or if after closure activities have commenced, unanticipated events necessitate a revision of the written closure plan. The Owner/Operator must amend the Plan at least sixty (60) days prior to a planned change in the operation for the CCR Unit, or no later than sixty (60) after an unanticipated event requires a revision to the Plan.

6.3 NOTIFICATIONS

The closure process requires a series of notifications to be completed prior to, and subsequent to closure activities. Prior to closure of a CCR Unit, a Notice of Intent to close the CCR unit must be prepared. The CQAP will also be prepared prior to closure and included with the Notice of Intent. The Notice of Intent must include the certification by a qualified professional engineer that the final cover system design meets the standards specified in §257.102(d)(3). Within 30 days of completion of closure of the CCR unit, Red Hills must prepare a Notification of Closure of a CCR unit. The Notification of Closure must include the certification by a qualified professional engineer verifying that closure has been completed in accordance with the closure plan. All notifications are considered complete when placed in the site operating record.

FIGURES

FIGURE 1
SITE LOCATION MAP



Red Hills Power Plant



Legend:

Source:
Digital-Topo-maps.com

Drawn By: JTB Checked By: BSK

Date: 9/29/2016 Scale: 1:24,000

Project No.: Drawing No: N/A

Red Hills Power Plant
2391 Pensacola Road
Ackerman, Mississippi




P.O. Box 356
Sherman, Mississippi 38869
(662) 840-5945

Figure 1: Site Location Map

FIGURE 2
AERIAL SITE MAP



<div></div> <div>Legend:</div> <div>Source: Google Earth (2016)</div>	<div>Drawn By: JTB</div> <div>Checked By: BSK</div>	
	<div>Date: 9/29/2016</div> <div>Scale: 1:24,000</div>	
	<div>Project No.:</div>	<div>Drawing No: N/A</div>
	<div>Red Hills Power Plant 2391 Pensacola Road Ackerman, Mississippi</div>	


<div></div> <div>ENVIRONMENTAL COMPLIANCE & SAFETY, INC.</div>	<div>P.O. Box 356 Sherman, Mississippi 38869 (662) 840-5945</div>
<div>Figure 2: Aerial Site Map</div>	

FIGURE 3
FACILITY DIAGRAM

