



Green CCR Landfill

Disposal of Coal Combustion Residuals (CCR) from Electric Utilities Final Rule CCR Landfill 2021 Annual Inspection Report

January 7, 2022

Prepared By:



Project ID: 21-0215

**Big Rivers Electric Corporation
Disposal of Coal Combustion Residuals (CCR) from Electric Utilities Final Rule
CCR Landfill 2021 Annual Inspection Report**

CCR Landfill Information

Name: Green CCR Landfill
Operator: Sebree Generating Station
Address: 9000 Highway 2096
Robards, KY 42452

Qualified Professional Engineer

Name: Justin S. Lamb
Company: Associated Engineers, Inc.
Kentucky P.E. Number: 32660

Regulatory Applicability

Per 40 CFR §257.84(b), annual inspections by a qualified professional engineer must ensure that the design, construction, operation, and maintenance of the CCR landfill is consistent with recognized and generally accepted good engineering standards.

Annual inspections of any CCR landfill must include, at a minimum: (1) a review of available information regarding the status and condition of the CCR unit, including, but not limited to, files available in the operating record (e.g., the results of inspections by a qualified person, and results of previous annual inspections); and (2) a visual inspection of the CCR unit to identify signs of distress or malfunction of the CCR unit.

Additionally, following each annual inspection, the qualified professional engineer must prepare an inspection report which documents the following: (1) any changes in geometry of the structure since the previous annual inspection, (2) the approximate volume of CCR at the time of the inspection, (3) 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 (4) any other change(s) which may have affected the stability or operation of the CCR unit since the previous annual inspection.

Inspection Description

This is the seventh annual inspection report for the Green CCR Landfill pursuant to the Disposal of Coal Combustion Residuals (CCR) from Electric Utilities Final Rule which

became effective April 17, 2015. The inspection was conducted on November 17th, 2021 by Justin S. Lamb P.E. and Brandon Watts of Associated Engineers, Inc. of Madisonville, Kentucky. Weekly (7-day) inspections conducted by Big Rivers Electric Corporation are kept in the facility operating record.

The inspection consisted of a visual assessment of the landfill and associated drainage control features; and began on the west side of the landfill adjacent to the vertical expansion combination wall (expansion wall). The evidence of recent subsurface drainage improvement activities along the toe of the wall were observed. This area lacked vegetative cover due to the recent construction activities. The drainage ditch adjacent to the west access road that parallels the expansion wall and reports to Pond 012 at the south end of the landfill, collects seepage from the base of the expansion wall. Since the prior inspection BREC has undertaken a substantial maintenance project to collect and divert the seepage from the landfill along the expansion wall underground. The water is then diverted to pond 012 via the subsurface drainage system. The area adjacent to the expansion wall has experienced substantial improvements in both the quantity and observable visual effects of seepage from the wall area. That being said, the presence of seepage along the toe of the wall is present. Areas, particularly at the southwest extent of the wall, are soft underfoot with periodic small sections of standing water with characteristics indicating contact with disposed material at the time of the inspection. It should be noted that maintenance activities are actively under way to improve the collection of seepage in this area as well as its routing to Pond 012 and that all seepage observed at the surface appears to be routed to Pond 012. The inspection proceeded along the south side of Pond 012 which was in an active construction state which includes the expansion of the physical footprint and storage capacity. It should be noted that sparse vegetation existed throughout Pond 012 due to active construction activities.

The inspection proceeded to the inactive east side of the landfill along the access road adjacent to the embankment toe. Proceeding north, standing water was observed in a ditch along the embankment toe, and seepage of discolored water was visible. Tall stands of dormant invasive vegetation were located along and within the ditch and wet areas. Areas of active seepage were observed at several locations along the embankment toe and flowing water was observed in the ditch at these locations. Additionally, along the lower bench at approximately the midpoint a small surficial slope failure of the cover material due to mower activity was noted. Active maintenance activities were observed which included cleaning and improvements to the ditch. The inspection of the lower slope continued to the north side of the inactive landfill where an area of seepage is located centrally along the toe of the north slope and drains east in a ditch to Pond 014.

After the inspection of the lower slope and toe the inspection proceeded to the first bench of the landfill on the west side which is comprised by the top of Poz-O-Tec fill placed against the expansion wall. The inspection then proceeded along the south, east, and north sides continuing bench by bench to the top of the landfill. The CCR fill material was firm and had

been compacted in all permeant areas of placement. There were areas in particular along the northwest side of the first bench in the active placement area where Poz-O-Tec had been placed in over steepened piles due to road grading and bench construction. These piles pose no significant threat to the overall structural integrity of the landfill. As inspection activities proceeded upward areas of minor to moderate erosion were noted. Particularly: The southeast inlet on the 3rd bench exhibited moderate erosion around its perimeter. The southwest inlet along the 3rd bench exhibited moderate erosion around its perimeter. The west ditch on the 2nd bench exhibited minor erosion and had placed small quantities of CCR material atop the temporary cover. Lastly, the top bench exhibited minor to moderate erosion at the south east corner.

Inspection Report Specifications

(i) CCR Landfill Geometry

The Green CCR Landfill is used for the placement of coal combustion residual material; currently fly ash, bottom ash and related material. The landfill is raised above adjacent ground to a maximum elevation of approximately 608 feet above mean sea level. The original ground surface within the landfill footprint was irregular and the predominant features were small stream valleys draining towards the Green River which is located just east of the landfill; and towards Groves Creek which is located just south of the landfill.

Changes to the landfill geometry since the previous (2020) annual inspection include continued placement of CCR material behind the constructed vertical expansion wall on the west exterior slope; and the placement of additional CCR and cover material on the landfill.

(ii) CCR Landfill Volume

The total volume of CCR material contained in the Green CCR Landfill was estimated to be 23.2 million cubic yards. This volume was calculated from available baseline topography compared to October 2021 flight derived topographic contours.

(iii) CCR Landfill Structural, Operational, and Safety Items

No deficiencies or disrupting conditions that would require immediate measures to remedy were identified in the inspection. The inspection findings consisted of maintenance items that were not observed to be signs or potential signs of significant structural weakness.

(iv) CCR Landfill Changes

There have been no changes to the Green CCR Landfill since the previous 2020 annual inspection that have the potential to affect the stability or operation of the landfill. Changes include placement of additional CCR and cover material as well as the improvement of the seepage collection system and Pond 012



Flight Date: September 17, 2021



BIG RIVERS ELECTRIC CORPORATION

Green CCR Landfill
2021 Annual Inspection Aerial Photo

Project Number:	21-0170
Date:	01/05/2022
Scale:	1" = 500'
Drawn By:	A.E.I.

2740 North Main St. • Madisonville, KY 42431
Phone: (270) 821-7732 • Fax: (270) 821-7789
www.associatedengineers.com

BREC Final Rule CCR Landfill 2021 Annual Inspection Checklist

Operator: Sebree Generating Station CCR Landfill: Green Date: November 17, 2021					Weather: Overcast Temperature (Degrees F): 58 (high) Inspector/Qualified Person: Justin S. Lamb P.E., Brandon Watts				
ITEM		STATUS			OBSERVATIONS				
		YES	NO	N/A					
1	CONDITION OF INACTIVE AREA								
	Access road deterioration (potholes, rutting, etc.)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
	Any erosion	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Some surficial erosion/rills in cover material				
	Longitudinal cracks	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>					
	Transverse cracks	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>					
	Visual depressions	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Some low areas in bench flowlines and longitudinal tracking from tractor/mower tires				
	Visual settlement	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>					
	Bulging or slumping	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>					
	Any drainage features obstructed or damaged	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Runoff ditches are eroded/contain sediment in areas				
	Are drainage features flowing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
	Is seepage present	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Some seepage present on west side at base of expansion wall and on east side toe and lower slope				
	Is seepage or discharge carrying sediment	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>					
	Adequate vegetative cover	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Isolated bare areas and invasive species monocultures				
	Are trees growing on the slope	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>					
	Are there any animal burrows	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sporadic small to large animal burrows; primarily rodent to larger mammal				
	Any stone deterioration	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>					
	Adequate riprap/slope protection	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>					
	Debris or trash present	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>					
	Is there exposed CCR material	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Isolated areas				
2	CONDITION OF ACTIVE AREA								
	Access road deterioration (potholes, rutting, etc.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>					
	Any erosion	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Minor to moderate erosion on active disposal areas and haul roads				
	Any cracks	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>					
	Any slides	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>					
	Visual depressions	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>					

		STATUS			OBSERVATIONS
		YES	NO	N/A	
	Visual settlement	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	Bulging or slumping	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	Any drainage features obstructed or damaged	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	Is seepage present	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Along base of wall construction and toe of east slope
	Is seepage or discharge carrying sediment	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	Debris or trash present	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3	LINER AND LEACHATE COLLECTION SYSTEM				
	Are liners intact and being installed correctly	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
	Is the leachate collection operating correctly	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
	Is the leachate collection pond/storage functioning correctly	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
	Is there any slope/bank erosion on pond	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
	Are there any animal burrows on pond	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
	Is the spillway functioning and discharging correctly	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4	RUN-ON/RUNOFF-CONTROLS				
	Are run-on/runoff controls in place	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Are run-on/runoff controls functioning	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Are run-on/runoff controls effective	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Are run-on runoff controls being maintained	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Signs of seepage or wetness	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Sediment transport or deposition	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
DEFICIENCIES AND MAINTENANCE ITEMS					
<p>No deficiencies or disrupting conditions that would require immediate measures to remedy were identified in the inspection. The inspection findings consisted of maintenance items that were not observed to be signs or potential signs of significant structural weakness.</p>					

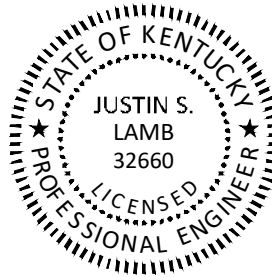
**Professional Engineer Certification [Per 40 CFR §257.84(b)]
Green CCR Landfill
Annual Inspections by a Qualified Professional Engineer**

I hereby certify that myself or an agent under my review has prepared this Annual Inspection Report (Report), and being familiar with the provisions of the final rule to regulate the disposal of coal combustion residuals (CCR) as solid waste under subtitle D of the Resource Conservation and Recovery Act (RCRA), attest that this Report has been prepared in accordance with good engineering practices and meets the intent of 40 CFR Part 257.84(b). To the best of my knowledge and belief, the information contained in this Report is true, complete, and accurate.



Justin S. Lamb P.E.

State of Kentucky License No. 32660



Date: January 7, 2022