AECOM

NRG BRANDYWINE ASH STORAGE SITE
BRANDYWINE, MARYLAND
2017 ANNUAL CCR INSPECTION REPORT

To: Walter Johnson, NRG MD Ash Management LLC

From: Jeffrey Hutchins, P.E., AECOM

Date: January 3, 2018

RE: Annual Coal Combustion Residuals (CCR) Inspection Report
Brandywine Ash Storage Site Operating Cell Phase 2

1.0 Introduction

As of October 19, 2015, the Brandywine Ash Storage Site has been regulated by the Code of Federal Regulations (CFR) under 40 CFR §257 Subpart D – Standards for Disposal of Coal Combustion Residuals (CCR) in Landfills and Surface Impoundments. Section §257. 84 of this regulation requires operators of existing CCR units to conduct an annual inspection by a qualified professional engineer to ensure the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering practices.

The initial Annual CCR Inspection Report for the Brandywine Phase 2 site was completed and placed in the Brandywine Operating Record on January 18, 2016, as required by Section §257.84.b(3). The regulations require that subsequent to completion of the initial Annual CCR Inspection Report, the owner/operator conduct inspections on an annual basis, with the completion date of the Annual Inspection Report being based on the completion date of the previous Annual Inspection Report.

The annual inspection for the Phase 2 operational area for the Brandywine Ash Site was conducted on December 13, 2017 and will be placed in the Brandywine operating record by January 18, 2018.

2.0 Site Background

The Brandywine Ash Storage Site is located at the intersection of North Keys Road and Gibbons Church Road in the town of Brandywine in Prince George's County, Maryland. The facility receives and stores CCRs produced at NRG's Morgantown and Chalk Point Generating Stations. The Brandywine facility was initially constructed in 1971 and has received ash in four cells since then, including Phase 1, Phase 2, and two historical areas.

Phase 2, which is the currently operational cell at the site, encompasses approximately 33 acres. It is located south of Phase 1 and the two historical areas and the main access road in the southern portion of the site. Phase 2 is subdivided into the current operational Phase 2A (approximately 8 acres) which is currently receiving CCRs, and Phase 2B (approximately 25 acres) which has reached final design elevation and has been fully stabilized with a soil cover layer and vegetation.

Phase 1 and the two historical areas have been closed for many years and were capped with a soil layer and stabilized with heavy vegetation. These cells are currently being capped with an engineered geosynthetic closure capping system under a Consent Decree with the Maryland Department of the Environment.

3.0 Phase 2 Inspection Results

On December 13, 2017, a Maryland Registered Professional Engineer employed by AECOM, accompanied by a representative of NRG, conducted an inspection of the Brandywine operational Phase 2 cell. The results of the inspection are presented in the subsections below. The inspection form that was prepared during the inspection is presented as Attachment A to this report.

3.1 Access Roads and Security

Any person, contractor, or vendor entering the Brandywine site must pass through the fenced and gated entrance into the site and the security guard station located at the gate. The access road gate is locked during non-business hours at the site and it precludes any vehicle access into the site other than during normal business hours when the guard station is manned. From the guard station, the access road to the site office trailers is paved and is in reasonably good condition. Roadside drainage features are well kept and in acceptable condition. The access road around Phase 2 is a thick layer of crushed aggregate in good condition, and it runs from the office trailers to Pond 006.

The interior access roads have a speed limit of 15 miles per hour and have the proper signage.

3.2 Phase 2 Operational Areas

- Exterior Side Slopes: The exterior side slopes of Phase 2 are heavily vegetated and stabilized in good condition; there are no signs of erosion on these slopes.
    - The Phase 2A exterior side slopes follow the access road from the juncture with the Phase 2 side slopes to the office trailer area and along the eastern side of the site. These slopes are all heavily vegetated and well stabilized. The eastern side slopes contain a number of benches that are heavily vegetated with no signs of erosion along the drainage pathways.
    - The Phase 2B exterior side slopes run along the western, southern and eastern sides of the Phase 2 area and have reached design elevations. These slopes are all stabilized with heavy vegetation; these slopes contain a number of drainage benches that are all heavily vegetated with no signs of erosion along the drainage pathways.
- Interior Side Slopes: The interior side slopes of Phase 2B are vegetated and well stabilized with grass and mulch; there are minimal signs of erosion on these stabilized slopes. The interior slopes of Phase 2A are temporarily vegetated and stable, and appear to be well maintained.
- CCR Storage in 2017: NRG's daily fly ash delivery records for the Brandywine site show that Phase 2 received 1,012 truckloads of CCR material (729 truckloads of mostly bottom ash and 283 truckloads of pond solids) during 2017. Based on the average capacity of the these highway-approved transport vehicles of 14 cubic yards per truckload, approximately 14,168 cubic yards of CCR material was delivered and stored in Phase 2 in 2017..
- Estimated In-place CCR Volume: It can be estimated that the in-place volume of CCR in Phase 2 is approximately 1,364,000 cubic yards. This volume is based on the original design documents and the estimated CCR capacity of Phase 2 (approximately 1,468,300 cubic yards), and the remaining estimated volume in Phase 2 (approximately 105,000 cubic yards) based on aerial topography of Phase 2 and the amount of CCR delivered in 2017.
- Site Geometry: The exterior side slopes of Phase 2 remain fixed in location; consequently, there has been no change in the overall geometry of Phase 2 except for the vertical rise in elevation of the operating Phase 2A area.

- CCR Placement in Phase 2: Hauling and placement of CCR in Phase 2A appears to have been accomplished in appropriate lift thicknesses based on the exterior slopes and benches, and the current lift appears to have been installed, compacted and graded in an acceptable manner. The Phase 2A operating floor has been properly compacted and graded to promote positive drainage to the chimney drains and the interior drainage system. There are no erosion gullies within the Phase 2A floor area.
- Chimney Drains: All chimney drains appear to be constructed and functioning properly. The interior chimney drains have been constructed to higher elevations in advance of CCR placement.
- There do not appear to be any areas in Phase 2A or 2B that represent actual or potential areas of structural weakness of the CCR unit. There do not appear to be any existing conditions that are disrupting of have the potential to disrupt the operation or safety of the CCR unit.

3.3 Sediment and Erosion Control Measures

- Proper sediment control measures are being employed as required in Phase 2, including:
    - Stabilized construction entrance materials used for haul trucks entering into Phase 2A.
    - Super silt fence installed around the perimeter of the toe of the northern and eastern exterior slopes.
    - Silt fence installed around the perimeter of the toe of slope of the top lift of Phase 2A.
    - Hauling trucks are washed at the dedicated truck wash station before leaving the site.

3.4 Storm Drainage Features

- Roadside Drainage Channels: Drainage channels along the access roads are well vegetated and stabilized with no signs of erosion.
- Operating Area Floor & Chimney Drains: The Phase 2A floor is graded and compacted to promote positive drainage to the interior chimney drains. The chimney drains appear to be constructed and functioning properly.
- Exterior Slope Benches: The Phase 2 exterior slope benches are heavily vegetated and stabilized. There are minimal signs of erosion on the benches which convey stormwater runoff to the perimeter ditch. The perimeter ditch is stabilized and in good condition.
- Run-on Control: Because of progress of CCR placement in Phase 2, stabilized exterior side slopes have been constructed around the entire perimeter of Phase 2, precluding any offsite storm water run-on into Phase 2 from occurring. Most of Phase 2B drains to the stabilized exterior slopes and benches and not into Phase 2A. There will be some minor stormwater run-on into the Phase 2A operating area from the interior slope of Phase 2B, which is stabilized. This stormwater run-on is controlled with the interior drainage system of Phase 2A and the chimney drains.
- Pond 006: Leachate from Phase 2 enters Pond 006 at the forebay through three HDPE pipes that discharge water onto a grouted rip rap apron. The rip rap apron appears to be in good condition and free of erosion. The weir connecting the forebay and the main pond area appears to be in good condition, free of erosion, with a small amount of water flowing into the main pond. The fabriform emergency spillway and the HDPE principal outfall structure both appear to be well maintained and in good condition. The primary discharge outlet in the principal riser has been closed, and water from Pond 006 is now pumped to the site's Waste Water Treatment System located on the plateau near Pond 004. Consequently, there are currently no discharges from the Pond 006.

- The Pond 006 principal outfall structure is connected to a high-flow discharge pipe that passes through the embankment and terminates at a headwall structure and a grouted rip rap apron downstream of the embankment. The rip rap apron appears to be in good condition and free of any erosion problems; the apron would perform adequately should any future flows be directed to the rip rap apron.

3.5 Recordkeeping

- Daily Operations and Maintenance inspection reports are kept in a binder in the onsite NRG MD Ash office trailer. The reports are up to date.
- Weekly CCR inspection reports and are up to date. They are stored in a binder in the onsite NRG MD Ash office trailer.

4.0 Brandywine Phase 2 Operational Areas Overview

During the 2017 reporting period, the operating portion of Phase 2 has received CCR material from the Morgantown and Chalk Point Generating Stations, which has been installed in lifts in the Phase 2A portion of Phase 2. The geometry of the site has not changed during 2017 other than the vertical rise of the CCR filling area in Phase 2A.

Phase 2 is well maintained and drainage and erosion control features appearing to functioning properly. There did not appear to be any areas in Phase 2 that represent actual or potential areas of structural weakness of the CCR unit. There are no existing conditions that are disrupting of have the potential to disrupt the operation or safety of the CCR unit.

Name: Jeffrey Hutchins Date: 1/03/18

Maryland PE #: 13186

AECOM
12420 Milestone Center Drive, Suite 150
Germantown, MD. 20876
Tel: 301.820.3000 Fax: 301.820.3009
www.aecom.com

ATTACHMENT A

NRG BRANDYWINE ASH SITE

ANNUAL CCR INSPECTION CHECKLIST

ANNUAL CCR STORAGE SITE INSPECTION CHECKLIST

Facility Name:	Brandywine Ash Storage Facility		
Address:	11710 North Keys Road, Brandywine, Maryland 20613		
Date: 12/13/2017	Time: 10:50 AM	Weather:	Sunny with few clouds, 38°
Inspection Representatives			
NRG:	Darren Buckler (Bowling Brothers NRG contractor)		
AECOM:	Jeffrey Hutchins	PE License #: 13186	
Other:			
Site Data			
Cell ID: Phase 2	Acreage:	33 acres	
Operational Area of Cell:	(Phase 2A) 8 acres	Closed Area of Cell: (Phase 2B) 25 acres	

Operational Criteria

	Acceptable	Needs Improvement	Comments
1. Security/Entrance Gate	√		
2. Condition of Access Road	√		
3. Operating Cell	√		
3a. Condition of Exposed Ash	√		
3b. Condition of Periodic Cover Soils	√		
3c. Acceptable Dust Control Measures	√		
3d General Integrity of Operating Cell/Signs of Distress	√		
3e. Condition of Chimney Drains	√		
3f. Condition of Erosion Control Measures	√		
3g. Visual signs of Erosion or Washouts	√		
3h. General Condition of Leachate Piping, Cleanouts	√		
4. Stormwater Management	√		
4a. Condition of Ditches, Diversions, Letdowns	√		
4b. Condition of Run-Off Control System	√		
4c. Condition of Perimeter Areas (stable, unstable, erosion, etc.)	√		

Comments:

The operating portion of Phase 2 is well maintained with no areas of instability or potential weakness.

There are no conditions at the present time that are disrupting or have the potential to disrupt the operation or safety of Phase 2.

Jeffrey Hutchins		12/13/2017
Print Name of Engineer Completing Form	Signature	Date