

Coal Combustion Residuals

Annual CCR Unit Inspection Report For Reporting Year 2021

Keystone-Conemaugh Projects, LLC
Conemaugh Ash/Refuse Disposal Site
Conemaugh Generating Station
New Florence, Pennsylvania

GAI Project Number: C151611.04, Task 003
January 2022



Prepared by: GAI Consultants, Inc.
Pittsburgh Office
385 East Waterfront Drive
Homestead, Pennsylvania 15120-5005

Prepared for: Keystone-Conemaugh Projects
Conemaugh Generating Station
1442 Power Plant Road
New Florence, Pennsylvania 15944

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Report Author:

James M. Joyce, PE
Project Manager

Professional Engineer's Certification

In accordance with §257.84(b) of the Rule, I hereby certify based on a review of available information within the facility's operating records and observations from my personal on-site inspection (including the photographs contained in Attachment 2), that the Conemaugh Ash Disposal Site does not exhibit any appearances of actual/potential structural weakness that would be disruptive to the normal operations of the Stage II/III CCR Unit. The unit is being operated and maintained consistent with recognized and generally accepted good engineering standards and practices.

Name of Professional Engineer: James M. Joyce

Company: GAI Consultants

Signature: _____

Date: 1/11/2022

PE Registration State: Pennsylvania

PE Registration Number: PE-047647-E

Professional Engineer Seal:

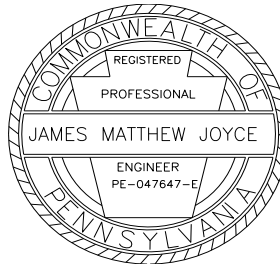


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Figure 1 – Photo Location Map

Appendix A Photographs

1.0 Introduction

Title 40 Code of Federal Regulations (CFR) Part 257 addresses, in part, the management of Coal Combustion Residuals (CCR Rule, or Rule) in regulated units, including landfills. Specific to §257.84(b) of the Rule, existing and new CCR landfills must be inspected on an annual basis by a qualified professional engineer. For the Keystone-Conemaugh Projects, LLC-Conemaugh Generating Station, this inspection requirement applies to the existing Ash/Refuse Disposal Site (Ash Disposal Site). In support of this obligation, Mr. James Joyce (a qualified professional engineer with GAI Consultants) conducted an on-site inspection of the Ash Disposal Site on November 10, 2021. The findings from this annual inspection are summarized in the remaining sections of this correspondence.

As required, this report will be placed in the Conemaugh facility's operating record per §257.105(g)(9), noticed to the State Director per §257.106(g)(7), and posted to the publicly accessible internet site per §257.107(g)(7). Placement of the prior annual inspection report into the facility's operating record was accomplished on January 16, 2021. Per §257.84(b)(4), the current report will be entered into the facility's operating record no later than January 16, 2022.

2.0 Background

The Ash Disposal Site consists of a valley fill located north of the Station proper, and is operated/maintained in accordance with Pennsylvania Department of Environmental Protection (PADEP) Solid Waste Permit No. 300876. The Ash Disposal Site consists of three stages, including Stage I (closed), Stage II (currently active), and Stage III (currently active horizontal and vertical expansion).

Stage I occupies approximately 160 acres within the northernmost reaches of the valley and was brought online in 1970. Stage I was constructed as an unlined facility and was subsequently closed in 1987. Stage II (brought online in 1985) is presently maintained as the primary active disposal area, and utilizes a single liner comprised of a 50-mil polyvinyl chloride (PVC) geomembrane with an accompanying leachate collection and detection system. Stage II occupies approximately 120 acres, and its northern side overlies the outslope of the Stage I disposal area (piggy-backs over Stage I); it extends approximately 2,000 feet southward into the valley from its interface with Stage I.

Stage IIIA, which is the first phase of construction of Stage III, has a double-synthetic composite liner system that includes a non-woven cushion geotextile; 60-mil HDPE primary liner; geocomposite drainage net; 60-mil HDPE secondary liner; geosynthetic clay liner (GCL), and a 6" thick soil subbase. In April 2019, PADEP issued its approval and authorization to initiate disposal activities in Stage IIIA, which is also currently active.

Upon complete buildout, Stage III will occupy an area of approximately 110 acres. The northern side of Stage III will piggy-back over the Stage II disposal area and it will extend southward approximately 2,100 feet where its outslope will terminate approximately 600 feet north of the existing Ash Disposal Site Leachate Surge Pond. At such time when the permitted disposal capacity has been fully expended and final grades attained, any uncapped areas of the Ash Disposal Site will be capped and closed in accordance with the approved Closure Plan.

With respect to the Ash Disposal Site, GAI's evaluation has focused on the following items as outlined in §257.84(b)(1)(i-ii):

- ▶ 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; and
- ▶ A visual inspection of the CCR unit to identify signs of distress or malfunction.

Specific to GAI's preparation of the annual inspection report, and per §257.84(b)(2)(i-iv), the following aspects have been addressed:

- ▶ Any changes in geometry of the structure since the previous annual inspection;
- ▶ The approximate volume of CCR contained in the unit at the time of the inspection;
- ▶ 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
- ▶ Any other change(s) which may have affected the stability or operation of the CCR unit since the previous annual inspection.

3.0 Operating Records Review

Principal items reviewed as part of this year's inspection included, but were not limited to: Design Drawings, Periodic Landfill Inspection Reports that have been completed since the 2020 Annual Inspection, 2020 Annual Landfill Operations Report, and the Solid Waste Permit No. 300876. During the site inspection, Mr. Joyce interviewed facility personnel to verify the information contained within the operating record.

3.1 Environmental Control System Overview

3.1.1 Bottom Liner System

- ▶ The bottom liner system of the Stage II landfill area is a 50-mil PVC geomembrane.
- ▶ The bottom liner system of the Stage IIIA landfill area is a composite liner, comprised from the top to bottom:
 - Non-woven cushion geotextile
 - Primary 60-mil high-density polyethylene (HDPE) liner
 - Geocomposite Drainage Net (Geonet) for leak detection
 - Secondary 60-mil HDPE liner
 - Geosynthetic Clay Liner (GCL)
 - six-inch thick soil subbase

3.1.2 Leachate Collection System

- ▶ The leachate collection systems of Stages II and III utilize gravity flow through the bottom ash material to a contact water drainage channel, which in turn drains to the Disposal Site Surge Pond. From the pond, leachate is routed to the Leachate Wastewater Treatment Plant (WWTP), with treated effluent managed in accordance with the Station's National Pollutant Discharge Elimination System (NPDES) Permit.

3.1.3 Stormwater Management

- ▶ "Non-contact" stormwater run-off from the closed Stage I area is managed in accordance with the current NPDES permit. Stormwater run-off from the Stage I area is discharged into a stormwater channel separate from the "contact" stormwater of the Stage II area.
- ▶ "Contact" stormwater falling on currently active areas of Stages II and III (Stage IIIA) is combined with leachate in the collection system and is conveyed to the Surge Pond south of the disposal site.

3.1.4 Cover System

- ▶ Stage I disposal area is capped and has established vegetative cover.
- ▶ Portions of the Stage II disposal area currently have an intermediate cover in place with established vegetation. These areas include the sideslopes and plateau areas adjacent to Stage I

3.2 Summary of Landfill Construction

The Stage II and IIIA disposal areas are currently accepting CCR.

3.3 Review of Prior Inspections

Periodic inspections: A review of weekly and periodic inspections has concluded that no significant deficiencies occurred at the facility that required remedial actions.

Previous Annual Inspection Report: The previous annual inspection report does not note any other deficiencies or releases, actual or potential structural weaknesses, or concern to the stability of the landfill. All environmental control systems were found to be in good operating condition and functioning as intended. Recommendations from the prior report (related to landfill operations and maintenance) were found to have been implemented.

3.4 CCR Disposal

The total in-place disposal quantity of CCR materials is presently estimated at approximately 68,862,277 tons (68,316,459 tons through December 2020 plus 545,818 tons through December 2021).

4.0 Site Inspection

The site inspection was performed on November 10, 2021 by Mr. Joyce, and during which time efforts were focused on identification of any standard geotechnical signs of distress or malfunction. Specific aspects such as slumping at the toe of slope, tensile cracking, abnormal or excessive erosion on the side slopes, slope bulging, and groundwater/surface water seepage or ponding were assessed. If present, these readily visible signs are potential indicators of structural weakness of the CCR Landfill unit.

4.1 Visual Signs of Distress or Malfunction

No visual signs of distress or malfunction were observed during the inspection. Stormwater drainage features, slope appearance and stability, leachate conveyance mechanisms, and overall site conditions were assessed. Closed portions of the landfill exhibited well established vegetative cover.

4.2 Review of Environmental Control Systems

Stage II and IIIA disposal area stormwater channels, leachate collection, and intermediate cover areas (Stage II only) are functioning as intended. With no evidence to the contrary, the bottom liner systems for the Stage II and IIIA disposal areas are believed to be in good operating condition and functioning as intended.

4.3 Review of Previously Recommended Actions

There were no deficiencies or releases identified during the 2020 annual inspection that required the owner or operator to perform corrective actions per §257.84(b)(5). Recommendations were limited to the continued operation and maintenance of the facility and maintaining access to closed portions of the landfill for inspection purposes. These recommendations were found to have been followed, based on site conditions and the review of weekly inspection logs.

5.0 Conclusions

5.1 Changes in Geometry

There have been no significant changes in geometry of the disposal site since the last inspection. CCR material placement has progressed in vertical elevation within the active Stage II and Stage IIIA disposal areas throughout the year.

5.2 In-Place CCR Disposal Quantities

The total in-place disposal quantity of CCR materials is presently estimated at approximately 68,862,277 tons (68,316,459 tons through December 2020 plus 545,818 tons through December 2021).

5.3 Appearance of an Actual or Potential Structural Weakness of the CCR Unit

At the time of inspection, there were no signs of distress or malfunction that would indicate actual or potential structural weakness at the Ash Disposal Site.

5.4 Changes that may Affect the Stability or Operation of the CCR Unit

There have been no changes to the inspected areas of the Ash Disposal Site that pose a threat or concern to the stability of the landfill.

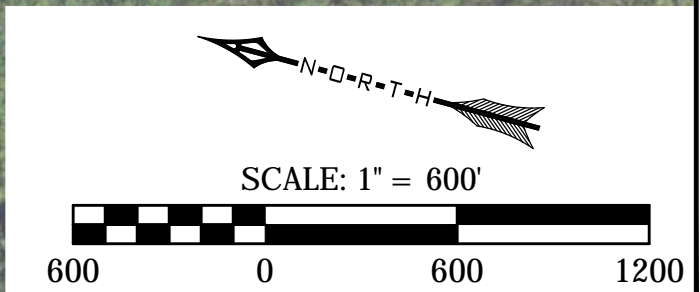
5.5 Other Items of Concern


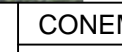
No items of concern are noted.

6.0 Recommendations

1. Continue operation and maintenance in the active areas as currently performed.
2. Ensure adequate access to the closed portions of the landfill to maintain the ability to perform weekly visual site structural inspections.

FIGURE



 gai consultants		DATE: 01/03/2022	CONEMAUGH		DRAWING NO.	
		BY: JSLODOWICK			SHEET:	
		CHK: ASCHELLER				REV:
		APP: JJOYCE	FIGURE 1 - PHOTO LOCATION MAP CONEMAUGH DISPOSAL SITE			
		SIZE: B 11X17				
		DISCIPLINE:				
	SCALE: AS SHOWN				FILE: C151611-04-000-WS-001	
NO.	DATE	REVISIONS	BY	CHK	APP	

APPENDIX A

Photographs



Photograph 1. Equalization Pond, immediately north of disposal site treatment plant; view southeast



Photograph 2. Disposal Site Surge Pond; view northwest



Photograph 3. Stage IIIA Stilling Basin, Leachate collection piping and v-notch weir (left), Leak detection pipe and v-notch weir (right)



Photograph 4. Stage IIIA toe collection channels and leachate and leak detection flows from stilling basin (right); view north



Photograph 5. Stage IIIA toe collection channel and flows from subgrade drain pipes (with signs) from Stages II/III; view westward



Photograph 6. Mulching taking place on a recently seeded Stage IIIA slope on the southern facing benches; view north



Photograph 7. Stage IIIA Collection Channel along first bench on east side of Stage IIIA; view northeast



Photograph 8. Erosion rills to be repaired in the northeast corner of Stage IIIA



Photograph 9. Haul truck returning to the plant after disposal in southern Stage II; view west



Photograph 10. East Side Collection Channel (foreground) and active Stage IIIA (background); view south



Photograph 11. The vegetated northeastern side of Stage II (foreground) and active Stage II in background; view southwest



Photograph 12. Perimeter access road on the northern end of Stage I; view eastward



Photograph 13. Perimeter access road along the northern portion of Stage I; view southwest



Photograph 14. Stage II northwest top surface drainage channel; view southeast



Photograph 15. Western benches of Stage II



Photograph 16. Northwest portion of Stage II; view southeast