

Harrison CCB Landfill Coal Combustion Residual 2016 Annual Report

Monongahela Power Company
Shinnston, Harrison County, West Virginia

December 2016

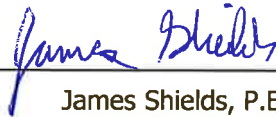
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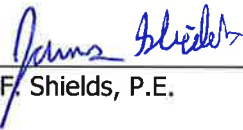
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Certification/Statement of Professional Opinion

The Annual Inspection of Harrison Power Station's CCB Landfill was performed by GAI Consultants, Inc. (GAI) on Wednesday, September 14, 2016. The Inspection was based on information described in Section 3.0 that GAI has relied on but not independently verified, and the visual observations made by GAI personnel at the Site during specific site visits. Therefore this Certification/Statement of Professional Opinion is limited to the information available to GAI at the time the Inspection was performed. On the basis of, and subject to the foregoing, it is my professional opinion, as a Professional Engineer licensed in the State of West Virginia, that the Inspection has been performed in accordance with good and accepted engineering practices, as exercised by other engineers practicing in the same discipline(s), under similar circumstances, and at the time and in the same locale. It is my professional opinion that the Annual Inspection Report was prepared consistent with the requirements of the United States Environmental Protection Agency's "Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments," published in the Federal Register on April 17, 2015 with an effective date of October 19, 2015.

The use of the words "certification" and/or "certify" in this document shall be interpreted and construed as a Statement of Professional Opinion and is not and shall not to be interpreted or construed as a guarantee, warranty or legal opinion.


James F. Shields, P.E.



1.0 Purpose

Pursuant to Federal Coal Combustion Residuals (CCR) Rule 40 Code of Federal Regulations (CFR) 257.84, each CCR unit is to have an annual inspection and report prepared by a qualified professional engineer. The inspection is to include:

- ▶ a review of available information regarding the status and condition of the CCR unit, including, but not limited to, files in the operating record; and
- ▶ a visual inspection of the CCR unit to identify signs of distress or malfunction of the CCR unit.

The Inspection Report is to include:

- ▶ 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 units since the previous annual inspection.

2.0 Introduction

The Harrison Power Station (Station) is a coal-fired electric generating station located near the community of Shinnston, in Harrison County, West Virginia (WV). CCRs generated at the Station are placed in the captive CCR landfill, which is located approximately one mile north-northeast of the Station. Approximately 95 percent of the waste consists of fixated flue gas desulfurization material. Fly ash, bottom ash, and miscellaneous wastes compose the remaining five percent.

According to the WV Department of Environmental Protection (WVDEP), the landfill is a Class F CCR Solid Waste Disposal Facility. The approximate center of the landfill is located at coordinates 39° 24' 16" north latitude, and 80° 19' 56" west longitude. Approximately 250 acres are currently permitted for landfill operations under WVDEP Permit No. WV0075795. The landfill is divided into three areas, referred to as the Lower Valley, Upper Valley, and Main Valley.

The landfill areas are contained within the same watershed. Surface runoff generally flows south/southeast through the Main Valley. The lower portion of the site is occupied by Sedimentation Pond No. 1 (Pond), which is used as a settling pond for stormwater runoff and leachate flows. An 84-inch reinforced concrete pipe is used to convey runoff around the Pond from undisturbed areas, then discharges through a National Pollutant Discharge Elimination System Outlet into Robinson Run via a grouted riprap channel.

An underdrain at the interface in the Phase 4 (overbuild of Upper and Main Valleys) area collects water from springs, and seeps. The underdrain consists of perforated pipes in gravel trenches and conveys the water separately from the leachate detection/groundwater underdrain.

Water from the Pond underdrain and the underdrain system installed in the Lower Valley is collected and pumped to the treatment wetlands. Leachate and groundwater that is collected in the leachate detection/groundwater underdrain and leachate collection systems drain to the Pond to undergo treatment.

3.0 Information Review

CCR Rule §257.84(b)(1)(i) states that an inspection includes, "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)."

GAI Consultants, Inc. (GAI) reviewed the following available information prior to performing the inspection:

- ▶ 2016 7-day CCR Inspection Reports;
- ▶ 2015 Annual Inspection Report;
- ▶ 2015 Annual Operations Report;
- ▶ Site Record Drawings; and
- ▶ WVDEP Permit Documents.

The reports are listed under the References section. Conversations were held with the landfill operators before the inspection to obtain additional information, such as operation and maintenance procedures; current state of the landfill; and repairs and maintenance that occurred since the 2015 annual inspection.

4.0 Visual Inspection

4.1 General Information

The inspection was performed on Wednesday September 14, 2016. The weather conditions were sunny with temperatures ranging from 65 to 80 degrees Fahrenheit. Mr. Ron Harris, P.E. and Mr. James Shields, P.E., of GAI performed the inspection.

4.2 Inspection Strategy and Route

The GAI team inspected the landfill and its facilities by making visual observations, recording site conditions, and talking to plant and landfill operator personnel. The site was walked in order to view the critical structures of the landfill.

The inspection began in the Lower Valley by observing the top, then walking along the benches starting on the east side of the landfill and finishing on the west side. The Main and Upper Valleys were observed by driving to critical locations, such as the active disposal area and the toe of the Main Valley. The Pond was observed last.

4.3 Facility Conditions

The facility conditions are noted in the Annual Inspection Checklist attached to this Report, with the observations described in detail below.

Landfill embankment slopes appeared to be stable, and no signs of structural instability such as scarps, cracking, sloughing, surface movements, depressions, or wet areas were observed. Erosion control features are in place and appeared to be functioning, as no signs of erosion were observed along the embankment slopes, nor around any landfill facility.

Surface water conveyance features (*i.e.* channels, culverts, manholes, etc.) appeared to be operating properly. No signs of water leaving the conveyance features were observed. Some vegetation and sediment were observed in the channels. The landfill operator indicated that the vegetation and sediment will be removed. No wet areas, nor ponding, were observed along the landfill benches, along

the toe of the landfill, along downstream embankments for the Pond, nor within drainage channels at the time of inspection.

No damage to the liner system was observed, as it was protected by adequate CCR cover.

The leachate collection system appeared to be functioning properly, as leachate was observed flowing out of the pipes and into the drainage channels located at the toe of the Lower and Main Valleys. No signs of clogging nor improper functioning of the leachate collection system were observed. No wet areas were observed at or around the toe of the Lower and Main Valleys.

The Pond appeared to be functioning properly. The downstream embankments appeared stable and no signs of structural instability such as scarps, cracking, sloughing, surface movements, depressions, or wet areas were observed. No signs of clogging nor improper functioning of the riser structures and pipes system were observed.

No fugitive dust was observed at the time of the inspection. Water quality monitoring is conducted on a regular basis.

4.4 Geometry

Pursuant to 40 CFR §257.84(b)(2)(i), "any changes in geometry of the structure since the previous annual inspection," are reported.

The existing landfill embankments consist of 20-foot wide benches, constructed every 25 vertical feet, with 2.5H:1V slopes between benches. Based on visual inspection and a review of the design drawings, no changes to the geometry of the landfill were observed since the 2015 annual inspection.

4.5 Approximate Volume of CCR

Pursuant to 40 CFR §257.84(b)(2)(ii), "the approximate volume of CCR contained in the unit at the time of inspection," is reported.

The approximate volume of CCR contained in the landfill at the time of the inspection was 58.0 million cubic yards.

4.6 Structural Appearance

Pursuant to 40 CFR §257.84(b)(2)(iii) and (iv), "any appearance 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," are reported.

Based on visual inspection, the landfill appeared to have no structural weaknesses, no existing conditions that are disrupting, or have the potential to disrupt the operation and safety of the CCR unit at the time of the inspection. No observable changes have occurred to the landfill since the 2015 annual inspection that would affect the stability or operation of the CCR unit.

4.7 Unit Performance

Based on a visual inspection, there did not appear to be any other changes that would affect the stability or operation of the landfill beyond what was mentioned in the Facility Conditions section.

4.8 Completed Repairs

The 2015 annual inspection revealed a two to three foot deep erosion gully that had been grassed over along two landfill slopes in the Lower Valley. This gully was repaired in July 2016. The channels that were observed during the 2015 annual inspection to contain sediment and vegetation were cleaned during routine maintenance operations.

5.0 Conclusions and Recommendations

During the 2016 visual inspection of the landfill, GAI did not identify any signs of distress or malfunction that would affect the structural condition of the landfill. No releases of CCR were observed during the 2016 inspection. The sediment and vegetation in the channels are maintenance issues that will be addressed by the landfill operator.

6.0 References

United States Environmental Protection Agency, *40 CFR Parts 257 and 261, Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities*, April 17, 2015.

GAI Consultants, Inc., *Federal CCR 7-Day Inspection Forms*, April 2016 through September 2016.

FirstEnergy Corp., *2015 Annual Operations Report, Harrison Power Station*, July 2016.

Application for Renewal, *Solid Waste Permit No. WV0075795, Harrison Power Station*, January 2011.

GAI Consultants, Inc., *2015 Annual Inspection Report, Harrison CCB Landfill*, January 2016.

APPENDIX A

Annual Inspection Checklist

CCR Landfill Annual Inspection Checklist

Project Name Harrison CCB Landfill Inspection
 Project No. C150917.03
 Inspector Name(s) Ron Harris, James Shields
 Time 9:00 to 12:30

Landfill No. WV0075795
 Date. 9/14/2016
 Weather Conditions Sunny
 Temperature 65° to 80°

Inspection	CCR Volume (CY)
Previous Annual Inspection	Approx. 56.8 million
Current Annual Inspection	Approx. 58.0 million
Difference	Approx. 1.2 million

Mark "Yes" or "No" if the condition is observed.

Review Available Information (Preamble and 257.84)	Yes	No	Comments
Status and condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Reviewed prior to inspection
Operating record	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Reviewed prior to inspection
Previous inspection forms	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Reviewed prior to inspection
Proper waste placement (Preamble)	Yes	No	
Waste appears to be placed in stable manner	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Loose piles of waste or other debris staged at site	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Slope Stability (Preamble and 257.84)	Yes	No	
Existing slopes and embankments appear stable	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surface cracking	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Signs of surface movement	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Sloughing	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Slides	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Unusual depressions	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Erosion Control (Preamble)	Yes	No	
Controls in-place and functioning	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Erosion damage (gullies/rills/deep channels) observed within the slopes of the landfill	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Gullies over nine inches	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Surface Water (Preamble)	Yes	No	
Wet areas/ponding	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Evidence of water percolation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Surface run-on	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Surface water channels functioning properly	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Vegetation/sediment in channels should be removed
Culverts/manholes for surface water management functioning properly	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Liner System (Preamble)	Yes	No	
Liner system installed	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Damage to liner system	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Liner system protected from damage from CCR transport and placement equipment	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Liner system properly maintained	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Liner designed, constructed and maintained as required to prevent lateral migration of leachate off-site	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

CCR Landfill Annual Inspection Checklist

Project Name Harrison CCB Landfill Inspection
 Project No. C150917.03
 Inspector Name(s) Ron Harris, James Shields
 Time 9:00 to 12:30

Landfill No. WV0075795
 Date. 9/14/2016
 Weather Conditions Sunny
 Temperature 65° to 80°

Leachate Collection/Detection System (Preamble)	Yes	No	
Leachate collection/detection system installed	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Leachate collection system flowing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Evidence of clogged piping or drainage materials	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Leachate system properly maintained	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Leachate detection zone discharge pipes monitored weekly	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Leachate detection zone flowing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Dust Control (Preamble)	Yes	No	
Fugitive dust being controlled	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Contingency Plan (Preamble)	Yes	No	
Plan in place to correct an deficiencies identified during the inspection	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Water Quality Monitoring System (Preamble)	Yes	No	
Water quality monitoring systems properly maintained and functioning	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Other Issues (257.84)	Yes	No	
Other issues identified during the inspection which are disrupting or have the potential to disrupt the operation or safety of the landfill	<input type="checkbox"/>	<input checked="" type="checkbox"/>	