Hatfield's Ferry CCB Landfill
Coal Combustion Residual 2019 Annual Report

FirstEnergy Generation, LLC
Masontown, Greene County, Pennsylvania

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Certification/Statement of Professional Opinion

The Annual Inspection of Hatfield's Ferry CCB Landfill was performed by GAI Consultants, Inc. (GAI) on Tuesday, October 29, 2019. 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 Commonwealth of Pennsylvania 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.

Kenneth R. Harris, 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 Hatfield's Ferry Coal Combustion Byproduct (CCB) Landfill (Landfill) is a captive facility located on the southern side of Route 21, adjacent to the now deactivated Hatfield's Ferry Power Station (Station), near Masontown, Pennsylvania (PA). According to the PA Department of Environmental Protection (PaDEP), it is a Class II residual waste facility operating under PaDEP Solid Waste Permit No. 300370. Presently, CCR and other permitted waste are being placed intermittently in the Landfill as FirstEnergy Generation, LLC's (FirstEnergy) Hatfield's Ferry Power Station (Station) was deactivated in October 2013.

The Landfill consists of three phases. Phases 1 and 2 were constructed first, and then in 2009, Phase 3 was constructed with a synthetic liner that partially covers Phases 1 and 2, thus effectively creating a cap on Phases 1 and 2. Waste was placed on lined areas of Phase 3 called Steps 1, 2, and 3-1. Grading for Phase 3, Step 3-2 was performed, but liner has not been installed.

Leachate from Phases 1 and 2 and springs/seeps exiting the strip mine beneath Phases 1 and 2 flow by gravity through collection laterals and headers to two existing concrete vaults/leachate collection sump/pump stations located at the toe of Phases 1 and 2. Leachate is then pumped via force mains to a passive wetland treatment system located on the northeast side of the site.

The passive wetland treatment system consists of a lined equalization basin, two sets of lined parallel vegetated aerobic wetland cells, and a series of shallow, manganese-oxidizing bacteria rock drains. The effluent from the system is discharged by gravity to the Phase 1/Phase 2 Sedimentation Pond where it is gradually released through the riser structure to an unnamed tributary of Little Whitely Creek via a National Pollutant Discharge Elimination System (NPDES) Outfall. Stormwater surface runoff from the revegetated Phases 1 and 2 flows to the Sedimentation Pond as well. Channels are in place to collect offsite stormwater run-on and divert the water around the Sedimentation pond.

Leachate from Phase 3 (i.e. Steps 1, 2, and 3-1) flows by gravity over land and by a network of collection laterals and headers to the Leachate Storage Impoundment (LSI). Leachate is then detained in order to allow suspended solids to settle before being released through the LSI riser structure. The open-top concrete riser is equipped with two Faircloth skimmers and a 60-inch-diameter barrel pipe which outlets to the Monongahela River via an NPDES Outfall.

Drainage from the haul road flows into a collection channel along the north edge of the road. The channel conveys drainage either to an upper sediment basin located east of and halfway down the haul road from the LSI, or to a lower sediment basin near the Monongahela River. Both basins discharge through an NPDES Outfall.

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:

- 2018 and 2019 7-day CCR Inspection Reports;
- 2015, 2016, 2017, and 2018 Annual Inspection Reports;
- Site Record Drawings;
- State Permit Documents; and
- 2018 Annual Operations Report.

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 2018 annual inspection.

4.0 Visual Inspection

4.1 General Information

The inspection was performed on Tuesday, October 29, 2019 by Ms. Leigh Rounce and Mr. Ron Harris, P.E. of GAI. They were accompanied by FirstEnergy representatives Mr. Ralph Borsani (Consultant Engineer), Mr. Jeff Kapolka (Senior Environmental Specialist), Mr. Jay Newbaker (Hydrogeologist), and Mr. Randy Jones (Staff Scientist). Mr. David Hoone (Supervisor, CCR and Waste Programs) was also present for part of the inspection. The weather conditions were partly cloudy, with temperatures ranging from 45 to 70 degrees Fahrenheit.

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 personnel.

The inspection began at the top of the Landfill by observing the perimeter berm, perimeter channels, and the Landfill crest. The inspection continued by walking along the Landfill crest to the northwest facing embankment, then walking along the benches of Phases 1 and 2 from west to east. The Phase 3 collection channels, leachate collection and leak detection outlet pipes, LSI, manholes, and groundwater drain were subsequently observed. Finally, the passive wetland treatment system, collection and diversion channels, leachate collection sump/pump stations, and the Sedimentation Pond were observed.

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. Limited CCR has been hauled/placed from the Station since

deactivation in October 2013. After a recent landslide on the north side of the haul road, approximately 63,400 cubic yards of CCRs and mine spoil material was placed in Step 1 of Phase 3 of the Landfill. The area of the landslide did not encompass any of the previously-permitted or active waste disposal areas (e.g., Phase 1, Phase 2, or Phase 3); however, it was within the permitted boundary for the site and was placed while the site was an active coal strip mine. A monitoring point related to the Pennsylvania Solid Waste Permit was temporarily inaccessible due to the slide. As of 11/1/2019, the monitoring point access has been restored. At the time of the 2019 annual inspection, the landslide area was stabilized, and final repairs were being made to the area. GAI did not inspect the landslide area during the 2019 annual inspection.

The areas observed on the Landfill embankment slopes appeared 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 functioning, as no signs of erosion were observed along the embankment slopes nor around Landfill facilities. One erosion rill up to one foot deep was observed on the first bench below northwest edge of the Landfill; standing water was observed on the bench where the rill outlets. An area of bare soil with a rut up to 1.5 feet deep was observed near the channel on the seventh bench below the north edge of the Landfill. The rut appeared to be made from equipment tire tracks. Vegetation up to three feet high was observed on the first bench below the west side of the Landfill. One bare spot was identified on the top of the Landfill near the southern edge.

Surface water conveyance features (i.e., channels, culverts, manholes, drop boxes, etc.) were operating properly. No signs of water leaving the conveyance features were observed. Heavy vegetation was observed in the north perimeter channel and the channel adjacent to the pond access road. No wet areas or ponding were observed along the toe of the Landfill, along downstream pond embankments, nor within drainage channels at the time of inspection.

The liner system was not observed, as it was protected by adequate CCR cover. The anchor trenches were covered and functioning properly. A four-foot-high containment berm was in place along the perimeter of the Landfill to prevent runoff from leaving the site.

The leachate collection system for Phases 1 and 2 is functioning properly, as leachate was observed flowing out of the toe drains and into the sump/pump stations. No wet areas were observed at or around the toe area for Phases 1 and 2. No signs of clogging nor improper functioning of the leachate collection system were observed.

Leachate was observed flowing out of the pipes located at the entrance to the LSI. De minimis flow was observed in the Phase 3 leak detection pipes. No signs of clogging nor improper functioning of the leachate collection/leak detection system were observed. The leak detection system for Phase 3 is monitored on a weekly basis by the Landfill personnel.

The passive wetland treatment system, the Phase 1/Phase 2 Sedimentation Pond, and the LSI appeared to be functioning properly. The areas observed on the downstream embankments appeared to show no signs of structural instability such as scarps, cracking, sloughing, surface movements, depressions, or wet areas. Leak detection from the LSI is monitored by a manhole located east of the facility.

There was no fugitive dust 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 Landfill embankment consists of 20-foot-wide benches constructed every 25 vertical feet with 2.5H:1V side slopes. Based on visual inspection and a review of the design drawings, and other than the placement of additional material from the recent slide, no changes to the geometry of the Landfill were observed.

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 3,109,880 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 2018 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 following concerns noted in the 2018 Landfill Inspection Report were repaired or addressed prior to the 2019 inspection report: two erosion gullies located in the Step 3-1 area; an erosion gully located on the first bench from the top of the western side of the Landfill; two bare areas on top of the southern berm running parallel to the collection channel; and a one-foot diameter erosion void located at the interface of the west concrete channel and the second bench from the top of Phase 1. Additionally, grass and vegetation were mowed prior to the 2019 inspection in accordance with the recommendation provided in the 2018 Landfill Inspection Report.

5.0 Conclusions and Recommendations

During the 2019 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 2019 inspection. The erosion rill, ruts, areas of bare soil, vegetation in channels, and heavy vegetation along the western side of the landfill are maintenance issues that will be addressed by the Landfill operator. It is also recommended that grass and vegetation continue to be mowed prior to each annual inspection.

6.0 References

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*; September 2018 through October 2019.

FirstEnergy Corp., *2018 Annual Operations Report, Hatfield's Ferry Power Station*; June 2019.

Minor Permit Modification Application, Hatfield CCB Landfill 300370; Revision 1 July 28, 2015, and Revision 2 August 19, 2015.

GAI Consultants, Inc., *2015 Annual Inspection Report, Hatfield's Ferry CCB Landfill*; January 2016.

GAI Consultants, Inc., *2016 Annual Inspection Report, Hatfield's Ferry CCB Landfill*; December 2016.

GAI Consultants, Inc., *2017 Annual Inspection Report, Hatfield's Ferry CCB Landfill*; December 2017.

GAI Consultants, Inc. *2018 Annual Inspection Report, Hatfield's Ferry CCB Landfill;* December 2018.

APPENDIX A
Annual Inspection Checklist

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CCR Landfill
Annual Inspection Checklist

Project Name	Hatfield's Ferry CCR Landfill Inspection	Landfill No.	300370
Project No.	C150917.24	Date.	10/29/2019
Inspector Name(s)	Ron Harris, P.E. and Leigh Rounce	Weather Conditions	Partly Cloudy
Time	9:00 AM - 12:30 PM	Temperature	45°F to 70°F

Inspection	CCR Volume (CY)
Previous Annual Inspection	3,046,480
Current Annual Inspection	3,109,880
Difference	63,400

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

Review Available Information (Preamble and 257.84)	Yes	No	**Comments**
Status and condition	☒	☐	Reviewed prior to inspection
Operating record	☒	☐	Reviewed prior to inspection
Previous inspection forms	☒	☐	Reviewed prior to inspection
Proper waste placement (Preamble)	Yes	No	
Waste appears to be placed in stable manner	☒	☐	
Loose piles of waste or other debris staged at site	☐	☒	
Slope Stability (Preamble and 257.84)	Yes	No	
Existing slopes and embankments appear stable	☒	☐	
Surface cracking	☐	☒	
Signs of surface movement	☐	☒	
Sloughing	☐	☒	
Slides	☐	☒	
Unusual depressions	☐	☒	
Erosion Control (Preamble)	Yes	No	
Controls in-place and functioning	☒	☐	
Erosion damage (gullys/rills/deep channels) observed within the slopes of the landfill	☒	☐	Rill/Bare spot on the southwest area of Step 3-2 Linear area.
Gullies over nine inches	☒	☐	Erosion rill up to 1' deep located below first bench on northwest side of landfill. 1.5' deep rut (likely from equipment tire) and bare soil located on a bench and near the channel along the northern side of landfill. Approximate dimensions are 20' x 30'.
Surface Water (Preamble)	Yes	No	
Wet areas/ponding	☐	☒	
Evidence of water percolation	☐	☒	
Surface run-on	☐	☒	
Surface water channels functioning properly	☐	☒	Vegetation growing in north perimeter channel and channel adjacent to the pond access road.
Culverts/manholes/drop boxes for surface water management functioning properly	☒	☐	

CCR Landfill
Annual Inspection Checklist

Project Name	Hatfield's Ferry CCR Landfill Inspection	Landfill No.	300370
Project No.	C150917.24	Date.	10/29/2019
Inspector Name(s)	Ron Harris, P.E. and Leigh Rounce	Weather Conditions	Partly Cloudy
Time	9:00 AM - 12:30 PM	Temperature	45°F to 70°F

Liner System (Preamble)	Yes	No	
Liner system installed	☒	☐	
Damage to liner system	☐	☒	
Liner system protected from damage from CCR transport and placement equipment	☒	☐	
Liner system properly maintained	☒	☐	
Liner designed, constructed and maintained as required to prevent lateral migration of leachate off-site	☒	☐	
Leachate Collection/Detection System (Preamble)	Yes	No	
Leachate collection/detection system installed	☒	☐	
Leachate collection system flowing	☒	☐	
Evidence of clogged piping or drainage materials	☐	☒	
Leachate system properly maintained	☒	☐	
Leachate detection zone discharge pipes monitored weekly	☒	☐	
Leachate detection zone flowing	☒	☐	
Dust Control (Preamble)	Yes	No	
Fugitive dust being controlled	☒	☐	
Contingency Plan (Preamble)	Yes	No	
Plan in place to correct an deficiencies identified during the inspection	☒	☐	
Water Quality Monitoring System (Preamble)	Yes	No	
Water quality monitoring systems properly maintained and functioning	☒	☐	
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	☐	☒	Vegetation up to 3' high below first bench on west side of landfill; recommend mowing area prior to next year's annual inspection.