

Fort Martin CCB Landfill Coal Combustion Residual 2018 Annual Report

Monongahela Power Company
Maidsville, Monongalia County, West Virginia

December 2018

Prepared for:
Monongahela Power Company
5001 Nasa Boulevard
Fairmont, West Virginia 26554

Prepared by:
GAI Consultants, Inc.
Murrysville Office
4200 Triangle Lane
Export, Pennsylvania 15632-1358

Report Authors:

Jason Gandee
Senior Project Engineer

Kenneth W. Kinder, P.E., C.F.M.
Engineering Manager

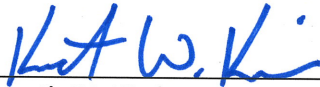
Table of Contents

Certification/Statement of Professional Opinion	ii
1.0 Purpose	1
2.0 Introduction	1
3.0 Information Review	2
4.0 Visual Inspection	2
4.1 General Information	2
4.2 Inspection Strategy and Route	2
4.3 Facility Conditions	3
4.4 Geometry	3
4.5 Approximate Volume of CCR	4
4.6 Structural Appearance	4
4.7 Unit Performance	4
4.8 Completed Repairs	4
5.0 Conclusions and Recommendations	4
6.0 References	5
Appendix A Annual Inspection Checklist	

Certification/Statement of Professional Opinion

The Annual Inspection of the Fort Martin Landfill was performed by GAI Consultants, Inc. (GAI) on Thursday, September 27, 2018. The Inspection was based on certain 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.



Kenneth W. Kinder, P.E., C.F.M.



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 Fort Martin Power Station (Station) is a coal-fired electric generating station located in Maidsville, in the Cass District of Monongalia County, West Virginia (WV). The captive landfill facility at the site accepts CCRs from the Station. The facility accepts gypsum, fly ash, bottom ash, and other approved ancillary materials. The Fort Martin Landfill (Landfill) is owned and operated by Monongahela Power Company. The approximate center of the Landfill is located at coordinates 39° 42' 46" north latitude, and 79° 56' 33" west longitude. The Landfill currently operates under West Virginia Department of Environmental Protection (WVDEP) Solid Waste/National Pollutant Discharge Elimination System (NPDES) Water Pollution Control Permit No. WV0075752.

The Landfill consists of two separate areas: the original area south of the haul road, the Fort Martin Landfill (Original Landfill), and the expansion area north of the haul road, the Fort Martin Expansion Area Landfill (FGD Landfill). The Original Landfill area is constructed with benches at 25-foot intervals and rises to an approximate elevation of 1,193 feet mean sea level (msl). The Expansion Area Landfill was permitted to be developed in two phases, Phase 1 and Phase 2. The Phase 1 disposal area was constructed with a liner system and represents the active portion of the expansion area. It has a top elevation of approximately 1,142 feet msl.

The area around the Original Landfill contains four sedimentation ponds (No's. 3, 4, 5, and 6) and various stormwater controls. The area around the Expansion Area Landfill contains a gypsum loading area, Sedimentation Pond No. 2, and various stormwater controls. A channel system is installed on and around both the Original Landfill and the Expansion Area Landfill that collects stormwater run-off from the landfills and guides it to one of the ponds. Force mains from each sedimentation pond connect to a main pipe southeast of the Original Landfill area and drain to the Station's cooling towers. Drainage from the haul road flows into a series of channels and culverts that drain into Sedimentation Pond No. 25. This sedimentation pond discharges through a NPDES Outlet into an unnamed tributary of the Monongahela River.

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 seven-day CCR Inspection Reports;
- ▶ 2015, 2016 and 2017 Annual Inspection Report;
- ▶ Site Record Drawings; and
- ▶ WVDEP Permit Documents.

GAI reviewed the following information after performing the inspection, as it became available to GAI:

- ▶ 2017 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 current state of the landfill and repairs and maintenance that occurred since the 2017 annual inspection.

No structural integrity problems were documented in the 2018 seven-day inspection reports nor the 2017 Annual Operations Report.

4.0 Visual Inspection

4.1 General Information

The inspection was performed on Thursday, September 27, 2018 by Jason Gandee and Kenneth Kinder, P.E. of GAI. They were accompanied by FirstEnergy representatives Ralph Borsani (Consultant Engineer), Randy Cain (Senior Consultant), John Kapolka (Senior Environmental Specialist), and Chad Wolfe (Adv. Environmental Specialist). The weather conditions were cloudy and the temperature ranged between 60 and 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 site was walked in order to view the critical structures of the landfill.

The inspection of the Fort Martin Landfill area began at Sedimentation Pond No. 3. After observing Sedimentation Pond No. 3, the inspection continued along the north facing embankment of the Original Landfill. The embankment slopes and benches were observed by traversing on foot around the landfill. The top of the landfill was observed by walking the haul road, then walking along the perimeter and across the landfill. Stormwater channels surrounding the landfill were observed while walking along the benches. Sedimentation Pond No's. 4, 5, and 6 were observed after the inspection of the landfill.

The inspection of the Fort Martin FGD Landfill began at Sedimentation Pond No. 2. The collection channels located along the perimeter were traversed for the inspection. Leachate cleanouts and groundwater underdrain cleanouts were visually observed. The top of the landfill was walked. The gypsum loading area was observed after the landfill and perimeter channels.

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.

The areas observed at both landfills appeared stable, and no signs of structural instability such as scarps, cracking, sloughing, surface movements, depressions, or wet areas were observed. Permanent erosion controls were in-place and functioning. No signs of erosion were observed along the landfill slopes nor around the pond embankment slopes. No wet areas or ponding were observed along the landfill benches, along the toe of the landfill, along downstream pond embankments for Sedimentation Pond Nos. 2, 3, 4, and 5, nor within drainage channels at the time of inspection. The culverts, manholes, drop boxes, and ponds observed at both landfill areas appeared to be working properly. Culverts and channels observed along the haul road appeared to be functioning properly. The fugitive dust control system was functioning. Water quality monitoring is conducted on a regular basis. Two animal burrows were observed along the downstream facing embankment for Sediment Pond No. 6. One of the animal burrows was located about halfway along the slope in the area of the principal spillway outlet pipe and was observed to have standing water in the hole. The downstream toe of this embankment was visibly wet; however, the field inspection was completed after a period of significant rain. It is recommended this area be observed again during drier conditions and monitored. The animal burrows should be backfilled.

There is a contact stormwater collection system installed at the Landfill area. At the Landfill area, trees were observed growing along landfill benches and slopes. Trees and brush have been removed since the 2017 inspection and this effort should continue. Vegetation on landfill slopes precludes observation in some areas; mowing of the slopes before the next annual inspections was recommended. The landfill benches had been mowed prior to the inspection. The channel tie-ins for Interceptor Channels V-C and V-D into Sediment Pond No. 4 were observed to be partially obstructed by a chain link fence and blocked with sediment, these channels should be cleaned and the sediment removed.

At the Fort Martin FGD Landfill area, all surface water channels were functioning properly. The leachate collection system appeared to be properly maintained and protected from potential damage due to equipment. Leachate outlet pipes were observed flowing into Sedimentation Pond No. 2 with no signs of clogging.

Several of the concrete aprons around the groundwater monitoring wells at the Original Landfill and the FGD Landfill were observed to be cracked. It is recommended the concrete aprons around all monitoring wells be inspected and repaired as necessary.

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 Fort Martin Original Landfill area consisted of 20-foot-wide benches built approximately every 25 vertical feet with side slopes of 2.5H:1V. The benches surround the active area located on the southwest top of the landfill.

The Fort Martin FGD Landfill area is in Phase 1 and no benches have been developed.

Based on a visual inspection and a review of design drawings, no changes to the geometry were observed at either landfill since the 2017 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 Fort Martin Landfill area at the time of the inspection was 3,060,910 cubic yards. The approximate volume of CCR contained in the Fort Martin FGD Landfill area at the time of the inspection was 332,000 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 a visual inspection, both landfills appeared to have no structural weaknesses, no existing conditions that were disrupting, or conditions that have the potential to disrupt the operation and safety of the landfill, at the time of the inspection. No observable changes have occurred to the landfill since the 2017 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 either landfill beyond what was mentioned in the Facility Conditions section.

4.8 Completed Repairs

At the Landfill area, sediment observed in a culvert near the weigh station during the 2017 annual inspection was cleaned during routine maintenance operations in 2018. Mowing has been completed around the sediment ponds and along the benches of the Original Landfill.

5.0 Conclusions and Recommendations

During the 2018 visual inspection of the landfills, GAI did not identify any signs of distress or malfunction that would affect the structural condition of the landfills. No releases of CCR were observed during the 2018 inspection. As previously discussed, trees should be removed and vegetation should be mowed to facilitate observations from all slopes of the Landfill. The animal burrows along the embankment for Sediment Pond No. 6 should be backfilled and the wet toe area should be observed again during drier conditions and monitored. If wet conditions persist, the area should be regraded to promote drainage of surface water away from the toe. The channel tie-ins for Interceptor Channels V-C and V-D should be cleaned and the sediment removed. Concrete aprons around the groundwater monitoring wells should be inspected for cracking and repaired as necessary.

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*; April 2016 through December 2016.
- FirstEnergy Corp., *Federal CCR 7-Day Inspection Forms*; January 2016 through March 2016.
- GAI Consultants, Inc. *Active Landfill Permit Compliance Evaluation, Fort Martin Power Station*; July 8, 2011.
- GAI Consultants, Inc., *Permit Renewal Application, Solid Waste/NPDES Water Pollution Control Permit No. WV0075752*; February 2013.
- Monongahela Power Co., *2014 Annual Operations Report, Fort Martin Power Station*; September 30, 2015.
- Monongahela Power Co., *2015 Annual Operations Report, Fort Martin Power Station*; September 30, 2016.
- RMC Environmental Services, Inc., *Supporting Document for Class F Industrial Landfill Facility Application*, Application No. WV0075752; April 1993.
- GAI Consultants, Inc., *2015 Annual Inspection Report, Fort Martin CCB Landfill*; January 2016.
- GAI Consultants, Inc., *2016 Annual Inspection Report, Fort Martin CCB Landfill*; December 2016.
- GAI Consultants, Inc., *2017 Annual Inspection Report, Fort Martin CCB Landfill*; December 2017.

APPENDIX A

Annual Inspection Checklist

CCR Landfill Annual Inspection Checklist

Project Name Fort Martin Original Landfill Inspection
 Project No. C150917.19
 Inspector Name(s) Jason Gandee, Kenneth Kinder
 Time 9:30 to 1:00

Landfill No. WV0075752
 Date. 9/27/2017
 Weather Conditions Cloudy
 Temperature 60° to 70°

Inspection	CCR Volume (CY)
Previous Annual Inspection	Approx. 3,050,000
Current Annual Inspection	Approx. 3,060,910
Difference	Approx. 10,910

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 after inspection
Previous inspection forms	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Reviewed prior to inspection
Proper waste placement (Preamble)			
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)			
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)			
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)			
Wet areas/ponding	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Toe of Pond 6 embankment observed to be wet
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/drop boxes for surface water management functioning properly	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Liner System (Preamble)			
Liner system installed	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Damage to liner system	<input type="checkbox"/>	<input type="checkbox"/>	Not applicable - no liner system installed
Liner system protected from damage from CCR transport and placement equipment	<input type="checkbox"/>	<input type="checkbox"/>	Not applicable - no liner system installed
Liner system properly maintained	<input type="checkbox"/>	<input type="checkbox"/>	Not applicable - no liner system installed
Liner designed, constructed and maintained as required to prevent lateral migration of leachate off-site	<input type="checkbox"/>	<input type="checkbox"/>	Not applicable - no liner system installed

CCR Landfill Annual Inspection Checklist

Project Name Fort Martin Original Landfill Inspection
 Project No. C150917.19
 Inspector Name(s) Jason Gandee, Kenneth Kinder
 Time 9:30 to 1:00

Landfill No. WV0075752
 Date. 9/27/2017
 Weather Conditions Cloudy
 Temperature 60° to 70°

Leachate Collection/Detection System (Preamble)	Yes	No	
Leachate collection/detection system installed	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Leachate collection system flowing	<input type="checkbox"/>	<input type="checkbox"/>	Not applicable - no leachate collection/detection system installed
Evidence of clogged piping or drainage materials	<input type="checkbox"/>	<input type="checkbox"/>	Not applicable - no leachate collection/detection system installed
Leachate system properly maintained	<input type="checkbox"/>	<input type="checkbox"/>	Not applicable - no leachate collection/detection system installed
Leachate detection zone discharge pipes monitored weekly	<input type="checkbox"/>	<input type="checkbox"/>	Not applicable - no leachate collection/detection system installed
Leachate detection zone flowing	<input type="checkbox"/>	<input type="checkbox"/>	Not applicable - no leachate collection/detection system installed
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"/>	Concrete aprons around monitoring wells should be inspected
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 checked="" type="checkbox"/>	<input type="checkbox"/>	Remove woody vegetation from landfill slopes

CCR Landfill Annual Inspection Checklist

Project Name Fort Martin Expansion Area Landfill Inspection
 Project No. C150917.19
 Inspector Name(s) Jason Gandee, Kenneth Kinder
 Time 9:30 to 1:00

Landfill No. WV0075752
 Date. 9/27/2017
 Weather Conditions Cloudy
 Temperature 60° to 70°

Inspection	CCR Volume (CY)
Previous Annual Inspection	Approx. 332,000
Current Annual Inspection	Approx. 332,000
Difference	Approx. 0

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 after inspection
Previous inspection forms	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Reviewed prior to inspection
Proper waste placement (Preamble)			
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)			
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)			
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)			
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"/>	
Culverts/manholes/drop boxes for surface water management functioning properly	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Liner System (Preamble)			
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 Fort Martin Expansion Area Landfill Inspection
 Project No. C150917.19
 Inspector Name(s) Jason Gandee, Kenneth Kinder
 Time 9:30 to 1:00

Landfill No. WV0075752
 Date. 9/27/2017
 Weather Conditions Cloudy
 Temperature 60° to 70°

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 type="checkbox"/>	<input checked="" type="checkbox"/>	Concrete aprons around monitoring wells should be inspected
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"/>	