2019 Annual Landfill Inspection Report

Amos FGD Landfill

John E. Amos Plant

Appalachian Power Company

Putnam County, West Virginia

August 14, 2019

Prepared for: Appalachian Power Co.

Prepared by: American Electric Power Service Corporation
1 Riverside Plaza
Columbus, OH 43215

Document ID: GERS-19-020

2019 Annual Landfill Inspection Report

John E. Amos Plant: FGD Landfill

Inspection Date: August 14, 2019

Document Number: GERS-19-020

PREPARED BY _____ DATE 9/19/2019
Brian G. Palmer P.E.

REVIEWED BY _____ DATE 9/19/2019
Brett Dreger, P.E.

APPROVED BY _____ DATE 9/19/2019
Gary F. Zych, P.E.
Manager – AEP Geotechnical Engineering

Gary F. Zych
GARY F. ZYCH REGISTERED 21201 STATE OF WEST VIRGINIA PROFESSIONAL ENGINEER
9/19/2019

I certify to the best of my knowledge, information and belief the information contained in this report meets the requirements of 40 CFR § 257.84(b).

Table of Contents

Table of Contents

Attachments

1.0 INTRODUCTION

This report was prepared by AEPSC-Geotechnical Engineering Services (GES) section, in part, to fulfill requirements of 40 CFR 257.84 and to provide the John E. Amos Plant an evaluation of the facility.

Mr. Brian Palmer performed the 2019 inspection of the FGD Landfill at the John E. Amos Plant. This report is a summary of the inspection and an assessment of the general condition of the facility. Mr. Rich Fuller, the landfill supervisor for the Plant, was the facility contact. The inspection was performed on August 14, 2019. Weather conditions were mostly cloudy and the temperature ranging from 65°F to 86°F. There were 0.43-inches of rainfall over the seven days prior to the inspection.

2.0 DESCRIPTION OF LANDFILL

The landfill was repermitted on September 7, 2017 by the West Virginia Department of Environmental Protection (Permit No. WV0116254) that reduces the number of sequences and footprint. The landfill now consists of 9 sequences that will encompass 191.9 acres for a permitted fill capacity of 36.8 million cubic yards.

The landfill permit revision also allows a design change from a 2 ft thick soil cover cap to a Coal Combustion Residuals (CCR) compliant cap. This permit revision also allows a change for the basal liner design from an 18 inch thick recompacted clay liner (overlain by a geomembrane and leachate collection system) to a 24 inch thick recompacted clay liner (overlain by a geomembrane and a leachate collection system) that is compliant with the Coal Combustion Residuals regulations.

Currently only Sequences 1 through 3, consisting of approximately 73 acres have been developed and contain CCR material. Sequences 1 through 3 drain to the South Valley leachate /sedimentation basin complex. Sequence 4 is currently under construction and along with future sequences (4-9) will drain to the North Valley leachate/sedimentation basin complex.

Approximately 16.3 acres within the South Valley had final cover cap installed since the last inspection. Less than an acre is at or near final cover with temporary cover installed. The remaining portions of Sequences 1 through 3 are active and are receiving CCR material.

The landfill utilizes sediment collection ponds and two leachate holding basins at the mouth of each drainage area (North and South Areas). The sediment collection ponds are used to collect watershed runoff that is not leachate or CCR contact water. The leachate holding basins collect and contain leachate and contact water generated from the landfill.

3.0 REVIEW OF AVAILABLE INFORMATION (257.84(b)(1)(i))

A review of available information regarding the status and condition of the Landfill which include

files available in the operating record, such as design and construction information, previous 7 day inspection reports, and previous annual inspections has been conducted. Based on the review of the data there were no signs of actual or potential structural weakness or adverse conditions.

4.0 INSPECTION (257.84(b)(1)(ii))

4.1 Changes In Geometry Since Last Inspection (257.84(b)(2)(i))

Construction of Sequence 4 (28.7 acres) is nearing completion. The final cover was completed on the west slope area of the South Valley (16.3 acres).

4.2 Volume (257.84(b)(2)(ii))

The 2018 "Annual Solid Waste Operating Report" states that the volume of CCR contained in the Landfill at the end of 2018 is approximately 7,175,221 CY based on aerial survey. The CCR Tracking Spreadsheet provided by Landfill staff indicates that 509,380 cubic yards of CCR was placed in the Landfill from January to the Early August 2019. From this, it is estimated that the approximate volume of CCR contained in the Landfill as of the End of August 2019 to be approximately 7,684,601 CY.

4.3 Definitions of Visual Observations and Deficiencies

This summary of the visual observations uses terms to describe the general appearance or condition of an observed item, activity or structure. The meaning of these terms is as follows:

Good: A condition or activity that is generally better or slightly better than what is minimally expected or anticipated from a design or maintenance point of view.

Fair/Satisfactory: A condition or activity that generally meets what is minimally expected or anticipated from a design or maintenance point of view.

Poor: A condition or activity that is generally below what is minimally expected or anticipated from a design or maintenance point of view.

Minor: A reference to an observed item (e.g., erosion, seepage, vegetation, etc.) where the current maintenance condition is below what is normal or desired, but which is not currently causing concern from a structure safety or stability point of view.

Significant: A reference to an observed item (e.g. erosion, seepage, vegetation, etc.) where the current maintenance program has neglected to improve the condition. Usually conditions that have been identified in the previous inspections, but have not been corrected.

Excessive: A reference to an observed item (e.g., erosion, seepage, vegetation, etc.) where the current maintenance condition is above or worse than what is normal or desired, and which may have affected the ability of the observer to properly evaluate the structure or particular area being observed or which may be a concern from a structure safety or stability point of view.

This document also uses the definition of a "deficiency" as referenced in the CCR rule section §257.84(b)(5) Inspection Requirements for CCR Landfills. This definition has been assembled using the CCR rule preamble as well as guidance from MSHA, "Qualifications for Impoundment Inspection" CI-31, 2004. These guidance documents further elaborate on the definition of deficiency. Items not defined by deficiency are considered maintenance or items to be monitored.

A "deficiency" is some evidence that a landfill has developed a problem that could impact the structural integrity of the landfill. There are four general categories of deficiencies. These four categories are described below:

1. Uncontrolled Seepage (Leachate Outbreak)
   Leachate outbreak is the uncontrolled release of leachate from the landfill.
2. Displacement of the Embankment
   Displacement of the embankment is large scale movement of part of the landfill. Common signs of displacement are cracks, scraps, bulges, depressions, sinkholes and slides.
3. Blockage of Control Features
   Blockage of Control Features is the restriction of flow at spillways, decant or pipe spillways, or drains.
4. Erosion
   Erosion is the gradual movement of surface material by water, wind or ice. Erosion is considered a deficiency when it is more than a minor routine maintenance item.

4.4 Visual Inspection (257.84(b)(1)(ii))

A visual inspection of the Landfill was conducted to identify any signs of distress or malfunction of the landfill and appurtenant structures. Specific items inspected included all structural elements of the landfill perimeter berms, temporary and final covers, drainage features, leachate ponds, open cells, and appurtenances such as chimney drains etc.

Overall the facility is in good condition. The landfill is functioning as intended with no signs of potential structural weakness or conditions which are disrupting to the safe operation of the landfill. Inspection photos are included in Attachment A. Additional pictures taken during the inspection can be made available upon request. A map presenting the site is included in Attachment B.

Active Landfill Disposal Areas (Sequences 1, 2 & 3)

1. During the inspection the active disposal area was being used for waste placement. The chimney drains were functioning as designed and there was no pooling of contact water around the drains. Waste was being compacted as it was placed.

Interim Cover Area (Sequence 3)

2. The northern portion of Sequences 3 has interim cover installed. Generally the interim cover was in good condition with vegetation and no erosion. The most recent areas of interim cover are scheduled to be seeded and mulched. (Photo 3)

3. The perimeter channel along the north side of sequence 3 had ditch checks and silt sox established within the channel that were functioning properly to retain sediment. The installation of riprap in this channel was an interim measure and the channel is designed to have a fabriform liner as erosion protection. (Photo 4)

Final Cover Area

4. The final cover construction on the west slope of the South Valley is complete and vegetation is getting established

Leachate Holding Ponds

5. The leachate holding ponds are generally in good condition. At the time of the inspection, the south leachate collection pond detection drain was discharging approximately 0.1 gpm.

6. The north leachate holding pond is constructed but is inactive pending completion of Sequence 4.

Sediment Collection Ponds

7. The sediment collection ponds were in good condition with no signs of erosion or blockage and appeared to be functioning as designed. Discharge from the sediment collection ponds was unobstructed and appeared to be visually clear.

8. The forebay of both sedimentation ponds were near capacity of sediment from recent construction and cleaning activities are scheduled.

9. The overflow channels from the sediment collection ponds were in good condition with no observable signs of erosion.

4.5 Changes That Effect Stability or Operation (257.84(b)(2)(iv))

Based on interviews with plant personnel and field observations there were no changes to the Landfill since the last annual inspection that would affect the stability of the Landfill.

5.0 SUMMARY OF FINDINGS

5.1 General Observations

The following general observations were identified during the visual inspection:

1) In general the landfill is functioning as intended with the active disposal area placing and compacting CCR material that is sloped to drain towards the bottom ash chimney drains that conveys the contact water to the leachate collection system.

2) The Plant is performing regular maintenance and inspections as required. Vegetation is well established for the embankments comprising the leachate holding basins, sediment

collection ponds and temporary soil cover slopes. Other erosion and sedimentation controls are in place and actively being maintained.

5.2 Maintenance Items

The following maintenance items were identified during the visual inspection. Contact GES for specific recommendations regarding repairs:

3) Add the new final cover area to the facility mowing activities.

4) Complete cleaning of sedimentation pond forebays as scheduled.

5.3 Items To Monitor

The following items were identified during the visual inspection as items to be monitored, see inspection map for locations:

5) None identified as part of the inspection.

5.4 Deficiencies (257.84(b)(2)(iii))

There were no signs of structural weakness or disruptive conditions that were observed at the time of the inspection that would require additional investigation or remedial action. There were no deficiencies noted during this inspection or during any of the periodic 7-day inspections. A deficiency is defined as either 1) uncontrolled seepage (leachate outbreak), 2) displacement of the embankment, 3) blockage of control features, or 4) erosion, more than minor maintenance. If any of these conditions occur before the next annual inspection contact AEP Geotechnical Engineering immediately.

ATTACHMENT A

Photos

AEP GES Landfill Inspection

Plant Name: Amos

Inspector: B Palmer

Unit: FGD Landfill

Date: August 14, 2019

Photo #: 1

Notes: South Valley Leachate Pond general condition.

N38 28.728 W81 51.526

Photo #: 2

Notes: South Valley Storm Water Pond general condition

N38 28.727 W81 51.514

AEP GES Landfill Inspection

Plant Name: Amos

Inspector: B Palmer

Unit: FGD Landfill

Date: August 14, 2019

Photo #: 3

Notes: South Valley west face south letdown channel

N38 28.766 W81 51.445

Photo #: 4

Notes: South Valley west face toe looking south

N38 28.780 W81 51.460

AEP GES Landfill Inspection

Plant Name: Amos

Inspector: B Palmer

Unit: FGD Landfill

Date: August 14, 2019

Photo #: 5

Notes: General condition of South Valley west slope looking south

N38 28.804 W81 51.452

Photo #: 6

Notes: South Valley west slope north letdown channel

N38 28.836 W81 51.445

AEP GES Landfill Inspection

Plant Name: Amos

Inspector: B Palmer

Unit: FGD Landfill

Date: August 14, 2019

Photo #: 7

Notes: Culverts at bench road on northside of west slope of south valley area

N38 28.921 W81 51.456

Photo #: 8

Notes: 930 bench access road

N38 28.923 W81 51.431

AEP GES Landfill Inspection

Plant Name: Amos

Inspector: B Palmer

Unit: FGD Landfill

Date: August 14, 2019

Photo #: 9

Notes: General condition of west slope of South. Valley Slope from bench access road

N38 28.877 W81 51.347

Photo #: 10

Notes: General condition of temporary cover above bench access road

N38 28.850 W81 51.293

AEP GES Landfill Inspection

Plant Name: Amos

Inspector: B Palmer

Unit: FGD Landfill

Date: August 14, 2019

Photo #: 11

Notes: South Valley west face south letdown channel

N38 28.835 W81 51.238

Photo #: 12

Notes: General condition of South Valley west slope looking northeast

N38 28.794 W81 51.349

AEP GES Landfill Inspection

Plant Name: Amos

Inspector: B Palmer

Unit: FGD Landfill

Date: August 14, 2019

Photo #: 13

Notes: Temporary cover on north face active area with Sequence 4 in background

N38 29.025 W81 51.214

Photo #: 14

Notes: Sequence 4 can construction

AEP GES Landfill Inspection

Plant Name: Amos

Inspector: B Palmer

Unit: FGD Landfill

Date: August 14, 2019

Photo #: 15

Notes: General condition of Active area

N38 28.977 W81 51.469

Photo #: 16

Notes: General condition of Active area

N38 28.974 W81 51.021

AEP GES Landfill Inspection

Plant Name: Amos

Inspector: B Palmer

Unit: FGD Landfill

Date: August 14, 2019

Photo #: 17

Notes: New fabriform lined drainage channel

N38 28.980 W81 51.012

Photo #: 18

Notes: New earthen exterior berm on north side of South Valley

N38 28.974 W81 51.014

AEP GES Landfill Inspection

Plant Name: Amos

Inspector: B Palmer

Unit: FGD Landfill

Date: August 14, 2019

Photo #: 19

Notes: Active Working area

N38 28.913 W81 51.005

Photo #: 20

Notes: General condition of Plateau Storm Water Pond

N38 29.023 W81 51.072

AEP GES Landfill Inspection

Plant Name: Amos

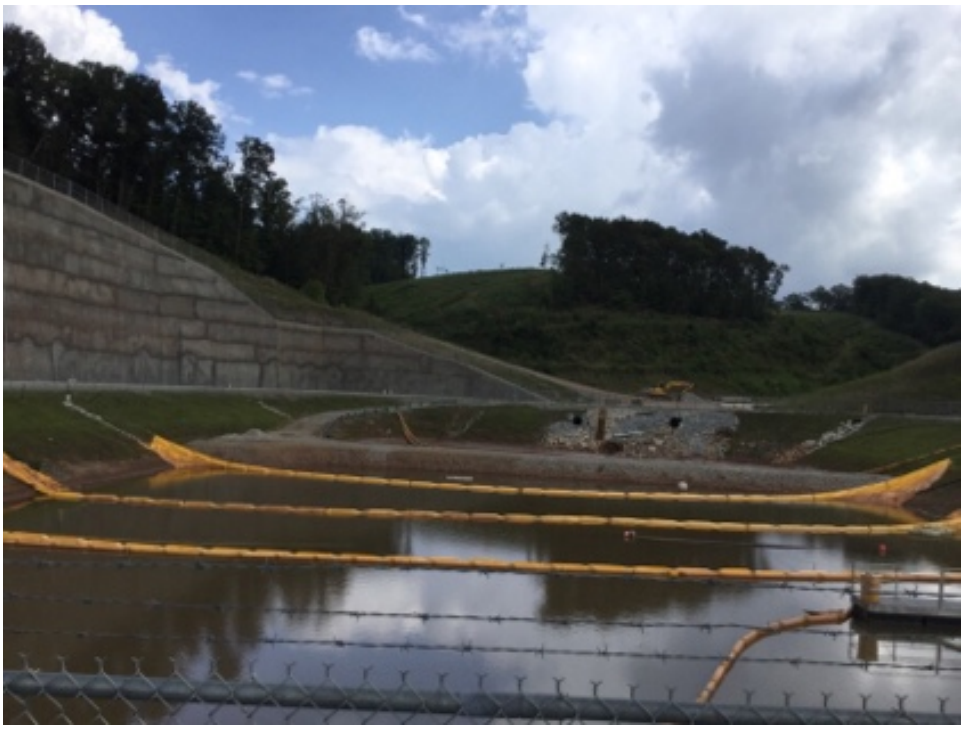
Inspector: B Palmer

Unit: FGD Landfill

Date: August 14, 2019

Photo #: 21

Notes: North Valley Storm Water Pond



N38 29.222 W81 51.667

Photo #: 22

Notes: North Valley Leachate Pond

N38 29.211 W81 51.676

ATTACHMENT B

Site Map

DRAWING NUMBER: FIGURE 1

APPALACHIAN POWER CO.

AMOS PLANT
PHOTOGRAPH MAP

WINFIELD 2019 WEST VIRGINIA

AEP AMERICAN ELECTRIC POWER

AEP SERVICE CORP.
1 RIVERSIDE PLAZA
COLUMBUS, OH 43215

PLOT DATE: 9/9/2019
PLOT TIME: 1:38:44 PM
BY: s279452
CROSS REFS:

A (8.5"x11")

4/18