2020 Annual Landfill Inspection Report

Landfill

Mitchell Plant

Kentucky Power Company and Wheeling Power Company

Moundsville, West Virginia

November, 2020

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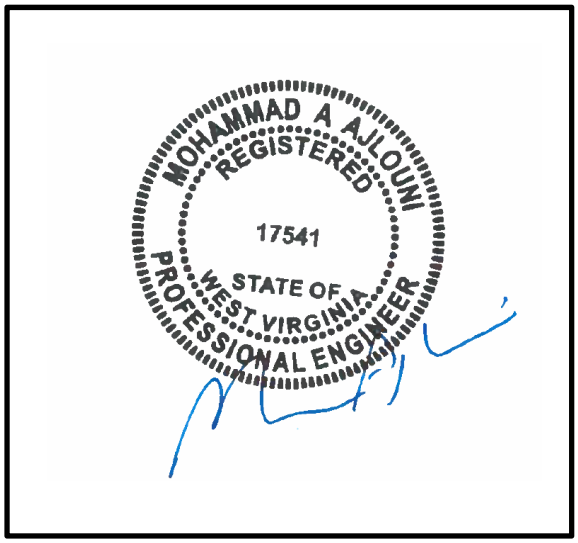

I certify to the best of my knowledge, information and belief the information contained in this report meets the requirements of 40 CFR § 257.84(b).

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1.0 INTRODUCTION

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

Mr. Mohammad Ajlouni, P.E. performed the 2020 inspection of the Landfill at the Mitchell Plant. This report is a summary of the inspection and an assessment of the general condition of the facility. Mrs. Danielle Roski was the Plant contact for the inspection. The inspection was performed on October 14, 2020. Weather conditions were sunny and the temperature was in the upper 70's (°F). There was 0.25 inches of rainfall in the area over the seven days prior to the inspection. Most of the landfill outer slopes had been recently mowed.

2.0 DESCRIPTION OF LANDFILL

The overall features of the landfill were categorized into the following components as a means of organizing the inspection and reporting:

- Active Landfill Disposal Areas (Phases 1, 2 & 3)
- Clay Berm
- Leachate Collection System (Leachate Sump & Lift Station, and Pond)
- Storm Water Control Features (South Pond, South Pond Forebay West and East Pond)

These features, including the approximate limits of each area, are shown on the Figure 1 of Attachment B. Selected photographs taken during the inspection and used to illustrate the visual observations presented in the report are presented in Attachment A. Additional inspection photos can be made available to the Plant upon request.

In general, the Mitchell Landfill is a lined valley fill landfill project with a leachate collection system. At the completion of the project, leachate and runoff will flow to the south end (downhill) of the landfill area. Leachate is then pumped uphill to a detached leachate collection pond on top of an adjacent ridgeline.

Phases 1, 2 and 3 are located near the northern limits of the site and are actively receiving CCR materials. Chimney drains constructed out of bottom ash material were observed inside the Phase 1, 2 and 3 area. These bottom ash chimney drains are connected to the leachate collection system to handle contact water runoff into the landfill area. A temporary clay berm exists immediately to the south of Phase 3.

Leachate collection pipes for Phase 1, Phase 2 and Phase 3 flow by gravity to the south and discharge into a concrete sump. Leachate water is then pumped to the leachate collection pond for recirculation back to the plant.

Non-contact storm water from the north end of the site is directed to the west sedimentation pond. Non-contact storm water from the east end of the site is directed to the east sedimentation pond.

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))

Changes since the 2019 annual inspection include the Phase 3 construction completion, certification and state approval to start the filling operation. Phase 3 is added to the currently active area.

4.2 VOLUME (257.84(b)(2)(ii))

The total volume of CCR material disposed at the landfill through October of 2020 is summarized in the table below. This is based on information from previous annual inspection reports and information received from Mitchell Plant personnel.

CCR Description	CCR Quantities to Mitchell Landfill (tons)							
	2014	2015	2016	2017	2018	2019	2020 [1]	Total
Fly Ash	244,944	114,725	383,522	383,295	298,640	215,250	108,560	1,748,936
Bottom Ash	*	*	31,758*	33,328*	36.165*	21,804*	14,287*	137,342
Soil				3,711	3,968	12,533	5,508	25,720
CPS Cookies			7,818	13,059	7,725	9,716	3,717	42,035
Gypsum	13,278	5,468	11,960	2,630	906	0	1,139	35,381
Combined	258,222	120,193	427,240	419,253	347,404	237,499	133,211	1,871,822

[1] = From January 2020 through October 2020.
* = Bottom ash used for construction and not considered part of disposal quantities.

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, CCR material placement, drainage features, storm water ponds/dams, leachate ponds, open cells, and appurtenances such as chimney drains and underdrains.

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 to the owner upon request. A map depicting the locations of the inspection observations is included in Attachment B.

Phase 1 Area

1. The Phase 1 Area is actively receiving CCR material for disposal. CCR material is dumped, spread out with a dozer and compacted with a smooth drummed roller. Chimney drains consisting of bottom ash piles were observed to be scattered around the Phase 1 area. There was no evidence of standing water, erosion, slope instabilities or uncontrolled seepage. Minor sediments collected in outer ditch north of phase 1 and 2 (Photograph 1).

Phase 2 Area

1. During the inspection, parts of Phase 2 area was actively receiving CCR materials. CCR material is dumped, spread out with a dozer and compacted with a smooth drummed roller.
2. Less than 6-inch deep erosion rills were noted along the northern slope of the temporary cover in the Phase 2 area (Photograph 2). Plant personnel indicated that erosion of this temporary cover is an on-going maintenance issue and usually addressed after rain events. There was no evidence of standing water, slope instabilities or uncontrolled seepage.

Phase 3 Area

1. During the inspection, Phase 3 area was actively receiving CCR material for disposal. CCR material is dumped, spread out with a dozer and compacted with a smooth drummed roller. Greater than 6-inch deep erosion rills were noted along the northern slope of the temporary cover in the Phase 3 area (Photographs 3 through 8).

Clay Berm

1. At the time of inspection, the clay berm south of phases 1 and 2 was recently mowed with good established grass cover. At some areas, the clay was harvested to be used in constructing the phase 3 Berm. At the right edge of the clay berm, there was a location of low freeboard that may cause some of the water in phase 1 to flow towards phase 3 and cause erosion in phase 3 area (photograph 9).
2. There was no evidence of uncontrolled leachate, slope instability or ponding water on the clay berm area.

Leachate Collection System

1. The leachate collection pipes are exposed at the ground surface in the area between the toe of the clay berm and the leachate lift station. There was no evidence of leachate leaking through defects or imperfections in the leachate collection pipes in this area where the pipes were exposed for visual inspection.
2. The leachate lift station was observed to be in good condition. The pumps and backup power generator appeared to be in good working order.
3. The water level in the leachate sump was about 10 feet below the elevation of the overflow structure.

Leachate Collection Pond

1. The water level in the leachate collection pond was approximately El. 1220 feet above mean sea level.
2. The geomembrane liner at the leachate pond appeared to be in good condition, with no evidence of tears, rips, holes or signs of flotation.
3. The overflow pipe at the leachate collection pond was observed to be unobstructed.

4. South edge of Soil nail wall facing downslope of the pond appear to become undermined (Photograph 10).
5. Minor Erosion rill was observed downslope of the pond to the north east (Photograph 11).

South Sedimentation Pond

1. The water level in the south pond was approximately El. 1030 feet above mean sea level.
2. The area of previous sloughing/instability on the east abutment, almost even with the crest of the south sedimentation pond embankment appeared stable with no signs of slope movement or instability.
3. The principal spillway riser appeared unobstructed. The trashrack and anti-vortex plate were in good condition and securely fastened to the riser structure.
4. Some minor vegetation was starting to grow amongst the riprap on the upstream slope of the south pond.
5. The principal spillway outlet was observed to be in good condition. Some brush vegetation was becoming established in the riprap around the principal spillway outlet area.
6. There are two, 12-inch-diameter perforated HDPE underdrain pipes which outlet at the downstream toe of the south pond dam. A section of corrugated plastic pipes had been secured to the HDPE pipes with screws to extend the outlet of these underdrain pipes.
7. Falling tree log on the two pipes referenced above were removed by cutting it and setting it aside (Photograph 12).

West Sedimentation Pond

1. The pool level in the west pond is about 7 feet below the top of the principal spillway riser. The trashrack and anti-vortex plate were in good condition and securely fastened to the principal spillway riser.
2. The grass cover on the downstream slope of the west pond embankment was observed to be in satisfactory conditions.
3. The emergency spillway of the west pond was observed to be unobstructed.
4. It should be noted that the riprap armoring for the west pond emergency spillway does not protect the downstream slope of the embankment, however the height of the embankment in this area does not appear to be more than 5 feet.
5. A surface drainage culvert is extended down the sloping natural ground to the waterline, on the eastern edge of the pond.

East Sedimentation Pond

1. The pool level in the east pond is about 10 feet below the top of the principal spillway riser. The trashrack and anti-vortex plate were in good condition and securely fastened to the principal spillway riser.
2. The grass cover, at areas where there is no riprap, on the downstream slope of the east pond embankment was observed to be in satisfactory conditions.

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 or the operation 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 and the landfill cells, leachate pipes and collection pond, and storm water controls are in good condition. The Plant is performing regular maintenance and inspections as required.

5.2 MAINTENANCE ITEMS

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

1) Continue to repair the erosion rills in the temporary ash cover on the north slope of Phase 2 and 3 areas and outside the landfill footprint after rain events.

2) Periodically remove the vegetation growing in the riprap-lined areas on the upstream slope and downstream toe area of the south pond dam.

3) Continue to perform routine maintenance on the leachate pump system components and remove any debris accumulation (leaf litter, sticks, etc.) as necessary for proper operation of the pumping system.

5.3 ITEMS TO MONITOR

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

1) Continue to the monitor the sediment accumulation in the storm water sedimentation ponds (including the south pond forebay) and plan to periodically remove the sediments as necessary to retain the design storage capacity of the ponds.
2) Communicate with Soil Contractor to evaluate the soil nail wall facing conditions and investigate the need for fix to the undermining issue.

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
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

Photo No. 1 Observation 1: Sediment Accumulation Location: Outer Ditch Phase 1 and 2 Recommendations: Clean ditch.	
Photo No. 2 Observation 2: Minor Erosion Location: East inboard slope of Phase 2 Recommendations: Repair erosion by placement of Bottom ash.	
Photo No. 3 Observation 3: Minor Erosion Location: left edge of East inboard slope of Phase 3. Recommendations: Repair erosion by placement of bottom ash.	

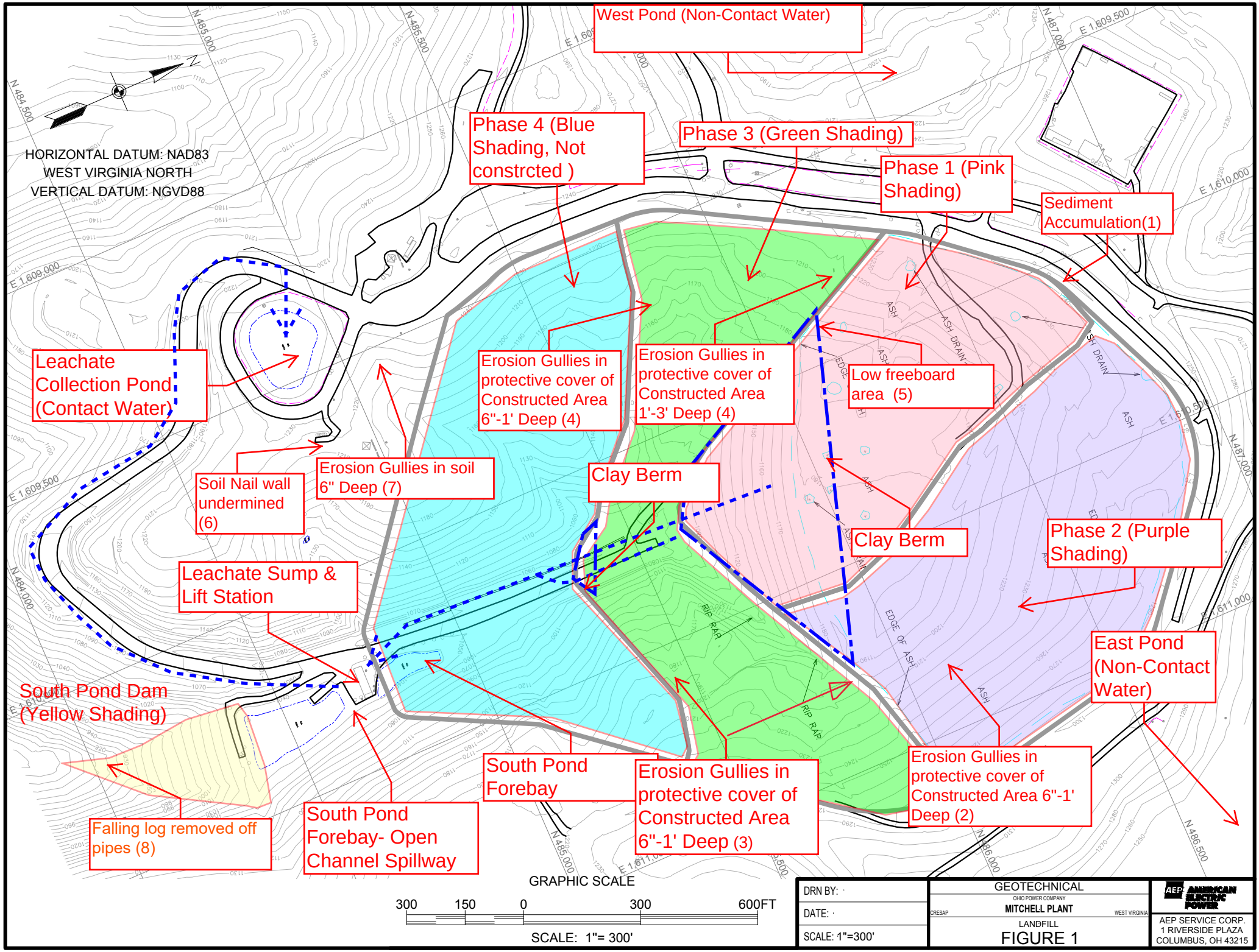
Photo No. 4 Observation 3: Minor Erosion Location: Right edge of East inboard slope of Phase 3 Recommendations: Repair erosion by placement of bottom ash.	
Photo No. 5 Observation 4: Minor Erosion Location: Right edge of East inboard slope of Phase 3. Recommendations: Repair erosion by placement of bottom ash.	
Photo No. 6 Observation 4: Poor Erosion Location: left edge of West inboard slope of Phase 3. Recommendations: Repair erosion by placement of bottom ash.	

Photo No. 7 Observation 4: Poor Erosion Location: left edge of West inboard slope of Phase 3. Recommendations: Repair erosion by placement of Bottom ash/soil.	
Photo No. 8 Observation 4: Minor Erosion Location: East inboard slope of Clear Recommendations: Repair erosion by placement of soil.	
Photo No. 9 Observation 5: Low Freeboard Location: Right side of phase 1/3 clay berm Recommendations: Repair by raising soil barier.	

Photo No. 10 Observation 6 : Soil Nail Facing undermined Location: East inboard slope of Clear Recommendations: Check on construction warranty.	
Photo No. 11 Observation 7: Minor Erosion Location: right of the right ditch outside west side of future Phase 4. Recommendations: Repair erosion by placement of soil.	
Photo No. 12 Observation 8: Falling log removed off pipes Location: downslope of west sediment pond. Recommendations: None.	

ATTACHMENT B

Inspection Map


West Pond (Non-Contact Water)
Phase 4 (Blue Shading, Not constrcted)
Phase 3 (Green Shading)
Phase 1 (Pink Shading)
Sediment Accumulation(1)
HORIZONTAL DATUM: NAD83
WEST VIRGINIA NORTH
VERTICAL DATUM: NGVD88
Leachate Collection Pond (Contact Water)
Erosion Gullies in protective cover of Constructed Area 6"-1' Deep (4)
Erosion Gullies in protective cover of Constructed Area 1'-3' Deep (4)
Low freeboard area (5)
Soil Nail wall undermined (6)
Erosion Gullies in soil 6" Deep (7)
Clay Berm
Clay Berm
Phase 2 (Purple Shading)
Leachate Sump & Lift Station
East Pond (Non-Contact Water)
South Pond Dam (Yellow Shading)
South Pond Forebay
Erosion Gullies in protective cover of Constructed Area 6"-1' Deep (3)
Erosion Gullies in protective cover of Constructed Area 6"-1' Deep (2)
Falling log removed off pipes (8)
South Pond Forebay- Open Channel Spillway
GRAPHIC SCALE
300 150 0 300 600FT
SCALE: 1"= 300'
DRN BY:
DATE:
SCALE: 1"=300'
GEOTECHNICAL
OHIO POWER COMPANY
CRESAP
MITCHELL PLANT
WEST VIRGINIA
LANDFILL
FIGURE 1
AEP SERVICE CORP.
1 RIVERSIDE PLAZA
COLUMBUS, OH 43215