Inspection Report

To:	**Brian Baierl (New Castle Generating Station)**
From:	**Richard Southorn, P.E., P.G.**
Re:	**New Castle Plant Ash Landfill–Annual CCR Unit Inspection Report**
Inspection Date:	**October 22, 2019**
Report Date:	**January 16, 2020**

INTRODUCTION

Title 40 Code of Federal Regulations (CFR) Part 257 addresses, in part, the management of Coal Combustion Residuals (CCR Rule, or Rule) in regulated units, including landfills. Specific to §257.84(b) of the Rule, existing and new CCR landfills must be inspected on an annual basis by a qualified professional engineer. For the New Castle Generating Station (operated by New Castle Power, LLC [formerly NRG or GenOn Power Midwest LP), this inspection requirement applies to the existing New Castle Plant Ash Landfill (Ash Landfill). In support of this obligation, Mr. Richard Southorn (a qualified professional engineer with Aptim Environmental & Infrastructure, LLC [APTIM]) conducted an on-site inspection of the Ash Landfill on October 22, 2019. The findings from this annual inspection are summarized in the remaining sections of this correspondence.

As required, this report will be placed in the New Castle facility's operating record per §257.105(g)(9), noticed to the State Director per §257.106(g)(7), and posted to the publicly accessible internet site per §257.107(g)(7). Placement of the prior annual inspection report into the facility's operating record was accomplished on January 16, 2019. Per §257.84(b)(4), the current report will be entered into the facility's operating record no later than January 16, 2020.

BACKGROUND

The Ash Landfill is situated north of the main generating station. Prior to landfill development in this portion of the property, an impoundment existed (occupying an area of approximately 120 acres) that was used for the disposal of sluiced fly ash and bottom ash; these operations took place from approximately 1939 to 1978. From 1978 to 1984 and following the installation of electrostatic precipitators at the station, "dry" fly ash was disposed on the dewatered impoundment area. Beginning in 1984, CCR materials (including "dry" fly ash and dredged bottom ash) have been placed in this area.

In 1997, the Pennsylvania Department of Environmental Protection (PADEP) issued Solid Waste Permit No. 300818 for the Ash Landfill, addressing Stages 1, 2, and 3A. In April 2008, a permit modification was issued for Stages 4, 5, 6, and 7, which together comprise a vertical expansion of the Ash Landfill over top of the previously PADEP permitted stages.

From 2008 through 2010, approximately 16.8 acres of layover liner system (liner between Stages 4 and underlying Stages 1, 2, and 3A) was placed within Stage 4. Approximately 17.9 acres of final cover cap liner system was installed over the lower landfill slopes (southern and eastern perimeters) in 2008/2009; approximately 11.6 acres installed over Stage 1, 2, and/or 3A beneath the area designated for Stage 5 (not active) in 2010; and approximately 10.2 acres installed over Stage 1, 2, and/or 3A beneath the area designated for Stage 6 (not active) in 2013. Therefore, Stages 1, 2, and 3A were entirely capped and/or closed by 2013 with the layover liner system installation in Stage 4 and final cover cap placement in the areas designated for Stages 5 and 6.

Stage 4 is currently the active disposal area. The currently permitted Ash Landfill occupies an area of approximately 60 acres (see Figure in Attachment 1), and is operated/maintained in accordance with Permit No. 300818.

In June 2016, the New Castle Generating Station successfully completed a natural gas addition project and began operating with this new fuel source (the ability to run on coal has still been maintained). As a result, disposal of CCR materials in the Stage 4 area has been significantly reduced since approximately May 2016. In 2017, intermediate cover was installed over the majority of the previous active face of Stage 4.

With respect to the Ash Landfill, APTIM's evaluation has focused on the following items as outlined in §257.84(b)(1)(i-ii):

- *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; and*
- *A visual inspection of the CCR unit to identify signs of distress or malfunction.*

Specific to APTIM's preparation of the annual inspection report, and per §257.84(b)(2)(i-iv), the following aspects have been addressed:

- *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 unit since the previous annual inspection.*

OPERATING RECORDS REVIEW

Principal items reviewed as part of this year's inspection included, but were not limited to: Design Drawings, 2018/2019 Weekly and Periodic Landfill Inspection Reports that have been completed since the 2018 inspection, 2018 Annual Landfill Operations Report, and Solid Waste Permit No. 300818. During the site inspection, Mr. Southorn interviewed facility personnel (Mr. Brian Baierl) to verify the information contained within the operating record.

Environmental Control System Overview

i. Bottom Liner System

a. The active disposal area overlies the previous disposal areas (Stages 1, 2, and 3A). An over liner consisting of the subbase layer, geosynthetic clay liner, and an engineered 60-mil textured HDPE geomembrane with a geocomposite drainage layer and leachate detection system was installed above Stages 1, 2, and 3A prior to placement of CCR materials in Stage 4. The top of Stages 1, 2, and 3A that was beneath the designated areas of Stages 5 and 6 was capped using two feet of final cover soil with vegetative cover; double-sided bonded geocomposite consisting of 220-mil geonet and 6 oz. geonet drainage layer; a 40-mil textured HDPE flexible membrane liner; and compacted subgrade.

ii. Leachate Collection System

a. An underdrain system is used to collect leachate from the Ash Landfill; leachate collected in the underdrain system is routed to the Leachate Pond via dedicated perimeter ditches. From the Leachate Pond, the flows are discharged to the Beaver River via Outfall 009 in accordance with the New Castle Station's National Pollutant Discharge Elimination System (NPDES) Permit. There is a leachate leak detection system in place, located beneath the over liner.

iii. Stormwater Management

a. "Non-contact" stormwater and surface water is drained downslope. The slopes drain to perimeter stormwater ditches (separate from the leachate ditches) which convey the water to a Sedimentation Pond. From this pond, the waters are discharged to the Beaver River via NPDES-permitted Outfall 006.

b. "Contact" stormwater from within the active disposal area is collected in the leachate underdrain system and routed to the Leachate Pond as described above.

iv. Cover System

a. All perimeter slopes, as well as the plateaus of Stages 5 and 6, have a final cover installed and established vegetation where final cover is present.

b. The majority of Stage 4 has intermediate cover installed.

Summary of Landfill Construction

i. No construction activity was completed in 2019 other than routine maintenance activities.

ii. The active disposal area (Stage 4) received approximately 1 ton of CCR materials in 2019. As a result, the geometry of Stage 4 has not been significantly modified.

Review of Prior Inspections

i. Weekly inspections: A review of weekly inspections has concluded that no significant deficiencies occurred at the facility that required remedial actions. Animal burrows are occasionally noted on inspection reports, but are addressed through backfilling in a timely manner.

ii. Annual inspections: A review of the previous annual inspection report has determined that there were no deficiencies or releases, actual or potential structural weaknesses, or concern to the stability of the land form. All environmental control systems were in good operating condition and functioning as intended.

CCR Disposal

i. Based on review of the 2018 Annual Landfill Operations Report and disposal quantities provided by Station personnel, the total in-place disposal quantity of CCR materials is estimated at approximately 1,378,458 tons (1,378,457 tons at end of year 2018 plus 1 ton in 2019).

SITE INSPECTION

The site inspection was performed on October 22, 2019 by Mr. Southorn, and during which time efforts were focused on identification of standard geotechnical signs of distress or malfunction. Specific aspects such as slumping at the toe of slope, tensile cracking, abnormal or excessive erosion on the side slopes, slope bulging, groundwater/surface water seepage or ponding were assessed. If present, these readily visible signs are potential indicators of structural weakness of the CCR Landfill unit.

Visual Signs of Distress or Malfunction

No visual signs of distress or malfunction were observed during the inspection. Stormwater drainage features, slope appearance and stability, leachate conveyance mechanisms, and overall site conditions were assessed. Capped portions of the Ash Landfill exhibited well established vegetative cover. The vegetation on intermediate cover of Stage 4 appears healthy with full coverage.

Review of Environmental Control Systems

With no evidence to the contrary, the bottom liner system at the active Stage 4 disposal area is believed to be in good operating condition and functioning as intended. At the time of the inspection, leachate and stormwater conveyance systems were operating as designed. A leachate leak detection pipe was reviewed during the inspection and was not flowing, indicating that the bottom liner system is not leaking.

Review of Previously Recommended Actions

2018 Inspection Recommendation No. 1: Continue to fill any animal burrows or holes observed during weekly inspections to prevent instability.

2019 Finding: Animal burrows are being identified during weekly inspections and being filled as appropriate.

2018 Inspection Recommendation No. 2: Ensure adequate access to the closed portions of the landfill to maintain the ability to perform weekly visual site structural inspections.

2019 Finding: The closed portion is accessible. Weekly site structural inspections have been completed appropriately.

2018 Inspection Recommendation No. 3: Continue operations and maintenance of stormwater drainage features and leachate collection systems.

2019 Finding: All stormwater drainage features, leachate discharge pipes, and conveyance channels were free of obstruction and functioning as intended.

CONCLUSIONS

Changes in geometry

During the previous annual inspection, CCR materials were being placed within the active disposal area at approximate elevations ranging between 829 and 840 feet mean sea level. No significant changes have been made to the geometry of the Ash Landfill site since the previous annual inspection.

In-Place CCR Disposal Quantities

As previously the total in-place disposal quantity of CCR materials is estimated at approximately 1,378,458 tons (1,378,457 tons at end of year 2018 plus 1 ton in 2019).

Appearances of an Actual or Potential Structural Weakness of CCR Unit

At the time of inspection, there were no signs of distress or malfunction that would indicate actual or potential structural weakness at the Ash Landfill.

Changes that may affect the stability or operation of the CCR Unit

There have been no changes to the Ash Landfill area that pose a threat or concern to the stability of the land form.

RECOMMENDATIONS

1. Continue to fill any animal burrows or holes observed during weekly inspections to prevent instability.

2. Ensure adequate access to the closed portions of the landfill to maintain the ability to perform weekly visual site structural inspections.

3. Continue operations and maintenance of stormwater drainage features and leachate collection systems.

There were no deficiencies or releases identified during the annual inspection that required the owner or operator to perform corrective actions as required under §257.84(b)(5).

PROFESSIONAL ENGINEER'S CERTIFICATION

In accordance with §257.84(b) of the Rule, I hereby certify based on a review of available information within the facility's operating records and observations from my personal on-site inspection (including the photographs contained in Attachment 2), that the New Castle Plant Ash Landfill does not exhibit any appearances of actual/potential structural weakness that would be disruptive to the normal operations of the CCR Unit. The unit is being operated and maintained consistent with recognized and generally accepted good engineering standards and practices.

Certified by: _____

Date: JAN 16, 2020

Richard Southorn, P.E., P.G.

Professional Engineer Registration No. PE085411

Aptim Environmental & Infrastructure, LLC

ATTACHMENTS

1. Site Map
2. Inspection Photo Log

REFERENCES

1. Application for Major Permit Modification and Permit Renewal, New Castle Plant Ash Landfill, April 2007 (including subsequent revisions).
2. PADEP Solid Waste Permit 300818, New Castle Plant Ash Landfill, April 23, 2008.
3. 2018 New Castle Generating Station Annual Landfill Operations Report.
4. Landfill Periodic Inspection Reports, November 2018 - October 2019.
5. 40 Code of Federal Regulations, Part 257.

Attachment 1

Site Map

LEGEND

2019 ANNUAL INSPECTION PHOTOGRAPH
(ARROW DENOTES DIRECTION OF VIEW)

REV. NO.	DATE	DESCRIPTION

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NEW CASTLE GENERATING STATION
WEST PITTSBURG, PENNSYLVANIA

PHOTOGRAPH LOCATION MAP

DRAWN BY:	APPROVED BY:	PROJ. NO.:	DATE:
BWM	RDS	631003785	JANUARY 2020

Attachment 2

Photo Log

Image: 3707 Date: 10/22/2019 Time: 8:34 AM Direction: North Description: Non-contact stormwater downchute. Clear of obstructions. Revetment is in good condition. Functioning as intended.	

Image: 3709 Date: 10/22/2019 Time: 8:35 AM Direction: Southwest Description: Minor ponding of water behind downchute. Ponding occurs over revetment lined area (Photograph taken during rainstorm).	

Image: 3711 Date: 10/22/2019 Time: 8:36 AM Direction: South Description: Non-contact stormwater downchute is clear of obstructions. Gabion energy dissipator is installed at the junction with the stormwater (non-contact water) perimeter ditch.	

Image: 3713 Date: 10/22/2019 Time: 8:37 AM Direction: West Description: Final cover sideslopes and terrace berm. Good condition, no evidence of animal burrows, erosion, or sloughing. Photograph shows area where minor erosion had been repaired in 2018. Repair location has become fully vegetated and appears stable.	

Image: 3715 Date: 10/22/2019 Time: 8:39 AM Direction: Northwest Description: Stage 6 final cover. Vegetation is healthy and well maintained. No evidence of animal burrows, erosion, or stability.	

Image: 3719 Date: 10/22/2019 Time: 8:39 AM Direction: West Description: Stage 6 final cover and transition slope to Stage 4. Vegetation is healthy and well maintained. No evidence of animal burrows, erosion, or stability.	

Image: 3721 Date: 10/22/2019 Time: 8:40 AM Direction: South Description: Stage 6 final cover (left) and transition slope to Stage 4 (right). Vegetation is healthy and well maintained. No evidence of animal burrows, erosion, or stability.	

Image: 3723 Date: 10/22/2019 Time: 8:40 AM Direction: West Description: Stage 4 leachate cleanout access.	

Image: 3727 Date: 10/22/2019 Time: 8:42 AM Direction: East Description: Stage 5 final cover. Vegetation is healthy and well maintained. No evidence of animal burrows, erosion, or stability.	

Image: 3729 Date: 10/22/2019 Time: 8:43 AM Direction: Northeast Description: Stage 5 final cover. Vegetation is healthy and well maintained. No evidence of animal burrows, erosion, or stability.	

Image: 3731 Date: 10/22/2019 Time: 8:43 AM Direction: East Description: Stage 5 final cover. Vegetation is healthy and well maintained. No evidence of animal burrows, erosion, or stability.	

Image: 3733 Date: 10/22/2019 Time: 8:44 AM Direction: West Description: Stage 5 final cover. Vegetation is healthy and well maintained. No evidence of animal burrows, erosion, or stability.	

Image: 3735 Date: 10/22/2019 Time: 8:44 AM Direction: East Description: Stage 5 final cover. Vegetation is healthy and well maintained. No evidence of animal burrows, erosion, or stability.	

Image: 3737 Date: 10/22/2019 Time: 8:45 AM Direction: Northeast Description: Stage 5 final cover. Vegetation is healthy and well maintained. No evidence of animal burrows, erosion, or stability.	

Image: 3739 Date: 10/22/2019 Time: 8:46 AM Direction: Southeast Description: Stage 6 final cover. Vegetation is healthy and well maintained. No evidence of animal burrows, erosion, or stability.	

Image: 3741 Date: 10/22/2019 Time: 8:47 AM Direction: Southeast Description: Stage 6 final cover. Vegetation is healthy and well maintained. No evidence of animal burrows, erosion, or stability. Stormwater Control Berm can be seen along limits of landfill terrace.	

Image: 3743 Date: 10/22/2019 Time: 8:47 AM Direction: North Description: Stage 6 Stormwater Control Berm used to direct stormwater to downchutes (letdown channels).	

Image: 3745 Date: 10/22/2019 Time: 8:47 AM Direction: North Description: Stage 6 final cover on sideslopes. Vegetation is healthy and well maintained. No evidence of animal burrows, erosion, or stability.	

Image: 3747 Date: 10/22/2019 Time: 8:48 AM Direction: South Description: Stage 6 final cover on sideslopes. Vegetation is healthy and well maintained. No evidence of animal burrows, erosion, or stability.	

Image: 3749 Date: 10/22/2019 Time: 8:49 AM Direction: South Description: Non-contact stormwater downchute is clear of obstructions. Gabion energy dissipator is installed at the junction with the stormwater (non-contact water) perimeter ditch.	

Image: 3751 Date: 10/22/2019 Time: 8:50 AM Direction: Southeast Description: Stage 4 intermediate cover. Vegetation is sufficient to prevent fugitive dust emissions and minimize the potential for erosion.	

Image: 3753 Date: 10/22/2019 Time: 8:51 AM Direction: East Description: Stage 4 intermediate cover. Vegetation is well established.	

Image: 3755 Date: 10/22/2019 Time: 8:51 AM Direction: Southeast Description: Stage 4 intermediate cover. Vegetation is well established.	

Image: 3757 Date: 10/22/2019 Time: 8:52 AM Direction: Northwest Description: Stage 4 active area. Well graded and compacted. Some ponding is occurring during rainstorm; this water will be treated as contact water.	

Image: 3759 Date: 10/22/2019 Time: 8:53 AM Direction: North Description: Vertical leachate riser within active area. The ground is sloped to drain into this riser, with contact water treated as leachate. Some ponding is occurring during rainstorm; this water will be treated as contact water.	

Image: 3761 Date: 10/22/2019 Time: 8:56 AM Direction: North Description: Final cover on the sideslopes of Stage 4. Final cover vegetation is healthy and well established. No stability concerns evident.	

Image: 3763 Date: 10/22/2019 Time: 8:57 AM Direction: South Description: Final cover and terrace on the sideslopes of Stage 4. Final cover vegetation is healthy and well established. No stability concerns evident. Terrace shows no indication of washout or evidence of erosive flow.	

Image: 3765 Date: 10/22/2019 Time: 8:57 AM Direction: North Description: Final cover on the sideslopes of Stage 4. Final cover vegetation is healthy and well established. No stability concerns evident.	

Image: 3767 Date: 10/22/2019 Time: 8:58 AM Direction: Northeast Description: Stage 4 intermediate cover. Vegetation is well established.	

Image: 3769 Date: 10/22/2019 Time: 8:58 AM Direction: Southeast Description: Stage 4 active area. Well graded and compacted. Some ponding is occurring during rainstorm; this water will be treated as contact water.	

Image: 3775 Date: 10/22/2019 Time: 9:02 AM Direction: West Description: Non-contact stormwater ditch along Stage 6 is free of obstructions and does not exhibit scour or erosion issues.	

Image: 3777 Date: 10/22/2019 Time: 9:03 AM Direction: North Description: Final cover on the sideslopes of Stage 6. Final cover vegetation is healthy and well established. No stability concerns evident.	

Image: 3779 Date: 10/22/2019 Time: 9:04 AM Direction: Northwest Description: Final cover on the sideslopes of Stage 6. Final cover vegetation is healthy and well established. No stability concerns evident.	

Image: 3781 Date: 10/22/2019 Time: 9:05 AM Direction: North Description: Non-contact stormwater ditch along Stage 6 is free of obstructions and does not exhibit scour or erosion issues. No stability issues are noted along the sideslope or toe of slope (sloughing, bulging, etc).	

Image: 3783 Date: 10/22/2019 Time: 9:05 AM Direction: Southwest Description: Final cover on the sideslopes of Stage 6. Final cover vegetation is healthy and well established. No stability concerns evident. Non-contact stormwater ditch along Stage 6 is free of obstructions and does not exhibit scour or erosion issues.	

Image: 3785 Date: 10/22/2019 Time: 9:06 AM Direction: West Description: Final cover on the sideslopes of Stage 6. Final cover vegetation is healthy and well established. No stability concerns evident. No stability issues are noted along the sideslope or toe of slope (sloughing, bulging, etc).	

Image: 3787 Date: 10/22/2019 Time: 9:07 AM Direction: Northwest Description: Non-contact stormwater ditch along Stage 5 is free of obstructions and does not exhibit scour or erosion issues. No stability issues are noted along the sideslope or toe of slope (sloughing, bulging, etc).	

Image: 3791 Date: 10/22/2019 Time: 9:08 AM Direction: West Description: Non-contact stormwater ditch along Stage 5 is free of obstructions and does not exhibit scour or erosion issues. No stability issues are noted along the sideslope or toe of slope (sloughing, bulging, etc).	

Image: 3793 Date: 10/22/2019 Time: 9:09 AM Direction: South Description: Non-contact stormwater downchute. Clear of obstructions. Revetment is in good condition. Functioning as intended.	

Image: 3795 Date: 10/22/2019 Time: 9:10 AM Direction: West Description: Non-contact stormwater ditch along Stage 5 is free of obstructions and does not exhibit scour or erosion issues. No stability issues are noted along the sideslope or toe of slope (sloughing, bulging, etc).	

Image: 3797 Date: 10/22/2019 Time: 9:10 AM Direction: East Description: Vegetation is well established. No stability issues are noted along the sideslope or toe of slope (sloughing, bulging, etc).	

Image: 3799 Date: 10/22/2019 Time: 9:10 AM Direction: West Description: Vegetation is well established. No stability issues are noted along the sideslope or toe of slope (sloughing, bulging, etc).	

Image: 3801 Date: 10/22/2019 Time: 9:11 AM Direction: South Description: Vegetation is well established. No stability issues are noted along the sideslope or toe of slope (sloughing, bulging, etc).	

Image: 3803 Date: 10/22/2019 Time: 9:12 AM Direction: South Description: Non-contact stormwater downchute. Clear of obstructions. Revetment is in good condition. Functioning as intended.	

Image: 3805 Date: 10/22/2019 Time: 9:13 AM Direction: East Description: Non-contact stormwater ditch along Stage 5 is free of obstructions and does not exhibit scour or erosion issues.	

Image: 3807 Date: 10/22/2019 Time: 9:13 AM Direction: Southeast Description: Stormwater ditch is in good working order.	

Image: 3809 Date: 10/22/2019 Time: 9:14 AM Direction: Southwest Description: Leachate Pond	

Image: 3815 Date: 10/22/2019 Time: 9:18 AM Direction: East Description: Non-contact stormwater downchute. Clear of obstructions. Revetment is in good condition. Functioning as intended	

Image: 3819 Date: 10/22/2019 Time: 9:19 AM Direction: East Description: Leachate pipe (on left) discharging into contact water ditch, which ultimately flows to Leachate Pond. Leak detection pipe (on right) which was not flowing, demonstrating that the liner is not leaking. Ditch is clear of obstructions.	

Image: 3823 Date: 10/22/2019 Time: 9:21 AM Direction: East Description: Non-contact stormwater downchute into non-contact water ditch. A gabion basket energy dissipator reduces energy from stormwater as it enters the ditch (shown in foreground).	

Image: 3825 Date: 10/22/2019 Time: 9:22 AM Direction: North Description: Non-contact stormwater ditch along Stage 4 is free of obstructions and does not exhibit scour or erosion issues.	

Image: 3827 Date: 10/22/2019 Time: 9:22 AM Direction: North Description: Final Cover on Stage 4 sideslopes is in good condition with no evidence of damage from erosion, animals, or sloughing or stability issues.	

Image: 3829 Date: 10/22/2019 Time: 9:22 AM Direction: Southeast Description: Final Cover on Stage 4 sideslopes is in good condition with no evidence of damage from erosion, animals, or sloughing or stability issues.	

Image: 3831 Date: 10/22/2019 Time: 9:24 AM Direction: North Description: Non-contact stormwater ditch at corner of landfill. Ditch is in good condition, well lined with vegetation, and does not have any noted obstructions.	

Image: 3833 Date: 10/22/2019 Time: 9:24 AM Direction: Northeast Description: Non-contact stormwater downchute is free of obstructions and in good condition.	

Image: 3835 Date: 10/22/2019 Time: 9:24 AM Direction: East Description: Non-contact stormwater ditch at corner of landfill. Ditch is in good condition, well lined with vegetation, and does not have any noted obstructions.