Inspection Report

To:	**Bill McGraw (Cheswick Generating Station)**
From:	**Richard Southorn, P.E., P.G.**
Re:	**Cheswick Ash Disposal Site – Annual CCR Unit Inspection Report**
Inspection Date:	**October 22, 2018**
Report Date:	**January 16, 2019**

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 Cheswick Generating Station (operated by NRG Power Midwest LP), this inspection requirement applies to the existing Cheswick Ash Disposal Site (Ash Disposal Site). In support of this obligation, Mr. Richard Southorn (a qualified professional engineer with Aptim Environmental & Infrastructure, Inc. [APTIM]) conducted an on-site inspection of the Ash Disposal Site on October 22, 2018. The findings from this annual inspection are summarized in the remaining sections of this correspondence.

As required, this report will be placed in the Cheswick 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 18, 2018. Per §257.84(b)(4), the current report will be entered into the facility's operating record no later than January 18, 2019.

BACKGROUND

The Ash Disposal Site is a captive landfill used for the disposal of CCR materials and other Pennsylvania residual wastes generated at the Cheswick Station, and is operated/maintained in accordance with Pennsylvania Department of Environmental Protection (PADEP) Solid Waste Permit No. 300720. Active operations are ongoing in the South Valley (Phase I; 51 acres), while the North Valley (Phase II; 31 acres) remains as an unpermitted potential future phase within the Solid Waste Permit boundary. If ever constructed, the North Valley would be considered a new CCR Landfill per the Rule.

Construction of the South Valley commenced in 1980 and disposal of CCR materials began in 1982. When ultimate development conditions are reached, the final upper surface elevation of South Valley will be at approximately 1,200 feet mean sea level (ft. MSL). The active fill area is generally level and is estimated to be at approximate average elevation 1106 ft. MSL, based on observed filling conditions at the time of inspection.

With respect to the Ash Disposal Site, 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, 2017/2018 Weekly and Periodic Landfill Inspection Reports that have been completed since the 2017 Inspection, 2017 Annual Landfill Operations Report, and Solid Waste Permit No. 300720. During the site inspection, Mr. Southorn interviewed facility personnel (Mr. Joshua Simon) to verify the information contained within the operating record.

Environmental Control System Overview

i. Leachate Collection System

   a. The South Valley disposal area has a gravity underdrain system. This system consists of a below-grade piping network that facilitates leachate conveyance ultimately for treatment at the Monarch Mine Dewatering Plant (MMDP). Treated effluent from the MMDP is discharged to Little Deer Creek via Outfall 002 in accordance with the Cheswick Station's National Pollutant Discharge Elimination System (NPDES) Permit.

ii. Stormwater Management

   a. "Non-contact" stormwater from the South Valley disposal area is routed (via NPDES-permitted perimeter drainage channels) to the sedimentation pond located at the base of the landfill.

   b. "Contact" stormwater from within the active disposal area is collected in the leachate underdrain system and routed for treatment in the MMDP as described above.

iii. Cover System

a. The eastern slope and portions of the northern and southern slopes of South Valley have final cover and established vegetation. The final cover system on the slopes includes benches to dissipate energy build-up and reduce erosion from stormwater run-off.

Summary of Landfill Construction

As previously noted, the active fill area is generally level and is estimated to be at approximate average elevation 1106 ft. MSL, based on observed filling conditions at the time of inspection. Exterior slopes have a final cover in place along with well-established and properly maintained vegetation.

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.

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

According to the 2017 Cheswick Generating Station Annual Landfill Operations Report, approximately 3,063,462 tons of CCR had been disposed in the landfill through December 2017. Approximately 128,493 tons of CCR were disposed in 2018, resulting in a total disposed volume of 3,191,955 tons of CCR.

SITE INSPECTION

The site inspection was performed on October 22, 2018 by Mr. Southorn, 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, and 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. Closed portions of the South Valley exhibited well established vegetative cover.

Review of Environmental Control Systems

With no evidence to the contrary, the environmental control systems at South Valley are 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.

Review of Previously Recommended Actions

No corrective actions were required based on the findings of the 2017 Annual Inspection. Recommendations were limited to the continued operation and maintenance of the facility and maintaining access to closed portions of the landfill for inspection purposes. These recommendations were found to have been followed, based on site conditions and the review of weekly inspection logs.

CONCLUSIONS

Changes in Geometry

CCR material placement has progressed in the active disposal area throughout this year. As of the date of the inspection, fill elevations in the active disposal area were at approximately 1106 ft. MSL. Changes in geometry are limited to the elevation increase of the active disposal area.

In-Place CCR Disposal Quantities

According to the 2017 Cheswick Generating Station Annual Landfill Operations Report, approximately 3,063,462 tons of CCR had been disposed in the landfill through December 2017. Approximately 128,493 tons of CCR were disposed in 2018, resulting in a total disposed volume of 3,191,955 tons of CCR.

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 South Valley.

Changes that May Affect the Stability or Operation of the CCR Unit

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

RECOMMENDATIONS

1. Continue operation and maintenance in the active areas as currently performed.

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

There were no deficiencies or releases identified during the 2018 annual inspection that required the owner or operator to perform corrective actions per §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 Cheswick Ash Disposal Site does not exhibit any appearances of actual/potential structural weakness that would be disruptive to the normal operations of the South Valley CCR Unit. The unit is being operated and maintained consistent with recognized and generally accepted good engineering standards and practices.

Certified by: RICHARD SOUTHORN

Date: JAN 16, 2019



1/16/19

LICENSE EXPIRES 9/30/19

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

Professional Engineer Registration PE085411

Aptim Environmental & Infrastructure, Inc.

ATTACHMENTS

1. Site Map
2. Inspection Photo Log

REFERENCES

1. 2017 Cheswick Generating Station Annual Landfill Operations Report.
2. Weekly and Periodic Landfill Inspection Reports 2017/2018.
3. 40 Code of Federal Regulations, Part 257.

Attachment 1

Site Map



REV. NO.	DATE	DESCRIPTION

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CHESWICK GENERATING STATION
SPRINGDALE, PENNSYLVANIA

PHOTOGRAPH LOCATION MAP

DRAWN BY:	APPROVED BY:	PROJ. NO.:	DATE:
BWM	RDS	1009134004	DECEMBER 2018

T:\AutoCAD\Projects\NRG\CCR-Annual Inspections\2018\Cheswick-PA.dwg, 11x17, 12/12/2018 8:38:10 AM

Attachment 2

Photo Log

Project: Cheswick 2018 Annual Inspection
Photographer: Richard Southorn

Image: 2394 Date: 10/22/2018 Time: 10:40 AM Direction: Southwest Description: A non-contact water (stormwater) non-perforated riser will be extended to final cover elevation and will accept stormwater after final cover is in place.	

Image: 2396 Date: 10/22/2018 Time: 10:41 AM Direction: West Description: Non-contact stormwater pipe along western sideslope. No evidence of erosion of sloughing. Active area is shown in foreground (spread and compacted bottom ash).	

Project: Cheswick 2018 Annual Inspection
Photographer: Richard Southorn

Image: 2398 Date: 10/22/2018 Time: 10:42 AM Direction: Southeast Description: The active area is well maintained with no ponding water. CCR material is spread and rolled shortly after being received.	

Image: 2400 Date: 10/22/2018 Time: 10:43 AM Direction: Northeast Description: A perforated contact-water (leachate) riser is shown in foreground. This riser is wrapped in filter fabric and surrounded with bottom ash. A non-contact water (stormwater) non-perforated riser is shown in the background. This riser will be extended to final cover elevation and will accept stormwater after final cover is in place.	

Image: 2402 Date: 10/22/2018 Time: 10:46 AM Direction: North Description: The active area is well maintained with no ponding water. CCR material is spread and rolled shortly after being received.	

Image: 2404 Date: 10/22/2018 Time: 10:46 AM Direction: West Description: Active area. Well maintained, no ponding water. Material is placed in even lifts that are spread and compacted.	

Image: 2406 Date: 10/22/2018 Time: 10:47 AM Direction: Northwest Description: Staking has been placed to represent the location and final target CCR elevation for the next terrace bench. Once final CCR material grades are achieved, final cover will be installed.	

Image: 2408 Date: 10/22/2018 Time: 10:47 AM Direction: North Description: Sideslope near active face. Vegetation is healthy and present across the entire sideslope. No evidence of erosion, sloughing, or indications of stability issues.	

Project: Cheswick 2018 Annual Inspection
Photographer: Richard Southorn

Image: 2410 Date: 10/22/2018 Time: 10:48 AM Direction: East Description: Vegetation on sideslope looking downslope. Vegetation is well established. No evidence of erosion or sloughing.	

Image: 2412 Date: 10/22/2018 Time: 10:48 AM Direction: Southeast Description: Vegetation on sideslope. Vegetation is well established. No evidence of erosion or sloughing.	

Image: 2416 Date: 10/22/2018 Time: 10:48 AM Direction: Northwest Description: Typical slope terrace. Terraces are well maintained with no evidence of sloughing or erosion. Vegetation is healthy.	

Image: 2418 Date: 10/22/2018 Time: 10:50 AM Direction: Southeast Description: Vegetation is healthy and present across the entire sideslope. No evidence of erosion, sloughing, or indications of stability issues.	

Project: Cheswick 2018 Annual Inspection
Photographer: Richard Southorn

Image: 2420 Date: 10/22/2018 Time: 10:51 AM Direction: Northwest Description: Vegetation is healthy and present across the entire sideslope. No evidence of erosion, sloughing, or indications of stability issues.	

Image: 2422 Date: 10/22/2018 Time: 10:51 AM Direction: Northeast Description: Vegetation is healthy and present across the entire sideslope. No evidence of erosion, sloughing, or indications of stability issues.	

Project: Cheswick 2018 Annual Inspection
Photographer: Richard Southorn

Image: 2424 Date: 10/22/2018 Time: 10:53 AM Direction: Southwest Description: Bottom Ash in active disposal area prior to speading and compacting.	

Image: 2426 Date: 10/22/2018 Time: 10:55 AM Direction: South Description: Active area with leachate collection riser in background. The active area is sloped to this low point to prevent run-off.	

Image: 2428 Date: 10/22/2018 Time: 10:56 AM Direction: Northeast Description: Typical healthy vegetation on sideslopes. No evidence of erosion or sloughing.	

Image: 2430 Date: 10/22/2018 Time: 10:57 AM Direction: East Description: South non-contact water channel. Free of debris and functioning as intended.	

Project: Cheswick 2018 Annual Inspection
Photographer: Richard Southorn

Image: 2434 Date: 10/22/2018 Time: 11:11 AM Direction: Southwest Description: Landfill sideslopes and sedimentation pond area. Well maintained.	

Image: 2436 Date: 10/22/2018 Time: 11:12 AM Direction: Southwest Description: Sedimentation Pond Spillway. Clear of debris. No cracking or evidence of structural damage.	

Project: Cheswick 2018 Annual Inspection
Photographer: Richard Southorn

Image: 2438 Date: 10/22/2018 Time: 11:13 AM Direction: Southwest Description: Security fence around Sedimentation Pond.	

Image: 2440 Date: 10/22/2018 Time: 11:14 AM Direction: South Description: Sedimentation Pond. Healthy vegetation on pond sideslopes. No trash or debris noted on water surface or in surrounding vegetation.	

Image: 2442 Date: 10/22/2018 Time: 11:14 AM Direction: West Description: North non-contact water channel inlet to Sedimentation Pond looking upslope. Clear of debris. Functioning as intended.	

Image: 2444 Date: 10/22/2018 Time: 11:15 AM Direction: East Description: North non-contact water channel inlet to Sedimentation Pond looking downslope. Clear of debris. Functioning as intended.	

Project: Cheswick 2018 Annual Inspection
Photographer: Richard Southorn

Image: 2448 Date: 10/22/2018 Time: 11:17 AM Direction: East Description: Leachate pumphouse installed in 2017. Leachate is directed to the Monarch Mine Dewatering Plant.	