



Inspection Report

To: Jill Buckley (Cheswick Generating Station)
From: Richard Southorn, P.E., P.G., CPSWQ
Re: Cheswick Ash Disposal Site – Annual CCR Unit Inspection Report
Inspection Date: October 17, 2017
Report Date: January 16, 2018

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 17, 2017. 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, 2017. Per §257.84(b)(4), the current report will be entered into the facility's operating record no later than January 18, 2018.

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 elevation 1120 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, 2016/2017 Weekly and Periodic Landfill Inspection Reports that have been completed since the 2016 Inspection (November 18, 2016), 2016 Annual Landfill Operations Report, and Solid Waste Permit No. 300720. During the site inspection, Mr. Southorn interviewed facility personnel (Ms. Jill Buckley) 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 elevation 1120 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

At the time of the annual inspection in November 2016, the in-place disposal estimate was approximately 2,959,818 tons. Approximately 103,644 tons have been disposed since that time. Therefore, the total in-place disposal quantity at the time of this year's inspection is estimated to be approximately 3,063,462 tons.

SITE INSPECTION

The site inspection was performed on October 17, 2017 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 2016 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, peak fill elevations in the active disposal area were at approximately 1120 ft. MSL. Changes in geometry are limited to the elevation increase of the active disposal area.

In-Place CCR Disposal Quantities

At the time of the previous annual inspection in November 2016, the in-place disposal estimate was approximately 2,959,818 tons. Approximately 103,644 tons have been disposed since that time. Therefore, the total in-place disposal quantity at the time of this year's inspection is estimated to be approximately 3,063,462 tons.

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.

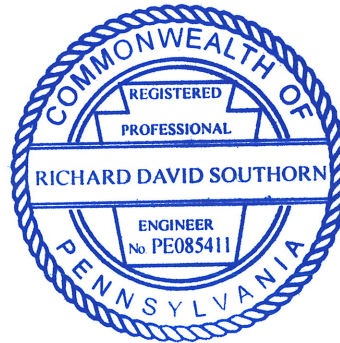
There were no deficiencies or releases identified during the 2017 annual inspection that required the owner or operator to perform corrective actions per §257.84(b)(5).

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, 2018

Richard Southorn, P.E., P.G., CPSWQ
Professional Engineer Registration PE085411
Aptim Environmental & Infrastructure, Inc.



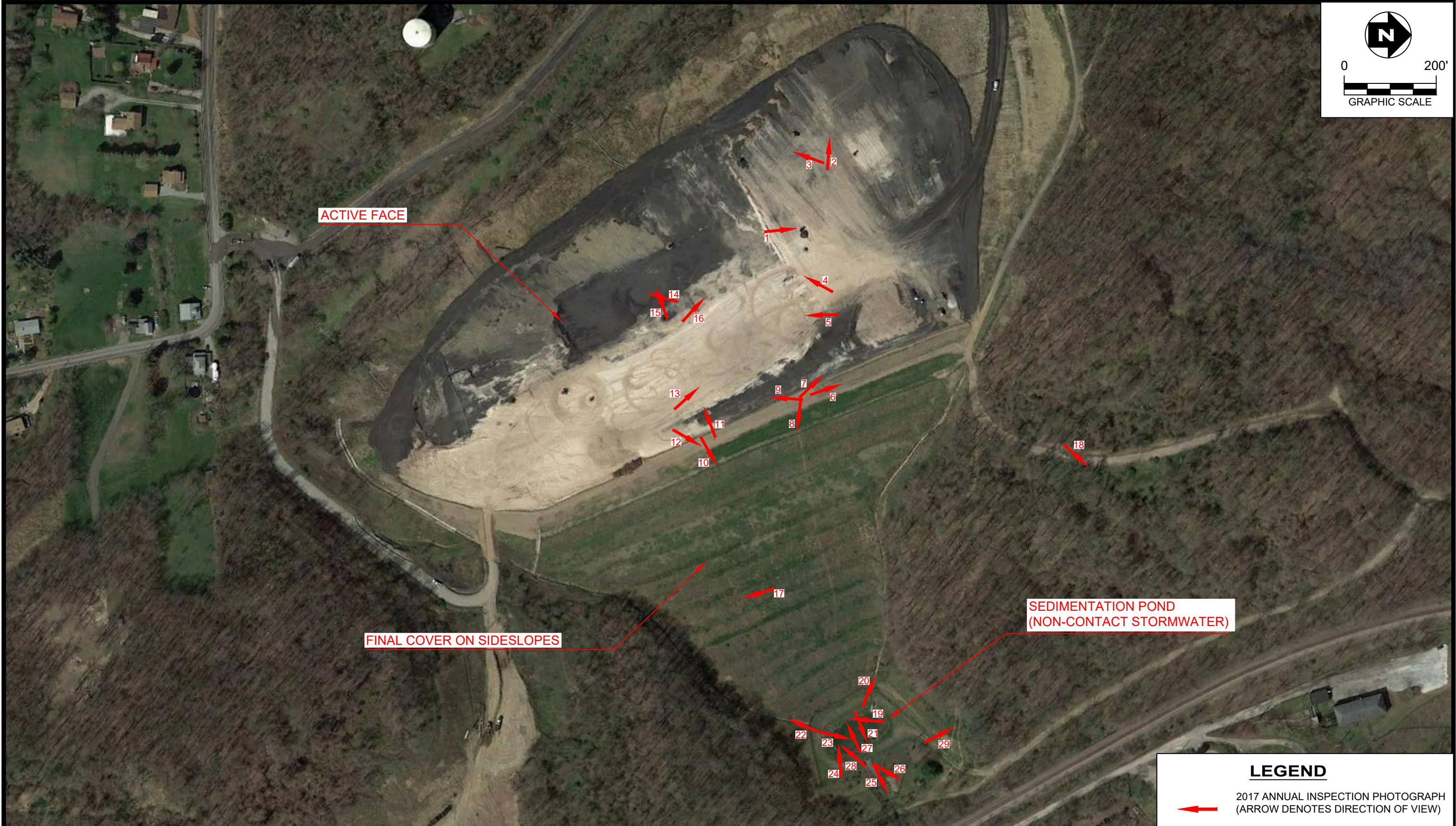
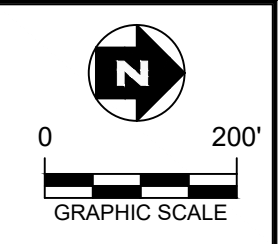
ATTACHMENTS

1. Site Map
2. Inspection Photo Log

REFERENCES

1. 2016 Cheswick Generating Station Annual Landfill Operations Report.
2. Weekly and Periodic Landfill Inspection Reports 2016/2017.
3. 40 Code of Federal Regulations Part 257.

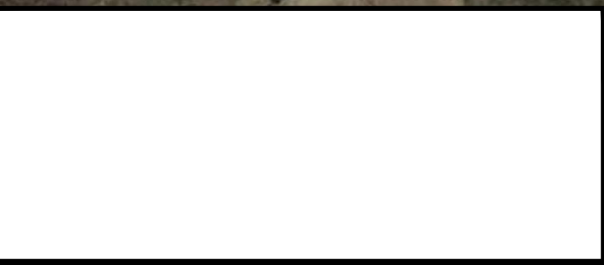

Attachment 1
Site Map



LEGEND

← 2017 ANNUAL INSPECTION PHOTOGRAPH (ARROW DENOTES DIRECTION OF VIEW)

REV. NO.	DATE	DESCRIPTION

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**CHESWICK GENERATING STATION
SPRINGDALE, PENNSYLVANIA**

PHOTOGRAPH LOCATION MAP

DRAWN BY: SJL APPROVED BY: RDS PROJ. NO.: 1009134004 DATE: JANUARY 2018

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Attachment 2
Photo Log

Project: 2017 Cheswick Annual Inspection

Project No.: 1009134004

Photographer: Richard Southorn

Photograph No. 1**Date:**

October 17, 2017

Direction:

North

Description:

Active filling area. A perforated contact-water (leachate) risers is shown on the left. This riser is wrapped in filter fabric and surrounded with bottom ash. A non-contact water (stormwater) non-perforated riser is shown on the right. This riser will be extended to final cover elevation and will accept stormwater after final cover is in place.

The active area is well maintained with no ponding water. CCR material is spread and rolled shortly after being received.

**Photograph No. 2****Date:**

October 17, 2017

Direction:

West

Description:

Non-contact stormwater pipe along western sideslope. No evidence of erosion or sloughing.

Active area is shown in foreground (gypsum and bottom ash).



Project: 2017 Cheswick Annual Inspection

Project No.: 1009134004

Photographer: Richard Southorn

Photograph No. 3**Date:**

October 17, 2017

Direction:

South

Description:

Active area near western limits. Contact water riser is shown in center, surrounded by bottom ash. The active area is well maintained.

**Photograph No. 4****Date:**

October 17, 2017

Direction:

Southwest

Description:

Active area. CCR material has been received and is being placed in a new lift.



Project: 2017 Cheswick Annual Inspection

Project No.: 1009134004

Photographer: Richard Southorn

Photograph No. 5**Date:**

October 17, 2017

Direction:

South

Description:

Active area. Well maintained, no ponding water. Material is placed in even lifts that are spread and compacted.

**Photograph No. 6****Date:**

October 17, 2017

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: 2017 Cheswick Annual Inspection

Project No.: 1009134004

Photographer: Richard Southorn

Photograph No. 7**Date:**

October 17, 2017

Direction:

Northwest

Description:

Typical slope terrace. Terraces are well maintained with no evidence of sloughing or erosion. Vegetation is healthy.

**Photograph No. 8****Date:**

October 17, 2017

Direction:

East

Description:

Vegetation on sideslope looking downslope. Vegetation is well established. No evidence of erosion or sloughing.



Photograph No. 9

Date:

October 17, 2017

Direction:

South

Description:

Slope terrace. Terraces are well maintained with no evidence of sloughing or erosion. Vegetation is healthy.



Photograph No. 10

Date:

October 17, 2017

Direction:

Northeast

Description:

Sedimentation Pond (non-contact stormwater) from upslope. Healthy vegetation.



Photograph No. 11**Date:**

October 17, 2017

Direction:

West

Description:

Stormwater inlet installed in final cover on terrace bench. Culvert is free of obstructions. There is no evidence of scour around inlet. This manhole is representative of the final conditions of the non-contact riser shown in Photograph No. 1.

**Photograph No. 12****Date:**

October 17, 2017

Direction:

Northeast

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.



Photograph No. 13

Date:

October 17, 2017

Direction:

Northwest

Description:

Unloading CCR material (gypsum) at active face.



Photograph No. 14

Date:

October 17, 2017

Direction:

South

Description:

Unloading CCR material (bottom ash) at active face.



Photograph No. 15

Date:

October 17, 2017

Direction:

West

Description:

Contact water (leachate) riser.



Photograph No. 16

Date:

October 17, 2017

Direction:

Northwest

Description:

Dozer is spreading gypsum in background while roller is smoothing surface on active face. Material is placed in even lifts following appropriate operational measures.



Photograph No. 17

Date:

October 17, 2017

Direction:

South

Description:

Sideslope on midslope area. Healthy vegetation with no evidence of erosion, sloughing or instability.



Photograph No. 18

Date:

October 17, 2017

Direction:

Northeast

Description:

Access road.



Photograph No. 19

Date:

October 17, 2017

Direction:

South

Description:

Sedimentation Pond. Healthy vegetation on pond sideslopes. No trash or debris noted on water surface or in surrounding vegetation.



Photograph No. 20

Date:

October 17, 2017

Direction:

Northwest

Description:

North non-contact water channel at entry point into Sedimentation Pond (looking upslope). Free of debris and functioning as intended.



Photograph No. 21

Date:

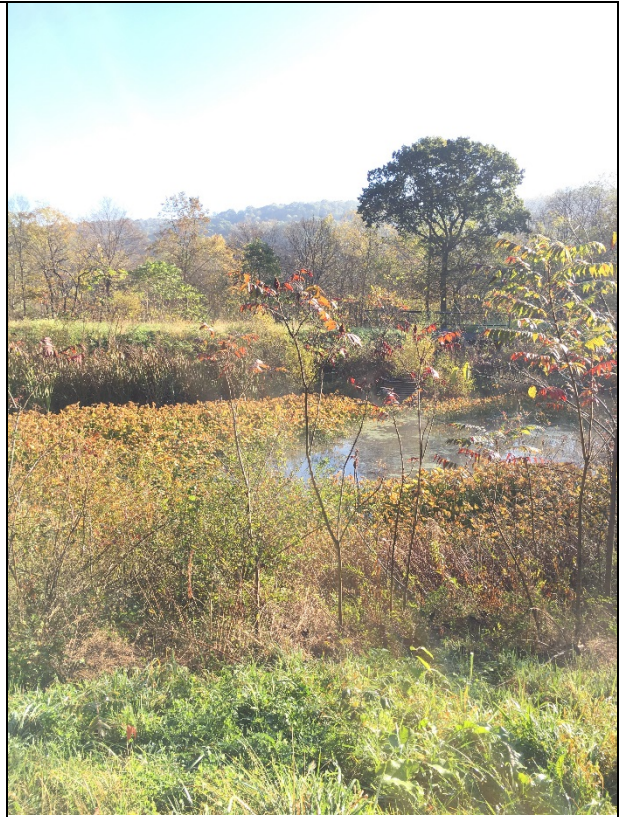
October 17, 2017

Direction:

East

Description:

Sedimentation Pond. Healthy vegetation on sideslopes.



Photograph No. 22

Date:

October 17, 2017

Direction:

Southwest

Description:

South non-contact water channel at entry point into Sedimentation Pond (looking upslope). Free of debris and functioning as intended.



Project: 2017 Cheswick Annual Inspection

Project No.: 1009134004

Photographer: Richard Southorn

Photograph No. 23**Date:**

October 17, 2017

Direction:

North

Description:

South non-contact water channel at entry point into Sedimentation Pond (looking toward pond). Channel is free of debris.

**Photograph No. 24****Date:**

October 17, 2017

Direction:

West

Description:

Looking toward landfill sideslopes to give overview of healthy vegetation. No evidence of erosion, sloughing, or instability.



Photograph No. 25

Date:

October 17, 2017

Direction:

Northeast

Description:

Spillway. Clear of debris. No cracking or evidence of structural damage.



Photograph No. 26

Date:

October 17, 2017

Direction:

Northeast

Description:

Newly installed leachate pumphouse (2017).



Photograph No. 27**Date:**

October 17, 2017

Direction:

Southwest

Description:

Looking toward landfill sideslopes with Sedimentation Pond in foreground. Vegetation is healthy, no signs of erosion, scour, or instability.

**Photograph No. 28****Date:**

October 5, 2017

Direction:

Southeast

Description:

South non-contact water channel inlet to Sedimentation Pond.



Photograph No. 29

Date:

October 17, 2017

Direction:

Northwest

Description:

Security fence around Sedimentation Pond.

