**INDIANA-KENTUCKY ELECTRIC CORPORATION**
3932 U. S. Route 23
P. O. Box 468
Piketon, Ohio 45661
740-289-7200

WRITER'S DIRECT DIAL NO:
740-897-7768

October 10, 2019

**CERTIFIED MAIL**
**RETURN RECEIPT REQUESTED**

Mr. Bruno Pigott
Commissioner
Indiana Department of Environmental Management
100 N. Senate Avenue
Mail Code 50-01
Indianapolis, IN 46204-2251

**Re: Indiana-Kentucky Electric Corporation**
**Clifty Creek Station**
**Notification of CCR Rule Information Posting**
**Annual Certified CCR Surface Impoundment Inspection Report**

Dear Mr. Pigott:

As required by 40 CFR 257.106(g), the Indiana-Kentucky Electric Corporation (IKEC) is providing notification to the Commissioner (State Director) of the Indiana Department of Environmental Management that a qualified professional engineer has completed the Annual CCR Surface Impoundment Inspection in accordance with 40 CFR 257.83(b) for IKEC's Clifty Creek Station. The inspection report has been placed in the facility's Operating Record, as well as on the company's publically accessible internet site.

This information can be viewed on IKEC's publically accessible internet site at:
http://www.ovec.com/CCRCompliance.php

If you have any questions, or require any additional information, please call me at (740) 897-7768.

Sincerely,

Tim Fulk
Engineer II

TLF:klr

# 2019 ANNUAL DAM AND DIKE INSPECTION REPORT

**West Boiler Slag Pond**
**& Landfill Runoff Collection Pond**

**CLIFTY CREEK PLANT**

**Indiana-Kentucky Electric Corporation**

**MADISON, INDIANA**

**September 2019**


Prepared for: Indiana-Kentucky Electric Corporation
3932 U.S. Route 23
P.O. Box 468
Piketon, Ohio 45661

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




Document ID: GERS-19-021

## Engineering Reports and Studies Checklist - General

Project Name: Clifty Creek Plant - Dam and Dike Inspection

Originated by: Mohammad Ajlouni

Checked by: Pedro Amaya Date: 9/10/2019

Description: West Boiler Slag Pond and Landfill Runoff Collection Pond

Unique Document ID: GERS-19-021

| | | Checking Engineer(s) Initials |
|---|---|---|
| 1. | Cover page includes: unique identification number, reference to date, revision, title, prepared by, reviewed by, approved by. | PJA |
| 2. | Revisions noted on revision page with revision number, reason and date. | NA |
| 3. | Pages numbered, including reference to total number of pages and revision number. | PJA |
| 4. | Executive summary concise (generally limit to one page). | NA |
| 5. | Information in executive summary contained in body of report. | NA |
| 6. | Table of contents including list of figures and tables. | PJA |
| 7. | Introduction with purpose and scope included. | PJA |
| 8. | Objective of work defined. | PJA |
| 9. | Assumptions identified and justified. | PJA |
| 10. | Assumptions that must be reviewed as design progresses identified. | NA |
| 11. | Supporting drawings, sketches, charts, drawings included. | PJA |
| 12. | Results summarized. | PJA |
| 13. | Conclusions and recommendations included. | PJA |
| 14. | Bibliography and references included. | NA |
| 15. | References required in appendix. | PJA |

# Dam & Dike Inspection Report
# West Boiler Slag Pond &
# Landfill Runoff Collection Pond

GERS-19-021

REVISION 0

## CLIFTY CREEK PLANT

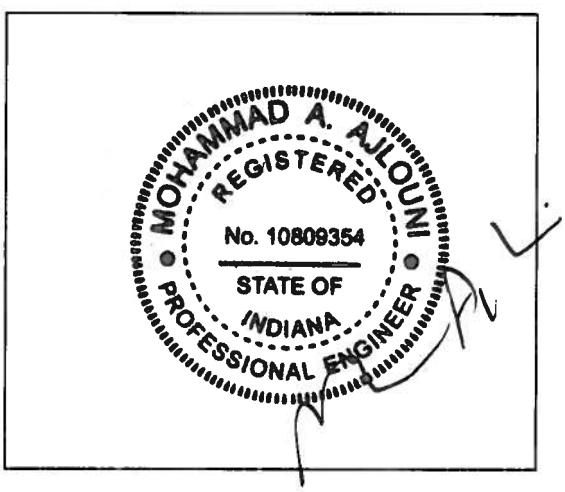
## MADISON, INDIANA

**INSPECTION DATE** **August 27, 2019**

**PREPARED BY** _____ **DATE** 9/10/2019
Mohammad A. Ajlouni, Ph.D.,P.E.

**REVIEWED BY** Pedro J Amaya **DATE** 9/12/2019
Pedro J. Amaya, P.E.

**APPROVED BY** Gary F. Zych **DATE** 9/19/2019
Gary F. Zych, P.E.
Manager - Geotechnical Engineering




**PROFESSIONAL ENGINEER SEAL & SIGNATURE**

I certify to the best of my knowledge, information and belief the information contained in this report meets the requirements of 40 CFR § 257.83(b).

## Engineering Reports and Studies Checklist – General cont.

| | | Checking Engineer(s) Initials |
|---|---|---|
| 16. | Text clear and readable. | RJA |
| 17. | Approach reasonable for objective identified. | RJA |
| 18. | Technical content adequate for the report purpose and scope. | RJA |
| 19. | Appropriate interdisciplinary review complete. | N/A |

Note: Use N/A to indicate check is not applicable.

| Pedro Amaya | Pedro J Amaya | 9/12/2019 |
|---|---|---|
| Checked by *(Print name legibly)* | *Checked by (Signature)* | Date |

Engineering completed in accordance with E-OI-730.03.01 - Engineering Reports and Studies, and reviewed by:

| Gary Zych JFZ | GES | 9/19/2019 |
|---|---|---|
| Engineering Manager | Department | Date |

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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 257.83 and the Indiana Department of Natural Resource (IDNR), Division of Water and to provide Indiana-Kentucky Electric Corporation (IKEC) and Clifty Creek Station with an evaluation of the facility.

American Electric Power Service Corporation's Civil Engineering Division administers the Clifty Creek Station Dam Inspection and Maintenance Program (DIMP). As part of the DIMP, staff from the GES annually conducts dam and dike inspections. This report contains the inspection findings, observations, photographic descriptions, conclusions, and maintenance recommendations. This inspection report addresses the West Boiler Slag Pond (WBSP) (Previously known as West Bottom Ash Pond), and Landfill Runoff Collection Pond (LRCP) (Previously known as Fly Ash Pond) at the Clifty Creek Station. The East Bottom Ash Pond (EBAP) is no longer active for ash storage and waste water treatment. The EBAP was drained, backfilled and closed converted to a surface water collection pond in the 2014.

Both Mr. Danny Hunt, Plant Engineer, Clifty Creek Station who provided onsite coordination for inspection activities, and Michael Kristofeck Plant Engineer, Clifty Creek Station, were present during this inspection. The inspection was performed on August 27, 2019 by Mohammad Ajlouni of AEP Geotechnical Engineering. Weather conditions were cloudy with temperatures ranging from the lower 70's F in the morning to the upper 70's F in the afternoon, with good visibility.

# 2.0 DESCRIPTIONS OF IMPOUNDMENTS

## 2.1 WEST BOILER SLAG POND

The WBSP (Figure 1) is located southwest of the station. It is formed by natural grade to the north, east, and west and an embankment dam on the south that runs along the bank of the Ohio River. The WBSP serves as a settling basin for sluiced bottom ash produced at the station and receives stormwater runoff from approximately 510 acres (Stantec, 2010a). The WBSP is used for the storage of bottom ash generated from all six generating Units. It consists of a single dike that is approximately 2,000 feet long and is approximately 35 feet high. The crest is at elevation 470.0 feet. The pond contains two primary areas: the eastern portion near the sluice pipes that is actively dredged for the recovery of material, and a western portion with minimal deposition or dredging activities. A vegetation delta separates the two areas acting as a natural filtering zone. The pond discharges to the Ohio River through a principal spillway at the southern edge of the impoundment.

## 2.2 LANDFILL RUNOFF COLLECTION POND

The LRCP is located at the southern edge of the station. It is bordered by the station's coal combustion residuals (CCR) landfill to the north, natural grade to the east and west, and by an embankment dam to the south that runs along the bank of the Ohio River.

The LRCP dam is a cross valley dam located on a no-named tributary to the Ohio River. The dam is approximately 1,025 feet long and has a maximum height of 75 feet. The crest is at

elevation 505.0 feet. Currently, the facility functions as the stormwater and leachate collection pond for the CCR landfill, and discharges to the Ohio River through a NPDES-permitted outfall.

Approximately 508 acres of both landfill contact water and stormwater runoff drain to the LRCP. Upon the completion of the CCR landfill, the area draining to the LRCP will be reduced to approximately 443 acres.

# 3.0 REVIEW OF AVAILABLE INFORMATION (257.83(b)(1)(i))

In addition to the current visual inspection, a review of available information regarding the status and condition of the WBSP and the LRCP including files available in the operating record was conducted. Available information consists of design and construction information, previous structural stability assessments, previous 7 day inspection reports, and previous annual inspection reports was conducted. Based on the findings of the current visual inspection and a review of the available data it is concluded that there were no signs of actual or potential structural weakness or adverse conditions and the facility is performing as intended in the design documents.

# 4.0 INSPECTION (257.83(b)(1)(ii))

## 4.1 General

The summary of the visual observations uses terms to describe the general appearance or condition of an observed item, activity or structure. Their meaning is understood 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 or 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 previously identified in the previous inspections, but have not yet been corrected.

Excessive: A reference to an observed item (e.g., erosion, seepage, vegetation, etc.) where the current maintenance condition is below 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's safety or stability point of view.

In addition, a "deficiency" is some evidence that a dam or dike has developed a condition that could impact the structural integrity of the impoundment. There are four general categories of deficiencies. These four categories are described below:

1. Uncontrolled Seepage

   Uncontrolled seepage is seepage that is not behaving as the design engineer has intended. An example of uncontrolled seepage is seepage that comes through or around the embankment and is not collected and safely carried off by a drain. Seepage that is collected by a drain can still be uncontrolled, if it is not safely transported, such as seepage that is not clear. Seepage that is unable to be measured and/or observed is considered uncontrolled seepage.

[Wet or soft areas are not considered uncontrolled seepage, but they can lead to this type of deficiency. These areas should be monitored frequently.]

2. Displacement of the Embankment:

   Displacement is a large scale movement of part of the dam. Common signs of displacement are cracks, scraps, bulges, depressions, sinkholes and slides.

3. Blockage of Water Control Appurtenances

   Blockage of water Control Appurtenances 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.

Results of the visual inspection performed on August 27, 2019, are summarized below, with inspection photographs included in Appendices A and B.

## 4.2 WEST BOILER SLAG POND

### 4.2.1 CHANGES IN GEOMETRY SINCE LAST INSPECTION (257.83(b)(2)(i))

No modifications have been made to the geometry of the WBSP since the 2018 annual inspection. The geometry of the impoundment has remained essentially unchanged.

### 4.2.2 INSTRUMENTATION (257.83(b)(2)(ii))

The location and type of instrumentation is shown on Figure 1. The results of the measurements of various piezometers since November 2015 are shown in Figure 2. The maximum recorded readings of each instrument since the previous annual inspection is shown in Table 1.

**Table 1 WBSP Maximum recorded instruments reading since the previous annual inspection**

| **INSTRUMENTATION DATA West Boiler Slag Pond** | | | |
|---|---|---|---|
| **Instrument** | **Type** | **Maximum Reading since last annual inspection** | **Date of Reading** |
| PZ-1 (B-1) | Piezometer | 437.14 | 3/12/2019 |
| PZ-3 (B-3) | Piezometer | 439.2 | 3/12/2019 |
| PZ-4 (B-4) | Piezometer | 434.8 | 3/12/2019 |
| PZ-5 (B-5) | Piezometer | 435.1 | 4/25/2019 |

A review of the data contained on the WBSP static water elevation plot showed that all piezometers exhibit consistent water elevations. PZ-1 is a piezometer located at the crest of the constructed dike (shown as B-1 on location plan) which was dry at the time of the readings in 2018 but is yielding results since the last inspection report date (October 2019). PZ-3 is a piezometer located at the crest of the constructed dike (shown as B-3 on location plan). PZ-4 is a piezometer located along a bench near the downstream toe of the constructed dike (shown as B-4 on location plan). PZ-5 is a piezometer located at the crest of the constructed dike (B-5 on location plan). Review of the static water elevation plot indicates that the static water levels for the piezometers generally fluctuate as a result

of the fluctuations in the pool level (head water) and the river level (tail water), however, it appears that the river water level has more influence on all the piezometer's water levels.

### 4.2.3 IMPOUNDMENT *CHARACTERISTICS* (257.83(b)(2)(iii, iv, v))

Below is a summary of the minimum, maximum, and present depth and elevation of the impounded water & CCR since the previous annual inspection; the storage capacity of the impounding structure at the time of the inspection; and the approximate volume of the impounded water and CCR at the time of the inspection.

**Table 2 Summary of Relevant Storage Information WBAP**

| **IMPOUNDMENT CHARACTERISTICS**<br>**West Boiler Slag Pond** | |
|---|---|
| Approximate **Minimum** depth (Elevation) of impounded water since last annual inspection | 11 ft.<br>(444) ft. |
| Approximate **Maximum** depth (Elevation) of impounded water since last annual inspection | 16.5 ft.<br>(449.5) ft. |
| Approximate **Present** depth (Elevation) of impounded water since last annual inspection | 14.5 ft.<br>(447.5) ft. |
| Approximate **Minimum** depth (Elevation) of CCR since last annual inspection | 7.5 ft.<br>(433) ft. |
| Approximate **Maximum** depth (Elevation) of CCR since last annual inspection (ft.) | 7.5 ft.<br>(433) ft. |
| Approximate **Present** depth (Elevation) of CCR since last annual inspection | 7.5 ft.<br>(433) ft. |
| Storage Capacity of impounding structure at the time of the inspection | 1,950,000 c.y. |
| Approximate volume of impounded water at the time of the inspection | 837,000 c.y. |
| Approximate volume of CCR at the time of the inspection | 782,000 c.y. |

### 4.2.4 VISUAL INSPECTION (257.83(b)(2)(i))

A visual inspection of the WBSP was conducted to identify any signs of distress or malfunction of the impoundment and appurtenant structures. Specific items inspected included all structural elements of the dam such as inboard and outboard slopes, crest, and toe; as well as appurtenances such as the outlet structure at the West Boiler Slag Pond, and pipe discharge structure.

– See Appendix A for Photographs and photographs location plan

In general, the crest, interior and exterior slopes of the dike appear to be in satisfactory and stable condition. No significant change to the exterior slope was noted from the previous inspection. No significant settlement or misalignment was observed. Seeps were not observed during the inspection. No animal burrows were observed during the inspection.

1. Photographs No. 1 and 2 illustrate a typical overview of the dike crest. The crest appears to be in good and stable condition. Signs of settlement, misalignment and cracking were not observed.

2. Photographs No. 3, and 4 illustrate the condition of the interior slopes at the settling end of the pond and the present extent of boiler slag buildup. The interior slope of the dike at this end of the pond appeared to be in satisfactory and stable condition.

3. There were a few locations where the use of the remotely controlled mower, appear to have caused disturbance to the inboard slope surfaces at areas where the soil is more granular.

4. Photograph No. 5 shows the Principal Spillway and Decant Structure along with some localized overgrown vegetation near the access stairs and water line. The overflow structure appeared to be in satisfactory condition.

5. The overflow discharge structure walkway, railings, metal decking, and visible concrete were found to be in satisfactory, functional condition. However, there was some overgrown vegetation adjacent to the access stairs. Photographs No. 5 and 6 illustrate the access stairs, metal walkway, metal deck, and concrete structure of the overflow discharge structure.

6. Photographs No. 7, 8 and 9 shows the general condition of the exterior slope and toe area of the south dike. The slope appeared in satisfactory and stable condition. There were no signs of settlement, misalignment, sloughing or erosion. No wet areas were noted during this inspection except along the toe area where it appears there was standing water in tire ruts caused from mowing activities.

7. Photograph No. 10 shows the typical condition of the discharge pipe and outlet channel. Erosion at the confluence of the channel and the river was consistent with the conditions observed in past years. The channel and outlet pipe were observed to be in good condition and were unobstructed and flowing steadily.

8. Significant Erosion along the Inboard slope few hundred feet from the inlet pipes. Erosion is taking place in an area with a very wide crest and does not constitute yet a detrimental condition to the integrity of the structure.

Overall the facility is in satisfactory condition. The impoundment is functioning as intended with no signs of potential structural weakness or conditions which maybe disrupting to the safe operation of the impoundment. Additional pictures taken during the inspection can be made available upon request.

#### 4.2.5 CHANGES THAT EFFECT STABILITY OR OPERATION (257.83(b)(2)(vii))

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

## 4.3 LANDFILL RUNOFF COLLECTION POND

#### 4.3.1 CHANGES IN GEOMETRY SINCE LAST INSPECTION (257.83(b)(2)(i))

No modifications have been made to the geometry of the LRCP since the 2018 annual inspection. The geometry of the impoundment has remained essential unchanged. However, In June of 2017 a repair to the northern section of the downstream slope was performed to stabilize previous embankment sloughing. A section of the downstream slope approximately 100 feet wide and extending from the toe to the crest was stabilized by excavating the loose material from the sloughing areas and placing a geotextile fabric and approximately 18-24” of stone rip rap. A seepage collection pipe was installed along the toe area of the rip rap.

### 4.3.2 INSTRUMENTATION (257.83(b)(2)(ii))

The location and type of instrumentation is shown on Figure 3. The results of the measurements of various piezometers since November 2015 are shown in Figure 4. The maximum recorded readings of each instrument since the previous annual inspection is shown in Table 3 below.

**Table 3 LRCP Maximum recorded instruments reading since the previous annual inspection**

| **INSTRUMENTATION DATA**<br>**Landfill Runoff Collection Pond** | | | |
|---|---|---|---|
| **Instrument** | **Type** | **Maximum Reading since last annual inspection** | **Date of reading** |
| CF-9405 | Piezometer | 447.29 | 2/20/2019 |
| CF-9406 | Piezometer | 447.45 | 2/20/2019 |
| CF-9407 | Piezometer | 455.01 | 2/20/2019 |
| SP-84-1 | Piezometer | 472.20 | 1/28/2019 |
| SP-84-2 | Piezometer | 449.58 | 4/24/2019 |
| SP-84-4 | Piezometer | 444.65 | 5/15/2019 |
| SP-84-5 | Piezometer | 445.76 | 3/12/2019 |
| SP-84-6 | Piezometer | 416.36 | 11/28/2018 |
| SP-84-7 | Piezometer | 452.99 | 2/20/2019 |
| SP-84-8A | Piezometer | 454.16 | 2/20/2019 |

There are piezometers and monitoring wells installed in and around the LRCP dam. Plan views showing the location of those piezometers and monitoring wells can be found in Appendix C along with plots of the historical static water levels for each location.

A review of the LRCP static water elevation plot indicates that two of the piezometers (SP-84-1 and SP-84-6) located along the crest of the dam historically exhibit consistent water elevations. Review of the static water elevation plot indicates that the static water levels for the piezometers and monitoring wells generally fluctuate as a result of the fluctuations in the pool and seasonal river water elevations, however, it appear that the river elevations has more influence on all the piezometers readings.

### 4.3.3 IMPOUNDMENT CHARACTERISTICS (257.83(b)(2)(iii, iv, v))

Below is a summary of the minimum, maximum, and present depth and elevation of the impounded water & CCR since the previous annual inspection; the storage capacity of the impounding structure at the time of the inspection; and the approximate volume of the impounded water and CCR at the time of the inspection.

**Table 4 Summary of Relevant Storage Information LRCP**

| **IMPOUNDMENT CHARACTERISTICS**<br>**Landfill Runoff Collection Pond** | |
|---|---|
| Approximate **Minimum** depth (Elevation) of impounded water since last annual inspection | 9.92 ft.<br>(484.92) ft. |
| Approximate **Maximum** depth (Elevation) of impounded water since last annual inspection | 13 ft.<br>(488) ft. |
| Approximate **Present** depth (Elevation) of impounded water since last annual inspection | 10.8 ft.<br>(485.8) ft. |

| | |
|---|---|
| Approximate **Minimum** depth (Elevation) of CCR since last annual inspection | 45 ft.<br>(475) ft. |
| Approximate **Maximum** depth (Elevation) of CCR since last annual inspection (ft.) | 45 ft.<br>(475) ft. |
| Approximate **Present** depth (Elevation) of CCR since last annual inspection | 45 ft.<br>(475) ft. |
| Storage Capacity of impounding structure at the time of the inspection | 930,000 c.y. |
| Approximate volume of impounded water at the time of the inspection | 553,000 c.y. |
| Approximate volume of CCR at the time of the inspection | 3,150,000 c.y. |

**4.3.4 VISUAL INSPECTION (257.83(B)(2)(i))**

A visual inspection of the LRCP was conducted to identify any signs of distress or malfunction of the impoundment and appurtenant structures. Specific items inspected included all structural elements of the dam such as inboard and outboard slopes, crest, and toe; as well as appurtenances such as the outlet structure at the Landfill Runoff Collection Pond, and pipe discharge structure.

– See Appendix B for Photographs and photographs location plan

Overall, the crest, interior slope and exterior slope is well vegetated and in stable condition. There were no apparent signs of new sloughing, depressions, areas of wetness, and seeps. Control of surface vegetation was considered satisfactory except along the outlet channel. The spillway outlet and discharge channel appear to have no obstructions but shows increased vegetation growth. Flow was minimal at the time of the inspection.

1. Photographs Nos. 1, and 2 show the generally condition of the crest of the dam. Signs of misalignment and settlement were not observed. Minor surface cracks in the pavement were observed. Those cracks are attributed to the age of the pavement and the results of weathering process.

2. Photographs Nos. 3 and 4 provide overviews of the interior slope of the dam above the operating pool. Vegetation control near the water line and the upper slope areas is lacking, however, erosion due to wave action was not observed. Overall the slope was found to be in satisfactory and stable condition.

3. Photographs No. 5 and 6 are an overview of the principal spillway decant structure. Vegetation control was observed to be lacking. The decant structure and the access stairway appeared to be functioning properly and was free of obstructions. Photograph No.6 shows the recently added pipe to allow for treatment of discharged water.

4. Photograph Nos. 7 and 8 is an overview of the principal spillway outlet channel. The channel is unobstructed with minimal flow at the time of the inspection. Vegetation control was observed to be lacking.

5. Photographs No's. 9 through 14 are all overviews of various areas of the exterior face of the dam as further described with each photograph. Throughout, vegetation control was adequate and there were no signs of sloughing, erosion or instability, except for the area adjacent to the previously repaired slope. No visible change was observed from previous inspections. In general, the exterior slope appeared to be in satisfactory and stable condition

6. The one area of concern is the slope adjacent to the previously repaired area in 2017. This area apparently did not experience additional sloughing/slip activity. A repair detail has been submitted to the state for approval before implementation.

7. Photograph No.11 and No. 12 shows the previously repaired slope area that experienced sloughing/slip near the left abutment. The area appears to be in stable conditions. The repair also included installing a seepage collection pipe at the toe of rip rap placement. The pipe showed minimal flow at the time of inspection.

Overall the facility was in satisfactory condition. The impoundment is functioning as intended with no signs of potential structural weakness or conditions which may be disrupting to the safe operation of the impoundment.

#### 4.3.5 CHANGES THAT EFFECT STABILITY OR OPERATION (257.83(b)(2)(vii))

Based on interviews with plant personnel and field observations there were no changes to the Landfill Runoff Collection Pond since the last annual inspection that would affect the stability or operation of the impounding structure.

# 5.0 SUMMARY OF FINDINGS

## 5.1 MAINTENANCE ITEMS

The following maintenance items were identified during the visual inspection:

**West Boiler Slag Pond**

- An evaluation of the use of the remotely controlled mower, purchased by the plant indicates that the anchors in the tracks are apparently disturbing the inboard slopes at areas where soil is more granular. Weed waking or other mowing techniques are suggested for these areas.
- Vegetation height was moderate at local areas on the inboard slopes of the WBSP (Photographs Nos. 4 and 6). These areas should be weed waked to prevent damage to the existing riprap.
- Erosion along the Inboard slope close to the Inlet Channel (Photographs No. 11) requires prompt maintenance.

**Landfill Runoff Collection Pond**

- Vegetation height was moderate to high on the inboard slopes of the LCRP near the top of the slope and at the water line. These areas should be maintained on a regular basis.

## 5.2 ITEMS TO MONITOR

**West Boiler Slag Pond**

- There are no items to monitor.

**Landfill Runoff Collection Pond**

- The soughing/slip area of the outboard slope needs to be repaired and stabilized in order to prevent additional damage to the slope area.

## 5.3 DEFICIENCIES (257.83(b)(2)(vi))

There were no deficiencies or 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 any of the periodic 7-day or monthly inspections. If any of these conditions occur before the next annual inspection contact AEP Geotechnical Engineering immediately.

If you have any questions with regard to this report, please contact Mohammad Ajlouni at 614-716-2939 or Gary Zych at 614-716-2917.

# FIGURES

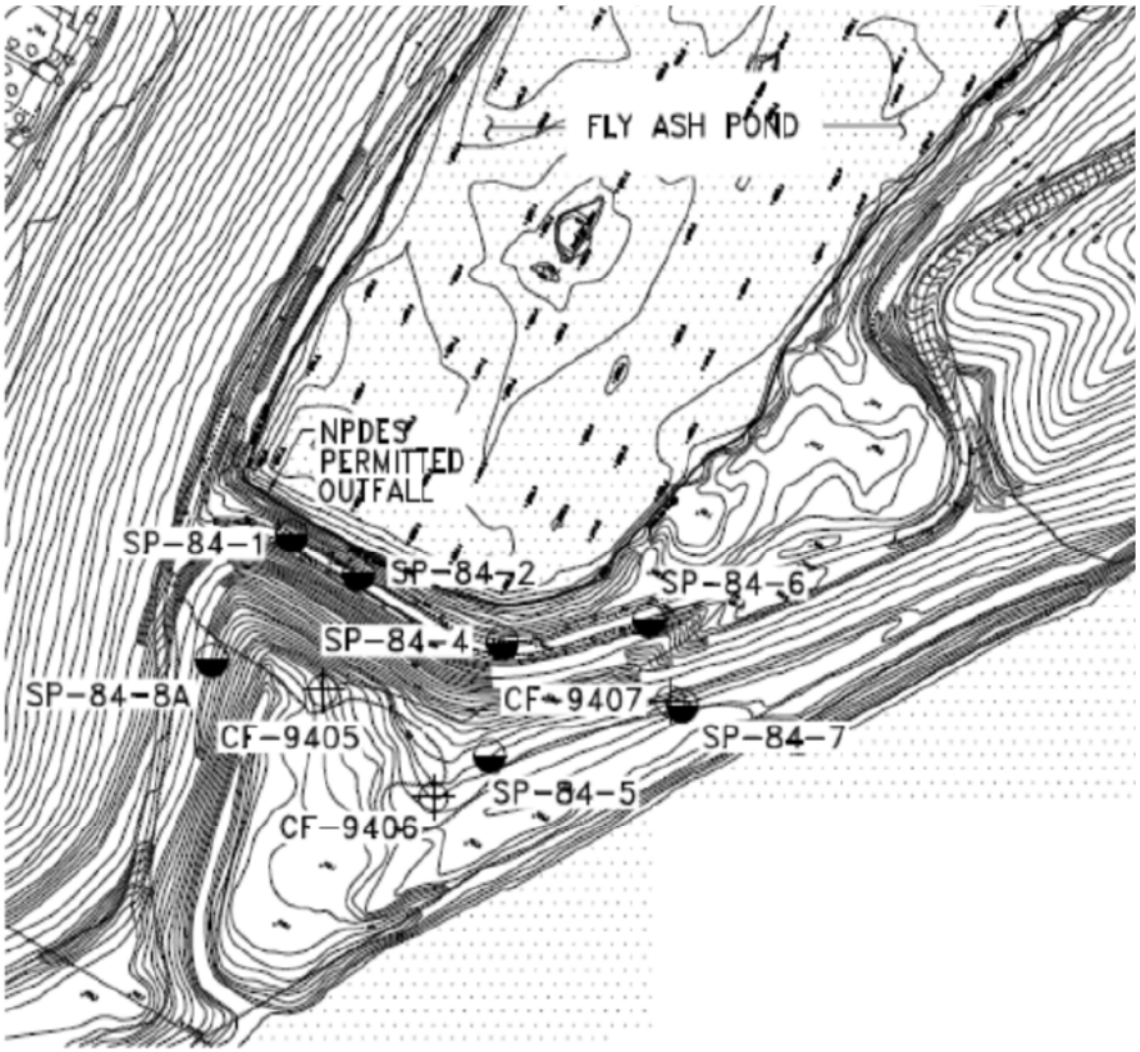


FIGURE 3. LANDFILL RUNOFF COLLECTION POND PIEZOMETERS LOCATION PLAN

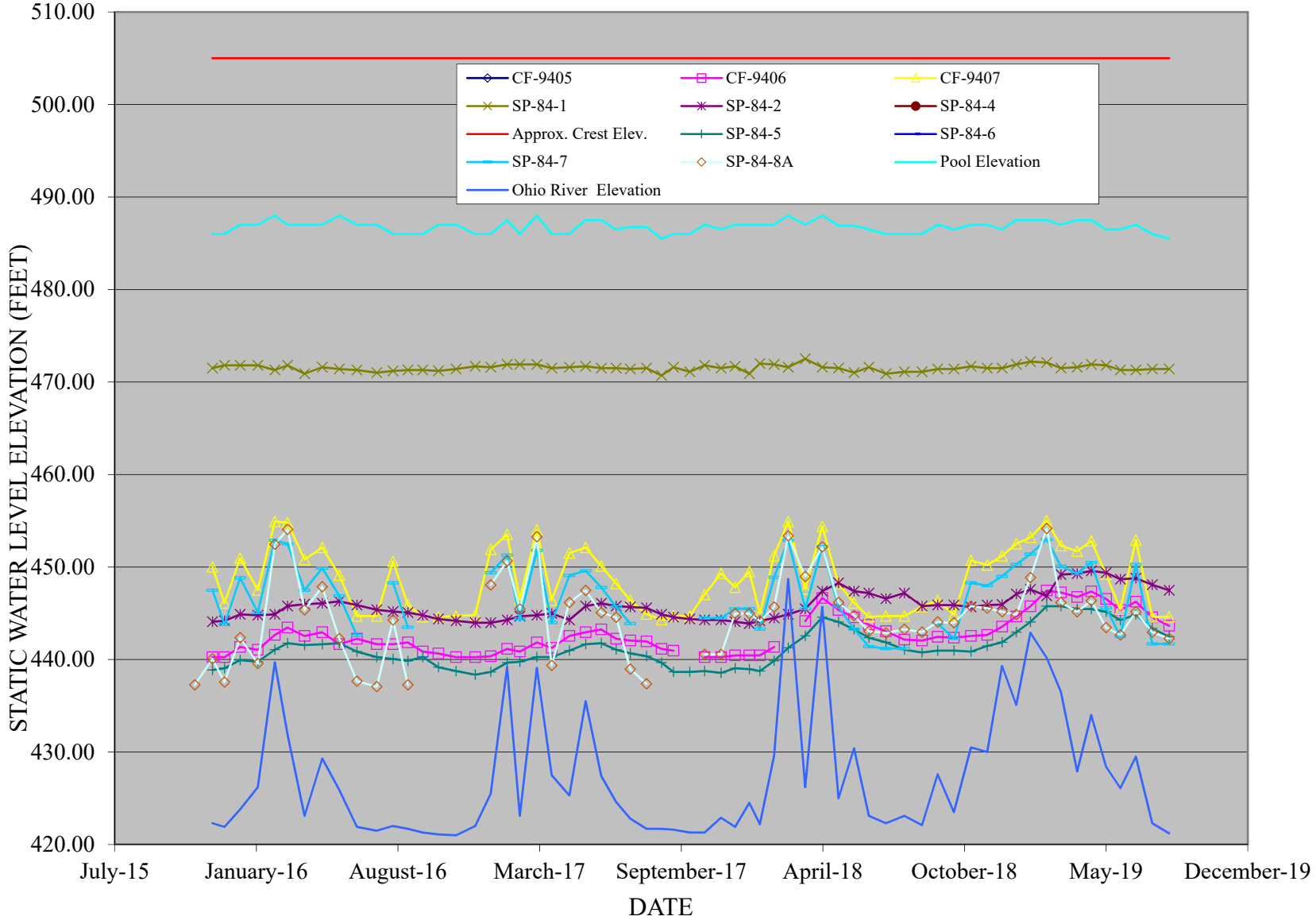


FIGURE 4. LANDFILL RUNOFF COLLECTION POND PIEZOMETERS MEASUREMENTS


FIGURE 1. WEST BOILER SLAG POND PIEZOMETERS LOCATION PLAN

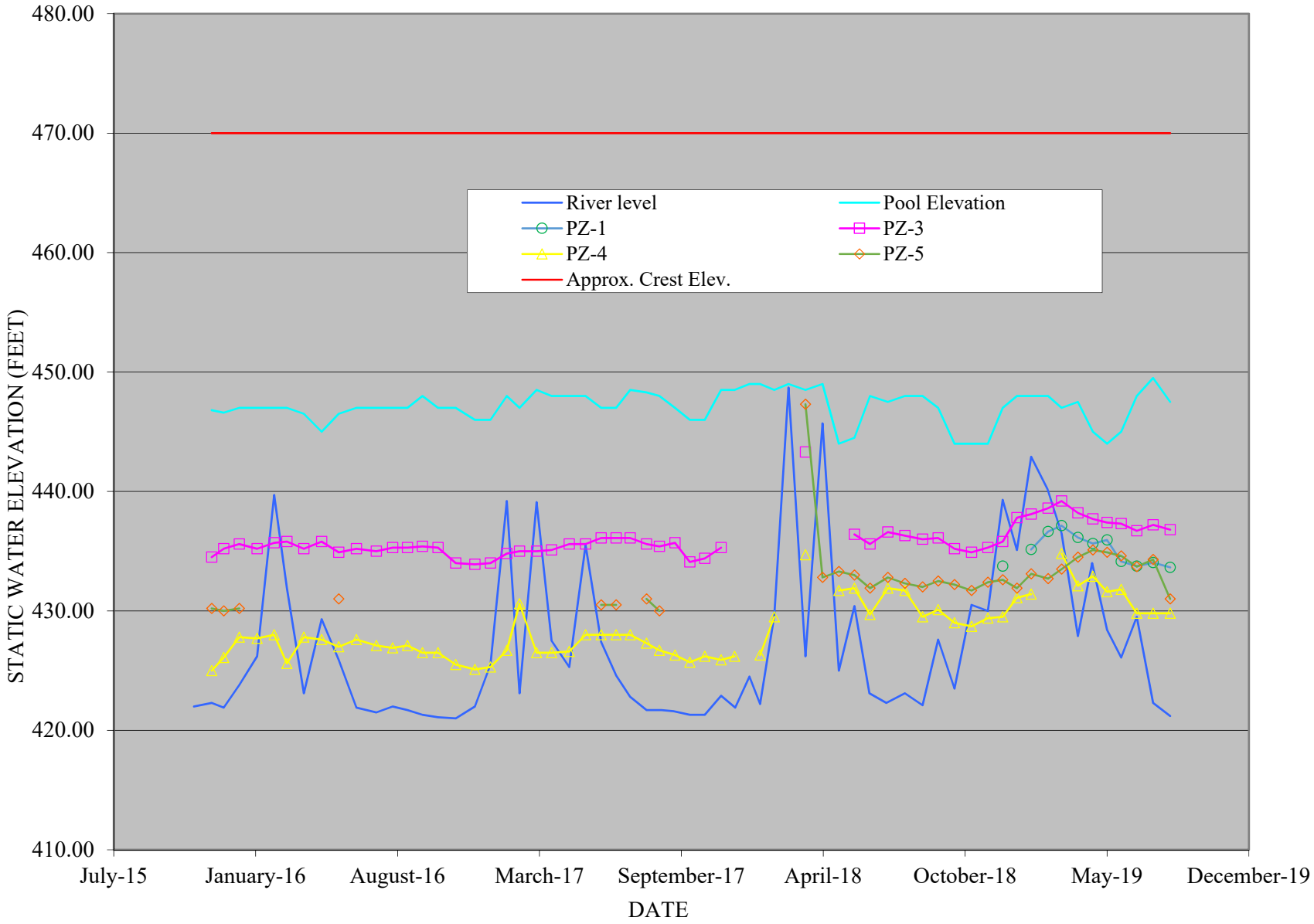


FIGURE 2. WEST BOILER SLAG POND PIEZOMETERS MEASUREMENTS

# APPENDICIES

# APPENDIX A

## WEST BOILER SLAG POND
## DIKE INSPECTION PHOTOGRAPHS

**APPENDIX A**
**CLIFTY CREEK WEST BOILER SLAG POND**
**DIKE INSPECTION PHOTOGRAPHS**

| | |
|---|---|
|  | **Photo No. 1**<br><br>View of the erosion rills on the protective<br>West Boiler Slag Pond Dike From Crest Looking Northeast<br><br>Overview of Crest |
|  | **Photo No. 2**<br><br>West Boiler Slag Pond Dike – Crest From Top Looking Northeast<br><br>General Condition |
|  | **Photo No. 3**<br><br>West Boiler Slag Pond – Near South End of Interior Slope<br><br>Area where some surface disturbance caused by the remotely controlled mower |

**APPENDIX A**
**CLIFTY CREEK WEST BOILER SLAG POND**
**DIKE INSPECTION PHOTOGRAPHS**

**Photo No. 4**

West Boiler Slag Pond Dike – Interior Slope Looking Northeast From Crest.

Overview of General Condition


**Photo No. 5**

West Boiler Slag Pond Principal Spillway Access Stairs and Decant Structure

Overview of General Condition

**Photo No. 6**

West Boiler Slag Pond Dike – Interior Slope Looking Northwest From Crest

Overview of General Condition
Local Vegetation growth

**APPENDIX A**
**CLIFTY CREEK WEST BOILER SLAG POND**
**DIKE INSPECTION PHOTOGRAPHS**

| | |
|---|---|
|  | **Photo No. 7**<br><br>West Boiler Slag Pond Dike – Exterior Slope From Toe Looking East<br><br>Overview of Vegetation and General Condition |
|  | **Photo No. 8**<br><br>West Boiler Slag Pond Dike Exterior Slope From Toe Looking Southwest<br><br>Overview of Vegetation and General Condition |
|  | **Photo No. 9**<br><br>West Boiler Slag Pond Dike – Exterior Slope From Toe Looking East<br><br>Overview of Vegetation and General Condition |

**APPENDIX A**
**CLIFTY CREEK WEST BOILER SLAG POND**
**DIKE INSPECTION PHOTOGRAPHS**

| | |
|---|---|
|  | **Photo No. 10**<br><br>West Boiler Slag Pond Principal Spillway Pipe Discharge<br><br>General Condition of End of Pipe and Outlet Channel<br><br>Some wood debris carried by the river during flooding events |
|  | **Photo No. 11**<br><br>West Boiler Slag Inboard slope close to the Inlet Channel<br><br>Significant Erosion along the Inboard slope close to the Inlet Channel. Erosion is taking place in an area with a very wide crest and does not constitute detrimental conditions. |

# APPENDIX B

## LANDFILL RUNOFF COLLECTION POND INSPECTION PHOTOGRAPHS

**APPENDIX B**
**CLIFTY CREEK LANDFILL RUNOFF COLLECTION POND**
**DAM INSPECTION PHOTOGRAPHS**

| | |
|---|---|
|  | **Photo No. 1**<br><br>Landfill Runoff Collection Pond Dam From Crest Looking Northeast Across Saddle Dam<br><br>General Overview |
|  | **Photo No. 2**<br><br>Landfill Runoff Collection Pond Dam From Crest Looking Southwest<br><br>General Overview |
|  | **Photo No. 3**<br><br>Landfill Runoff Collection Pond Dam From Up Stream Slope<br><br>Overview of Current Operating Pool and Vegetation Conditions on Interior Slope.<br><br>Significant vegetation Growth along the Upstream of Dam |

**APPENDIX B**
**CLIFTY CREEK LANDFILL RUNOFF COLLECTION POND**
**DAM INSPECTION PHOTOGRAPHS**

**Photo No. 4**

Landfill Runoff Collection Pond Dam From Up Stream Slope

Overview of Vegetation and General Conditions

**Photo No. 5**

Landfill Runoff Collection Pond Dam From Roadway Leading to Crest Looking Northeast

Overview of Vegetation Management and General Condition-overgrown vegetation.

**Photo No. 6**

Landfill Runoff Collection Pond Principal Spillway Structure

Looking at drop inlet for treatment pipe.
-overgrown vegetation

**APPENDIX B**
**CLIFTY CREEK LANDFILL RUNOFF COLLECTION POND**
**DAM INSPECTION PHOTOGRAPHS**

**Photo No. 7**

Landfill Runoff Collection Pond
Principal Spillway Outlet

General Overview –Backwater has been minimized since last inspection.
Overgrown vegetation

**Photo No. 8**

Landfill Runoff Collection Pond
Principal Spillway Outlet Channel
Looking Downstream

General Overview-overgrown vegetation

**Photo No. 9**

Landfill Runoff Collection Pond Dam
Adjacent To Toe of Slope Looking East

Overview of Vegetation and General Conditions

**APPENDIX B**
**CLIFTY CREEK LANDFILL RUNOFF COLLECTION POND**
**DAM INSPECTION PHOTOGRAPHS**

| | |
|---|---|
|  | **Photo No. 10**<br><br>Landfill Runoff Collection Pond Dam Adjacent To Toe of Slope Looking East<br><br>Overview of downstream slope adjacent to rip rap repair area. |
|  | **Photo No. 11**<br><br>Landfill Runoff Collection Pond Dam Adjacent To Toe of Slope Looking Southwest<br><br>Overview of Vegetation and General Conditions |
|  | **Photo No. 12**<br><br>Overview of rip rap toe drain outlet pipe. There was minor flow at time of inspection. Looking west. |

**APPENDIX B**
**CLIFTY CREEK LANDFILL RUNOFF COLLECTION POND**
**DAM INSPECTION PHOTOGRAPHS**

| | |
|---|---|
|  | **Photo No. 13**<br><br>Overview of downstream slope area. Looking west.<br><br>General Overview |
|  | **Photo No. 14**<br><br>Landfill Runoff Collection Pond Dam From Top of Slope In Right Groin Looking East<br><br>Overview of Vegetation and General Conditions |