

2021 VISUAL INSPECTION OF ASH POND EMBANKMENTS AES PETERSBURG ASH POND SYSTEM

AES INDIANA PETERSBURG GENERATING STATION 6925 NORTH STATE ROAD 57 PETERSBURG, INDIANA 47567

ATC PROJECT NO. 170LF01141

DECEMBER 28, 2021

PREPARED FOR:

AES INDIANA 6925 NORTH STATE ROAD 57 PETERSBURG, INDIANA 47567

ATTENTION: MR. WILL TEAGUE



December 28, 2021

Mr. Will Teague Senior Scientist AES Indiana 6925 North State Road 57 Petersburg, Indiana 47567-0436 ATC Group Services / Atlas

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Re: 2021 Visual Inspection of Ash Pond Embankments Petersburg Ash Basin Pond System AES Indiana Petersburg Generating Station Petersburg, Indiana ATC Project No. 170LF01141

Dear Mr. Teague:

ATC Group Services, an Atlas Company, is pleased to present the findings of the November 16, 2021 Visual Site Inspection of the AES Petersburg Generating Station Ash Pond Embankments of the Ash Ponds A, A', B, C and D. This visual inspection and report were done in accordance with guidelines established by the Coal Combustion Residuals (CCR) Rule published by the Environmental Protection Agency (EPA) on April 17, 2015.

The scope of this inspection was limited to an examination of readily observable surficial features of the ash pond embankments and its appurtenant structures, and a review of information that you provided. Please note that the inspection did not include any test drilling, testing of materials, precise physical measurements of ash pond system features, detailed calculations to verify slope stability, or other engineering analyses. Although the inspection was conducted by competent personnel in accordance with generally accepted methods for ash pond systems, it should not be considered as a warranty or guaranty of the future performance/safety of the ash pond embankments.

The AES Petersburg Generating Station Ash Basin Pond System is located about four (4) miles north of the City of Petersburg in Pike County, Indiana west of State Road 57 (Figure 1). The ash pond system encompasses an area of approximately 157.9 acres (Figure 2).

The ash pond embankments inspection was completed by Martin Brungard and Sendhil Kumar of ATC Group Services (ATC). The weather condition during the inspection was approximately 55°F and sunny. Contained herein is a summary of the engineering observations of the ash pond embankments including condition of the pond side slopes, grading and erosion, vegetation, haul

roads, perimeter ditches, downdrain channels, riprap areas, culverts, and other adjacent structures. A vicinity map and the ash pond limits are shown in Figures 1 and 2 of this report for reference.

The 2021 Annual Inspection was performed to address the standards and guidelines required by the CCR Rule instituted by the Environmental Protection Agency on April 17, 2015. As a result, CCR ash ponds are now required to meet the requirements of 40 C.F.R. §257 to conduct annual inspections of the landfill in accordance with 40 C.F.R. §257.83(b). Listed below are requirements specified within the CCR Rule and the observations made by Martin Brungard and Sendhil Kumar during the annual inspection:

- i. A review of available information regarding the status and condition of the CCR Unit;
- ii. A visual inspection of the CCR Unit to identify signs of distress or malfunction;
- iii. A visual inspection of any hydraulic structures underlying the base of the CCR unit;

Inspection Summary

A site inspection grid map for the ash pond system at the AES Petersburg station is presented in Figure 3. The area occupied by Ash Pond D has been repurposed with the construction of a wastewater treatment plant, Ash Ponds B and C are closed, and Ash Pond A is in the closure process as in-place closure. Ash Pond A' is largely dewatered and will soon be regraded and closed as part of the Ash Pond A closure.

Engineering observations performed on November 16, 2021 are shown in Figure 3, 2021 Visual Site Inspection Grid Map. ATC visually inspected the embankments for Ash Ponds A, A', B, C, and D and found no areas of instability. However, there were several areas with concerns relating to the erosion of final cover soils over Ash Ponds B & C as shown in the photos. Figures 3 & 4 present the locations for the photos included with this report.

A description of the inspection findings are presented in sections below.

Changes in Geometry of Ash Pond

Observed geometry changes during the 2021 Petersburg ash basin embankment inspection consisted mainly of grading measures within the limits of Ash Pond A and A' which are in the process of being closed in place. There were no changes to the observed geometry of Ponds B, C & D.

Ash Pond A and A'

Ash Pond A & A' are approximately 70.1 acres in size and are in the process of being closed in place. Active construction activities were on-going within the limits of the ash pond to regrade and install the approved geocomposite final cover system.

Ash Pond B

Ash Pond B is approximately 33.1 acres and has been closed with a geomembrane-composite final cover, with the exception to the south side slope which is closed with an approved soil final cover. Ash Pond B does not receive ash anymore. In general, this pond has a good soil cover and is well-vegetated along the side slopes and top of the former ash pond basin. Some areas of the pond do have erosion as noted below.

- 1. The side slopes along the northwestern and northeastern faces of Ash Pond B had significant erosion rills and gullies observed generally in grids C-8, C-9 and H-7.
 - Recommendation: Repair the soil cover and install erosion control mats as needed in areas affected by erosion rills and gullies. Overseed these areas to establish a protective grass cover. As an alternative to the repair recommendation above, these areas apparently receive concentrated storm flow and constructing riprap-lined downchutes may be suitable for those rill locations.
- 2. Along the side slopes on the southeastern side of Ash Pond B, minor erosion and rills were observed at locations shown in grid I-11.
 - Recommendation: Repair the soil cover and overseed these areas to establish a protective grass cover.
- 3. Along the diversion berm swales on the south and east sides of Ash Pond B, significant erosion and rills were observed at locations shown in grids F-10, G-6, and G-8.
 - Recommendation: Repair the soil cover and overseed these areas to establish a protective grass cover.

Ash Pond C

Ash Pond C is approximately 45.7 acres and has been recently closed with a geomembranecomposite final cover and does not receive ash anymore. The former ash pond appears to have a good soil cover and vegetation established along the side slopes and upper cover. The following problems were noted during the inspection.

- 1. Along the side slopes on the southeastern side of Ash Pond C, poor vegetation cover was observed in grid J-10.
 - Recommendation: Overseed the area to enhance the protective grass cover.
- 2. Along the diversion berm swales on the southeast side of Ash Pond C, minor erosion and rills were observed at locations shown in grids N-3 and O-3.
 - Recommendation: Repair the soil cover and overseed these areas to establish a protective grass cover.

Ash Pond D

The area for Ash Pond D has been repurposed and does not receive ash sluicing anymore. In general, this area has been paved with asphalt and is now entirely occupied by a wastewater treatment plant and a parking facility.

Structural Integrity

All ash pond embankment slopes appear to be stable with no visual indications or signs of sloughing or subsidence were detected during this inspection.

Stability and Operation

The ash pond embankments are generally in good condition and the slopes are well vegetated in most places. Areas of localized surficial erosion were found around the former ponds and their upper surfaces. Those erosional features did not appear to penetrate through the soil cover, but they should be refilled and revegetated to prevent further damage to the cover or embankments. No other significant deficiencies were noted and operation of the ash pond system at this time is not expected to be adversely affected by any items detected during the 2021 inspection.

We appreciate the opportunity to assist you with this project. If you have any questions concerning information contained in this report, please do not hesitate to call either of the undersigned at 317.849.4990.

Sincerely,

ATC Group Services LLC

Martin Brungard, P.E., D.WRE. Senior Project Engineer

Sendhil Kumar, P.E. Senior Project Engineer

Copies:

Will Teague (1) John Hendrix (1)

Attachments:

| Figure 1 | Vicinity Map |
|----------|---------------------------------|
| Figure 2 | CCR Disposal Facilities |
| Figure 3 | Visual Site Inspection Grid Map |
| Figure 4 | Site Plan for Photo Locations |

Attachment A: Dam Inspection Report































Attachment A: Dam Inspection Report

SUGGESTED DAM INSPECTION REPORT (Refer to pages 5 and 6 for instructions.)

| Name of Professional Conducting Inspection Martin Brungard | | | | | | Profes PE1 | Professional License No. (Indiana) PE10910458 | | | | | | |
|--|--|---|--------------------------------------|--|----------------------------|--------------------|--|-------------------------|-------------------------|---------------------|-------------------|-----------------------|--------------------------------------|
| Business Address Phone: (day) 317 - 849 - 40 7988 Centerpoint Dr, Suite 100, Indianapolis, IN 46256 (evening) | | | | | | | | - 4990 - | | | | | |
| Company Name | ATC Gr | oup Services | | | | | | | | | | | |
| INSPECTION PRE Yes ⊠ No □ Con | EPARATION: F nment <u></u> | Reviewed all perti | nent tecl | nnical document | ation r | elated | to this | dam and | d site in | the S | tate's a | and the | Owner's files: |
| MULTIDISCIPINAF properly inspect thi hydrologic, structur | RY:I am experie s dam and app ral, and mecha | enced in the techr urtenant works. Te nical. Yes 🕱 No 🛙 | nical disci echnical d ⊐ Commo | iplines or I am w lisciplines, in addi ent | orking tional | with o to the g | ther pro eneral c | fessiona civil engir | s experie leering, m | nced ay ind | in the clude g | technica eotechnio | l disciplines to cal, geological, |
| Dam Name AES Petersburg | Ash Pond A | | | | | Quad. | Petersk | ourg | Date o | fInspe | ection | 11 / 1 | 6 / 2021 |
| State Dam ID N/A | Permit (if u N/A | inapproved see po | g. 6) Co Pike | ounty Ə | Se 1 | c. 3, | t. 1 <u>N</u> | , <u>8</u> V | Last | Inspe | ction | 10 / 2 | 28 / 2020 |
| Owners Name AES Indiana | | | | | | | | | | Owr (81 | ner's Ph 2)60 | ione)1-7115 | |
| 6925 North State | e Road 57, Pe | tersburg, IN 475 | 67 Contac | t's Phone (dav) | 812 | |)1 | 7115 | Spillw | av Wi | dth | | Ft. FBD. |
| Wil Teague Hazard | Drainage Area | Surface Area | Height | (evening) Crest Lengt | 812 h | 5 | 32 _ dth | 9797 | 9797 Top N/A Bot. N/A N | | | N/A | |
| Low | 0.16 MI ² | 81 AC | 20 | FT 6900 | FT | 20 |) F | T | N/A | FT | | Down 2 | 2.5 |
| FIELD CONDITIONS OBSERVED DRAWDOWN STRUCTURE Water Level - Below Dam CrestFt. Image: Structure Condition: Dry image: Snowcover_image: OtherOther Ground Moisture Condition: Dry image: Wet_image: Snowcover_image: OtherOther Image: Snowcover_image: Snowcov | | | | | | | | | | | | | |
| MONITORING Comments | 🗆 Yes 🛛 No | one [🗖 Gage Ro | d 🗖 | Piezometers | □ Se | epage | Weirs | | urvey Mo | numei | nts | Othe | r] |
| A UPSTREAM SLOPE GOOD Image: Acceptable A (A-4) Cracks-with Displacement Image: Acceptable Image: Acceptable DEFICIENT Image: Acceptable POOR Image: Acceptable | | | | | | | | | | | | | |
| B CREST GOOD ACCEPTABLE DEFICIENT POOR □ | PROBLEM (B-5) Sin Drainage Comments | S NOTED: ⊠ kholes □ (B-6) □ (B-10) Trees, | (B-1) Nor Not Wide Brush, B | ne ☐ (B-2) Rut Enough ☐ (B- riars ☐ (B-11) | s or Pu 7) Lov Other | uddles v Area | □ (B- □ (B- | 3) Erosio 8) Misali | n □ (B gnment | -4) Cr □ (B — | acks wi | ith Displa | icement Surface |

Spillway Width refers to the open channel (typically the emergency or auxiliary spillway) at the control section. Ft. FBD. refers to the vertical distance from the emergency (auxiliary) spillway control section to the lowest point of the crest of the dam. Inlet Below Crest refers to the vertical distance from the inlet of the principal spillway to the crest of the dam.

_state dam i.d<u>.</u>N/A

| C DOWNSTREAM SLOPE GOOD X ACCEPTABLE D DEFICIENT D POOR | PROBLEMS NOTED: ☑ (C-1) None □ (C-2) Livestock Damage □ (C-3) Erosion or Gullies □ (C-4) Cracks with Displacement □ (C-5) Sinkholes □ (C-6) Appears too Steep □ (C-7) Depression or Bulges □ (C-8) Slide □ (C-9) Soft Areas □ (C-10) Trees, Brush, Briars □ (C-11) Animal Burrows □ (C-12)Other |
|--|---|
| D SEEPAGE GOOD (NONE) ACCEPTABLE DEFICIENT POOR | PROBLEMS NOTED: ▼ (D-1) None □ (D-2) Saturated Embankment Area □ (D-3) Seepage Exits on Embankment □ (D-4) Seepage Exits at Point Source □ (D-5) Seepage Area at Toe □ (D-6) Flow Adjacent to Outlet □ (D-7) Seepage Clear/Muddy □ (D-7) Seepage Clear/Muddy □ (D-8) Flow Clear/Muddy □ (D-9) Dry/Obstructed] □ (D-10) Other |
| E PRINCIPAL SPILLWAY GOOD X ACCEPTABLE D DEFICIENT POOR D | DESCRIPTION: PROBLEMS NOTED: ★ (E-1) None □ (E-2) Deterioration □ (E-3) Separation □ (E-4) Cracking □ (E-5) Inlet, Outlet Deficiency □ (E-6) Stilling Basin Inadequacies □ (E-7) Trash Rack □ (E-8) Other Comments: Being removed from service as ash pond is closed. |
| AUXILIARY SPILLWAY GOOD ACCEPTABLE DEFICIENT POOR | DESCRIPTION: N/A PROBLEMS NOTED: (F-1) None (F-2) No Auxiliary Spillway Found (F-3) Erosion-with Backcutting (F-4) Crack with Displacement (F-5) Appears to be Structurally Inadequate (F-6) Appears too Small (F-7) Inadequate Freeboard (F-8) Flow Obstructed (F-9) Concrete Deteriorated/Undermined (F-10) Other Comments: |
| G MAINTENANCE AND REPAIRS GOOD X ACCEPTABLE DEFICIENT DEFICIENT | PROBLEMS NOTED: Image G(G-4) G(G-5) G(G-4) Spillway Obstruction Image G(G-6) Trees on Upstream Slope, Crest, Downstream Slope Image Image G(G-6) Trees on Upstream Slope, Crest, Downstream Slope Image Image Image |
| Based on this inspe | ction and recent file review, the overall surficial condition is determined to be: 🛛 (H-1) Satisfactory 🗆 (H-2) Fair y Poor 📄 (H-4) Poor 📄 (H-5) Unsatisfactory RATING IS DIFFERENT THAN PREVIOUS IDNR RATING, PLEASE ATTACH EXPLANATION AND REASONS FOR CHANGE ON PAGE 4. |

RECOMMENDATIONS AND ITEMS REQUIRING ACTION BY OWNER TO IMPROVE THE SAFETY OF THE DAM

| MAINTENANCE-MINOR REPAIR-MONITORING 11) Provide Additional Erosion Protection: 2) Mow: 2) Mow: 3) Clear Trees and/or Brush From: 3) Clear Trees and/or Brush From: 4) Initiate Rodent Control Program and Properly Backfill Existing Holes: 5) Repair: 6) Provide Surface Drainage For: 7) Monitor: 7) Monitor: 8) Other: 8) Other: ENGINEERING-EMPLOY AN ENGINEER EXPERIENCED IN DESIGN AND CONSTRUCTION OF DAMS TO: (Plans & Specifications must be approved by State prior to construction.) 10) Prepare Plans and Specifications for the Rehabilitation of the Dam: 11) Prepare As-Built Drawings of: 12) Perform a Geotechnical Investigation to Evaluate the Stability of the Dam: 13) Perform a Hydrologic Study to Determine Required Spillway Size: 14) Prepare Plans and Specifications for an Adequate Spillway Size: 14) Prepare Plans and Specifications for an Adequate Spillway: 15) Set up a Monitoring Program: 16) Refer to Unapproved Status of Dam: 17) Develop an Emergency Action Plan: 18) Other: 19) Other: | |
|---|---------------------|
| Recommended schedule for upgrades/comments (Please prioritize and note importance of each item.) | |
| | |
| Photographs Attachments | |
| ENGINEER'S INSTRUCTION Instructed owner on the safety concerns with the structure and how to monitor and inspect the works in the interim period between the regulatory two-year inspections. Yes D No X Comment Further inspections as a dam facility will not be needed when ash pond is closed. | dam and appurtenant |
| Professional Engineer's Signature | Date |
| Reviewed By Owner/Owner's Representative | Date |

EXPLANATION FOR CHANGE IN RATINGS (Describe all repairs, upgrades or improvements made if dam conditions and rating have improved since the last inspection. Describe deteriorating conditions if ratings have worsened.)

REASONS FOR RATING CHANGE:

Ash Pond A is being removed from service and is being permanently capped with geomembrane final cover.

PREVIOUS RECOMMENDATIONS FOR MAINTENANCE, REPAIRS, AND UPGRADES:

HAVE THEY BEEN PERFORMED X YES D NO (If no, please explain:)

Supporting Documentation

Photographs \Box Attachments \Box Calculations \Box Drawings \Box Other \Box

Comments:

INSTRUCTIONS FOR COMPLETING DAM VISUAL INSPECTION REPORT

1. Complete all items that are applicable; if not applicable, write in "N/A". For concrete dams, complete all applicable items and use "comments" section to cover items not included in the check boxes. Also indicate that the dam is concrete in the comments section.

2. Use page 6 to determine ratings of each dam component (items A through G) and for Overall Conditions (Item H).

3. Please write legibly and concisely.

4. Inspector must be knowledgeable with the type of dam, materials, and components being inspected. If not, qualified assistance shall be engaged.

5. The inspector shall review the dam owner's and IDNR project files prior to the inspection. Previous inspection reports shall be closely reviewed for previous problems and deficiencies.

6. If the ratings of the components (items A through G) or the Overall Conditions (item H) of the dam have changed since the last inspection, please complete page 4. If a rating has improved, dam repairs, improvements, analyses, or maintenance must have been performed and documented on page 4.

7. For a dam to have a satisfactory "Overall Conditions" rating, it must have no existing or potential dam safety deficiencies recognized. Safe performance is expected under all anticipated loading conditions, including infrequent hydrologic events (PMP for high hazard dams) and seismic events. The dam owner's project files must contain hydrologic and hydraulic analyses of the dam and its spillways to verify performance. The files must also contain slope stability analyses to verify embankment stability under full reservoir conditions and rapid-draw down conditions. The dam and all of its components must meet current IDNR and design standards. "Normal" deficiencies such as minor erosion, minor seepage, or normal concrete aging may not make a dam unsatisfactory or unacceptable. For a satisfactory "Overall Conditions" rating to be assigned, items A through G generally should all have a "good" rating; however, in some cases an "acceptable" rating may be satisfactory if the "Problems Noted" are minor, or "normal" conditions, such as minor erosion rills, small puddles on crest, or if grass needs mowed, but is in good condition.

8. An inspection report form must be submitted to IDNR along with a formal technical inspection report as described in Chapter 4.0 of Part 3 of the Indiana Dam Safety Inspection Manual.

9. Please sign and date this page in the space below to verify that you have read and understand these instructions.

Inspector's Signature:

Date:

CONDITIONS OBSERVED - APPLIES TO UPSTREAM SLOPE, CREST, DOWNSTREAM SLOPE, PRINCIPAL SPILLWAY, AUXILIARY SPILLWAY

| | | | , DO THO HEAR OLD | | | | |
|--|---|---|--|---|--|--|--|
| GOOD | ACCEPTABLE | | DEFICIENT | | POOR | | |
| In general, this part of the structure has a good appearance, and conditions observed in this area do not appear to threaten the safety of the dam. | Although general cr tained, surfaces may rutted, spalled, or o condition. Conditior currently appear to t the dam. | ross-section is main- be irregular, eroded, therwise not in new is in this area do not hreaten the safety of | Continued deterioration and/or unusual loading may threaten the safety of the dam. | | Conditions observed in this area appear to threaten the safety of the dam. Conditions observed in this area are unacceptable. | | |
| | CO | NDITIONS OBSERVED | - APPLIES TO SEEPA | AGE | | | |
| GOOD (NONE) | | DEFICIENT | | POOR | | | |
| No evidence of uncontrolled seepage. No unexplained increase in flows from de- signed drains. All seepage is clear. Seep- age conditions do not appear to threaten the safety of the dam. | Some seepage exists at areas other than the drain outfalls, or other designed drains. No unexplained increase in flows from designed drains. All seepage is clear. Seepage conditions observed do not cur- rently appear to threaten the safety of the dam. | | Excessive seepage than drain outfalls drains. Seepage net Increased flow and/r ration in seepage cor the safety of the dan | exists at areas other and other designed eds to be evaluated. or continued deterio- nditions may threaten h. | Excessive seepage conditions observed appear to threaten the safety of the dam and is unacceptable. Examples: 1) De- signed drain or seepage flows have in- creased without increase in reservoir level. 2) Drain or seepage flows contain sedi- ment. i.e., muddy water or particles in jai samples. 3) Widespread seepage, con- centrated seepage or ponding appears to threaten the safety of the dam. | | |
| | CONDITIONS | OBSERVED - APPLIE | S TO MAINTENANCE | AND REPAIR | | | |
| GOOD | ACCEPTABLE | | DEFICIENT | | POOR | | |
| Dam appears to receive effective on-going maintenance and repair, and only a few minor items may need to be addressed. Dam appear some maintenante dressed. No | | n appears to receive maintenance, but le maintenance items need to be ad- ssed. No major repairs are required. | | ee of the dam needs ent. Major repairs may ed neglect of mainte- the safety of the dam. | Dam does not receive adequate maint nance. One or more items needing mai tenance or repair has begun to threate the safety of the dam. Level of maint nance is unacceptable. | | |
| | | OVERALL C | ONDITIONS | | | | |
| SATISFACTORY-No existing or potential dam safety deficiencies recognized. Safe performance is expected under all antici- pated loading conditions, including such events as infrequent hydrologic and/or seismic events. Project Files contain nec- essary hydrologic, and other engineering calculations to verify dam safety and performance. FAIR - No existing dam safety deficien- cies are recognized for normal loading conditions. Infrequent hydrologic and/or | | | d probably result in a acy. POOR - A potential recognized for un- onswhich may realis- e expected life of the NALLY POOR may incertainties exist as rameters which iden- n safety deficiency; as and studies are | POOR - A potential d is clearly recognizer conditions. Immedia the deficiency are re voir restrictions may problem resolution. UNSATISFACTORY ciency exists for nor mediate remedial a problem resolution. | am safety deficiency 1 for normal loading ite actions to resolve 2 commended; reser- 7 be necessary until 7 - A dam safety defi- rmal conditions. Im- ction is required for | | |
| | HAZ | ARDCLASSIFICATION | IS OF DAMS (STRUCT | JRE) | | | |
| LOW HAZARD- A structure the failure of which may damage farm buildings, agri- cultural land, or local roads | | SIGNIFICANT HAZARD- A structure the failure of which may damage isolated homes and highways, or cause the tempo- rary interruption of public utility services. | | HIGH HAZARD-A str which may cause th serious damage to ho commercial buildings, highways, or railroad | ucture the failure of ne loss of life and omes, industrial and publicutilities, major ls. | | |
| | | | | | | | |

UNAPPROVED STATUS OF DAM

A dam that has been given an unapproved status (see entry for permit) means that plans, construction specifications, hydraulic analyses, and/or a geotechnical investigation on your dam, proving the safety of the structure, have not been received and approved by the Indiana Department of Natural Resources (IDNR). IDNR records indicate that no progress has been made to secure this approval. The fact that the dam is inspected under the Regulation of Dams Act (IC 14-27-7.5) in no way alters the illegal status of the structures.

If your dam is indicated to be unapproved, it is requested that your engineer contact the Indiana Department of Natural Resources,