

MEMORANDUM – Operating Record (40 CFR 257.105(h)(12))

March 23, 2023
File No. 0133274-012

TO: AES Indiana – Petersburg Generating Station

FROM: Haley & Aldrich, Inc.

SUBJECT: Semi-Annual Remedy Selection Progress Report Pursuant to 40 CFR §257.97(a)
Petersburg Generating Station - Ash Pond System and Type I Restricted Waste Landfill

Indianapolis Power & Light Company d/b/a AES Indiana (AESI) initiated corrective measures for the Ash Pond System and Type I Restricted Waste Landfill (Landfill) at the Petersburg Generating Station (PGS) on April 15, 2019, in response to statistically significant levels (SSL) of Appendix IV constituents (lithium and molybdenum) exceeding Groundwater Protection Standards (GWPS). Pursuant to 40 CFR §257.96(a), a demonstration of need for a 60-day extension for the assessment of corrective measures was completed on July 12, 2019. The Corrective Measures Assessment (CMA) Report was completed and placed in the facility operating record on September 13, 2019, and subsequently amended on October 11, 2019.

In accordance with the Federal CCR Rule, following completion of the CMA, AES Indiana must, as soon as feasible, select a remedy that meets the standards listed in 40 CFR §257.97(b). Pursuant to §257.97(a), the owner or operator of a Coal Combustion Residual (CCR) management unit that has completed a CMA for groundwater is required to prepare a semi-annual report describing the progress made in selecting and designing the remedy. This report documents activities completed in support of selecting and designing a remedy during the period from September 15, 2022 through March 23, 2023. A summary of the progress made in selecting a remedy is provided below.

SUMMARY OF ACTIONS COMPLETED

Ash Pond System and Landfill

The following actions have been completed during this reporting period for the Ash Pond System and the Landfill:

- Completed the statistical analysis of the May 2022 sampling results for the presence of Appendix IV constituents to be present at concentrations above GWPS.
- Continued Assessment Monitoring: Collected groundwater samples and evaluated the results of the November 2022 sampling event in support of ongoing groundwater monitoring compliance and nature and extent (N&E) evaluations. Final laboratory results were placed in the facility's CCR operating record. The groundwater monitoring data for the November 2022 sampling event is being evaluated for statistically significant levels compared to GWPS. Any new parameters that exceed GWPS will be considered in the selection of the final remedy.

- Updated a 3-D model for the Landfill and Ash Pond System to aid in the Geochemical evaluation and further advance the conceptual site model (CSM).

Ash Pond System

The following actions have been completed during this reporting period for the Ash Pond System:

- Submitted a revised groundwater Sampling and Analysis Plan for the Ash Pond System to Indiana Department of Environmental Management (IDEM).
- Continued implementation of the approved IDEM Ash Pond System Closure Plan / Post Closure Plan¹:
 - Completed dewatering activities of Ponds A and Pond A' as allowed under the facilities NPDES permit;
 - Completed installation of the geosynthetic liner system over Pond A and Pond A';
 - Continued placing the protective soil cover for the final cover system along the west side of Pond A and Pond A'; and
 - Completed seeding of Phase 1 and Phase 2 cover soil.
- AESI continued efforts to further establish N&E to support the CMA and selection of remedy:
 - Completed installation of eighteen (18) supplemental N&E monitoring wells along the northern and western property boundary. The wells were nested in six (6) groups (MW-38, MW-39, MW-41, MW-45, MW-46 and MW-47) that were completed in late September and October 2022;
 - Completed installation of six (6) supplemental N&E monitoring wells (AP-9B, AP-9I, AP-10B, AP-10I, AP-11B, AP-11I) to provide additional vertical delineation of Appendix IV SSLs. The wells were completed in late September and October 2022;
 - Collected soil samples from the screen intervals of the eighteen (18) new nested N&E monitoring wells. The analytical results will be used to evaluate geochemical conditions that can impact attenuation or mobility of Appendix IV constituents in groundwater;
 - Collected two rounds of groundwater samples from the eighteen (18) newly installed supplemental nested wells in November 2022 and February 2023;
 - Collected the initial round of groundwater samples from the six (6) newly installed supplemental wells in December 2022; and
 - AESI collected groundwater samples from temporary monitoring wells that were installed at eight (8) locations within the channel of the White River using a sonic drill rig positioned on a sectional barge. Eighteen (18) groundwater samples were collected from multiple intervals beneath the White River between January and March 2023.
- Completed in-situ hydraulic testing of the shale bedrock at five (5) monitoring well locations MW-37, MW-40, MW-42, MW-44 and MW-47 in late September through October 2022 to establish vertical permeability of the shale formation that is beneath the Ash Pond System.
- Groundwater samples were collected from the existing N&E monitoring wells during the second semi-annual sampling event in 2022 to provide supplemental groundwater data to:
 - Define the horizontal and vertical extent of Appendix IV constituents along the White River;

¹ The CMA groundwater remedy consists of two parts: source control (unit closure) and groundwater treatment. Installation of the final cover system is the source control element for this unit. that will reduce infiltration of precipitation to groundwater thereby isolating the CCR material.

- Supplement and enhance the evaluation of the extent of groundwater impacts and assessment of corrective measures;
 - Inform what additional steps, if any, are necessary to fully delineate N&E of Appendix IV constituents; and
 - Support the selection of remedy.
- Completed hydraulic conductivity testing on all the newly installed monitoring wells in December 2022 to provide data to better understand aquifer characteristics and groundwater flow patterns.
- Installed thirty-nine (39) pressure transducers at fourteen (14) nested N&E monitoring well locations to collect groundwater elevation data to better understand vertical groundwater gradients to support the CSM. Pressure transducers were installed in October 2022 and were downloaded on a monthly basis through March 2023.

Landfill

The following actions have been completed during this reporting period for the Landfill that will better define whether historic mining activities (e.g., underground and surface mining and the placement of mine spoils) and/or naturally occurring geologic units immediately surrounding the Landfill impact background conditions:

- Continued evaluating geochemical conditions to determine whether naturally occurring sources of lithium and or molybdenum are contributing to GWPS exceedances down-gradient of the Landfill.
- Installed a supplemental N&E monitoring well (MW-15B) to provide additional vertical delineation of Appendix IV SSLs downgradient of the landfill. The well was completed in late September 2022 and the initial groundwater sample was collected in December 2022.
- AESI received approval from IDEM in November 2022 and subsequently installed two (2) new background wells MW-1A and MW-12A in March 2023. The wells will serve to supplement existing background well MW-1.

PLANNED ACTIVITIES

Anticipated activities which will support CMA and selection of remedy for the upcoming six months include the following (subject to change):

- Complete the statistical analysis of the November 2022 sampling event to evaluate groundwater for the presence of SSLs above GWPS downgradient of the Ash Pond System and Landfill.
- Continue Assessment Monitoring by collecting groundwater samples in May 2023 from the existing CCR well network and the seven (7) additional monitoring wells that will be incorporated into the CCR network. In addition, collect up to two (2) additional rounds of groundwater samples from the new wells that will be incorporated into the CCR network. The groundwater data will be evaluated for statistically significant levels compared to GWPS. Any new constituents that exceed GWPS will be considered in selection of the final remedy.
- Continue efforts to establish N&E along the western property boundary for the Ash Pond System which will support CMA and selection of remedy:
 - Collect groundwater samples from the nested N&E monitoring wells along the western property boundary to define the vertical and lateral extent of Appendix IV constituents;

- Evaluate the N&E groundwater analytical results and if necessary, install additional N&E monitoring wells to define horizontal and vertical extent of Appendix IV constituents; and
 - Continue to collect groundwater elevation data from the fourteen (14) nested N&E monitoring well locations to better understand vertical groundwater gradients to support the CSM.
- Complete hydraulic conductivity testing on the new background monitoring wells to provide data to better understand aquifer characteristics and groundwater flow patterns.
- Collect up to four (4) rounds of groundwater samples from the two new background wells located upgradient of the landfill to provide a representative data set that can be used in a statistical evaluation.
- Evaluate the groundwater analytical data collected during the May 2023 semi-annual assessment monitoring sampling event that will include the N&E monitoring wells.
- As appropriate, refine CSM and associated groundwater flow and solute transport model.
- Continue to perform an engineering review of the five (5) potential CMA remedial alternatives. For these reviews, emphases will be placed on understanding and reacting to impacts of newly gathered analytical results, identifying and evaluating applicability of emerging technologies and their impacts on the CMA and selection of remedy process.
- Continue permit applicability and risk assessment for CMA options.
- Complete closure activities at Pond A and A' (final cover system installation and seeding) in accordance with the IDEM-approved and federal CCR Ash Pond System Closure Plan / Post Closure Plan.
- Following the delineation of groundwater impacts estimate quantity of Appendix IV material released as required under 40 CFR §257.95(g)(1)(ii) and place in the facility's CCR operating record.
- Provide a semi-annual progress report that summarizes AESI's progress and status regarding a selection of remedy.