CCR COMPLIANCE
GROUNDWATER MONITORING AND CORRECTIVE ACTION
ANNUAL REPORT
ASH FILTER PONDS AND ASH/REFUSE DISPOSAL SITE

Prepared for:

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Executive Summary

In response to the newly adopted Part A elements (effective September 28, 2020) of the Coal Combustion Residuals (CCR) Rule (or Rule), this Executive Summary has been incorporated into the annual report per the specific provisions as codified in 40 CFR §257.90(e)(6). These provisions require that an up-front overview of the current status (covering the immediately preceding calendar year) of groundwater monitoring and corrective action programs be provided in a concise and focused manner for each CCR unit at the facility. Accordingly, the following paragraphs document the respective groundwater monitoring status (for Calendar Year 2020) of the Ash Filter Ponds and the Ash Disposal Site at the Keystone-Conemaugh Projects, LLC – Conemaugh Generating Station. Tables and/or figures referenced in the discussions below are included at the end of the report and further support the text (Sections 2.0 and 3.0) in the main body of the report.

The Ash Filter Ponds represent a collective CCR unit, and encompasses four ponds designated as Ponds "A," "B,", "C," and "D" (see Figure 1). Also as shown on Figure 1, the associated CCR groundwater monitoring network is comprised of five wells, including two upgradient locations (Wells MW-1B and MW-2) and three downgradient locations (Wells MW-3, MW-4, and MW-23). For Calendar Year 2020, the Ash Filter Ponds entered and ended the period in the Detection Monitoring Program, wherein they have remained since CCR groundwater monitoring activities were initiated. To support this continuation, an Alternate Source Demonstration (ASD) was completed in April 2018, which successfully showed that incidental deposition of gypsum in the area of Well MW-4 was responsible for the statistically significant increase (SSI) in sulfate (CCR Appendix III constituent) in the localized groundwater (see Table 1). The findings and conclusions from the April 2018 ASD remain relevant and applicable to the current groundwater monitoring observations, which continue to show sulfate as the only Appendix III constituent elevated above background and only in downgradient Well MW-4 (see Table 1). No groundwater activities to date have triggered the Ash Filter Ponds into the Assessment Monitoring Program, and correspondingly, there has never been basis for performance of an Assessment of Corrective Measures.

As shown in Figure 2, the Ash Disposal Site is a captive landfill located in the northern portion of the Conemaugh Generating Station proper, and includes a CCR groundwater monitoring network consisting of four wells, including one upgradient location (Well MW-31) and three downgradient locations (Wells MW-9, MW-10, and MW-11). For Calendar Year 2020, the Ash Disposal Site entered and ended the period in the Assessment Monitoring Program. The Ash Disposal Site has remained in Assessment Monitoring since being transitioned in January 2018 following confirmed SSIs for CCR Appendix III constituents, including calcium, chloride, sulfate, and total dissolved solids (TDS) in the downgradient wells (see Table 3). Assessment Monitoring events conducted in January, May, and October 2020 (see Table 4) did not reveal any CCR Appendix IV constituents

at concentrations representing a statistically significant level (SSL) above the corresponding groundwater protection standards (GWPSs). These events further continued to show several Appendix III constituents at values above background in the downgradient wells, including Wells MW-9 and MW-10 (calcium, chloride, pH, sulfate, and TDS), and Well MW-11 (calcium, chloride, fluoride, sulfate, and TDS). No groundwater-related findings to date have triggered the Ash Disposal Site into an Assessment of Corrective Measures. A surficial (non-groundwater) release of CCR materials (ash) did occur at the Ash Disposal Site in August 2018 and was immediately addressed via appropriate response actions. These actions and the associated Assessment of Corrective Measures were documented in a report issued in January 2019, and which also encompassed a public meeting that was held on December 18, 2018.

1.0 Introduction

Title 40 Code of Federal Regulations (CFR) §257.90 mandates that existing Coal Combustion Residuals (CCR) landfills and surface impoundments, also known as CCR units, be subject to groundwater monitoring and corrective action requirements as further detailed in §257.91 through §257.98. These requirements are part of the overall CCR Rule (or Rule) which was published in the Federal Register on April 17, 2015 and which became effective on October 19, 2015. Specific obligations for Owners and Operators of existing CCR units regarding the preparation of "Annual Groundwater Monitoring and Corrective Action Reports (Annual Report)" are outlined in §257.90(e)(1-5). The first of these Annual Reports was completed no later than January 31, 2018, and provided information to address the following aspects for the preceding calendar year:

- Document the status of the groundwater monitoring and corrective action program for the respective CCR units;
- Summarize key actions completed;
- Describe any problems encountered and actions taken to resolve the problems; and
- Offer a projection of key activities for the upcoming year.

At a minimum, the Annual Report must contain the following information to the extent applicable and available, and beginning with the current report, must also address the items contained in §257.90(e)(6) in the form of an Executive Summary:

- A map, aerial image, or diagram showing the CCR unit and all background/upgradient and downgradient monitoring wells, to include the well identification numbers, that are part of the groundwater monitoring program;
- Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken;
- In addition to all the monitoring data obtained under §257.90 through §257.98, a summary including the number of groundwater samples that were collected for analysis for each background/upgradient and downgradient well, the dates the samples were collected, and whether the sample was required by the detection monitoring or assessment monitoring programs;
- A narrative discussion of any transition between monitoring programs (e.g., the date and circumstances for transitioning from detection monitoring to assessment monitoring in addition to identifying the constituent(s) detected at a statistically significant increase over background levels); and
- Any other information required to be included as specified in §257.90 through §257.98.

Keystone-Conemaugh Projects, LLC – Conemaugh Generating Station, is an electric generating station located in New Florence, Pennsylvania. The Station operates two coal-fired boilers each with a steam turbine-driven electric generator that provides electricity to the regional electric grid. The Rule applies to this facility due to the management/disposal of CCR materials that are generated from the combustion of coal. CCR units associated with Station operations include the Conemaugh Ash/Refuse Disposal Site and four Ash Filter Ponds (Ponds "A," "B," "C," and "D") used for the management of bottom ash. Each of these CCR units has a dedicated groundwater monitoring system that was originally installed to comply with Commonwealth of Pennsylvania Residual Waste Regulations, and was subsequently evaluated and modified (as needed) for use under the CCR program. Additionally, in accordance with the provisions of §257.91(d) of the Rule, the groundwater monitoring system for the Ash Filter Ponds has been designated to provide coverage in the context of a multiunit system encompassing all four ponds collectively.

In summary, this fourth Annual Report has been prepared to comply with the requirements of §257.90(e), addressing each of the Station's CCR units with respect to the groundwater monitoring and corrective actions undertaken during Calendar Year 2020. This Annual Report and all subsequent reports thereto will be placed in the Station's operating record per §257.105(h)(1), noticed to the State Director per §257.106(h)(1), and posted to the publicly accessible internet site per §257.107(h)(1).

2.0 Ash Filter Ponds

2.1 Groundwater Monitoring Network

The CCR groundwater monitoring system for the Ash Filter Ponds is comprised of five wells, including Wells MW-1B and MW-2 (upgradient), and Wells MW-3, MW-4, and MW-23 (downgradient). All five wells communicate with the alluvium, which is the uppermost aquifer. The locations of the groundwater monitoring wells are shown on Figure 1, along with depiction of the generalized groundwater flow direction in the area of the ponds. Each of these wells was already existing, and no new wells were added nor were any existing wells abandoned/replaced during the 2020 reporting period.

2.2 Summary of Previously-Reported Monitoring Activities

In accordance with the Detection Monitoring requirements under §257.94(b) for existing CCR surface impoundments, a minimum of eight independent samples from each background and downgradient well were collected and analyzed for the constituents listed in Appendices III and IV of the Rule prior to October 17, 2017. The results from these samples, which were collected during the period from December 2015 through July 2017, were presented in the first Annual Report issued in January 2018. In addition, a ninth round of samples was collected (October 1-4, 2017) and analyzed for Appendix III constituents only. The results from these samples served as the initial point of comparison to determine if concentrations in any of the downgradient wells were at levels representing a statistically significant increase (SSI) over the background concentrations established in the upgradient well(s).

During January 2018, the results from the October 1-4, 2017 Detection Monitoring event were reviewed, and subsequent determination made that one downgradient well (MW-4) showed an Appendix III constituent (sulfate) at levels representing an SSI above corresponding background concentrations. Accordingly, and per the provisions of §257.94(e)(2), efforts were undertaken to conduct an Alternate Source Demonstration (ASD) in an attempt to identify a potential source other than the Ash Filter Ponds which was responsible for the observed SSI. This ASD (April 2018) was ultimately successful and determined that incidental gypsum deposition in the area of Well MW-4 was causing the elevated sulfate readings in the localized groundwater. As a result, the Ash Filter Ponds were deemed to remain in the CCR Detection Monitoring Program, and were additionally sampled in May 2018 and October 2018 with continuing observations of SSIs only for sulfate in Well MW-4. These results, along with the detailed findings and conclusions from the ASD, were presented in the second Annual Report issued in January 2019.

During the 2019 reporting period, the Ash Filter Ponds remained in the Detection Monitoring Program, with sampling events conducted in April, July, and October. The results from each of

the 2019 events consistently showed SSIs for sulfate in downgradient Well MW-4 only, along with an SSI for calcium in this same well during the October event. With both calcium and sulfate being the principal components of gypsum, the previously completed ASD was deemed as still relevant and applicable, allowing the Ash Filter Ponds to continue in the CCR Detection Monitoring Program. The results and accompanying discussion were presented in the third Annual Report issued in January 2020.

2.3 2020 Data Collection

The Ash Filter Ponds remained in the CCR Detection Monitoring Program during the 2020 reporting period, and were subjected to sampling for Appendix III constituents as part of monitoring events conducted in May and October 2020 (the required monitoring frequency "shall be at least semiannual" for the Appendix III constituents). As shown in Table 1, the results from each of the 2020 events again consistently showed SSIs for sulfate only in downgradient Well MW-4. Consequently, based on review of the collective 2020 analytical data and continued relevance/applicability of the previously completed ASD, the Ash Filter Ponds will remain in the CCR Detection Monitoring Program in Calendar Year 2021.

As an additional note, downgradient Well MW-3 was re-surveyed in January 2020 and the top of casing elevation (from which depth to groundwater is recorded) was adjusted upward by 4.25 feet. This adjustment has been appropriately applied to all the previously calculated groundwater elevation values for Well MW-3 contained in Table 1, and results in a more uniform depiction of the local groundwater table but does not alter the generalized flow directions.

2.4 2020 Monitoring Program Transitions

During 2020, there were no transitions between monitoring programs, with the Ash Filter Ponds remaining in the CCR Detection Monitoring Program.

2.5 2020 Corrective Actions

During 2020, there were no problems identified or corrective actions undertaken.

2.6 2021 Projected Activities

As noted, it is anticipated that Detection Monitoring activities will continue for the Ash Filter Ponds during 2021, with continued review of Appendix III constituent concentrations and comparison with the calculated background values.

3.0 Ash Disposal Site

3.1 Groundwater Monitoring Network

The CCR groundwater monitoring system for the Ash Disposal Site is comprised of four wells, including Well MW-31 (upgradient) and Wells MW-9, MW-10, and MW-11 (downgradient). Monitoring Wells MW-9 and MW-11 communicate with the shallow unconfined groundwater in bedrock and Monitoring Wells MW-10 and MW-31 communicate with shallow groundwater across the soil/bedrock interface. Hence, all four wells monitor the uppermost aquifer in the area of the Ash Disposal Site. The locations of the groundwater monitoring wells are shown on Figure 2, along with depiction of the generalized groundwater flow direction in the area of the disposal site. Each of these wells was already existing, and no new wells were added nor were any existing wells abandoned/replaced during the 2020 reporting period.

3.2 Summary of Previously-Reported Monitoring Activities

In accordance with the Detection Monitoring requirements under §257.94(b) for existing CCR landfills, a minimum of eight independent samples from each background and downgradient well were collected and analyzed for the constituents listed in Appendices III and IV of the Rule prior to October 17, 2017. The results from these samples, which were collected during the period from December 2015 through July 2017, were presented in the first Annual Report issued in January 2018. In addition, a ninth round of samples was collected (October 2-3, 2017) and analyzed for Appendix III constituents only. The results from these samples served as the initial point of comparison to determine if concentrations in any of the downgradient wells were at levels representing an SSI over the background concentrations established in the upgradient well(s).

During January 2018, the results from the October 2017 Detection Monitoring event were reviewed, and subsequent determination made that all three downgradient wells showed several Appendix III constituents at levels representing an SSI above corresponding background concentrations. Accordingly, the Ash Disposal Site was transitioned into the CCR Assessment Monitoring Program, and an initial round of samples covering all Appendix IV constituents was collected in March 2018 per §257.95(b). From these results, the detected Appendix IV constituents were carried forward and analyzed during continued Assessment Monitoring events conducted in May 2018 and October 2018. As was observed, none of the Appendix IV constituents from any of the 2018 sampling events were measured at concentrations representing a statistically significant level (SSL) above the corresponding site-specific groundwater protection standards (GWPSs). All analytical results from the 2018 Assessment Monitoring were presented in the second Annual Report issued in January 2019.

It is additionally noted that the May 2018 Assessment Monitoring event yielded an erroneous result for Radium-226/228 in downgradient Well MW-9. The initially reported value (103.6 pCi/L) was generated via an incorrect laboratory analytical method. Following this determination, a new sample (for Radium analysis only) was collected from MW-9 in July 2018 and reanalyzed using the correct analytical method. The revised result (0.32 pCi/L) from the July 2018 sampling aligns with the historical values detected in this well, and correspondingly remains below background and the groundwater protection standard.

During the 2019 reporting period, the Ash Disposal Site remained in the CCR Assessment Monitoring Program, with sampling events conducted in April, July, and October 2019. None of these events showed any Appendix IV constituents at levels representing an SSL above the corresponding GWPSs. However, with detections of at least one Appendix IV constituent and several Appendix III constituents above calculated background, the Ash Disposal Site was deemed to remain in the CCR Assessment Monitoring Program. All analytical results from the 2019 Assessment Monitoring were presented in the third Annual Report issued in January 2020.

3.3 2020 Data Collection

Following its transition in early-2018, the Ash Disposal Site continued in the CCR Assessment Monitoring Program during the 2020 reporting period. Accordingly, samples were collected and analyzed for Appendix III and Appendix IV constituents as required, during the January, May, and October 2020 monitoring events (similar to the monitoring frequency for the Appendix III constituents, the required monitoring frequency is "on at least a semiannual basis" for the Appendix IV constituents following completion of the initial sampling event for the Assessment Monitoring Program). Results from the 2020 sampling events are summarized in Tables 3 and 4, covering Appendix III and Appendix IV, respectively. As shown in Table 4, none of the Appendix IV constituents from the 2020 sampling events were measured at concentrations representing an SSL above the corresponding GWPSs. Detected concentrations of two Appendix IV constituents (barium and fluoride) as well as several Appendix III constituents; however, do remain above calculated background, and thus providing the basis for continued Assessment Monitoring into 2021.

3.4 2020 Monitoring Program Transitions

During 2020, there were no transitions between monitoring programs, with the Ash Disposal Site remaining in the CCR Assessment Monitoring Program.

3.5 2020 Corrective Actions

During 2020, there were no problems identified or corrective actions undertaken.

3.6 2021 Projected Activities

As noted, it is anticipated that Assessment Monitoring activities will continue for the Ash Disposal Site during 2021, with continued review of Appendix III/Appendix IV constituent concentrations and comparison against calculated background and established groundwater protection standards.

Tables

Figures