2024 ANNUAL CCR RULE GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

McELROY'S RUN COAL COMBUSTION BYPRODUCT DISPOSAL FACILITY

Pleasants Power Station
Pleasants County, West Virginia

Prepared for:

Allegheny Energy Supply Company
A Wholly Owned Subsidiary of FirstEnergy

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Tetra Tech Project No. 212C-SW-00070

January 2025

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1.0 INTRODUCTION

This 2024 Annual Coal Combustion Residuals (CCR) Groundwater Monitoring and Corrective Action Report was prepared by Tetra Tech, Inc. (Tetra Tech) on behalf of Allegheny Energy Supply Company (AESC), for the McElroy's Run Coal Combustion Byproduct Disposal Facility ("CCBDF", "CCR units", or "site") associated with the Pleasants Power Station (hereinafter referred to as the "Station"). The CCR unit and Station are located in Pleasants County, West Virginia. This report was developed to comply with the requirements of § 257.90(e) of the federal CCR Rule (40 CFR, Part 257, Subpart D). In accordance with § 257.90(e)(6), an overview of the current status of the CCR groundwater program at the site is provided in the table below, and discussed in Sections 2.0 through 5.0 of this report:

Status Summary for Reporting Period (January 1 to December 31, 2024)	
Groundwater Monitoring Program in Effect as of January 1, 2024 - 257.90(e)(6)(i)	Assessment Monitoring (Sampling Event AM-12)
Groundwater Monitoring Program in Effect as of December 31, 2024 - 257.90(e)(6)(ii)	Assessment Monitoring (Sampling Event AM-14)
Appendix III SSI's during Reporting Period - 257.90(e)(6)(iii)	n/a – Site in Assessment Monitoring
Appendix IV SSL's during Reporting Period - 257.90(e)(6)(iv)	Arsenic in GW-19, -23, -24, -25, and -29 (Same parameter and same wells as Sampling Events AM-1 through AM-12 with the exception that GW-29 not an SSL in 2023)
Assessment of Corrective Measures - 257.90(e)(6)(iv)	Initiated April 2019 Completed October 2019
Assessment of Corrective Measures Public Meeting - 257.90(e)(6)(iv)	n/a – Selection of Remedy Ongoing
Selection of Remedy - 257.90(e)(6)(v)	On-going, with Semi-Annual Progress Reports prepared for 2024
Corrective Action - 257.90(e)(6)(vi)	n/a - Selection of Remedy Ongoing

1.1 BACKGROUND AND SITE CHARACTERISTICS

CCRs produced at the Station are placed in the CCBDF, which is located approximately one mile east-southeast of the Station. The facility consists of both a wet disposal area (impoundment) and dry disposal area (landfill) developed in the McElroy's Run watershed. Taken together, the landfill and impoundment are regulated under West Virginia Department of Environmental

Protection (WVDEP) Solid Waste/National Pollutant Discharge Elimination System (NPDES) Water Pollution Control Permit No. WV0079171 and also under the CCR Rule. As per the CCR Rule, the landfill and impoundment are considered two separate, existing CCR units that share a common boundary (the impoundment dam). As provided by the CCR Rule, a multi-unit groundwater monitoring system has been established for the CCBDF.

A WVDEP groundwater monitoring program for the facility has been in effect since 1994 and a separate CCR Rule groundwater monitoring program was established in 2017. West Virginia State Legislative Rule 33 CSR-1B, which adopts the federal CCR Rule at 40 CFR Part 257, was promulgated on March 1, 2022. WVDEP subsequently issued Administrative Order No. 10076 on July 29, 2022, recognizing the groundwater monitoring program established for the site under the CCR Rule on an interim basis until such time as a major permit modification permanently establishing the CCR Rule monitoring well network as the sole program for the site was approved. A major permit modification application was submitted for WVDEP review on September 9, 2022, and the department issued a draft permit on August 28, 2023, for AESC and public review/comment. AESC comments on the draft permit were provided to WVDEP on November 7, 2023. Final Modification No. 1 of WVDEP Solid Waste/NPDES Permit No. WV0079171 was issued by WVDEP on February 7, 2024 and it expires on June 21, 2025.

The impoundment is situated in the upper portion of the watershed, is unlined, and was in continuous use from the late 1970s until CCR sluicing operations ceased at the end of 2023. The landfill is situated in the lower portion of the watershed (adjacent to and overlying the impoundment dam), is lined, and has been in continuous use since the early 1990s. At the current water level, the surface impoundment area is approximately 250 acres. The impoundment dam was constructed with a clay-filled cutoff trench at the upstream toe and with a clay blanket on the upstream face for a low permeability seepage barrier. The downstream portion of the dam was constructed using compacted fly ash and intermittent layers of bottom ash for blanket drains connected to sloping chimney drains that collect and convey seepage to discharge pipes for monitoring. The downstream face of the dam is covered by the landfill facility which WVDEP considers to be a buttress for the dam.

The landfill consists of three primary development stages (I, II, and III in the original WVDEP permit drawings and now referred to as 1, 2, and 3) which are further subdivided into construction subareas (e.g., Stage 1G, 2A, etc.). At this time, development and disposal operations have only been performed in the Stage 1 and 2 areas while the Stage 3 area remains undeveloped. Up until 2009, all the landfill subareas were constructed with a compacted clay liner system that

included an underlying combined groundwater underdrain/leak detection system and overlying leachate collection system. However, since 2009 (in subareas 1G and 2B), a composite geosynthetic liner system (geosynthetic clay liner and geomembrane) has been used which also includes an underlying combined groundwater underdrain/leak detection system and overlying leachate collection system. For all portions of the landfill that overlie the downstream face of the impoundment dam, a bottom ash blanket drain layer has also been installed beneath the liner system. Leachate and contact stormwater runoff from the Stage 1 and 2 disposal areas are managed in Sedimentation Pond Nos. 1 and 2, which are geosynthetic-lined impoundments located immediately down-valley of the future Stage 3 landfill development area.

Groundwater in the CCBDF area occurs primarily within fractured bedrock, principally in the following sandstone units (listed in descending order): the Morgantown sandstone, Grafton sandstone, Jane Lew sandstone, and the Saltsburg sandstone. Groundwater has also been identified in the Ames limestone and Harlem Coal (in association with the Jane Lew sandstone), and, to a lesser extent, the redbed units at the site. Generally, the fine-grained rock units (e.g., redbeds) typically serve as aquitards to limit vertical groundwater migration, while the coarser grained rock units (e.g., sandstones) typically have more well-developed and open fracture systems and are the primary conduits for groundwater migration. The fractured bedrock of multiple sandstone units, including the Morgantown sandstone, Grafton sandstone, Jane Lew sandstone, and Saltsburg sandstone, has been collectively identified as the uppermost aquifer for CCR Rule groundwater monitoring for the combined landfill and impoundment CCR units.

Historic and recent groundwater level data indicate groundwater flow at the CCBDF as being primarily controlled by topography (more important for vertical migration across groundwater flow units along the valley margins near where the units outcrop) with limited, secondary control by orientation (strike and dip) of the rock units (i.e., migration down-dip within a groundwater flow unit). Groundwater is interpreted to generally flow north from the topographically higher areas located to the south of the impoundment, with some flow divergence towards the northwest and to the northeast near the northern boundary of the site. West and northwest of the impoundment dam, topography may be the dominant influence on groundwater flow, as the multiple sandstone units underlying the site are eroded and discontinuous across the valley. Groundwater flow northwest of the dam and under the landfill is in the downstream direction of McElroy's Run toward the west. Flow in all of the rock units exhibit very little seasonal and temporal fluctuations. Water level data from the current reporting period (2024) were used for contouring groundwater flow

patterns at the site. A more detailed discussion of the site's geologic and hydrogeologic characteristics is provided in Section 2.0 of this report.

1.2 REGULATORY BASIS

As required by § 257.90(e) of the CCR Rule, Owners or Operators of existing CCR landfills and surface impoundments were to prepare an initial Annual Groundwater Monitoring and Corrective Action Report ("AGMCA Report") no later than January 31, 2018, and annually thereafter. According to the subject section, "For the preceding calendar year, the annual report must document the status of the groundwater monitoring and corrective action program for the CCR unit, summarize key actions completed, describe any problems encountered, discuss actions to resolve the problems, and project key activities for the upcoming year."

This report has been developed to meet the general requirements above and the specific requirements of §§ 257.90(e)(1) through (6), which include:

(1) A map, aerial image, or diagram showing the CCR unit and all background (or upgradient) and downgradient monitoring wells, to include the well identification numbers, that are part of the groundwater monitoring program for the CCR unit (see Figures 2-1 and 2-2);

(2) 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 (see Section 2.1.1);

(3) 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 and downgradient well, the dates the samples were collected, and whether the sample was required by the detection monitoring or assessment monitoring programs (see Sections 3.0 and 4.0 and Table 3-1);

(4) 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; see Section 2.3);

(5) Other information required to be included in the annual report as specified in §§ 257.90 through 257.98 (see Sections 4.1 and 5.0 and Tables 4-1, 4-2, and 5-1); and

(6) A section at the beginning of the annual report that provides an overview of the current status of groundwater monitoring and corrective action programs for the CCR unit. (See Section 1.0).

In addition, the Owner or Operator must place the report in the facility's operating record as required by § 257.105(h)(1), provide notification of the report's availability to the appropriate State Director within 30 days of placement in the operating record as required by § 257.106(h)(1), and place the report on the facility's publicly accessible website, also within 30 days of placing the report in the operating record, as required by § 257.107(h)(1).

1.3 OVERVIEW OF REPORT CONTENTS

Section 1.0 of this report provided an overview of the CCR groundwater program status, CCR unit characteristics, regulatory basis, and a summary of the requirements for CCR Annual Groundwater Monitoring and Corrective Action Reports. Section 2.0 summarizes the status of key actions pertaining to CCR groundwater monitoring and activities completed during 2024 for the CCBDF and plans for the upcoming year. Section 3.0 presents Detection Monitoring (DM) results from groundwater sampling events completed in 2024. Section 4.0 presents Assessment Monitoring (AM) results from groundwater sampling events completed in 2024. Finally, Section 5.0 presents a summary of the Selection of Remedy (SoR) activities that were performed for the CCR units during 2024, including additional Nature and Extent (N&E) of Release characterization activities performed using the new wells installed at the site in 2021 and 2022.

2.0 GENERAL INFORMATION

This section provides an overview of the status of the CCR groundwater monitoring program through 2024 and key activities planned for 2025.

2.1 STATUS OF THE CCR GROUNDWATER MONITORING AND CORRECTIVE ACTION PROGRAM

During calendar year 2024 (January 1st through December 31st), the following key actions were completed with regard to the CCR groundwater monitoring program for the CCBDF.

2.1.1 Groundwater Monitoring Well System

As documented in the facility's previous AGMCA Reports (accessible at http://ccrdocs.firstenergycorp.com/), the certified CCR monitoring well network currently consists of three upgradient (background) wells (GW-7, -21, and -22), seven downgradient wells to monitor the northern side of the combined CCR units (GW-9, -19, -20, -23, -24, -25, and -26), and three downgradient wells to monitor the western side of the combined CCR units (GW-27, -28, and -29). There are also three downgradient (GW-30, -31, and -32) and two side-gradient (GW-33A and GW-34) N&E of Release wells installed in 2021 and 2022 as part of ongoing SoR activities at the site. All of these wells are summarized in attached Table 2-1 and shown on attached Figures 2-1 and 2-2. As detailed in the 2020 AGMCA Report, only GW-7 is currently being used for upgradient/background interwell comparisons based on a combination of factors which include: statistical dissimilarity that precludes upgradient well grouping; recurring problems with the availability of sufficient volumes of recoverable water in GW-21; and the slow drop and subsequent stabilization of groundwater levels in some of the CCR network wells installed in 2016 that resulted in a modified interpretation of groundwater flow patterns along the northern boundary of the site that resulted in GW-21 and -22 not being used for background comparison. No changes to the certified monitoring well network (i.e., new wells added or existing wells abandoned) occurred during 2024.

2.1.2 Groundwater Monitoring Plan

Consistent with the work performed and summarized in previous AGMCA Reports, the CCR unit's Groundwater Monitoring Plan (GWMP) was followed during all 2024 field sampling and laboratory analysis activities and for statistically evaluating groundwater monitoring data developed from the CCR sampling and analysis program. No changes to the facility's GWMP occurred during 2024.

2.1.3 Background Groundwater Sampling

As documented in the 2017 and 2018 AGMCA Reports, eight independent rounds of background groundwater samples were collected from each CCR monitoring well and each sample was analyzed for all Appendix III and IV parameters prior to initiating the facility's CCR DM program in October 2017. No modifications to this background dataset occurred during 2024.

2.1.4 Statistical Methods

As documented in the 2017 and 2018 AGMCA Reports, the background dataset discussed in Section 2.1.3 of this Report was used to select the appropriate statistical evaluation methods for each CCR groundwater monitoring parameter to identify any Statistically Significant Increases (SSIs) over background concentrations and to determine whether any concentrations were at Statistically Significant Levels (SSLs) above their respective Groundwater Protection Standards (GWPS) established for the site. These statistical methods are available on the facility's publicly accessible website and no changes were made to them during 2024.

2.2 PROBLEMS ENCOUNTERED/RESOLVED

Consistent with previous sampling events, GW-21, GW-23, GW-24, and GW-25 were sampled with HYDRASleeves™ during both the AM-13 and AM-14 events due to insufficient volumes of recoverable water to allow for sampling using the wells' dedicated bladder pumps. As with all past sampling events, these four wells also exhibited petroleum impacts (odor and sheen) with wells GW-23 and GW-24 being noted as having "heavy sheen", "strong petroleum odor", and/or "free product" present during both AM-13 and AM-14.

Additionally, during both the AM-13 and AM-14 events, GW-21 and GW-22 were also sampled with HYDRASleeves™ . This sampling method was used in GW-21 due to the low volume of recoverable water present in that well (insufficient volume for a low-flow pump to operate) and in GW-22 due to the pump being removed for service during AM-9 but not being reinstalled. The data obtained from GW-21 during AM-13 and AM-14 will be compiled with the existing GW-21 dataset and used to determine whether or not it is statistically appropriate to group its results with the dataset for upgradient well GW-22.

No samples were collected from GW-26 during both AM-13 and AM-14 due to an insufficient volume of recoverable water, with a similar issue occurring during SoR/N&E of Release sampling events on April 23, 2024 and September 9, 2024 (discussed in Section 5.0 of this report), where

an insufficient volume of recoverable water was available in GW-30 to complete sampling of that well.

Lastly, during the SoR/N&E of Release sampling on September 9, 2024 (discussed in Section 5.0 of this report), groundwater samples could not be collected from GW-33A due to the presence of light non-aqueous phase liquid (LNAPL) being present in the well and limited equipment to sample a well with LNAPL. A separate mobilization was completed by Tetra Tech on December 18, 2024, to remove and dispose of the LNAPL from the well and sample GW-33A.

Other than the issues discussed above, there were no other significant problems encountered during 2024 with regard to the CCR groundwater monitoring program.

2.3 TRANSITION BETWEEN MONITORING PROGRAMS

As documented in the 2018 AGMCA Report, the CCR units transitioned from DM to AM that year. As part of this transition, all required notifications were issued, appropriate GWPS for Appendix IV parameters were established, and the first two AM sampling events (AM-1 and AM-2) were completed that year. Statistical evaluations of the AM-1, -2, and -3 sampling events were performed and documented in the 2019 AGMCA Report and the data indicated there were SSLs in one or more well comparisons. Based on the parameters for which SSLs were identified, an Appendix IV Alternative Source Demonstration (ASD) was then undertaken but not all of the Appendix IV SSLs that were identified could be attributed to alternative sources. As such, N&E of Release characterization activities and an Assessment of Corrective Measures (ACM) were completed and are documented in the 2019 AGMCA Report. Since that time and throughout 2024, the CCR unit has remained in AM with ongoing SoR activities being performed as discussed in Section 5.0 of this report, which included additional SoR/N&E of Release characterization work.

2.4 KEY ACTIVITIES PLANNED FOR THE UPCOMING YEAR

The following are the key CCR groundwater compliance activities planned for 2025:

- Continue with AM by conducting the semi-annual rounds of sampling and analysis for Appendix III and Appendix IV constituents [per 40 CFR § 257.96(b)] and evaluate the need to update the background data sets and associated Upper Prediction Limits (UPLs).
- Given the limited groundwater availability, evaluate other pumping options and methods to sample GW-22 in addition to other wells.
- If any new SSLs are identified, provide appropriate notification [per § 257.95(g)] then potentially conduct an Appendix IV ASD [per § 257.95(g)(3)(ii)] to determine if a source

other than the CCR units may be causing the new SSLs. Concurrent with undertaking an Appendix IV ASD, characterize the Nature and Extent of the new Appendix IV release and provide appropriate notification depending on the findings [per §§ 257.95(g)(1) and (2), respectively].

- If any new SSLs are identified and an ASD is either not undertaken, indicates that an alternative source is not responsible for all the new SSLs identified, or is not completed within 90 days of identifying there are new SSLs, then initiate and perform an Assessment of Corrective Measures for the new SSLs in accordance with § 257.96.
- Conduct SoR activities in compliance with § 257.97(a), which states that as soon as feasible after completion of the ACM, select a remedy that, at a minimum, meets the performance standards listed in § 257.97(b) and the evaluation factors listed in § 257.97(c) These activities are currently in progress and include continued sampling of SoR/N&E of Release monitoring wells GW-30, -31, -32, -33A, and -34; evaluating the historic groundwater monitoring dataset for relationships between key parameters affecting arsenic natural attenuation and arsenic concentrations in groundwater; and completing development of the Arsenic Natural Attenuation Evaluation Work Plan. Based on the results obtained from these wells, the need for additional SoR/N&E wells will be evaluated.
- As required by § 257.97(d), specify, as part of the selected remedy, a schedule(s) for implementing and completing remedial activities. The schedule will require the completion of remedial activities within a reasonable period of time taking into consideration the factors set forth in §§ 257.97(d)(1) through (d)(6).
- As required by § 257.97(a), continue preparing semi-annual reports describing the progress in selecting and designing the remedy.
- Should all required SoR activities be completed in 2025, prepare a final report describing the selected remedy. The final report will include a certification from a qualified professional engineer that the remedy selected meets the requirements of the CCR Rule selection criteria and the final report will be placed in the facility's operating record as required by § 257.105(h)(12).
- As required by § 257.96(e), discuss the results of the ACM at least 30 days prior to the final SoR, in a public meeting with interested and affected parties.

3.0 DETECTION MONITORING INFORMATION

3.1 GROUNDWATER ANALYTICAL RESULTS SUMMARY

As noted in Section 2.3, site-wide AM was performed throughout 2024. As part of the AM program, all DM (Appendix III) parameters were also analyzed during each AM sampling event.

The need to statistically evaluate the 2024 Appendix III data to identify SSIs and determine if AM was necessary was precluded by the CCR units already being in AM during all of 2024, so no statistical analysis of the Appendix III data was necessary. The 2024 Appendix III data that was collected and validated is presented in Table 3-1 with the intent of using it during the next update of the background dataset and associated UPLs, which will help increase the statistical power of future analyses.

4.0 ASSESSMENT MONITORING INFORMATION

4.1 GROUNDWATER ANALYTICAL RESULTS SUMMARY

In accordance with 40 CFR §§ 257.95(b) and (d)(1), the CCR groundwater sampling and analysis program implemented during 2024 consisted of two AM sampling events (AM-13 and AM-14) performed between March 18 and March 25, 2024, and between September 12 and October 1, 2024, respectively. For both AM events, all Appendix III and all Appendix IV constituents were analyzed with the exception of combined radium 226/228 during AM-13, which was excluded from the sampling event. However, as documented in the CCR unit's 2019 Appendix IV ASD, multiple lines of evidence (LOE) indicate that elevated concentrations of combined radium 226/228 found in groundwater can be attributed to historical and current oil and gas exploration and production activities that have occurred at the site and, as such, the lack of radium data for AM-13 did not affect the 2024 AM program evaluations for the CCR units. The analyses that were performed exceed the requirements of § 257.95 which only stipulate analyzing for all Appendix IV parameters once per year. Laboratory analysis and subsequent validation of the sample data were completed on August 17, 2023, and January 15, 2025, for AM-13 and AM-14, respectively. Table 3-1 presents the validated analytical results for these events.

Statistical evaluations of 2024 AM data included sampling events AM-13 and AM-14, respectively. All statistical evaluation work was performed in accordance with the certified methods included in both the facility's operating record and the publicly accessible website, and the results were used to determine whether there were any detected Appendix IV parameters at SSLs above the CCR unit's established GWPS. As documented in the 2018 AGMCA Report, site-specific Appendix IV GWPS were established for the CCR units using the higher of the federal Maximum Contaminant Level (MCL) or UPL for each parameter or, for those parameters that do not have MCLs, the higher of the EPA Risk Screening Level (RSL) or the UPL. The site-specific GWPS and the results of the statistical evaluations of AM-13 and AM-14 are presented in Tables 4-1 (northern boundary) and 4-2 (western boundary) and discussed below.

For the northern boundary monitoring wells, results from statistical analysis of the AM-13 and AM-14 data were generally consistent with results of the AM-1 to AM-12 data, including recurring SSLs in multiple downgradient wells for arsenic (GW-19, -23, -24, and -25), barium (GW-23, -24, and -25), lithium (GW-23, -24, and -25), and combined radium 226/228 (GW-23, -24, and -25). As documented in the CCR unit's 2019 Appendix IV ASD, multiple LOE indicate that the elevated concentrations of barium and combined radium 226/228 can be attributed to historical and current

oil and gas exploration and production activities that have occurred at the site, and that a high potential exists that the elevated lithium concentrations are also attributable to these oil and gas activities. During AM-14 there was an SSL for fluoride in GW-23, which is the first time fluoride has been measured at a detectible level in GW-23. It was also noted that the chloride result for GW-23 was very high during this sampling event (13,780 mg/L) which could have resulted in chromatographic interference between measured chloride and fluoride. Because of these factors, this result is considered to be an outlier and will be re-evaluated during the 2025 program. During AM-11 there was also a recurring SSL for molybdenum in GW-20 (molybdenum was first identified as a potential SSL in GW-20 during AM-3 and AM-4, but the exceedances were attributed to sample turbidity issues, which was later confirmed by results below the associated GWPS during AM-5 and AM-6). However, during AM-12 through AM-14, molybdenum concentrations again dropped below the GWPS (0.1 mg/L) with measured concentrations of 0.09237, 0.087203, and 0.09375 mg/L, respectively. As such, the need to provide notification of the SSL, perform an Appendix IV ASD to determine if a source other than the CCR units may be causing the molybdenum SSLs, and to characterize the N&E of the molybdenum release will be re-evaluated in accordance with the associated CCR Rule requirements cited in Section 2.4 of this report.

For the western boundary monitoring wells, results from statistical analysis of the AM-13 and AM-14 data for GW-27 and GW-28 were generally consistent with results of the AM-1 to AM-12 data with no SSLs. Arsenic concentrations in GW-29, which had been at SSLs above the GWPS (0.1 mg/L) from AM-1 to AM-9 before falling to just below the GWPS in AM-10, continued to be below the GWPS during AM-11 through AM-13, before returning to a concentration of 0.010009 mg/L, just above the GWPS of 0.010 mg/L, during AM-14. There was also recurring SSL in GW-29 during AM-13 and AM-14 for lithium that was first identified during both AM-7 and AM-8 and continued during AM-9 through AM-12. After a first-time GWPS exceedance for combined radium 226/228 was identified in GW-27 during AM-8, combined radium 226/228 was below its respective GWPS during AM-9 through AM-14. As documented in the CCR unit's 2019 Appendix IV ASD, multiple LOE indicate that the elevated concentrations of combined radium 226/228 can be attributed to historical and current oil and gas exploration and production activities that have occurred at the site, and that a high potential exists that the elevated lithium concentrations are also attributable to these oil and gas activities.

Taking into account the ASD exclusions for barium, combined radium 226/228, and lithium, and the data presented in Tables 4-1 and 4-2, arsenic was the only Appendix IV constituent detected at SSLs above its respective GWPS under the CCR units' AM program during the reporting period,

and arsenic currently remains the only parameter that is the focus of ongoing SoR activities for the CCR units as discussed in Section 5.0 of this report.

5.0 SELECTION OF REMEDY

As previously noted in Section 2.3 of this report, throughout 2024 the CCR unit remained in AM with ongoing SoR activities being performed. As detailed in the CCR units' 2019 ACM Report, the evaluation of viable remediation technologies for addressing arsenic in groundwater at the site determined that Monitored Natural Attenuation (MNA), combined with source control by the eventual installation of a final cover system on the CCR units, ranked highest among the evaluated options. Therefore, the 2024 SoR activities were focused on developing additional information and data to determine if the preferred remedy identified during the ACM meets the performance standards listed in 40 CFR § 257.97(b), while considering the evaluation factors listed in § 257.97(c).

5.1 CURRENT STATUS OF THE SELECTION OF REMEDY PROGRAM

As outlined in the Semi-Annual SoR Progress reporting included as Attachment A of this report, the following activities were performed during the current reporting period to support final remedy selection at the site:

- Two rounds of SoR/N&E of Release characterization sampling (Event 27 / NE-5 and Event 28 and 29 / NE-6) for GW-30, GW-31, -32, -33A, and -34 were completed in April, September, and December 2024. However, due to an insufficient recoverable volume of water, GW-30 could not be sampled during NE-5 or NE-6. Due to an issue with the portable low flow pump, GW-34 was sampled using a bailer during the NE-5 event. Additionally, GW-33A could not be sampled during the September field work (Event 28) and required a separate mobilization by Tetra Tech in December 2024 (Event 29). The results from NE-5 and NE-6 are presented in Table 5-1. In addition to arsenic, analyses were performed for all other CCR Rule Appendix III and Appendix IV parameters during NE-5 and NE-6 in order to begin building a background dataset for use when the wells are eventually incorporated into the AM and/or Corrective Action Monitoring network.
- Continued development of a Natural Attenuation Evaluation Work Plan to include evaluating historic concentrations of parameters which can affect the natural attenuation of arsenic (e.g., iron, pH, ORP, etc.) as well as planning the sampling and analysis program that would be associated with future MNA activities.
- Continued a review of candidate technologies with regard to their potential to meet the performance standards listed in § 257.97(b) and the evaluation factors listed in § 257.97(c).

- Assessed March and September 2024 groundwater flow patterns in the monitoring network areas downgradient of the CCR units and confirmed they were consistent with established flow patterns at the site.
- Completed statistical evaluations of the AM-13 and AM-14 analytical data to determine whether there were any detected Appendix IV parameters at SSLs above the CCR unit's established GWPS other than arsenic and those previously determined by the 2019 Appendix IV ASD to be attributable to other sources.

Ongoing and/or new SoR activities that are planned for 2025 have been included in Section 2.4 of this report.

6.0 WVDEP PERMIT COMPLIANCE ACTIVITIES

As previously noted in Section 1.1 of this report, with the West Virginia state legislature's adoption of the federal CCR Rule on March 1, 2022 through 33 CSR-1B and the WVDEP's subsequent issuance of a modified permit on February 7, 2024, the McElroy's Run CCBDF is now jointly regulated under both WVDEP Solid Waste/NPDES Permit No. WV0079171 and the CCR Rule. However, this joint regulation does result in some differing compliance requirements, which are identified and addressed below.

In addition to the downgradient monitoring wells included in the certified CCR monitoring network detailed in Section 2.1.1, the WVDEP Permit also treats installed N&E wells GW-30, GW-31, GW-32, GW-33A, and GW-34 as AM wells. These wells have not yet been certified as part of the CCR monitoring well network as their use is currently limited to N&E characterization under the CCR Rule. Because these wells are not positioned at the waste boundary in accordance with 40 CFR § 257.97(a)(2), the N&E wells are not intended to monitor groundwater as part of DM and AM. Upon completion of SoR, these wells will be certified as Corrective Action Monitoring (CAM) network wells for purposes of monitoring the effectiveness of the selected remedy. However, by treating the N&E wells as DM/AM wells, the WVDEP permit requires performing statistical evaluations of the 2024 N&E data from sampling events AM-13 and AM-14 for all Appendix III and Appendix IV parameters instead of the targeted N&E/SoR parameters required under the CCR Rule.

The aforementioned statistical evaluations were completed in accordance with the certified methods detailed in Section 4.1. and used to determine whether there were any detected Appendix IV parameters at SSLs above the CCR unit's established GWPS. As documented in the 2018 AGMCA Report, site-specific Appendix IV GWPS were established for the CCR units using the higher of the federal Maximum Contaminant Level (MCL) or UPL for each parameter or, for those parameters that do not have MCLs, the higher of the EPA Risk Screening Level (RSL) or the UPL. The site-specific GWPS and the results of the statistical evaluations of AM-13 and AM-14 are presented in Table 6-1 and discussed below.

For the N&E wells, results from statistical analysis of the AM-13/NE-5 and AM-14/NE-6 results included exceedances of the GWPS for arsenic, barium, lithium, molybdenum, and combined radium 226/228 in one or more wells during either event. GWPS exceedances in multiple N&E wells for arsenic (GW-31, -32, -33A, and -34) occurred during both events; barium in GW-32 for both events and in GW-31 for only AM-14/NE-6;, lithium in GW-32, -33A, and -34 during both

events and in GW-31 for only AM-14/NE-6; molybdenum in GW-34 during only AM-13/NE-5; and combined radium 226/228 in GW-32 during both events and in GW-31 and GW-33A during AM-14/NE-6. As discussed in Section 4.1, multiple LOE developed in the 2019 ASD indicate that the elevated concentrations of barium and combined radium 226/228 can be attributed to historical and current oil and gas exploration and production activities that have occurred at the site, and that a high potential exists that the elevated lithium concentrations are also attributable to these oil and gas activities. Molybdenum, identified as a GWPS exceedance in a single well (GW-34) during AM-13, was measured in that well at a concentration two orders of magnitude lower during AM-14. and Given that the AM-13 sample for this well was collected with a bailer whereas the AM-14 sample was collected with a low-flow bladder pump, the sampling methodology is determined to be the cause of the GWPS exceedance during AM-13. This single result is considered an outlier that will be further evaluated as part of the 2025 monitoring program

TABLES

TABLE 2-1
CCR RULE GROUNDWATER MONITORING SYSTEM WELL SUMMARY
McELROY's RUN CCB DISPOSAL FACILITY – 2024 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

Well	Year Installed	Formation Monitored	Ground Surface Elevation (ft MSL)	Total Well Depth (ft bgs)	Monitored Interval (ft bgs)	Monitored Interval (ft MSL)	Casing ID and Material
Certified Upgradient (Background) Monitoring Wells							
GW-7	1994	Grafton SS, Ames LS	918.40	101.2	75.7 – 100.7	817.70 – 842.70	4" - Sch. 40 PVC
GW-21	2016	Morgantown SS	1033.01	234.2	214.2 – 234.2	798.77 – 818.77	2" - Sch. 40 PVC
GW-22	2016	Morgantown SS	1045.18	370.2	350.2 – 370.2	675.02 – 695.02	2.5" - Sch. 80 PVC
Certified Downgradient Monitoring Wells							
GW-9	1994	Ames LS, Jane Lew SS, Pittsburgh RB	797.42	177.7	137.2 – 177.2	620.22 – 660.22	4" - Sch. 40 PVC
GW-19	1995	Birmingham RB, Grafton SS, Ames LS	920.64	238.9	198.9 – 238.9	681.74 – 721.74	2" - Sch. 40 PVC
GW-20	1995	Lower Clarksburg RB	923.00	150.5	100.5 – 150.5	772.50 – 822.50	2" - Sch. 40 PVC
GW-23	2016	Grafton SS	974.40	392.9	372.9 – 392.9	581.53 – 601.53	2.5" - Sch. 80 PVC
GW-24	2016	Grafton SS	941.55	271.1	251.1 – 271.1	670.50 – 690.50	2" - Sch. 40 PVC
GW-25	2016	Grafton SS	1006.22	303.7	283.7 – 303.7	702.53 – 722.53	2" - Sch. 40 PVC
GW-26	2016	Grafton SS	984.16	288.2	268.2 – 288.2	695.95 – 715.95	2" - Sch. 40 PVC
GW-27	2016	Saltsburg SS	675.30	48.3	38.3 – 48.3	626.96 – 636.96	2" - Sch. 40 PVC
GW-28	2016	Saltsburg SS	801.95	175.6	165.6 – 175.6	626.38 – 636.38	2" - Sch. 40 PVC
GW-29	2016	Grafton SS	928.49	166.0	156.0 – 166.0	762.45 – 772.45	2" - Sch. 40 PVC
Nature & Extent of Release Characterization Wells							
GW-30*	2022	Grafton SS	733.80	114.0	86.0 – 114.0	619.80– 647.80	4" - Sch. 40 PVC
GW-31*	2021	Grafton SS	1044.68	360.0	333.0 – 361.0	683.68 – 711.68	4" - Sch. 80 PVC
GW-32*	2021	Grafton SS	918.64	424.0	398.0 – 426.0	492.64 – 520.64	4" - Sch. 80 PVC
GW-33A*	2021	Morgantown SS	1052.42	467.0	432.0 – 467.0	585.42 – 620.42	4" - Sch. 80 PVC
GW-34*	2021	Grafton SS	1043.68	543.5	515.0 – 548.0	495.68 – 528.68	4" - Sch. 80 PVC

Notes: SS = sandstone LS = limestone RB = red beds MSL = mean sea level bgs = below ground surface ID = inside diameter PVC = polyvinyl chloride
* = Not currently part of certified monitoring network but are being sampled and analyzed for all Appendix III and IV parameters for ultimate transition to Corrective Action Monitoring wells.

			APPENDIX III (all Chemical Constituents reported as TOTAL RECOVERABLE)[1]							APPENDIX IV (all Chemical Constituents reported as TOTAL RECOVERABLE)[1]														
SAMPLING EVENT NO.[2,5]	WELL ID[3]	SAMPLE DATE	BORON METALS MG/L	CALCIUM METALS MG/L	CHLORIDE MISC MG/L	FLUORIDE MISC MG/L	PH[4] MISC S.U.	SULFATE MISC MG/L	TDS MISC MG/L	ANTIMONY METALS MG/L	ARSENIC METALS MG/L	BARIUM METALS MG/L	BERYLLIUM METALS MG/L	CADMIUM METALS MG/L	CHROMIUM METALS MG/L	COBALT METALS MG/L	LEAD METALS MG/L	LITHIUM METALS MG/L	MERCURY METALS MG/L	MOLYBDENUM METALS MG/L	SELENIUM METALS MG/L	THALLIUM METALS MG/L	RADIUM-226 RADIOCHEM PCI/L	RADIUM-228 RADIOCHEM PCI/L
26 (AM-13)	GW-7	3/20/2024	0.572 U	2.86	126.3	8.1046	8.06	0.0838 J	1350	0.00565 U	0.0016 U	0.082497	0.0003 U	0.0004 U	0.00321 U	0.0004 U	0.00045 U	0.023344	0.00018 J	0.0011 U	0.0063 U	0.0002 U	NA	NA
26 (AM-13)	GW-7 (D)	3/20/2024	0.572 U	3.14	124.6	8.2093	8.06	0.0862 J	1308	0.00565 U	0.0016 U	0.086366	0.0003 U	0.0004 U	0.00321 U	0.0004 U	0.00045 U	0.023465	0.00018 J	0.0011 U	0.0063 U	0.0002 U	NA	NA
28 (AM-14)	GW-7	10/1/2024	0.572 U	2.82	122.8	8.2814	8.41	0.1169 J	1340	0.0113 U	0.0032 U	0.083807	0.0006 U	0.0008 U	0.00642 U	0.0008 U	0.0009 U	0.023449	0.000163 U	0.0022 U	0.0126 U	0.0004 U	0.192	0.145 U
26 (AM-13)	GW-9	3/25/2024	0.572 U	6.16	176.4	2.4666	8.29	14.62	1252	0.00565 U	0.0016 U	0.19073	0.0003 U	0.0004 U	0.00321 U	0.0004 U	0.00045 U	0.019307	0.00019 J	0.0011 U	0.0063 U	0.0002 U	NA	NA
28 (AM-14)	GW-9	9/23/2024	0.572 U	6.38	161.5	2.5155	8.38	16.46	1184	0.0113 U	0.0032 U	0.167783	0.0006 U	0.0008 U	0.00642 U	0.0008 U	0.0009 U	0.019289	0.000163 U	0.0022 U	0.0126 U	0.0004 U	1.41	0.160 U
26 (AM-13)	GW-19	3/21/2024	0.572 U	9.9	604.8	1.7867	7.66	0.0385 U	2500	0.00565 U	0.126408	1.2644	0.0003 U	0.0004 U	0.00321 U	0.0004 U	0.00045 U	0.017614	0.00019 J	0.0011 U	0.0063 U	0.0002 U	NA	NA
28 (AM-14)	GW-19	9/26/2024	0.572 U	10.025	644.3	1.8555	7.67	0.0385 U	2240	0.0113 U	0.125084	1.49808	0.0006 U	0.0008 U	0.00642 U	0.0008 U	0.0009 U	0.019316	0.000163 U	0.0022 U	0.0126 U	0.0004 U	1.32	0.455 U
26 (AM-13)	GW-20	3/20/2024	0.572 U	5.12	491.5	5.5914	7.90	29.61	1866.667	0.00565 U	0.002057	0.200068	0.0003 U	0.000573 J	0.00321 U	0.0004 U	0.00045 U	0.016079	0.00018 J	0.087203	0.0063 U	0.0002 U	NA	NA
28 (AM-14)	GW-20	9/16/2024	0.5999	5.43	467	5.827	7.88	30.97	1800	0.0113 U	0.0032 U	0.18749	0.0006 U	0.0008 U	0.00642 U	0.0008 U	0.0009 U	0.016991	0.000163 U	0.09375	0.024652	0.0004 U	0.222	1 U
26 (AM-13)	GW-21	3/21/2024	0.572 U	14.013	1035	1.7327	7.80	137.2	3500	0.00565 U	0.006411	0.211591	0.0003 U	0.0004 U	0.00321 U	0.0004 U	0.00045 U	0.021546	0.00019 J	0.163161	0.020763	0.0002 U	NA	NA
28 (AM-14)	GW-21	9/19/2024	0.572 U	14.081	1102	1.8115	7.75	125.5 U	2860	0.0113 U	0.009685	0.208298	0.0006 U	0.0008 U	0.00642 U	0.0008 U	0.0009 U	0.025431	0.000163 U	0.17137	0.035262	0.0004 U	0.119 U	1.00
26 (AM-13)	GW-22	3/25/2024	0.572 U	12.024	1013	1.64	7.79	42.2	2495	0.00565 U	0.116134	0.142356	0.0003 U	0.0004 U	0.00321 U	0.0004 U	0.00045 U	0.019147	0.00018 J	0.07739	0.0063 U	0.0002 U	NA	NA
28 (AM-14)	GW-22	9/17/2024	0.572 U	13.581	933.4	1.5676	7.79	31.72	2510	0.0113 U	0.153467	0.174292	0.0006 U	0.0008 U	0.00642 U	0.0008 U	0.0009 U	0.022026	0.000163 U	0.052295	0.0126 U	0.0004 U	0.169 U	1
26 (AM-13)	GW-23	3/21/2024	0.572 U	759	13580	0.025 U	7.80	0.508	31500	0.017 U	0.028539	14.83687	0.0009 U	0.0012 U	0.00963 U	0.001941	0.00135 U	0.207244	0.00022 J	0.0033 U	0.0189 U	0.0006 U	NA	NA
28 (AM-14)	GW-23	9/16/2024	0.572 U	652	13780	17.5	7.67	0.0385 U	32980	0.0113 U	0.031515	17.67525	0.0015 U	0.002 U	0.00642 U	0.001654	0.0009 U	0.229549	0.000163 U	0.0022 U	0.0126 U	0.0004 U	38.5	115
26 (AM-13)	GW-24	3/25/2024	0.572 U	419	9684	0.025 U	7.03	0.0385 U	22140	0.017 U	0.028999	14.91761	0.0009 U	0.0012 U	0.00963 U	0.001204	0.00135 U	0.086077	0.00019 J	0.0033 U	0.0252 U	0.0006 U	NA	NA
28 (AM-14)	GW-24	9/19/2024	0.572 U	361	9512	0.025 U	8.38	0.0385 U	22600	0.0113 U	0.028086	16.49079	0.0006 U	0.0008 U	0.00642 U	0.001088	0.0009 U	0.090446	0.000163 U	0.003179	0.0126 U	0.0004 U	23.1	48.5
26 (AM-13)	GW-25	3/21/2024	0.572 U	359	8786	0.025 U	7.78	0.7164	20240	0.017 U	0.043228	10.14871	0.0009 U	0.0012 U	0.00963 U	0.0012 U	0.00135 U	0.060733	0.00021 J	0.012465	0.0126 U	0.0006 U	NA	NA
28 (AM-14)	GW-25	9/24/2024	0.572 U	375	9300	0.025 U	7.67	0.2803	21080	0.0113 U	0.035453	13.08498	0.0006 U	0.0008 U	0.00642 U	0.00083 J	0.0009 U	0.075835	0.000163 U	0.013982	0.0126 U	0.0004 U	18.2	23.9
26 (AM-13)	GW-26[5]	3/21/2024	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
28 (AM-14)	GW-26[5]	10/1/2024	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
26 (AM-13)	GW-27	3/19/2024	0.572 U	61.267	127	0.3148	NA	2.7947	592	0.00564 U	0.0048 U	1.01002	0.0009 U	0.0004 U	0.00321 U	0.0004 U	0.00135 U	0.01614	0.00018 J	0.002286	0.0189 U	0.002 U	NA	NA
28 (AM-14)	GW-27	10/1/2024	0.572 U	55.561	127.4	0.2312	7.17	2.646	588	0.0113 U	0.0032 U	1.09848	0.0006 U	0.0008 U	0.00642 U	0.0008 U	0.0009 U	0.01701	0.000163 U	0.002823	0.0126 U	0.0004 U	0.351	1.11 U
28 (AM-14)	GW-27 (D)	10/1/2024	0.572 U	55.905	125.6	0.2347	7.17	2.6253	600	0.0113 U	0.0032 U	1.08597	0.0006 U	0.0008 U	0.00642 U	0.0008 U	0.0009 U	0.017686	0.000163 U	0.002811	0.0126 U	0.0004 U	0.593	0.855
26 (AM-13)	GW-28	3/20/2024	0.572 U	6.41	702	2.0404	7.82	0.6768	2330	0.00565 U	0.002939	0.269166	0.0003 U	0.0004 U	0.00321 U	0.0004 U	0.00045 U	0.023068	0.00019 J	0.034399	0.0063 U	0.0002 U	NA	NA
28 (AM-14)	GW-28	9/17/2024	0.572 U	6.5	661.9	2.1006	7.78	0.7971	2290	0.0113 U	0.003645	0.240554	0.0006 U	0.0008 U	0.00642 U	0.0008 U	0.0009 U	0.023541	0.000163 U	0.034995	0.0126 U	0.0004 U	0.228	0.544 U
26 (AM-13)	GW-29	3/20/2024	0.572 U	12.978	1026	1.2722	7.81	0.2184	3780	0.00565 U	0.008854	1.26599	0.0003 U	0.0004 U	0.00321 U	0.0004 U	0.00045 U	0.044843	0.00018 J	0.003998	0.0063 U	0.0002 U	NA	NA
28 (AM-14)	GW-29	9/16/2024	0.572 U	13.804	1011	1.239	7.84	1.136	3680	0.0113 U	0.010009	1.27511	0.0006 U	0.0008 U	0.00642 U	0.0008 U	0.0009 U	0.04587	0.000163 U	0.005774	0.0126 U	0.0004 U	0.583	1.65 U

NOTES:

[1] Lab analyses were completed by Beta Lab and Eurofins Laboratories, Inc., both of which are accredited/certified laboratories: Beta Lab NSF/ISR ISO 9001: Cert. No. 83761-IS10 (Exp. 01-16-27) and Eurofins WVDEP Certificate No. 142, Expiration Date: 1-31-25.

[2] Sampling Event Nos. 26 and 28 correspond to Assessment Monitoring (AM) sampling events AM-13 and AM-14, respectively.

[3] Field duplicate samples that were taken for Quality Control purposes are noted with a (D).

[4] pH results reported are field sampling measurements as lab pH testing exceeded hold times.

[5] GW-26 could not be sampled during AM-13 and AM-14 due to insuffient volume of water.

NA = Parameter was not analyzed.

NS = Not sampled.

DATA QUALIFIER DEFINITIONS:

The following definitions provide brief explanations of the validation qualifiers assigned to results in the data review process.

U	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted method detection limit for sample and method.
J	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the reporting limit).
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported detection limit is approximate and may be inaccurate or imprecise.
R	The sample result (detected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in sample
UR	The sample result (nondetected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in sample.
G	The sample MDC (minimum detectible concentration) is greater than the requested reporting limit.

Northern Boundary							Event 26 (AM-13) Downgradient Wells								Event 26 (AM-13) Upgradient Well GW-7	
Parameter	Units	Data Distribution for Upgradient Well GW-7	UPL Type	UPL Value[a,b]	Federal MCLs/RSLs	GWPS	GW-9	GW-19	GW-20	GW-23	GW-24	GW-25	GW-26[f]			
Antimony	mg/L	Unknown	Poisson	0.00133	0.006	0.006	<0.00565	<0.00565	<0.00565	<0.017	<0.017	<0.017	NS		<0.00565	U
Arsenic	mg/L	Unknown	Poisson	0.00682	0.01	0.01	<0.0016	0.126408	0.002057	0.028539	0.028999	0.043228	NS		<0.0016	U
Barium	mg/L	Log–Normal	Parametric	0.0934	2	2	0.19073	1.2644	0.200068	14.83687	14.91761	10.14871	NS		0.084432	
Beryllium	mg/L	Unknown[c]	DQ[d]	NA	0.004	0.004	<0.0003	<0.0003	<0.0003	<0.0009	<0.0009	<0.0009	NS		<0.0003	U
Cadmium	mg/L	Unknown[c]	DQ[d]	NA	0.005	0.005	<0.0004	<0.0004	0.000573	<0.0012	<0.0012	<0.0012	NS		<0.0004	U
T. Chromium	mg/L	Unknown[c]	DQ[d]	NA	0.1	0.1	<0.00321	<0.00321	<0.00321	<0.00963	<0.00963	<0.00963	NS		<0.00321	U
Cobalt	mg/L	Unknown[c]	DQ[d]	NA	0.006	0.006	<0.0004	<0.0004	<0.0004	0.001941	0.001204	<0.0012	NS		<0.0004	U
Fluoride	mg/L	Normal	Parametric	9.291	4	9.291	2.4666	1.7867	*5.5914*	<0.025	<0.025	<0.025	NS		*8.15695*	
Lead	mg/L	Unknown[c]	DQ[d]	NA	0.015	0.015	<0.00045	<0.00045	<0.00045	<0.00135	<0.00135	<0.00135	NS		<0.00045	U
Lithium	mg/L	Normal	Parametric	0.023374	0.04	0.04	0.019307	0.017614	0.016079	0.207244	0.086077	0.060733	NS		0.023405	
Mercury	mg/L	Unknown	Poisson	0.00031	0.002	0.002	0.00019	0.00019	0.00018	0.00022	0.00019	0.00021	NS		0.00018	J
Molybdenum	mg/L	Log–Normal	Parametric	0.006805	0.1	0.1	<0.0011	<0.0011	0.087203	<0.0033	<0.0033	0.012465	NS		<0.0011	U
Selenium	mg/L	Unknown[c]	DQ[d]	NA	0.5	0.5	<0.0063	<0.0063	<0.0063	<0.0189	<0.0252	<0.0126	NS		<0.0063	U
Thallium	mg/L	Unknown[c]	DQ[d]	NA	0.002	0.002	<0.0002	<0.0002	<0.0002	<0.0006	<0.0006	<0.0006	NS		<0.0002	U
Sum Ra226+Ra228	pCi/L	Unknown	Poisson	0.58	5	5	NA[e]	NA[e]	NA[e]	NA[e]	NA[e]	NA[e]	NS		NA[e]	

[a]Prediction Limits calculated using 5% alpha.
[b]Upper Prediction Limit used for all parameters.
[c]Data distribution set to Unknown if all values non-detect in upgradient well.
[d]DQ is Double Quantification Rule. If two successive, independent detected values occur, that would be an SSI and also an SSL if > GWPS. However, if value was detected in upgradient well during the same sampling event, would use Poisson PL instead.
[e]Not analyzed (NA)
[f]GW-26 not sampled (NS) due to insufficient recoverable water.

#.#### = UPL > Result > MCL/RSL
= SSI < GWPS
= SSI > GWPS
= DQ Parameter with Verification Sampling Needed

Northern Boundary							Event 28 (AM-14) Downgradient Wells								Event 28 (AM-14) Upgradient Well GW-7	
Parameter	Units	Data Distribution for Upgradient Well GW-7	UPL Type	UPL Value[a,b]	Federal MCLs/RSLs	GWPS	GW-9	GW-19	GW-20	GW-23	GW-24	GW-25	GW-26[e]			
Antimony	mg/L	Unknown	Poisson	0.00133	0.006	0.006	<0.0113	<0.0113	<0.0113	<0.0113	<0.0113	<0.0113	NS		<0.0113	U
Arsenic	mg/L	Unknown	Poisson	0.00682	0.01	0.01	<0.0032	0.125084	<0.0032	0.031515	0.028086	0.035453	NS		<0.0032	U
Barium	mg/L	Log–Normal	Parametric	0.0934	2	2	0.167783	1.49808	0.18749	17.67525	16.49079	13.08498	NS		0.083807	
Beryllium	mg/L	Unknown[c]	DQ[d]	NA	0.004	0.004	<0.0006	<0.0006	<0.0006	<0.0015	<0.0006	<0.0006	NS		<0.0006	U
Cadmium	mg/L	Unknown[c]	DQ[d]	NA	0.005	0.005	<0.0008	<0.0008	<0.0008	<0.002	<0.0008	<0.0008	NS		<0.0008	U
T. Chromium	mg/L	Unknown[c]	DQ[d]	NA	0.1	0.1	<0.00642	<0.00642	<0.00642	<0.00642	<0.00642	<0.00642	NS		<0.00642	U
Cobalt	mg/L	Unknown[c]	DQ[d]	NA	0.006	0.006	<0.0008	<0.0008	<0.0008	0.001654	0.001088	0.00083	NS		<0.0008	U
Fluoride	mg/L	Normal	Parametric	9.291	4	9.291	2.5155	1.8555	*5.827*	17.5	<0.025	<0.025	NS		*8.2814*	
Lead	mg/L	Unknown[c]	DQ[d]	NA	0.015	0.015	<0.0009	<0.0009	<0.0009	<0.0009	<0.0009	<0.0009	NS		<0.0009	U
Lithium	mg/L	Normal	Parametric	0.023374	0.04	0.04	0.019289	0.019316	0.016991	0.229549	0.090446	0.075835	NS		0.023449	
Mercury	mg/L	Unknown	Poisson	0.00031	0.002	0.002	<0.000163	<0.000163	<0.000163	<0.000163	<0.000163	<0.000163	NS		<0.000163	U
Molybdenum	mg/L	Log–Normal	Parametric	0.006805	0.1	0.1	<0.0022	<0.0022	0.09375	<0.0022	0.003179	0.013982	NS		<0.0022	U
Selenium	mg/L	Unknown[c]	DQ[d]	NA	0.5	0.5	<0.0126	<0.0126	0.024652	<0.0126	<0.0126	<0.0126	NS		<0.0126	U
Thallium	mg/L	Unknown[c]	DQ[d]	NA	0.002	0.002	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	NS		<0.0004	U
Sum Ra226+Ra228	pCi/L	Unknown	Poisson	0.58	5	5	1.57	1.78	1.22	153.5	71.6	42.1	NS		<0.337	U

[a]Prediction Limits calculated using 5% alpha.
[b]Upper Prediction Limit used for all parameters.
[c]Data distribution set to Unknown if all values non-detect in upgradient well.
[d]DQ is Double Quantification Rule. If two successive, independent detected values occur, that would be an SSI and also an SSL if > GWPS. However, if value was detected in upgradient well during the same sampling event, would use Poisson PL instead.
[e]GW-26 not sampled (NS) due to insufficient recoverable water.

#.#### = UPL > Result > MCL/RSL
= SSI < GWPS
= SSI > GWPS
= DQ Parameter with Verification Sampling Needed

TETRA TECH

Western Boundary							Event 26 (AM-13) Downgradient Wells								Event 26 (AM-13) Upgradient Well GW-7	
Parameter	Units	Data Distribution for Upgradient Well GW-7	UPL Type	UPL Value[a,b]	Federal MCLs/RSLs	GWPS	GW-27	GW-28	GW-29							
Antimony	mg/L	Unknown	Poisson	0.00133	0.006	0.006	<0.0.00564	<0.0.00565	<0.00565						<0.00565	U
Arsenic	mg/L	Unknown	Poisson	0.00682	0.01	0.01	<0.0048	0.002939	0.008854						<0.0016	U
Barium	mg/L	Log−Normal	Parametric	0.0934	2	2	1.01002	0.269166	1.26599						0.0844315	
Beryllium	mg/L	Unknown[c]	DQ[d]	NA	0.004	0.004	<0.0009	<0.0003	<0.0003						<0.0003	U
Cadmium	mg/L	Unknown[c]	DQ[d]	NA	0.005	0.005	<0.0004	<0.0004	<0.0004						<0.0004	U
T. Chromium	mg/L	Unknown[c]	DQ[d]	NA	0.1	0.1	<0.00321	<0.00321	<0.00321						<0.00321	U
Cobalt	mg/L	Unknown[c]	DQ[d]	NA	0.006	0.006	<0.0004	<0.0004	<0.0004						<0.0004	U
Fluoride	mg/L	Normal	Parametric	9.291	4	9.291	0.3148	2.0404	1.2722						*8.15695*	
Lead	mg/L	Unknown[c]	DQ[d]	NA	0.015	0.015	<0.00135	<0.00045	<0.00045						<0.00045	U
Lithium	mg/L	Normal	Parametric	0.023374	0.04	0.04	0.01614	0.023068	0.044843						0.0234045	
Mercury	mg/L	Unknown	Poisson	0.00031	0.002	0.002	0.00018	0.00019	0.00018						0.00018	J
Molybdenum	mg/L	Log−Normal	Parametric	0.006805	0.1	0.1	0.002286	0.034399	0.003998						<0.0011	U
Selenium	mg/L	Unknown[c]	DQ[d]	NA	0.05	0.05	<0.0189	<0.0063	<0.0063						<0.0063	U
Thallium	mg/L	Unknown[c]	DQ[d]	NA	0.002	0.002	<0.002	<0.0002	<0.0002						<0.0002	U
Sum Ra226+Ra228	pCi/L	Unknown	Poisson	0.58	5	5	NA[e]	NA[e]	NA[e]						NA[e]	

[a]Prediction Limits calculated using 5% alpha.
[b]Upper Prediction Limit used for all parameters.
[c]Data distribution set to Unknown if all values non-detect in upgradient well.
[d]DQ is Double Quantification Rule. If two successive, independent detected values occur, that would be an SSI and also an SSL if > GWPS. However, if value was detected in upgradient well during the same sampling event, would use Poisson PL instead.
[e]Not analyzed (NA)

#.#### = UPL > Result > MCL/RSL
= SSI < GWPS
= SSI > GWPS
= DQ Parameter with Verification Sampling Needed

Western Boundary							Event 28 (AM-14) Downgradient Wells								Event 28 (AM-14) Upgradient Well GW-7	
Parameter	Units	Data Distribution for Upgradient Well GW-7	UPL Type	UPL Value[a,b]	Federal MCLs/RSLs	GWPS	GW-27	GW-28	GW-29							
Antimony	mg/L	Unknown	Poisson	0.00133	0.006	0.006	<0.0113	<0.0113	<0.0113						<0.0113	U
Arsenic	mg/L	Unknown	Poisson	0.00682	0.01	0.01	<0.0032	0.003645	0.010009						<0.0032	U
Barium	mg/L	Log−Normal	Parametric	0.0934	2	2	1.092225	0.240554	1.27511						0.083807	
Beryllium	mg/L	Unknown[c]	DQ[d]	NA	0.004	0.004	<0.0006	<0.0006	<0.0006						<0.0006	U
Cadmium	mg/L	Unknown[c]	DQ[d]	NA	0.005	0.005	<0.0008	<0.0008	<0.0008						<0.0008	U
T. Chromium	mg/L	Unknown[c]	DQ[d]	NA	0.1	0.1	<0.00642	<0.00642	<0.00642						<0.00642	U
Cobalt	mg/L	Unknown[c]	DQ[d]	NA	0.006	0.006	<0.0008	<0.0008	<0.0008						<0.0008	U
Fluoride	mg/L	Normal	Parametric	9.291	4	9.291	0.23295	2.1006	1.239						*8.2814*	
Lead	mg/L	Unknown[c]	DQ[d]	NA	0.015	0.015	<0.0009	<0.0009	<0.0009						<0.0009	U
Lithium	mg/L	Normal	Parametric	0.023374	0.04	0.04	0.017348	0.023541	0.04587						0.023449	
Mercury	mg/L	Unknown	Poisson	0.00031	0.002	0.002	<0.000163	<0.000163	<0.000163						<0.000163	U
Molybdenum	mg/L	Log−Normal	Parametric	0.006805	0.1	0.1	0.002817	0.034995	0.005774						<0.0022	U
Selenium	mg/L	Unknown[c]	DQ[d]	NA	0.05	0.05	<0.0126	<0.0126	<0.0126						<0.0126	U
Thallium	mg/L	Unknown[c]	DQ[d]	NA	0.002	0.002	<0.0004	<0.0004	<0.0004						<0.0004	U
Sum Ra226+Ra228	pCi/L	Unknown	Poisson	0.58	5	5	1.455	0.772	2.23						<0.337	U

[a]Prediction Limits calculated using 5% alpha.
[b]Upper Prediction Limit used for all parameters.
[c]Data distribution set to Unknown if all values non-detect in upgradient well.
[d]DQ is Double Quantification Rule. If two successive, independent detected values occur, that would be an SSI and also an SSL if > GWPS. However, if value was detected in upgradient well during the same sampling event, would use Poisson PL instead.

#.#### = UPL > Result > MCL/RSL
= SSI < GWPS
= SSI > GWPS
= DQ Parameter with Verification Sampling Needed

TETRA TECH

			APPENDIX III (all Chemical Constituents reported as TOTAL RECOVERABLE)[1]							APPENDIX IV (all Chemical Constituents reported as TOTAL RECOVERABLE)[1]														
SAMPLING EVENT NO.[2]	WELL ID[3]	SAMPLE DATE	BORON METALS MG/L	CALCIUM METALS MG/L	CHLORIDE MISC MG/L	FLUORIDE MISC MG/L	PH[4] MISC S.U.	SULFATE MISC MG/L	TDS MISC MG/L	ANTIMONY METALS MG/L	ARSENIC METALS MG/L	BARIUM METALS MG/L	BERYLLIUM METALS MG/L	CADMIUM METALS MG/L	CHROMIUM METALS MG/L	COBALT METALS MG/L	LEAD METALS MG/L	LITHIUM METALS MG/L	MERCURY METALS MG/L	MOLYBDENUM METALS MG/L	SELENIUM METALS MG/L	THALLIUM METALS MG/L	RADIUM-226 RADIOCHEM PCI/L	RADIUM-228 RADIOCHEM PCI/L
27 (NE-5)	GW-30[5]	4/23/2024	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
28 (NE-6)	GW-30[5]	9/23/2024	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
27 (NE-5)	GW-31	4/25/2024	1.14 U	54.891	1239	0.6784	6.99	0.0586 J	3940	0.0113 U	0.017461	1.47528	0.0006 U	0.0008 U	0.00642 U	0.0008 U	0.0009 U	0.019158	0.000163 U	0.0022 U	0.0189 U	0.0004 U	1.28	2.22
28 (NE-6)	GW-31	9/26/2024	0.572 U	141	3916	0.8236	7.25	0.2058	9140	0.0113 U	0.033861	7.47607	0.0006 U	0.0008 U	0.00642 U	0.0008 U	0.0009 U	0.0605	0.000163 U	0.003494	0.0126 U	0.0004 U	4.19	12.2
27 (NE-5)	GW-32	4/24/2024	1.14 U	389	6661	0.025 U	6.5	0.5375	17000	0.0113 U	0.012312	5.32113	0.0006 U	0.0008 U	0.00642 U	0.0008 U	0.0009 U	0.157918	0.000163 U	0.0022 U	0.0189 U	0.0004 U	12.7	24.2
27 (NE-5)	GW-32 (D)	4/24/2024	1.14 U	377	6799	0.025 U	6.5	0.6127	13460	0.0113 U	0.012807	5.04291	0.0006 U	0.0008 U	0.00642 U	0.0008 U	0.0009 U	0.15039	0.000163 U	0.0022 U	0.0189 U	0.0004 U	13.5	23.0
28 (NE-6)	GW-32	9/23/2024	0.572 U	620	11000	0.025 U	7.1	0.8852	26760	0.0113 U	0.030375	11.30876	0.0015 U	0.002 U	0.00642 U	0.001204	0.0009 U	0.221159	0.000163 U	0.002365 J	0.0126 U	0.0004 U	32.5	65.0
27 (NE-5)	GW-33A	4/24/2024	1.14 U	47.549	1972	1.043	6.83	65.58	5360	0.0113 U	0.193093	0.427981	0.0006 U	0.0008 U	0.00642 U	0.0008 U	0.0009 U	0.053409	0.000163 U	0.028166	0.0189 U	0.0004 U	1.22	1.11
29 (NE-6)	GW-33A	12/18/2024	1.14 U	137	4578	0.025 U	7.55	1.3566 J+	10560	0.0113 U	0.147175	1.52606	0.0009 U	0.0008 U	0.00642 U	0.0008 U	0.0009 U	0.104262	0.000163 U	0.0022 U	0.0126 UJ	0.0004 U	6.42	5.75
27 (NE-5)	GW-34	4/23/2024	1.14 U	30.179	1778	2.1325	7.14	132.1	3720	0.0113 U	0.010034	0.173451	0.0006 U	0.0008 U	0.00642 U	0.0008 U	0.0009 U	0.047952	0.000163 U	0.118143	0.0189 U	0.0004 U	0.408	0.721 U
28 (NE-6)	GW-34	9/24/2024	0.572 U	49.174	2692	1.8639	7.46	94.46	4860	0.0113 U	0.01352	0.847229	0.0006 U	0.0008 U	0.00642 U	0.0008 U	0.0009 U	0.060888	0.000163 U	0.006945	0.0126 U	0.0004 U	2.22	0.296 U

NOTES:

[1] Lab analyses were completed by Beta Lab and Eurofins/TestAmerica Laboratories, Inc., both of which are accredited/certified laboratories: Beta Lab NSF/ISR ISO 9001: Cert. No. 83761-IS10 (Exp. 01-16-27) and Eurofins/TestAmerica WVDEP Certificate No. 142, Expiration Date: 1-31-25.

[2] Event Nos. 27, 28, and 29 correspond to Nature and Extent (N&E) sampling events NE-5 (27) and NE-6 (28 and 29).

[3] Field duplicate samples that were taken for Quality Control purposes are noted with a (D).

[4] pH results reported are field sampling measurments as lab pH testing exceeded hold times.

[5] GW-30 not sampled during NE-5 or NE-6 due to insufficient volume of recoverable water in well.

NA = Parameter was not analyzed.

NS = Not sampled.

DATA QUALIFIER DEFINITIONS:

The following definitions provide brief explanations of the validation qualifiers assigned to results in the data review process.

D	Sample dilution performed.
JD	The analyte was positively identified, but the concentration is estimated and falls between the Method Detection Limit and Reporting Limit for a diluted sample.
UD	The analyte was analyzed for, but was not detected for a diluted sample.
G	The minimum detectable concentration of the sample is greater than the requested reporting limit.
U	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted method detection limit for sample and method.
J	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the reporting limit).
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported detection limit is approximate and may be inaccurate or imprecise.
R	The sample result (detected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in sample
UR	The sample result (nondetected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in sample.

Northern Boundary							Event 27 (AM-13/NE-5) N&E Wells									Event 27 (AM-13) Upgradient Well GW-7	
Parameter	Units	Data Distribution for Upgradient Well GW-7	UPL Type	UPL Value[a,b]	Federal MCLs/RSLs	GWPS	GW-30	GW-31	GW-32	GW-33A	GW-34						
Antimony	mg/L	Unknown	Poisson	0.00133	0.006	0.006	NS[f]	<0.0113	<0.0113	<0.0113	<0.0113					<0.00565	U
Arsenic	mg/L	Unknown	Poisson	0.00682	0.01	0.01	NS[f]	0.017461	0.01256	0.193093	0.010034					<0.0016	U
Barium	mg/L	Log-Norma	Parametric	0.0934	2	2	NS[f]	1.47528	5.18202	0.427981	0.173451					0.0844315	
Beryllium	mg/L	Unknown[c]	DQ[d]	NA	0.004	0.004	NS[f]	<0.0006	<0.0006	<0.0006	<0.0006					<0.0003	U
Cadmium	mg/L	Unknown[c]	DQ[d]	NA	0.005	0.005	NS[f]	<0.0008	<0.0008	<0.0008	<0.0008					<0.0004	U
T. Chromium	mg/L	Unknown[c]	DQ[d]	NA	0.1	0.1	NS[f]	<0.00642	<0.00642	<0.00642	<0.00642					<0.00321	U
Cobalt	mg/L	Unknown[c]	DQ[d]	NA	0.006	0.006	NS[f]	<0.0008	<0.0008	<0.0008	<0.0008					<0.0004	U
Fluoride	mg/L	Normal	Parametric	9.291	4	9.291	NS[f]	0.6784	<0.025	1.043	2.1325					*8.15695*	
Lead	mg/L	Unknown[c]	DQ[d]	NA	0.015	0.015	NS[f]	<0.0009	<0.0009	<0.0009	<0.0009					<0.00045	U
Lithium	mg/L	Normal	Parametric	0.023374	0.04	0.04	NS[f]	0.019158	0.154154	0.053409	0.047952					0.0234045	
Mercury	mg/L	Unknown	Poisson	0.00031	0.002	0.002	NS[f]	<0.000163	<0.000163	<0.000163	<0.000163					0.00018	J
Molybdenum	mg/L	Log-Norma	Parametric	0.006805	0.1	0.1	NS[f]	<0.0022	<0.0022	0.028166	0.118143					<0.0011	U
Selenium	mg/L	Unknown[c]	DQ[d]	NA	0.05	0.05	NS[f]	<0.0189	<0.0189	<0.0189	<0.0189					<0.0063	U
Thallium	mg/L	Unknown[c]	DQ[d]	NA	0.002	0.002	NS[f]	<0.0004	<0.0004	<0.0004	<0.0004					<0.0002	U
Sum Ra226+Ra228	pCi/L	Unknown	Poisson	0.58	5	5	NS[f]	3.49	36.7	2.34	1.13					NA[e]	

[a]Prediction Limits calculated using 5% alpha.

[b]Upper Prediction Limit used for all parameters.

[c]Data distribution set to Unknown if all values non-detect in upgradient well.

[d]DQ is Double Quantification Rule. If two successive, independent detected values occur, that would be an SSI and also an SSL if > GWPS. However, if value was detected in upgradient well during the same sampling event, would use Poisson PL instead.

[e]Not analyzed (NA)

[f]Not sampled (NS)

#.#### = UPL > Result > MCL/RSL

= SSI < GWPS

= SSI > GWPS

= DQ Parameter with Verification Sampling Needed

Northern Boundary							Events 28 and 29 (AM-14/NE-6) N&E Wells									Events 28 and 29 (AM-14) Upgradient Well GW-7	
Parameter	Units	Data Distribution for Upgradient Well GW-7	UPL Type	UPL Value[a,b]	Federal MCLs/RSLs	GWPS	GW-30	GW-31	GW-32	GW-33A	GW-34						
Antimony	mg/L	Unknown	Poisson	0.00133	0.006	0.006	NS[e]	<0.0113	<0.0113	<0.0113	<0.0113					<0.0113	U
Arsenic	mg/L	Unknown	Poisson	0.00682	0.01	0.01	NS[e]	0.033861	0.030375	0.147175	0.01352					<0.0032	U
Barium	mg/L	Log-Norma	Parametric	0.0934	2	2	NS[e]	7.47607	11.30876	1.52606	0.847229					0.083807	
Beryllium	mg/L	Unknown[c]	DQ[d]	NA	0.004	0.004	NS[e]	<0.0006	<0.0015	<0.0009	<0.0006					<0.0006	U
Cadmium	mg/L	Unknown[c]	DQ[d]	NA	0.005	0.005	NS[e]	<0.0008	<0.002	<0.0008	<0.0008					<0.0008	U
T. Chromium	mg/L	Unknown[c]	DQ[d]	NA	0.1	0.1	NS[e]	<0.00642	<0.00642	<0.00642	<0.00642					<0.00642	U
Cobalt	mg/L	Unknown[c]	DQ[d]	NA	0.006	0.006	NS[e]	<0.0008	0.001204	<0.0008	<0.0008					<0.0008	U
Fluoride	mg/L	Normal	Parametric	9.291	4	9.291	NS[e]	0.8236	<0.025	<0.025	1.8639					*8.2814*	
Lead	mg/L	Unknown[c]	DQ[d]	NA	0.015	0.015	NS[e]	<0.0009	<0.0009	<0.0009	<0.0009					<0.0009	U
Lithium	mg/L	Normal	Parametric	0.023374	0.04	0.04	NS[e]	0.0605	0.221159	0.104262	0.060888					0.023449	
Mercury	mg/L	Unknown	Poisson	0.00031	0.002	0.002	NS[e]	<0.000163	<0.000163	<0.000163	<0.000163					<0.000163	U
Molybdenum	mg/L	Log-Norma	Parametric	0.006805	0.1	0.1	NS[e]	0.003494	0.002365	<0.0022	0.006945					<0.0022	U
Selenium	mg/L	Unknown[c]	DQ[d]	NA	0.05	0.05	NS[e]	<0.0126	<0.0126	<0.0126	<0.0126					<0.0126	U
Thallium	mg/L	Unknown[c]	DQ[d]	NA	0.002	0.002	NS[e]	<0.0004	<0.0004	<0.0004	<0.0004					<0.0004	U
Sum Ra226+Ra228	pCi/L	Unknown	Poisson	0.58	5	5	NS[e]	16.3	97.5	12.17	2.52					<0.337	U

[a]Prediction Limits calculated using 5% alpha.

[b]Upper Prediction Limit used for all parameters.

[c]Data distribution set to Unknown if all values non-detect in upgradient well.

[d]DQ is Double Quantification Rule. If two successive, independent detected values occur, that would be an SSI and also an SSL if > GWPS. However, if value was detected in upgradient well during the same sampling event, would use Poisson PL instead.

[e]Not Sampled (NS)

#.#### = UPL > Result > MCL/RSL

= SSI < GWPS

= SSI > GWPS

= DQ Parameter with Verification Sampling Needed

TETRA TECH

FIGURES

PGH \\EGSS706GISFS1\EGS\PITTSBURGH\GIS\GIS\FIRST_ENERGY\MAPDOCS\PLEASANTS_POWER_STATION\PLEASANTS_CCR_GWMONITORING_2024_03MAR_20250106.APRX 1/8/2025 TIM.TEAFORD

References:
1. Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (©2021 ESRI and its data suppliers).
2. Contours obtained from the West Virginia GIS Technical Center.
3. Monitoring well locations were obtained from "Groundwater Quality at the Pleasants and Willow Island Power Plants, Pleasants County, West Virginia"; EPRI Research Project: 9106; Site Investigation Report; dated April 1999.
4. Approximate Waste Boundary lines were obtained from FirstEnergy Drawing Nos. C7950106, Rev. A (Sheets 1 and 2) and C79508868, Rev. A.
5. Approximate Parcel Boundary obtained from FirstEnergy Drawing No. C7950064, Rev. A (Sheets 1 through 3), dated 2/14/1997.
6. Monitoring wells GW-21 through GW-29 were installed by Tetra Tech, Inc. in July/August 2016. As-built well locations were obtained by field survey performed by Tetra Tech, Inc. on 8-12-2016.
7. Monitoring wells GW-30 through GW-34 were installed and field surveyed by Tetra Tech, Inc. in 2021 (August through December) and 2022 (March through April).
8. Groundwater elevations from March 2024 were used to generate contours.

Eureka Sedimentation Pond Nos. 1 & 2

GW-30 <618.89 (DRY)
GW-31 (735.29)
GW-19 (716.63)
GW-26 (697.87)
GW-9 (663.63)
GW-3 (NM)
GW-25 (711.83)
GW-4* (884.12)
GW-16A (651.83)
GW-27 (666.19)
GW-17 (652.24)
MP-4 (647.75)
MP-3 (643.26)
GW-28 (678.04)
GW-24 (717.32)
GW-23 (690.01)
GW-32 (702.13)
GW-12 (668.62)
GW-8 (774.10)
GW-29 (787.22)
MP-1B* (866.86)
GW-20* (844.52)
GW-33A (NM)
GW-5* (889.67)
GW-7 (890.29)
GW-22 (722.92)
GW-21 (806.87)
GW-34 (NM)

McElroy's Run Landfill
Impoundment Dam
McElroy's Run Disposal Impoundment
McElroys Run
Pleasants Run
Peggy Run
French Creek
S Pleasants Hwy
Hammett
Sharp Holw
Henry Camp Rd

N

1,000 0 1,000 Feet

Legend

- Pre-CCR Rule Monitoring Well
- Pre-CCR Rule Piezometer
- Post-CCR Rule Monitoring Well
- GW-# Certified WVDEP/CCR Monitoring Well
- GW-# Nature and Extent Well

Monitoring Wells Not Used For Contouring

- GW-#* Not Used For Contouring Due To Different Groundwater Flow Zone Being Monitored
- Approximate Waste Boundary
- Approximate Parcel Boundary
- Groundwater Elevation Contour (50-foot)
- (790.17) Groundwater Elevation March 2024 (NM = Not Monitored)
- Grafton Sandstone Outcrop
- Interpreted Groundwater Flow Direction
- Topographic Contour (10-foot)

Geologic Unit Groupings

- Lower Connellsville SS/ Lower Clarksburg RB
- Morgantown SS/Birmingham RB
- Birmingham RB/Grafton SS/ Ames LS
- Grafton SS
- Ames LS/Jane Lew SS/ Pittsburgh RB
- Saltsburg SS/Alluvium

TETRA TECH

CCR RULE GROUNDWATER MONITORING SYSTEM
INTERPRETED GROUNDWATER FLOW MARCH 2024
PLEASANTS POWER STATION
McELROY'S RUN CCB DISPOSAL FACILITY

ALLEGHENY ENERGY SUPPLY COMPANY
GREENSBURG, PENNSYLVANIA

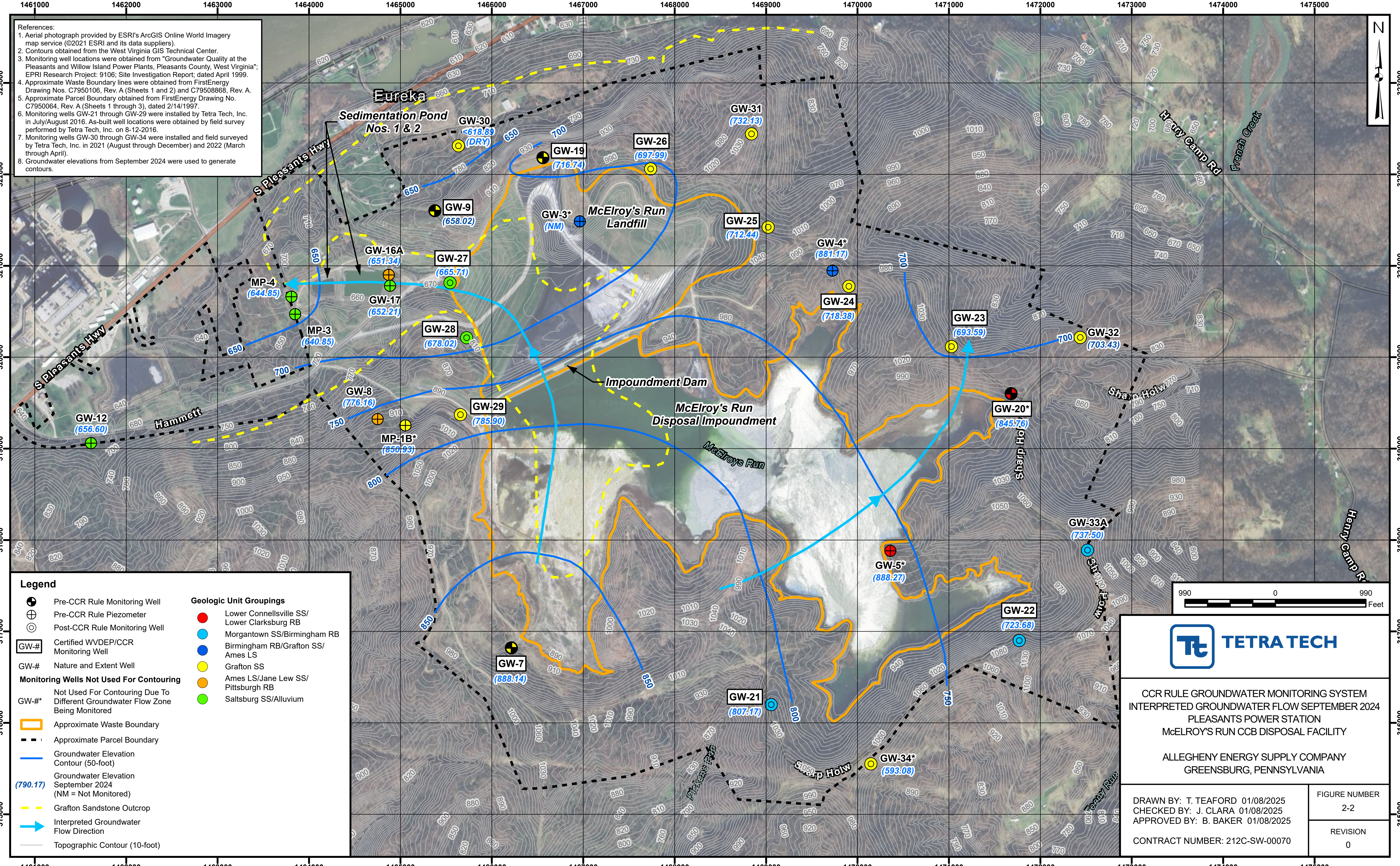
DRAWN BY: T. TEAFORD 01/08/2025
CHECKED BY: J. CLARA 01/08/2025
APPROVED BY: B. BAKER 01/08/2025

CONTRACT NUMBER: 212C-SW-00070

FIGURE NUMBER 2-1

REVISION 0

PGH \\EGSS706GISFS1\EGS\PITTSBURGH\GIS\GIS\FIRST_ENERGY\MAPDOCS\PLEASANTS_POWER_STATION\PLEASANTS_CCR_GWMONITORING_2024_09SEP_20250106.APRX 1/8/2025 TIM.TEAFORD



References:

1. Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (©2021 ESRI and its data suppliers).
2. Contours obtained from the West Virginia GIS Technical Center.
3. Monitoring well locations were obtained from "Groundwater Quality at the Pleasants and Willow Island Power Plants, Pleasants County, West Virginia"; EPRI Research Project: 9106; Site Investigation Report; dated April 1999.
4. Approximate Waste Boundary lines were obtained from FirstEnergy Drawing Nos. C7950106, Rev. A (Sheets 1 and 2) and C79508868, Rev. A.
5. Approximate Parcel Boundary obtained from FirstEnergy Drawing No. C7950064, Rev. A (Sheets 1 through 3), dated 2/14/1997.
6. Monitoring wells GW-21 through GW-29 were installed by Tetra Tech, Inc. in July/August 2016. As-built well locations were obtained by field survey performed by Tetra Tech, Inc. on 8-12-2016.
7. Monitoring wells GW-30 through GW-34 were installed and field surveyed by Tetra Tech, Inc. in 2021 (August through December) and 2022 (March through April).
8. Groundwater elevations from September 2024 were used to generate contours.

Legend

- Pre-CCR Rule Monitoring Well
- Pre-CCR Rule Piezometer
- Post-CCR Rule Monitoring Well
- GW-# Certified WVDEP/CCR Monitoring Well
- GW-# Nature and Extent Well

Monitoring Wells Not Used For Contouring

- GW-#* Not Used For Contouring Due To Different Groundwater Flow Zone Being Monitored
- Approximate Waste Boundary
- Approximate Parcel Boundary
- Groundwater Elevation Contour (50-foot)
- (790.17) Groundwater Elevation September 2024 (NM = Not Monitored)
- Grafton Sandstone Outcrop
- Interpreted Groundwater Flow Direction
- Topographic Contour (10-foot)

Geologic Unit Groupings

- Lower Connellsville SS/ Lower Clarksburg RB
- Morgantown SS/Birmingham RB
- Birmingham RB/Grafton SS/ Ames LS
- Grafton SS
- Ames LS/Jane Lew SS/ Pittsburgh RB
- Saltsburg SS/Alluvium

TETRA TECH

CCR RULE GROUNDWATER MONITORING SYSTEM
INTERPRETED GROUNDWATER FLOW SEPTEMBER 2024
PLEASANTS POWER STATION
McELROY'S RUN CCB DISPOSAL FACILITY

ALLEGHENY ENERGY SUPPLY COMPANY
GREENSBURG, PENNSYLVANIA

DRAWN BY: T. TEAFORD 01/08/2025
CHECKED BY: J. CLARA 01/08/2025
APPROVED BY: B. BAKER 01/08/2025

CONTRACT NUMBER: 212C-SW-00070

FIGURE NUMBER 2-2

REVISION 0

ATTACHMENT A

SEMI-ANNUAL SELECTION OF REMEDY (SoR) PROGRESS REPORT (Q1 and Q2 2024)

McELROY'S RUN COAL COMBUSTION BYPRODUCT DISPOSAL FACILITY

Pleasants Power Station
Pleasants County, West Virginia

Prepared for:

Allegheny Energy Supply Company
A Wholly Owned Subsidiary of FirstEnergy

800 Cabin Hill Drive
Greensburg, PA 15601

Prepared by:

Tetra Tech, Inc.

400 Penn Center Boulevard, Suite 200
Pittsburgh, PA 15235
Phone: (412) 829-3600
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Tetra Tech Project No. 212C-SW-00070

July 2024

TABLE OF CONTENTS

1.0 INTRODUCTION

This Semi-Annual Selection of Remedy (SoR) Progress Report was prepared by Tetra Tech, Inc. (Tetra Tech) on behalf of Allegheny Energy Supply Company (AESC) for the Coal Combustion Byproduct Disposal Facility ("CCBDF", "CCR units", or "site") associated with the Pleasants Power Station (hereinafter referred to as the "Station"). The CCR units and Station are located near the town of Belmont in Pleasants County, West Virginia. The period covered by this report includes the first two quarters (Q1and Q2) of calendar year 2024 (January 1st through June 30th).

As per 40 CFR 257.97(a), once a Coal Combustion Residual (CCR) unit has completed an Assessment of Corrective Measures (ACM) and transitions to SoR, "The owner or operator must prepare a semiannual report describing the progress in selecting and designing the remedy." Accordingly, this report summarizes the progress during the current reporting period in selecting and designing the remedy for addressing arsenic concentrations in groundwater downgradient of the CCR units and also includes a summary of anticipated SoR activities which will be conducted over the next SoR reporting period.

Detailed background information on the CCR units, hydrogeologic site conditions, and CCR monitoring results can be found in various other documents on the CCBDF's publicly accessible website, the most recent of which being the 2023 Annual CCR Rule Groundwater Monitoring and Corrective Action Report (McElroy's Run CCB Disposal Facility 2023 Annual GWMCA Report). The following section provides background information as it relates to the SoR at the CCR units.

1.1 Background

Groundwater Assessment Monitoring (AM) conducted at the site in accordance with the federal CCR Rule identified arsenic, barium, lithium, and radium concentrations in certain downgradient CCR monitoring wells which were at Statistically Significant Levels (SSLs) above their corresponding Groundwater Protection Standards (GWPS). Pursuant to 40 CFR 257.95(g)(3)(ii), Tetra Tech performed an Alternative Source Demonstration (ASD) to assess if the Appendix IV SSLs determined for sampling events AM-1, -2, and -3 were attributable to a release from the CCR units or from a demonstrable alternative source(s). The Appendix IV ASD is included as Attachment A of the ACM Report prepared for the Site (McElroy's Run CCB Disposal Facility 2019 ACM Report) and determined that the barium and radium SSLs could be attributed to historical and current oil and gas exploration and production activities that have occurred at the site; that the source of the lithium SSLs was indeterminate but there is a high potential they are also attributable to oil and gas impacts at the site; and that the arsenic SSLs could not be attributed to

sources other than the CCR units. As such, a transition to Nature and Extent (N&E) of release characterization and ACM for arsenic per 40 CFR 257.96 of the CCR Rule were implemented.

As required by 40 CFR 257.96(c), the ACM conducted by Tetra Tech on behalf of AESC included an analysis of the effectiveness of potential corrective measures in meeting the remedy requirements and objectives as described under 40 CFR 257.97. The ACM Report evaluated the following corrective measures against the criteria referenced in 40 CFR 257.96(c): Source Control, Groundwater Extraction and Treatment, In-Situ Technologies, and Monitored Natural Attenuation (MNA).

Based on the evaluation of viable remediation technologies, MNA, combined with source control by the eventual installation of a final cover system on the CCR units, ranks highest among the evaluated options. In September 2019, pursuant to 40 CFR 257.96(d), the ACM Report was posted in the CCR units' Operating Record, and then subsequently posted to the facility's publicly accessible website on October 16, 2019 (McElroy's Run CCB Disposal Facility 2019 ACM Report).

1.2 SoR Regulatory Basis

SoR activities must be completed in compliance with 40 CFR 257.97(a), which states that as soon as feasible after completion of the ACM, a remedy must be selected that, at a minimum, meets the performance standards listed in 40 CFR 257.97(b), and considers the evaluation factors listed in 40 CFR 257.97(c).

2.0 CURRENT STATUS OF THE SELECTION OF REMEDY PROGRAM

The following activities have been performed during the current reporting period as part of selecting the remedy at the site:

- Continued AM with a sampling event in March 2024 (AM-13), which included sampling of the site's CCR monitoring well network with analyses for all Appendix III and Appendix IV parameters (with the exception of Radium 226/228) along with targeted general chemistry parameters to assist in evaluating potential natural attenuation impacts.
- Assessed the March 2024 groundwater flow patterns in the monitoring network areas downgradient of the CCR units and found they remained consistent with established flow patterns at the site.
- Continued N&E of Release Characterization with a sampling event in April 2024 (NE-5) which included sampling of the site's current N&E monitoring well network (GW-30, GW-31, -32, -33A, and -34). However, due to an insufficient recoverable volume of water, GW-30 could not be sampled during NE-5 and, due to an issue

with the portable low flow pump, GW-34 was sampled using a bailer during the NE-5 event. The results indicated that some downgradient attenuation of arsenic is occurring along the northern and northeastern sides of the site, with the measured arsenic concentrations in GW-31 and GW-32 being 17.5 and 12.6 ppb, respectively, which are above the GWPS of 10 ppb and slightly higher than the levels measured in those wells during the prior N&E sampling event. Along the southeastern and southern sides of the site, the sidegradient arsenic concentrations in GW-33A and GW-34 were measured at 193.1 and 10.0 ppb, respectively, one of which exceeds and the other equals the GWPS, but both are lower than the levels measured in those wells during the prior N&E sampling event. In addition to arsenic, analyses were performed for all other CCR Rule Appendix III and Appendix IV parameters in order to continue building a background dataset for use when the wells are eventually incorporated into the AM and/or Corrective Action Monitoring (CAM) network.

- Continued development of a Natural Attenuation Evaluation Work Plan that includes evaluating historic concentrations of parameters which can affect the natural attenuation of arsenic (e.g., iron, pH, ORP, etc.) as well as planning the sampling and analysis program that would be associated with future MNA activities.
- Continued reviewing candidate technologies with regard to their potential to meet the performance standards listed in 40 CFR 257.97(b) and the evaluation factors listed in 40 CFR 257.97(c).

3.0 PLANNED SOR ACTIVITIES

The following activities are planned as part of the ongoing SoR process:

- Complete the second scheduled 2024 AM sampling event at the site (AM-14), along with continued N&E/background sampling of monitoring wells GW-30, -31, -32, -33A, and -34. If GW-30 again yields insufficient water for sampling, evaluate the viability of redeveloping the well.
- Evaluate the need for installing additional monitoring wells to characterize the nature and extent of arsenic in groundwater in accordance with 40 CFR 257.95(g)(1)(i-iv), including GW-33B which was unsuccessfully attempted in the fall of 2021 due to recurring formation instability issues at depth and the return of significant volumes of natural oil and gas with the borehole cuttings. Install the appropriate number of monitoring wells needed to define the arsenic plume and support an accurate assessment of the selected remedy.

- Continue development of the Arsenic Natural Attenuation Evaluation Work Plan, including a review of the historic groundwater monitoring data set for relationships between key parameters affecting arsenic natural attenuation and arsenic concentrations in groundwater.
- Continue evaluating the candidate technologies identified in the ACM against the performance standards listed in 40 CFR 257.97(b) and the evaluation factors listed in 40 CFR 257.97(c).
- As required by 40 CFR 257.96(e), AESC will discuss the results of the corrective measures assessment at least 30 days prior to the final selection of remedy, in a public meeting.
- Upon completion of all required SoR activities, AESC will prepare a final report describing the selected remedy and how it, at a minimum, meets the performance standards listed in 40 CFR 257.97(b) and considers the evaluation factors listed in 40 CFR 257.97(c).
- As required by 40 CFR 257.97(d), AESC will specify, as part of the selected arsenic remedy, a schedule(s) for implementing and completing remedial activities.

Should the final remedy for the CCR units not be selected during Q3 or Q4 2024, then another Semi-Annual SoR Report will be prepared as required by 40 CFR 257.97(a).

SEMI-ANNUAL SELECTION OF REMEDY (SoR) PROGRESS REPORT (Q3 and Q4 2024)

McELROY'S RUN COAL COMBUSTION BYPRODUCT DISPOSAL FACILITY

Pleasants Power Station
Pleasants County, West Virginia

Prepared for:

Allegheny Energy Supply Company
A Wholly Owned Subsidiary of FirstEnergy

800 Cabin Hill Drive
Greensburg, PA 15601

Prepared by:

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Tetra Tech Project No. 212C-SW-00070

January 2025

TABLE OF CONTENTS

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sources other than the CCR units. As such, a transition to Nature and Extent (N&E) of release characterization and ACM for arsenic per 40 CFR 257.96 of the CCR Rule were implemented.

As required by 40 CFR 257.96(c), the ACM conducted by Tetra Tech on behalf of AESC included an analysis of the effectiveness of potential corrective measures in meeting the remedy requirements and objectives as described under 40 CFR 257.97. The ACM Report evaluated the following corrective measures against the criteria referenced in 40 CFR 257.96(c): Source Control, Groundwater Extraction and Treatment, In-Situ Technologies, and Monitored Natural Attenuation (MNA).

Based on the evaluation of viable remediation technologies, MNA, combined with source control by the eventual installation of a final cover system on the CCR units, ranks highest among the evaluated options. In September 2019, pursuant to 40 CFR 257.96(d), the ACM Report was posted in the CCR units' Operating Record, and then subsequently posted to the facility's publicly accessible website on October 16, 2019 (McElroy's Run CCB Disposal Facility 2019 ACM Report).

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- Continued AM with a sampling event in September 2024 (AM-14), which included sampling of the site's CCR monitoring well network with analyses for all Appendix III and Appendix IV parameters along with targeted general chemistry parameters to assist in evaluating potential natural attenuation impacts.
- Assessed the September 2024 groundwater flow patterns in the monitoring network areas downgradient of the CCR units and found they remained consistent with established flow patterns at the site.
- Continued N&E of Release Characterization with sampling events in September and December 2024 (NE-6) which included sampling of the site's current N&E monitoring well network (GW-30, GW-31, -32, -33A, and -34). Similar to NE-5, due to an insufficient recoverable volume of water GW-30 could not be sampled during NE-6 and, due to an issue with the portable low flow pump, GW-34 was sampled

using a bailer during NE-6. Additionally, GW-33A could not be sampled during the September field work due to complications related to the amount of free product in the well and required a separate mobilization in December. The results indicated that some downgradient attenuation of arsenic is occurring along the northern and northeastern sides of the site, with the measured arsenic concentrations in GW-31 and GW-32 being 33.9 and 30.4 ppb, respectively, which are above the GWPS of 10 ppb and higher than the levels measured in those wells during the prior N&E sampling event. Along the southeastern and southern sides of the site, the sidegradient arsenic concentrations in GW-33A and GW-34 were measured at 147.2 and 13.5 ppb, respectively, which exceed the GWPS and are similar to the levels measured in those wells during the prior N&E sampling event. In addition to arsenic, analyses were performed for all other CCR Rule Appendix III and Appendix IV parameters in order to continue building a background dataset for use when the wells are eventually incorporated into the AM and/or Corrective Action Monitoring (CAM) network.

- Continued development of a Natural Attenuation Evaluation Work Plan that includes evaluating historic concentrations of parameters which can affect the natural attenuation of arsenic (e.g., iron, pH, ORP, etc.) as well as planning the sampling and analysis program that would be associated with future MNA activities.
- Continued reviewing candidate technologies with regard to their potential to meet the performance standards listed in 40 CFR 257.97(b) and the evaluation factors listed in 40 CFR 257.97(c).

3.0 PLANNED SOR ACTIVITIES

The following activities are planned as part of the ongoing SoR process:

- Complete the first scheduled 2025 AM sampling event at the site (AM-15), along with continued N&E/background sampling of monitoring wells GW-30, -31, -32, -33A, and -34. If GW-30 again yields insufficient water for sampling, evaluate the viability of redeveloping the well.
- Evaluate the need for installing additional monitoring wells to characterize the nature and extent of arsenic in groundwater in accordance with 40 CFR 257.95(g)(1)(i-iv), including GW-33B which was unsuccessfully attempted in the fall of 2021 due to recurring formation instability issues at depth and the return of significant volumes of natural oil and gas with the borehole cuttings. Install the appropriate number of monitoring wells needed to define the arsenic plume and support an accurate assessment of the selected remedy.

- Continue development of the Arsenic Natural Attenuation Evaluation Work Plan, including a review of the historic groundwater monitoring data set for relationships between key parameters affecting arsenic natural attenuation and arsenic concentrations in groundwater.
- Continue evaluating the candidate technologies identified in the ACM against the performance standards listed in 40 CFR 257.97(b) and the evaluation factors listed in 40 CFR 257.97(c).
- As required by 40 CFR 257.96(e), AESC will discuss the results of the corrective measures assessment at least 30 days prior to the final selection of remedy, in a public meeting.
- Upon completion of all required SoR activities, AESC will prepare a final report describing the selected remedy and how it, at a minimum, meets the performance standards listed in 40 CFR 257.97(b) and considers the evaluation factors listed in 40 CFR 257.97(c).
- As required by 40 CFR 257.97(d), AESC will specify, as part of the selected arsenic remedy, a schedule(s) for implementing and completing remedial activities.

Should the final remedy for the CCR units not be selected during Q1 or Q2 2025, then another Semi-Annual SoR Report will be prepared as required by 40 CFR 257.97(a).