

**2022 ANNUAL GROUNDWATER MONITORING
AND CORRECTIVE ACTION REPORT
BOTTOM ASH SETTLING AREA
TECUMSEH ENERGY CENTER
TECUMSEH, KANSAS**

by
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Cleveland, Ohio

for
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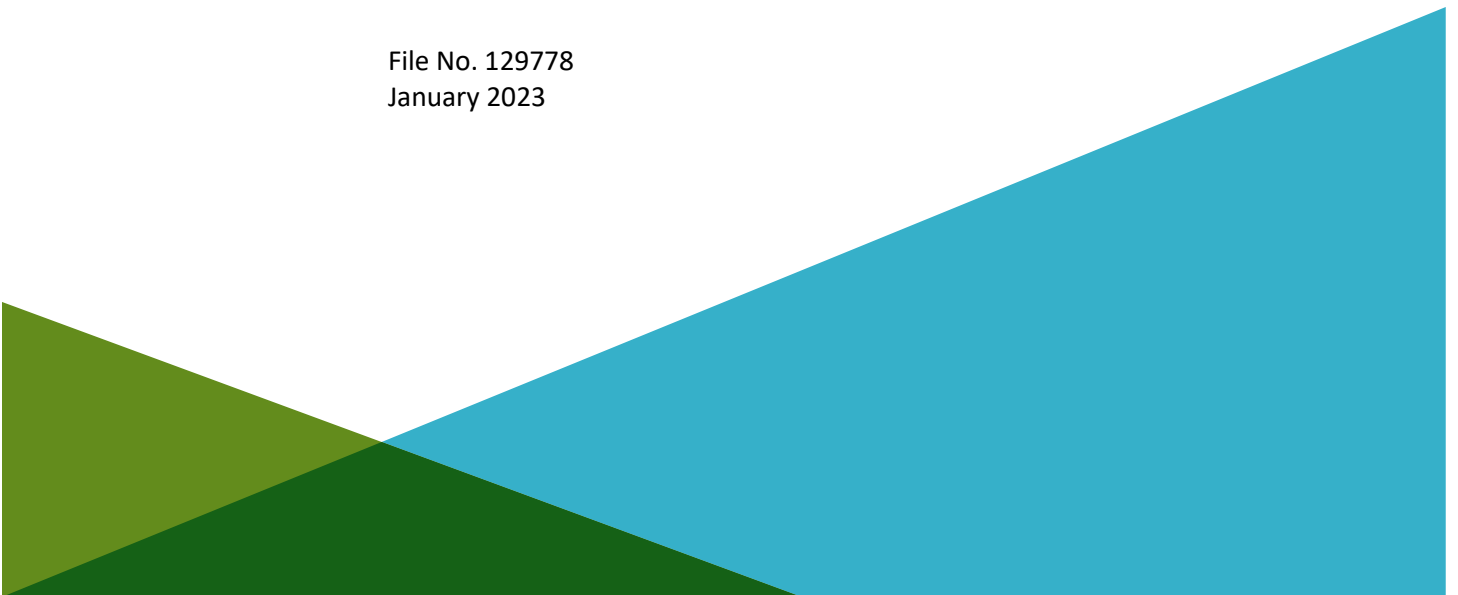


Table of Contents

		Page
List of Tables		ii
List of Figures		ii
1.	Introduction	1
1.1	40 CFR § 257.90(E)(6) SUMMARY	1
1.1.1	40 CFR § 257.90(e)(6)(i) – Initial Monitoring Program	1
1.1.2	40 CFR § 257.90(e)(6)(ii) – Final Monitoring Program	1
1.1.3	40 CFR § 257.90(e)(6)(iii) – Statistically Significant Increases	2
1.1.4	40 CFR § 257.90(e)(6)(iv) – Statistically Significant Levels	2
1.1.5	40 CFR § 257.90(e)(6)(v) – Selection of Remedy	3
1.1.6	40 CFR § 257.90(e)(6)(vi) – Remedial Activities	3
2.	40 CFR § 257.90 Applicability	4
2.1	40 CFR § 257.90(A)	4
2.2	40 CFR § 257.90(E) – SUMMARY	4
2.2.1	Status of the Groundwater Monitoring Program	4
2.2.2	Key Actions Completed	5
2.2.3	Problems Encountered	5
2.2.4	Actions to Resolve Problems	5
2.2.5	Project Key Activities for Upcoming Year	5
2.3	40 CFR § 257.90(E) – INFORMATION	5
2.3.1	40 CFR § 257.90(e)(1)	5
2.3.2	40 CFR § 257.90(e)(2) – Monitoring System Changes	6
2.3.3	40 CFR § 257.90(e)(3) – Summary of Sampling Events	6
2.3.4	40 CFR § 257.90(e)(4) – Monitoring Transition Narrative	6
2.3.5	40 CFR § 257.90(e)(5) – Other Requirements	7

Revision No.	Date	Notes

List of Tables

Table No.	Title
I	Statistically Significant Levels of Appendix IV Constituents

List of Figures

Figure No.	Title
1	Bottom Ash Settling Area Monitoring Well Location Map

**2022 Annual Groundwater Monitoring
and Corrective Action Report**

This Annual Groundwater Monitoring and Corrective Action Report documents the groundwater monitoring program for the Tecumseh Energy Center (TEC) Bottom Ash Settling Area (BASA) consistent with applicable sections of Code of Federal Regulations Title 40 §§ 257.90 through 257.98, describes activities conducted in the prior calendar year (2022), and documents compliance with the U.S. Environmental Protection Agency Coal Combustion Residual Rule. I certify that the 2022 Annual Groundwater Monitoring and Corrective Action Report for the TEC BASA is, to the best of my knowledge, accurate and complete.

Signed: 
Professional Geologist



Print Name: Mark Nicholls
Kansas License No.: Professional Geologist No. 881
Title: Principal Consultant
Company: Haley & Aldrich, Inc.

1. Introduction

This 2022 Annual Groundwater Monitoring and Corrective Action Report (Annual Report) addresses the Bottom Ash Settling Area (BASA; also known as the Bottom Ash Settling Pond) at the Tecumseh Energy Center (TEC), operated by Evergy Kansas Central, Inc. (Evergy). This Annual Report was developed in accordance with the U.S. Environmental Protection Agency Coal Combustion Residual (CCR) Rule (Rule) effective October 19, 2015, including subsequent revisions, specifically Title 40 Code of Federal Regulations (40 CFR), § 257.90(e). The Annual Report documents the groundwater monitoring system for the BASA consistent with applicable sections of 40 CFR 257.90 through 257.98, describes activities conducted in the prior calendar year (2022), and documents compliance with the Rule. The specific requirements for the Annual Report listed in § 257.90(e) of the Rule are provided in Sections 1 and 2 of this Annual Report and are in ***bold italic font***, followed by a short narrative describing how each Rule requirement has been met.

1.1 40 CFR § 257.90(e)(6) SUMMARY

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. At a minimum, the summary must specify all of the following:

1.1.1 40 CFR § 257.90(e)(6)(i) – Initial Monitoring Program

At the start of the current annual reporting period, whether the CCR unit was operating under the detection monitoring program in § 257.94 or the assessment monitoring program in § 257.95;

At the start of the current annual reporting period (January 1, 2022), the BASA had been closed in accordance with the requirements of 40 CFR § 257.102(c). Upon documentation of CCR waste material removal from the unit on September 5, 2019, two consecutive sampling events (October 2019 and December 2019) were used to document that detected Appendix IV constituents did not exceed the groundwater protection standards (GWPS) for the BASA pursuant to § 257.95(h). The TEC BASA surface impoundment was closed on August 11, 2020 in accordance with the requirements of § 257.102(c). Pursuant to the Consent Agreement and Final Order In the Matter of Evergy Kansas Central, Inc.: Docket No. RCRA-07-2023-0001 dated November 7, 2022 (CAFO), the TEC BASA surface impoundment has been reopened for further analysis.

1.1.2 40 CFR § 257.90(e)(6)(ii) – Final Monitoring Program

At the end of the current annual reporting period, whether the CCR unit was operating under the detection monitoring program in § 257.94 or the assessment monitoring program in § 257.95;

At the end of the current annual reporting period (December 31, 2022), the BASA was under an assessment monitoring program in compliance with 40 CFR § 257.95 for all constituents except arsenic and cobalt.

1.1.3 40 CFR § 257.90(e)(6)(iii) – Statistically Significant Increases

If it was determined that there was a statistically significant increase over background for one or more constituents listed in Appendix III to this part pursuant to § 257.94(e):

1.1.3.1 40 CFR § 257.90(e)(6)(iii)(a) – Statistically Significant Increase Constituents

Identify those constituents listed in Appendix III to this part and the names of the monitoring wells associated with such an increase; and

The BASA was operating under an assessment monitoring program; therefore, no statistical evaluations were completed on Appendix III constituents in 2022.

1.1.3.2 40 CFR § 257.90(e)(6)(iii)(b) – Initiation of Assessment Monitoring

Provide the date when the assessment monitoring program was initiated for the CCR unit.

An assessment monitoring program was initiated on July 17, 2018 for the BASA with a notification establishing assessment monitoring provided on August 15, 2018 to meet the requirements of 40 CFR § 257.95. The TEC BASA surface impoundment was closed on August 11, 2020 in accordance with the requirements of § 257.102(c).

Pursuant to the CAFO dated November 7, 2022, the TEC BASA surface impoundment has been reopened for further assessment monitoring, and the assessment monitoring program has been re-established to meet the requirements of 40 CFR § 257.95.

1.1.4 40 CFR § 257.90(e)(6)(iv) – Statistically Significant Levels

If it was determined that there was a statistically significant level above the groundwater protection standard for one or more constituents listed in Appendix IV to this part pursuant to § 257.95(g) include all of the following:

1.1.4.1 40 CFR § 257.90(e)(6)(iv)(A) – Statistically Significant Level Constituents

Identify those constituents listed in Appendix IV to this part and the names of the monitoring wells associated with such an increase;

Statistically significant levels (SSLs) above the GWPS identified in 2022 are listed in the attached Table I.

1.1.4.2 40 CFR § 257.90(e)(6)(iv)(B) – Initiation of the Assessment of Corrective Measures

Provide the date when the assessment of corrective measures was initiated for the CCR unit;

A Corrective Measures Assessment (CMA) was not initiated in 2022 at the BASA. A CMA will be initiated within 90 days of identification of SSLs listed in Table I in accordance with 40 CFR § 257.96.

**2020 Annual Groundwater Monitoring
and Corrective Action Report**

1.1.4.3 40 CFR § 257.90(e)(6)(iv)(C) – Assessment of Corrective Measures Public Meeting

Provide the date when the public meeting was held for the assessment of corrective measures for the CCR unit; and

A public meeting was not held in 2022. A public meeting to discuss the results of the CMA will be held at least 30 days prior to the selection of remedy in accordance with § 257.96(e).

1.1.4.4 40 CFR § 257.90(e)(6)(iv)(D) – Completion of the Assessment of Corrective Measures

Provide the date when the assessment of corrective measures was completed for the CCR unit.

A CMA was not completed in 2022 at the BASA. A CMA will be initiated within 90 days of identification of SSLs listed in Table I in accordance with 40 CFR § 257.96 and will be completed following the schedule agreed upon between Energy and the USEPA in accordance with the CAFO.

1.1.5 40 CFR § 257.90(e)(6)(v) – Selection of Remedy

Whether a remedy was selected pursuant to § 257.97 during the current annual reporting period, and if so, the date of remedy selection; and

A remedy was not selected in 2022 for arsenic and cobalt at the BASA.

1.1.6 40 CFR § 257.90(e)(6)(vi) – Remedial Activities

Whether remedial activities were initiated or are ongoing pursuant to § 257.98 during the current annual reporting period.

No remedial activities were initiated in 2022; therefore, no demonstration or certification is applicable for this unit.

2. 40 CFR § 257.90 Applicability

2.1 40 CFR § 257.90(a)

All CCR landfills, CCR surface impoundments, and lateral expansions of CCR units are subject to the groundwater monitoring and corrective action requirements under §§ 257.90 through 257.99, except as provided in paragraph (g) [Suspension of groundwater monitoring requirements] of this section.

Evergy has installed and certified a groundwater monitoring system at the TEC BASA. The BASA is subject to the groundwater monitoring and corrective action requirements described under 40 CFR §§ 257.90 through 257.98. This document addresses the requirement for the Owner/Operator to prepare an Annual Report per § 257.90(e).

2.2 40 CFR § 257.90(e) – SUMMARY

Annual groundwater monitoring and corrective action report. For existing CCR landfills and existing CCR surface impoundments, no later than January 31, 2018, and annually thereafter, the owner or operator must prepare an annual groundwater monitoring and corrective action report. For new CCR landfills, new CCR surface impoundments, and all lateral expansions of CCR units, the owner or operator must prepare the initial annual groundwater monitoring and corrective action report no later than January 31 of the year following the calendar year a groundwater monitoring system has been established for such CCR unit as required by this subpart, and annually thereafter. 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. For purposes of this section, the owner or operator has prepared the annual report when the report is placed in the facility's operating record as required by § 257.105(h)(1).

This Annual Report describes monitoring completed and actions taken for the groundwater monitoring system at the TEC BASA as required by the Rule. Groundwater sampling and analysis was conducted per the requirements described in § 257.93, and the status of the groundwater monitoring program described in § 257.94 and § 257.95 is also provided in this report. This Annual Report documents the applicable groundwater-related activities completed in calendar year 2022.

2.2.1 Status of the Groundwater Monitoring Program

Pursuant to the CAFO dated November 7, 2022, the TEC BASA surface impoundment has been reopened for further assessment monitoring, and the assessment monitoring program has been re-established to meet the requirements of 40 CFR § 257.95.

Appendix IV SSLs were detected above the GWPS for arsenic and cobalt in 2022; therefore, a CMA will be initiated within 90 days of identification of SSLs listed in Table I in accordance with 40 CFR § 257.96. Evergy is currently conducting an assessment monitoring program for all other constituents.

2020 Annual Groundwater Monitoring and Corrective Action Report

2.2.2 Key Actions Completed

In accordance with paragraph 10.c of the CAFO, statistical evaluations were completed for assessment monitoring groundwater data collected after January 1, 2018 at the BASA using interwell comparison methods to establish background levels and identify Appendix IV SSLs and to determine GWPS in accordance with 40 CFR § 257.95(h) and (i). The statistical evaluations indicated Appendix IV SSLs above the GWPS for arsenic and cobalt.

2.2.3 Problems Encountered

No noteworthy problems (i.e., problems could include damaged wells, issues with sample collection or lack of sampling, or problems with analytical analysis) were encountered at the BASA in 2022. Sampling of the previously closed BASA was reinitiated pursuant to the CAFO, and the subsequent assessment monitoring samples were scheduled to be collected in January 2023. Results of this sampling event will be reported in the 2023 Annual Report due January 31, 2024.

2.2.4 Actions to Resolve Problems

No problems were encountered at the BASA in 2022; therefore, no actions to resolve problems were required.

2.2.5 Project Key Activities for Upcoming Year

Key activities planned for 2023 include the 2022 Annual Groundwater Monitoring and Corrective Action Report, statistical evaluation of semi-annual assessment monitoring analytical data collected in March 2023, semi-annual assessment monitoring and subsequent statistical evaluations, and annual assessment monitoring.

Energy will initiate drilling, installation, and sampling of compliance monitoring wells and nature and extent monitoring wells, and complete a CMA in accordance with the schedules outlined in development plans negotiated with the USEPA. These development plans are still pending.

2.3 40 CFR § 257.90(e) – INFORMATION

At a minimum, the annual groundwater monitoring and corrective action report must contain the following information, to the extent available:

2.3.1 40 CFR § 257.90(e)(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;

As required by § 257.90(e)(1), a map showing the locations of the CCR unit and associated upgradient and downgradient monitoring wells for the TEC BASA is included in this report as Figure 1.

2.3.2 40 CFR § 257.90(e)(2) – Monitoring System Changes

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;

No monitoring wells were installed or decommissioned during 2022.

2.3.3 40 CFR § 257.90(e)(3) – Summary of Sampling Events

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;

No sampling events were completed at the TEC BASA in 2022.

2.3.4 40 CFR § 257.90(e)(4) – Monitoring Transition Narrative

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

The assessment monitoring program was initiated on July 17, 2018 with a notification establishing assessment monitoring provided on August 15, 2018 to meet the requirements of 40 CFR § 257.95. Upon documentation of CCR waste material removal from the unit on September 5, 2019, two consecutive sampling events (October 2019 and December 2019) were used to document that detected Appendix IV constituents did not exceed the GWPS for the BASA pursuant to § 257.95(h). The TEC BASA surface impoundment was closed on August 11, 2020 in accordance with the requirements of § 257.102(c).

Pursuant to the CAFO, the TEC BASA surface impoundment has been reopened for further assessment monitoring, and the assessment monitoring program has been re-established to meet the requirements of 40 CFR § 257.95. A CMA will be initiated within 90 days of identification of SSLs listed in Table I in accordance with 40 CFR § 257.96. The TEC BASA remains in assessment monitoring for all other constituents. Arsenic and cobalt continue to be monitored under the assessment monitoring program in accordance with 40 CFR § 257.96(b).

2.3.5 40 CFR § 257.90(e)(5) – Other Requirements

Other information required to be included in the annual report as specified in § 257.90 through § 257.98.

This Annual Report documents activities conducted to comply with §§ 257.90 through 257.95 of the Rule. It is understood that there are supplemental references in §§ 257.90 through 257.98 that must be placed in the Annual Report. The following requirements include relevant and required information in the Annual Report for activities completed in calendar year 2022.

2.3.5.1 40 CFR § 257.94(d)(3) – Demonstration for Alternative Detection Monitoring Frequency

The owner or operator must obtain a certification from a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority stating that the demonstration for an alternative groundwater sampling and analysis frequency meets the requirements of this section. The owner or operator must include the demonstration providing the basis for the alternative monitoring frequency and the certification by a qualified professional engineer or the approval from the Participating State Director or approval from EPA where EPA is the permitting authority in the annual groundwater monitoring and corrective action report required by § 257.90(e).

An alternative groundwater detection monitoring sampling and analysis frequency has not been established for this CCR unit; therefore, no demonstration or certification is applicable.

2.3.5.2 40 CFR § 257.94(e)(2) – Detection Monitoring Alternate Source Demonstration

The owner or operator may demonstrate that a source other than the CCR unit caused the statistically significant increase over background levels for a constituent or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. The owner or operator must complete the written demonstration within 90 days of detecting a statistically significant increase over background levels to include obtaining a certification from a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority verifying the accuracy of the information in the report. If a successful demonstration is completed within the 90-day period, the owner or operator of the CCR unit may continue with a detection monitoring program under this section. If a successful demonstration is not completed within the 90-day period, the owner or operator of the CCR unit must initiate an assessment monitoring program as required under § 257.95. The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by § 257.90(e), in addition to the certification by a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority.

This unit is in assessment monitoring; therefore, no detection monitoring alternate source demonstration (ASD) or certification is applicable.

2.3.5.3 40 CFR § 257.95(c)(3) – Demonstration for Alternative Assessment Monitoring Frequency

The owner or operator must obtain a certification from a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority stating that the demonstration for an alternative groundwater sampling and analysis frequency meets the requirements of this section. The owner or operator must include the demonstration providing the basis for the alternative monitoring frequency and the certification by a qualified professional engineer or the approval from the Participating State Director or approval from EPA where EPA is the permitting authority in the annual groundwater monitoring and corrective action report required by § 257.90(e).

An alternative groundwater assessment monitoring sampling and analysis frequency has not been established for this CCR unit; therefore, no demonstration or certification is applicable.

2.3.5.4 40 CFR § 257.95(d)(3) – Assessment Monitoring Concentrations and Groundwater Protection Standards

Include the recorded concentrations required by paragraph (d)(1) of this section, identify the background concentrations established under § 257.94(b), and identify the groundwater protection standards established under paragraph (d)(2) of this section in the annual groundwater monitoring and corrective action report required by § 257.90(e).

An assessment monitoring program has been implemented at the CCR unit since December 12, 2022. The re-initiated annual assessment monitoring sampling event is scheduled for January 2023. Upon receipt of the validation analytical data from the annual assessment monitoring sampling event, the background concentrations (upper tolerance limits) and GWPS will be established for detected Appendix IV constituents for the TEC BASA.

2.3.5.5 40 CFR § 257.95(g)(3)(ii) – Assessment Monitoring Alternate Source Demonstration

Demonstrate that a source other than the CCR unit caused the contamination, or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Any such demonstration must be supported by a report that includes the factual or evidentiary basis for any conclusions and must be certified to be accurate by a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority. If a successful demonstration is made, the owner or operator must continue monitoring in accordance with the assessment monitoring program pursuant to this section, and may return to detection monitoring if the constituents in Appendices III and IV to this part are at or below background as specified in paragraph (e) of this section. The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by § 257.90(e), in addition to the certification by a qualified professional engineer or the approval from the Participating State Director or approval from EPA where EPA is the permitting authority.

No assessment monitoring ASD or certification was required in 2022.

2020 Annual Groundwater Monitoring
and Corrective Action Report

2.3.5.6 40 CFR § 257.96(a) – Demonstration for Additional Time for Assessment of Corrective Measures

Within 90 days of finding that any constituent listed in appendix IV to this part has been detected at a statistically significant level exceeding the groundwater protection standard defined under § 257.95(h), or immediately upon detection of a release from a CCR unit, the owner or operator must initiate an assessment of corrective measures to prevent further releases, to remediate any releases and to restore affected area to original conditions. The assessment of corrective measures must be completed within 90 days, unless the owner or operator demonstrates the need for additional time to complete the assessment of corrective measures due to site-specific conditions or circumstances. The owner or operator must obtain a certification from a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority attesting that the demonstration is accurate. The 90-day deadline to complete the assessment of corrective measures may be extended for no longer than 60 days. The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by § 257.90(e), in addition to the certification by a qualified professional engineer or the approval from the Participating State Director or approval from EPA where EPA is the permitting authority.

Evergy will initiate a CMA within 90 days of identification of SSLs listed in Table I in accordance with 40 CFR § 257.96. At this time, Evergy was not required to complete demonstration for the need for additional time beyond the regulatory timeline period, which will be outlined in the CAFO development plans negotiated with the USEPA.

TABLE

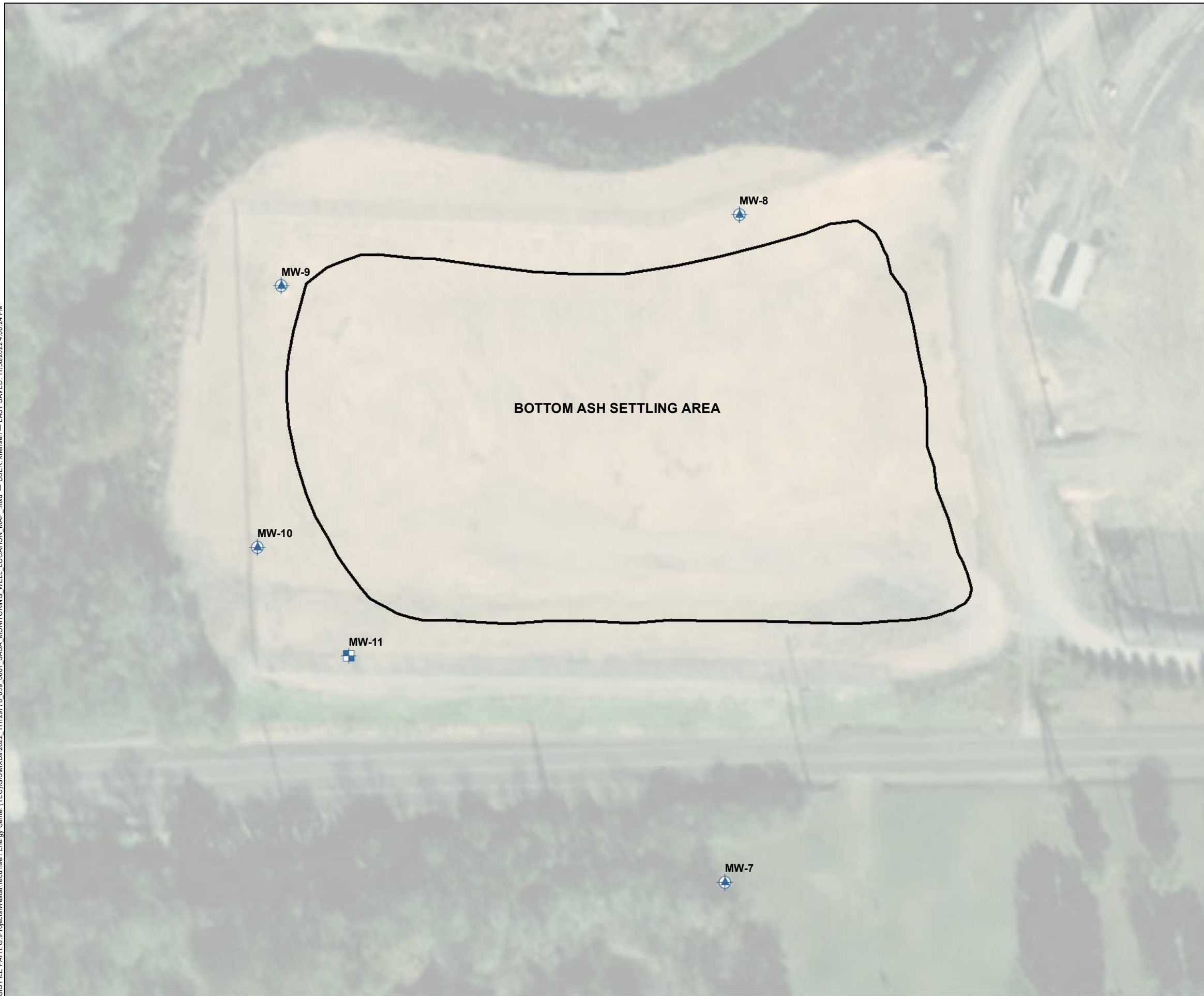
TABLE I
STATISTICALLY SIGNIFICANT LEVELS OF APPENDIX IV CONSTITUENTS
 TECUMSEH ENERGY CENTER
 BOTTOM ASH SETTLING AREA

Constituent	Sampling Event	Well ID	Groundwater Protection Standard (mg/L)
Arsenic	September 2018	MW-9	0.010
		MW-10	
	March 2019	MW-9	
		MW-10	
	October 2019	MW-9	
		MW-10	
	December 2019	MW-9	
		MW-10	
Cobalt	September 2018	MW-9	0.006
	March 2019	MW-9	
	October 2019	MW-9	
	December 2019	MW-9	




Notes and Abbreviations:
 mg/L = milligrams per liter

FIGURE

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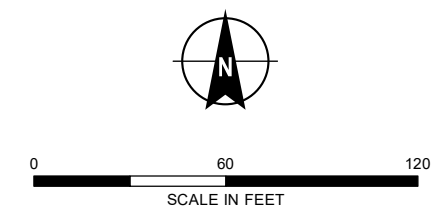


LEGEND

-  MONITORING WELL
-  PIEZOMETER OBSERVATION ONLY
-  BOTTOM ASH SETTLING AREA

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
4. AERIAL IMAGERY SOURCE: ESRI, NOVEMBER 7, 2019



HALEY ALDRICH EVERGY KANSAS CENTRAL, INC.
TECUMSEH ENERGY CENTER
TECUMSEH, KANSAS

**BOTTOM ASH SETTLING AREA
MONITORING WELL LOCATION MAP**