

2021 ANNUAL GROUNDWATER MONITORING AND  
CORRECTIVE ACTION REPORT  
FLY ASH LANDFILL  
JEFFREY ENERGY CENTER  
ST. MARYS, KANSAS

by  
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for  
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## Table of Contents

	Page
<b>1. Introduction</b>	<b>1</b>
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	1
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	2
1.1.6 40 CFR § 257.90(e)(6)(vi) – Remedial Activities	3
<b>2. 40 CFR § 257.90 Applicability</b>	<b>4</b>
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	4
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)	6
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	6

Revision No.	Date	Notes

**2021 Annual Groundwater Monitoring  
and Corrective Action Report**

**List of Tables**

<b>Table No.</b>	<b>Title</b>
I	Summary of Analytical Results – 2021 Assessment Monitoring
II	Assessment Groundwater Monitoring – Detected Appendix IV GWPS – September 2020 Sampling Event
III	Assessment Groundwater Monitoring – Detected Appendix IV GWPS – March 2021 Sampling Event

**List of Figures**

<b>Figure No.</b>	<b>Title</b>
1	Fly Ash Landfill, Monitoring Well Location Map
2	Fly Ash Landfill Groundwater Potentiometric Elevation Contour Map – March 4, 2021
3	Fly Ash Landfill Groundwater Potentiometric Elevation Contour Map – June 9, 2021
4	Fly Ash Landfill Groundwater Potentiometric Elevation Contour Map – September 14, 2021

**2021 Annual Groundwater Monitoring  
and Corrective Action Report**

This Annual Groundwater Monitoring and Corrective Action Report documents the groundwater monitoring program for the Jeffrey Energy Center Fly Ash Landfill (FAL) consistent with applicable sections of 257.90 through 257.98, and describes activities conducted in the prior calendar year (2021) and documents compliance with the U.S. Environmental Protection Agency Coal Combustion Residual Rule. I certify that the 2021 Annual Groundwater Monitoring and Corrective Action Report for the JEC FAL 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: Technical Expert 2  
Company: Haley & Aldrich, Inc.



## 1. Introduction

This 2021 Annual Groundwater Monitoring and Corrective Action Report (Annual Report) addresses the Fly Ash Landfill (FAL) at the Jeffrey Energy Center (JEC), 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 Code of Federal Regulations Title 40 (40 CFR), subsection 257.90(e). The Annual Report documents the groundwater monitoring system for the FAL consistent with applicable sections of 257.90 through 257.98, and describes activities conducted in the prior calendar year (2021) and document compliance with the Rule. The specific requirements for the Annual Report listed in § 257.90(e)(1)-(5) 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, 2021), the FAL was operating under an assessment monitoring program in compliance with 40 CFR § 257.95.

#### 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, 2021), the FAL was operating under an assessment monitoring program in compliance with 40 CFR § 257.95.

#### 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)

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

The FAL is operating under an assessment monitoring program; therefore, no statistical evaluations were completed on appendix III constituents in 2021.

**2021 Annual Groundwater Monitoring  
and Corrective Action Report**

**1.1.3.2 40 CFR § 257.90(e)(6)(iii)(b)**

***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 FAL with a notification establishing assessment monitoring provided on August 15, 2018 to meet the requirements of 40 CFR § 257.95. The FAL remained in assessment monitoring in 2021.

**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;***

No statistically significant levels were identified above the groundwater protection standard for those constituents listed in appendix IV to this part in 2021 for the FAL.

**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;***

No assessment of corrective measures was required to be initiated in 2021 for this unit. The FAL remained in assessment monitoring during 2021.

**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***

An assessment of corrective measures was not required for the FAL in 2021; therefore, a public meeting was not held.

**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.***

No assessment of corrective measures was required to be initiated in 2021 for this unit. The FAL remained in assessment monitoring during 2021.

**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***

The FAL remains in assessment monitoring, and no remedy was required to be selected.

**2021 Annual Groundwater Monitoring  
and Corrective Action Report**

**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 required in 2021.

## 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 JEC FAL. The FAL 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 JEC FAL as required by the Rule. Groundwater sampling and analysis was conducted in accordance with 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 the calendar year 2021.

#### 2.2.1 Status of the Groundwater Monitoring Program

The FAL remained in the assessment monitoring program during 2021.

#### 2.2.2 Key Actions Completed

The 2020 Annual Groundwater Monitoring and Corrective Action Report was completed in January 2021. Statistical evaluation was completed in January 2021 on analytical data from the September 2020 semi-annual assessment monitoring sampling event.



## 2021 Annual Groundwater Monitoring and Corrective Action Report

A semi-annual assessment monitoring sampling event was completed in March 2021 for detected appendix IV constituents identified from the June 2020 annual assessment monitoring sampling event. Statistical evaluation was completed in July 2021 on analytical data from the March 2021 semi-annual assessment monitoring sampling event.

An annual assessment monitoring sampling event was completed in June 2021 to identify detected appendix IV constituents for subsequent semi-annual sampling events in September 2021 and planned for March 2022. Semi-annual assessment monitoring sampling was completed in September 2021 for detected appendix IV constituents identified during the June 2021 annual monitoring event. Statistical evaluation of the results from the September 2021 semi-annual assessment monitoring sampling event are due to be completed in January 2022 and will be reported in the next annual report.

### 2.2.3 Problems Encountered

One problem encountered during groundwater monitoring activities in 2021 consisted of a potential erroneous analytical result that required the laboratory to reanalyze select analytical results. Arsenic was reanalyzed for monitoring well MW-FAA-6, and its corresponding duplicate sample, in the March 2021 semi-annual assessment monitoring sampling event. Well MW-FAA-6 was resampled in April 2021 to confirm the March 2021 result. The analytical result was revised accordingly. This was the only issue that needed to be addressed at the FAL in 2021.

### 2.2.4 Actions to Resolve Problems

The resolution to problems encountered in 2021 included additional laboratory analyses and resampling event as described above. The analytical result was revised accordingly. No other problems were encountered at the FAL in 2021; therefore, no actions to resolve problems were required.

### 2.2.5 Project Key Activities for Upcoming Year

Key activities planned for 2022 include the completion of the 2021 Annual Groundwater Monitoring and Corrective Action Report, statistical evaluation of semi-annual assessment monitoring analytical data collected in September 2021, semi-annual assessment monitoring and subsequent statistical evaluations, and annual assessment monitoring.

## 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 FAL 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 2021.

**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;***

In accordance with § 257.95(b) and § 257.95(d)(1), three independent assessment monitoring samples from each background and downgradient monitoring well were collected in 2021. A summary including sample names, dates of sample collection, field parameters, and monitoring data obtained for the groundwater monitoring program for the FAL is presented in Table I of this report. Groundwater potentiometric elevation contour maps associated with each groundwater monitoring sampling event in 2021 are provided in Figures 2 through 4.

**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. The FAL remained in assessment monitoring during 2021.

**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 2021.

**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 alternative source demonstration 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).***

## 2021 Annual Groundwater Monitoring and Corrective Action Report

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 July 17, 2018. Three rounds of assessment monitoring sampling were completed in 2021. Analytical results for both downgradient and upgradient wells are provided in Table I. The background concentrations (upper tolerance limits) and groundwater protection standards established for detected appendix IV constituents for the FAL are included in Tables II and III. The background concentrations and groundwater protection standards provided in Tables II and III were utilized for the statistical evaluations completed in 2021 for September 2020 and March 2021 semi-annual assessment monitoring sampling events, respectively.

### 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 alternative source demonstration or certification was required in 2021. The FAL remained in assessment monitoring during 2021.

### 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***

2021 Annual Groundwater Monitoring  
and Corrective Action Report

***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.***

No assessment of corrective measures was required to be initiated in 2021; therefore, no demonstration or certification is applicable for this unit.

## **TABLES**

**TABLE I**  
**SUMMARY OF ANALYTICAL RESULTS - 2021 ASSESSMENT MONITORING**  
 EVERGY KANSAS CENTRAL, INC.  
 JEFFREY ENERGY CENTER  
 FLY ASH LANDFILL  
 ST. MARYS, KANSAS

Location	Upgradient			Downgradient					
	MW-FAA-5			MW-FAA-3			MW-FAA-4		
Measure Point (TOC)	1250.80			1165.66			1213.81		
Sample Name	FAA-5-030421	FAA-5-06/09/21	FAA-5-091421	FAA-3-030421	FAA-3-06/09/21	FAA-3-091421	FAA-4-030421	FAA-4-06/09/21	FAA-4-091421
Sample Date	3/4/2021	06/09/2021	9/14/2021	3/4/2021	06/09/2021	9/14/2021	3/4/2021	06/09/2021	9/14/2021
Final Lab Report Date	3/17/2021	6/18/2021	12/1/2021	3/17/2021	6/18/2021	12/2/2021	3/17/2021	6/18/2021	12/2/2021
Final Lab Report Revision Date	3/23/2021	NA	N/A	3/23/2021	NA	N/A	3/23/2021	NA	N/A
Final Radiation Lab Report Date	3/30/2021	7/7/2021	12/1/2021	3/30/2021	7/7/2021	12/2/2021	3/30/2021	7/7/2021	12/2/2021
Final Radiation Lab Report Revision Date	N/A	NA	N/A	N/A	NA	N/A	N/A	NA	N/A
Lab Data Reviewed and Validated	4/16/2021	8/2/2021	12/10/2021	4/16/2021	8/2/2021	12/10/2021	4/16/2021	8/2/2021	12/10/2021
Depth to Water (ft btoc)	87.05	87.05	87.11	13.60	12.60	16.33	57.59	55.63	58.40
Temperature (Deg C)	14.62	16.91	16.80	15.04	16.79	17.14	13.74	17.38	16.37
Conductivity, Field (µS/cm)	3530	3480	3180	2420	1700	1610	2680	1610	1710
Turbidity, Field (NTU)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
pH, Field (su)	6.86	6.64	6.84	7.29	6.90	7.44	7.38	6.96	7.74
Boron, Total (mg/L)	1.7	-	1.8	0.53	-	0.55	0.71	-	0.73
Calcium, Total (mg/L)	537	-	539	195	-	191	195	-	190
Chloride (mg/L)	89.9	-	80.8	84.2	-	78.2	77.9	-	83.8
Fluoride (mg/L)	1.1	-	0.71	< 0.20	-	0.35	< 0.20	-	0.38
Sulfate, Total (mg/L)	2200	-	1980	556	-	408	536	-	488
pH (su)	6.9	-	7.3	7.10	-	7.4	6.9	-	7.4
TDS (mg/L)	3640	-	3580	1130	-	1080	1140	-	1220
Antimony, Total (mg/L)	-	< 0.0010	< 0.005	-	< 0.0010	-	-	< 0.0010	-
Arsenic, Total (mg/L)	< 0.0010	< 0.0010	< 0.0050	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Barium, Total (mg/L)	< 0.0050	< 0.0050	< 0.0050	0.029	0.031	0.032	0.051	0.046	0.046
Beryllium, Total (mg/L)	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-
Cadmium, Total (mg/L)	-	< 0.00050	< 0.0025	-	< 0.00050	-	-	< 0.00050	-
Chromium, Total (mg/L)	-	< 0.0050	< 0.0050	-	< 0.0050	-	-	< 0.0050	-
Cobalt, Total (mg/L)	0.0031	0.0028	< 0.0050	< 0.0010	< 0.0010	< 0.0010	0.0021	0.0027	0.0022
Lead, Total (mg/L)	-	< 0.010	< 0.010	-	< 0.010	-	-	< 0.010	-
Lithium, Total (mg/L)	0.14	0.13	0.15	0.023	< 0.010	0.012	0.021	0.011	0.017
Molybdenum, Total (mg/L)	0.029	0.026	0.023	0.0082	0.0062	0.0090	0.0073	0.0094	0.0084
Selenium, Total (mg/L)	< 0.0010	< 0.0010	< 0.0050	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Thallium, Total (mg/L)	-	< 0.0010	< 0.0050	-	< 0.0010	-	-	< 0.0010	-
Mercury, Total (mg/L)	-	< 0.00020	< 0.00020	-	< 0.00020	-	-	< 0.00020	-
Fluoride (mg/L)	1.1	0.55	0.71	< 0.20	0.28	0.35	< 0.20	< 0.20	0.38
Radium-226 & 228 (pCi/L)	1.43 ± 0.646 (0.735)	1.35 ± 0.822 (0.985)	1.79 ± 1.14 (1.82)	0.482 ± 0.587 (0.905)	1.07 ± 0.617 (0.931)	0.000 ± 0.791 (1.96)	1.14 ± 0.709 (0.922)	0.220 ± 0.594 (0.981)	0.731 ± 0.979 (1.95)

**TABLE I**  
**SUMMARY OF ANALYTICAL RESULTS - 2021 ASSESSMENT MONITORING**  
 EVERGY KANSAS CENTRAL, INC.  
 JEFFREY ENERGY CENTER  
 FLY ASH LANDFILL  
 ST. MARYS, KANSAS

Location	Downgradient						
	MW-FAA-6						
Measure Point (TOC)	1162.76						
Sample Name	FAA-6-030421	FAL-DUP-030421	FAA-6-040121*	FAA-6-06/09/21	FAA-DUP-06/09/21	FAA-6-091421	JEC-FAA-DUP-091421
Sample Date	3/4/2021	3/4/2021	4/1/2021	06/09/2021	06/09/2021	9/14/2021	9/14/2021
Final Lab Report Date	3/17/2021	3/17/2021	4/5/2021	6/18/2021	6/18/2021	12/2/2021	12/2/2021
Final Lab Report Revision Date	3/23/2021	3/23/2021	N/A	NA	NA	N/A	N/A
Final Radiation Lab Report Date	3/30/2021	3/30/2021	N/A	7/7/2021	7/7/2021	12/2/2021	12/2/2021
Final Radiation Lab Report Revision Date	N/A	N/A	N/A	NA	NA	N/A	N/A
Lab Data Reviewed and Validated	4/16/2021	4/16/2021	4/16/2021	8/2/2021	8/2/2021	12/10/2021	12/10/2021
Depth to Water (ft btoc)	14.62	-	14.62	14.37	-	19.17	-
Temperature (Deg C)	16.27	-	13.81	18.48	-	17.28	-
Conductivity, Field (µS/cm)	4910	-	1920	1760	-	1860	-
Turbidity, Field (NTU)	0.0	-	0.0	0.0	-	0.0	-
pH, Field (su)	8.00	-	7.19	6.71	-	7.45	-
Boron, Total (mg/L)	<b>4.2</b>	<b>4.1</b>	-	-	-	<b>2.0</b>	<b>2.7</b>
Calcium, Total (mg/L)	<b>101</b>	<b>99.1</b>	-	-	-	<b>134</b>	<b>135</b>
Chloride (mg/L)	<b>74.4</b>	<b>75.0</b>	-	-	-	<b>74.3</b>	<b>75.0</b>
Fluoride (mg/L)	<b>1.1</b>	<b>1.1</b>	-	-	-	<b>0.67</b>	<b>0.77</b>
Sulfate, Total (mg/L)	<b>1470</b>	<b>1460</b>	-	-	-	<b>932</b>	<b>979</b>
pH (su)	<b>7.8</b>	<b>7.9</b>	-	-	-	<b>7.2</b>	<b>7.4</b>
TDS (mg/L)	<b>2280</b>	<b>2440</b>	-	-	-	<b>1770</b>	<b>1750</b>
Antimony, Total (mg/L)	-	-	-	< 0.0010	< 0.0010	-	-
Arsenic, Total (mg/L)	<b>0.011</b>	<b>0.011</b>	<b>0.0043</b>	<b>0.0055</b>	<b>0.0063</b>	<b>0.0052</b>	<b>0.0065</b>
Barium, Total (mg/L)	<b>0.024</b>	<b>0.023</b>	-	<b>0.035</b>	<b>0.034</b>	<b>0.033</b>	<b>0.032</b>
Beryllium, Total (mg/L)	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	-	-
Cadmium, Total (mg/L)	-	-	-	< 0.00050	< 0.00050	-	-
Chromium, Total (mg/L)	-	-	-	< 0.0050	< 0.0050	-	-
Cobalt, Total (mg/L)	<b>0.0013</b>	<b>0.0013</b>	-	<b>0.0017</b>	<b>0.0016</b>	<b>0.0017</b>	<b>0.0015</b>
Lead, Total (mg/L)	-	-	-	< 0.010	< 0.010	-	-
Lithium, Total (mg/L)	< 0.010	< 0.010	-	< 0.010	< 0.010	<b>0.012</b>	< 0.010
Molybdenum, Total (mg/L)	<b>0.49</b>	<b>0.48</b>	-	<b>0.34</b>	<b>0.38</b>	<b>0.26</b>	<b>0.30</b>
Selenium, Total (mg/L)	< 0.0010	< 0.0010	-	<b>0.0018</b>	<b>0.0018</b>	< 0.0010	< 0.0010
Thallium, Total (mg/L)	-	-	-	< 0.0010	< 0.0010	-	-
Mercury, Total (mg/L)	-	-	-	< 0.00020	< 0.00020	-	-
Fluoride (mg/L)	<b>1.1</b>	<b>1.1</b>	-	<b>0.66</b>	<b>0.68</b>	<b>0.67</b>	<b>0.77</b>
Radium-226 & 228 (pCi/L)	0.538 ± 0.514 (0.878)	0.709 ± 0.532 (0.794)	-	0.495 ± 0.590 (0.871)	0.661 ± 0.562 (0.843)	0.570 ± 0.965 (1.98)	0.866 ± 1.04 (2.03)

**Notes and Abbreviations:**

**Bold value:** Detection above laboratory reporting limit or minimum detectable concentration (MDC).  
 Radiological results are presented as activity plus or minus uncertainty with MDC.  
 Data presented in this table were verified against the laboratory and validation reports.  
 µS/cm = micro Siemens per centimeter  
 Deg C = degrees Celsius  
 ft btoc = feet below top of casing  
 mg/L = milligrams per liter  
 N/A = Not Applicable  
 NTU = Nephelometric Turbidity Unit  
 pCi/L = picoCuries per liter  
 su = standard unit  
 TDS = total dissolved solids  
 TOC = top of casing



**TABLE II**  
**ASSESSMENT GROUNDWATER MONITORING - DETECTED APPENDIX IV GWPS**  
 SEPTEMBER 2020 SAMPLING EVENT  
 JEFFREY ENERGY CENTER  
 FLY ASH LANDFILL

Well Number	Background Value <sup>1</sup>	GWPS
<b>CCR Appendix-IV Arsenic, Total (mg/L)</b>		
MW-FAA-5 (upgradient)	0.0035	NA
MW-FAA-3		0.010
MW-FAA-4		0.010
MW-FAA-6		0.010
<b>CCR Appendix-IV Barium, Total (mg/L)</b>		
MW-FAA-5 (upgradient)	0.013	NA
MW-FAA-3		2
MW-FAA-4		2
MW-FAA-6		2
<b>CCR Appendix-IV: Beryllium, Total (mg/L)</b>		
MW-FAA-5 (upgradient)	0.0018 <sup>3</sup>	NA
MW-FAA-3		0.004
MW-FAA-4		0.004
MW-FAA-6		0.004
<b>CCR Appendix-IV Cobalt, Total (mg/L)</b>		
MW-FAA-5 (upgradient)	0.00521	NA
MW-FAA-3		0.006
MW-FAA-4		0.006
MW-FAA-6		0.006
<b>CCR Appendix-IV Fluoride, Total (mg/L)</b>		
MW-FAA-5 (upgradient)	1.430	NA
MW-FAA-3		4.0
MW-FAA-4		4.0
MW-FAA-6		4.0
<b>CCR Appendix-IV Lithium, Total (mg/L)</b>		
MW-FAA-5 (upgradient)	0.171	NA
MW-FAA-3		0.171
MW-FAA-4		0.171
MW-FAA-6		0.171
<b>CCR Appendix-IV Molybdenum, Total (mg/L)</b>		
MW-FAA-5 (upgradient)	0.0652	NA
MW-FAA-3		0.100
MW-FAA-4		0.100
MW-FAA-6	0.929 <sup>2</sup>	0.929
<b>CCR Appendix-IV Radium-226 &amp; 228 Combined (pCi/L)</b>		
MW-FAA-5 (upgradient)	2.342	NA
MW-FAA-3		5
MW-FAA-4		5
MW-FAA-6		5
<b>CCR Appendix-IV Selenium, Total (mg/L)</b>		
MW-FAA-5 (upgradient)	0.00370	NA
MW-FAA-3		0.05
MW-FAA-4		0.05
MW-FAA-6		0.05

**Notes and Abbreviations:**

<sup>1</sup> Interwell background data collected from 08/19/2016 through 03/04/2020, unless otherwise noted.

<sup>2</sup> Intrawell background data collected from 08/19/2016 through 06/23/2019.

<sup>3</sup> Interwell background data collected from 08/19/2016 through 09/14/2020.

CCR = Coal Combustion Residuals

GWPS = Groundwater Protection Standard

mg/L = milligrams per Liter

NA = Not Applicable

pCi/L = picoCuries per Liter

**TABLE III**  
**ASSESSMENT GROUNDWATER MONITORING - DETECTED APPENDIX IV GWPS**  
MARCH 2021 SAMPLING EVENT  
JEFFREY ENERGY CENTER  
FLY ASH LANDFILL

Well Number	Background Value <sup>1,2</sup>	GWPS
<b>CCR Appendix-IV Arsenic, Total (mg/L)</b>		
MW-FAA-5 (upgradient)	0.0035	NA
MW-FAA-3		0.010
MW-FAA-4		0.010
MW-FAA-6		0.010
<b>CCR Appendix-IV Barium, Total (mg/L)</b>		
MW-FAA-5 (upgradient)	0.013	NA
MW-FAA-3		2
MW-FAA-4		2
MW-FAA-6		2
<b>CCR Appendix-IV Beryllium, Total (mg/L)</b>		
MW-FAA-5 (upgradient)	0.0018 <sup>3</sup>	NA
MW-FAA-3		0.004
MW-FAA-4		0.004
MW-FAA-6		0.004
<b>CCR Appendix-IV Cobalt, Total (mg/L)</b>		
MW-FAA-5 (upgradient)	0.00521	NA
MW-FAA-3		0.006
MW-FAA-4		0.006
MW-FAA-6		0.006
<b>CCR Appendix-IV Fluoride, Total (mg/L)</b>		
MW-FAA-5 (upgradient)	1.430	NA
MW-FAA-3		4.0
MW-FAA-4		4.0
MW-FAA-6		4.0
<b>CCR Appendix-IV Lithium, Total (mg/L)</b>		
MW-FAA-5 (upgradient)	0.171	NA
MW-FAA-3		0.171
MW-FAA-4		0.171
MW-FAA-6		0.171
<b>CCR Appendix-IV Molybdenum, Total (mg/L)</b>		
MW-FAA-5 (upgradient)	0.0652	NA
MW-FAA-3		0.100
MW-FAA-4		0.100
MW-FAA-6	0.901 <sup>2</sup>	0.901
<b>CCR Appendix-IV Radium-226 &amp; 228 Combined (pCi/L)</b>		
MW-FAA-5 (upgradient)	2.342	NA
MW-FAA-3		5
MW-FAA-4		5
MW-FAA-6		5
<b>CCR Appendix-IV Selenium, Total (mg/L)</b>		
MW-FAA-5 (upgradient)	0.00370	NA
MW-FAA-3		0.05
MW-FAA-4		0.05
MW-FAA-6		0.05

**Notes and Abbreviations:**

<sup>1</sup> Interwell background data collected from 08/19/2016 through 03/04/2020, unless otherwise noted.

<sup>2</sup> Intrawell background data collected from 08/19/2016 through 09/14/2020.

<sup>3</sup> Interwell background data collected from 08/19/2016 through 09/14/2020.

CCR = Coal Combustion Residuals

GWPS = Groundwater Protection Standard

MCL = Maximum Contaminant Level

mg/L = milligrams per Liter




NA = Not Applicable

pCi/L = picoCuries per Liter

## FIGURES

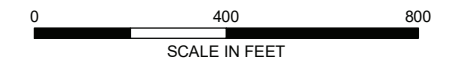


**LEGEND**

-  MONITORING WELL
-  PIEZOMETER OBSERVATION ONLY
-  FLY ASH LANDFILL

**NOTES**

- 1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
- 4. AERIAL IMAGERY SOURCE: ESRI, SEPTEMBER 3, 2019



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ST. MARYS, KANSAS

**FLY ASH LANDFILL  
MONITORING WELL LOCATION MAP**








JANUARY 2022

FIGURE 1

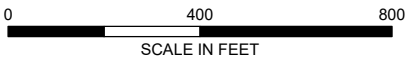


**LEGEND**

- MW-FAA-4**  
1167.47 WELL NAME WITH GROUNDWATER ELEVATION, (FT AMSL)  
MARCH 2021
-  PIEZOMETER OBSERVATION ONLY
-  MONITORING WELL
-  ESTIMATED GROUNDWATER POTENTIOMETRIC  
OBSERVATION ELEVATION CONTOUR, 2-FT INTERVAL (AMSL)
-  APPROXIMATE GROUNDWATER FLOW DIRECTION
-  FLY ASH LANDFILL

**NOTES**

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. GROUNDWATER POTENTIOMETRIC ELEVATIONS WERE MEASURED 04 MARCH 2021.
3. AMSL = ABOVE MEAN SEA LEVEL
4. AERIAL IMAGERY SOURCE: ESRI, 3 SEPTEMBER 2019



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JEFFREY ENERGY CENTER  
ST. MARY'S, KANSAS

FLY ASH LANDFILL  
GROUNDWATER POTENTIOMETRIC  
ELEVATION CONTOUR MAP  
MARCH 4, 2021








JANUARY 2022

FIGURE 2

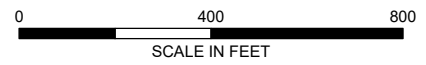


**LEGEND**

- MW-FAA-4**  
1167.47 WELL NAME WITH GROUNDWATER ELEVATION, (FT AMSL)  
JUNE 2021
-  PIEZOMETER OBSERVATION ONLY
-  MONITORING WELL
-  ESTIMATED GROUNDWATER POTENTIOMETRIC  
OBSERVATION ELEVATION CONTOUR, 2-FT INTERVAL (AMSL)
-  APPROXIMATE GROUNDWATER FLOW DIRECTION
-  FLY ASH LANDFILL

**NOTES**

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. GROUNDWATER POTENTIOMETRIC ELEVATIONS WERE MEASURED 09 JUNE 2021.
3. AMSL = ABOVE MEAN SEA LEVEL
4. AERIAL IMAGERY SOURCE: ESRI, 3 SEPTEMBER 2019



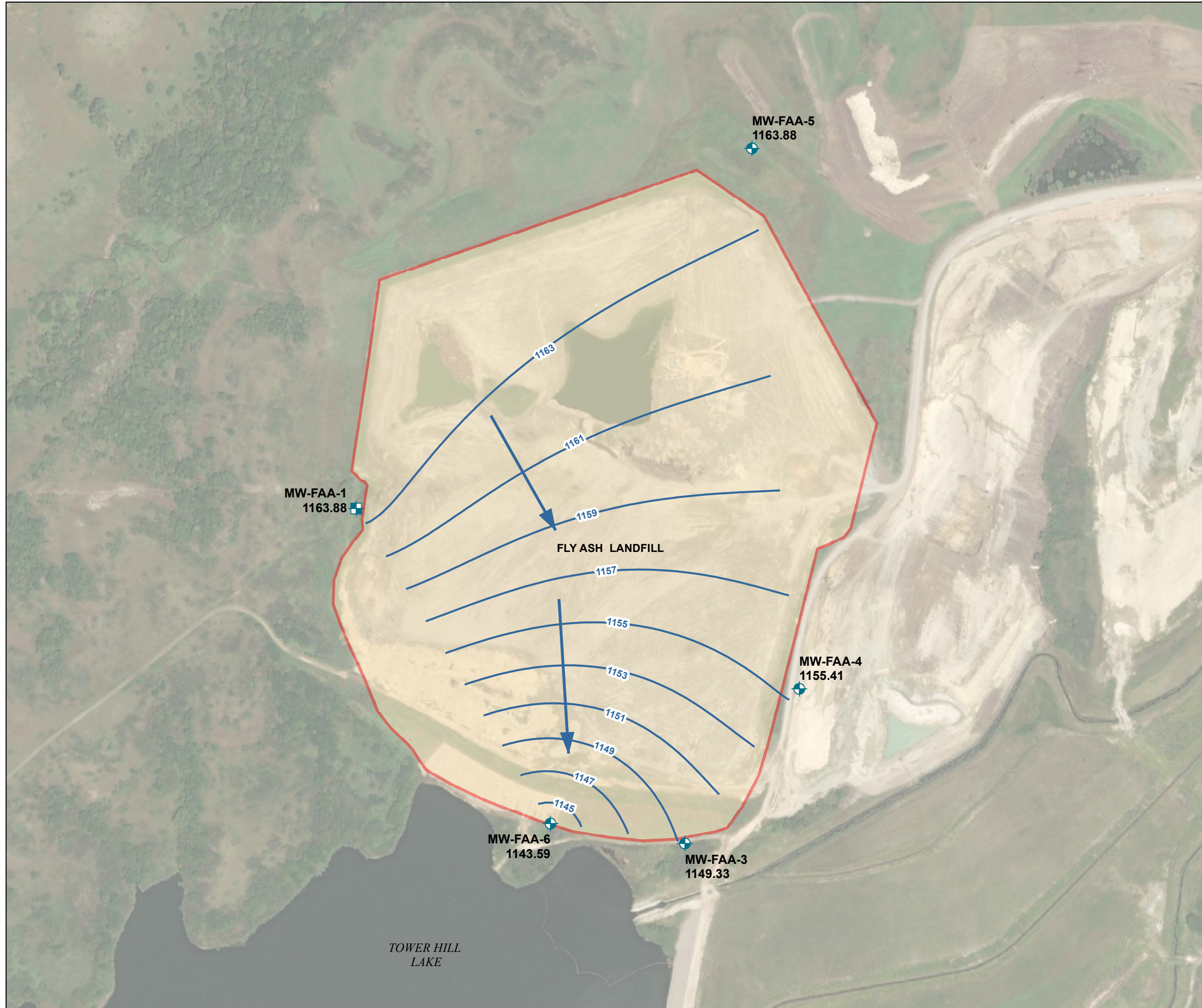
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FLY ASH LANDFILL  
GROUNDWATER POTENTIOMETRIC  
ELEVATION CONTOUR MAP  
JUNE 09, 2021








JANUARY 2022

FIGURE 3

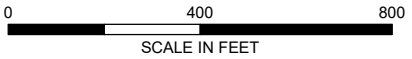


**LEGEND**

- MW-FAA-4  
1167.47** WELL NAME WITH GROUNDWATER ELEVATION, (FT AMSL)  
SEPTEMBER 2021
-  PIEZOMETER OBSERVATION ONLY
-  MONITORING WELL
-  ESTIMATED GROUNDWATER POTENTIOMETRIC  
OBSERVATION ELEVATION CONTOUR, 2-FT INTERVAL (AMSL)
-  APPROXIMATE GROUNDWATER FLOW DIRECTION
-  FLY ASH LANDFILL

**NOTES**

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. GROUNDWATER POTENTIOMETRIC ELEVATIONS WERE MEASURED 14 SEPTEMBER 2021.
3. AMSL = ABOVE MEAN SEA LEVEL
4. AERIAL IMAGERY SOURCE: ESRI, 3 SEPTEMBER 2019



EVERGY KANSAS CENTRAL, INC.  
JEFFREY ENERGY CENTER  
ST. MARY'S, KANSAS

FLY ASH LANDFILL  
GROUNDWATER POTENTIOMETRIC  
ELEVATION CONTOUR MAP  
SEPTEMBER 14, 2021



JANUARY 2022

FIGURE 4