

2020 ANNUAL GROUNDWATER MONITORING  
AND CORRECTIVE ACTION REPORT  
FLY ASH LANDFILL  
JEFFREY ENERGY CENTER  
ST. MARYS, KANSAS

by Haley & Aldrich, Inc.  
Cleveland, Ohio

for Evergy Kansas Central, Inc.  
Topeka, Kansas

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Revision No.	Date	Notes
0	2/1/2021	Original
1	4/16/2021	Revised to include groundwater potentiometric elevation contour maps for 2020

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**2020 Annual Groundwater Monitoring  
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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 (2020) and documents compliance with the U.S. Environmental Protection Agency Coal Combustion Residual Rule. I certify that the 2020 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 2020 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 (2020) 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, 2020), 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, 2020), 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 2020.

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 2020.

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 2020 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 2020 for this unit. The FAL remained in assessment monitoring during 2020.

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 2020; 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 2020 for this unit. The FAL remained in assessment monitoring during 2020.

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.

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**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 2020.

## 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 2020.

#### 2.2.1 Status of the Groundwater Monitoring Program

The FAL remained in the assessment monitoring program during 2020.

#### 2.2.2 Key Actions Completed

The 2019 Annual Groundwater Monitoring and Corrective Action Report was completed in January 2020. Statistical evaluation was completed in January 2020 on analytical data from the September 2019 semi-annual assessment monitoring sampling event.



## 2020 Annual Groundwater Monitoring and Corrective Action Report

A semi-annual assessment monitoring sampling event was completed in March 2020 for detected appendix IV constituents identified from the June 2019 annual assessment monitoring sampling event. Statistical evaluation was completed in July 2020 on analytical data from the March 2020 semi-annual assessment monitoring sampling event.

An annual assessment monitoring sampling event was completed in June 2020 to identify detected appendix IV constituents for subsequent semi-annual sampling events in September 2020 and planned for March 2021. Semi-annual assessment monitoring sampling was completed in September 2020 for detected appendix IV constituents identified during the June 2020 annual monitoring event. Statistical evaluation of the results from the September 2020 semi-annual assessment monitoring sampling event are due to be completed in January 2021 and will be reported in the next annual report.

### 2.2.3 Problems Encountered

No noteworthy problems (i.e., problems could include damaged wells, issues with sample collection or lack of sampling, and problems with analytical analysis) were encountered at the FAL in 2020.

### 2.2.4 Actions to Resolve Problems

No problems were encountered at the FAL in 2020, therefore, no actions to resolve problems were required.

### 2.2.5 Project Key Activities for Upcoming Year

Key activities planned for 2021 include the completion of the 2020 Annual Groundwater Monitoring and Corrective Action Report, statistical evaluation of semi-annual assessment monitoring analytical data collected in September 2020, 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 2020.

**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 2020. 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 2020 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 2020.

**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 2020.

**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).***

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 2020. 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 2020 for September 2019 and March 2020 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 2020. The FAL remained in assessment monitoring during 2020.

**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***

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***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 2020; therefore, no demonstration or certification is applicable for this unit.

## **TABLES**

**TABLE I**  
**SUMMARY OF ANALYTICAL RESULTS - 2020 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-05-030420	FAA-05-061120	FAA-05-091420	FAA-03-030420	FAA-03-061120	FAA-03-091420	FAA-04-030420	FAA-04-061120	DUP-FAL-061120	FAA-04-091420
Sample Date	03/04/2020	06/11/2020	9/14/2020	03/04/2020	06/11/2020	9/14/2020	03/05/2020	06/11/2020	06/11/2020	9/14/2020
Final Lab Report Date	3/16/2020	6/23/2020	9/28/2020	3/16/2020	6/23/2020	9/28/2020	3/16/2020	6/23/2020	6/23/2020	9/28/2020
Final Lab Report Revision Date	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Final Radiation Lab Report Date	3/30/2020	7/8/2020	10/7/2020	3/30/2020	7/8/2020	10/7/2020	3/30/2020	7/8/2020	7/8/2020	10/7/2020
Final Radiation Lab Report Revision Date	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lab Data Reviewed and Accepted	4/20/2020	7/16/2020	10/21/2020	4/20/2020	7/16/2020	10/21/2020	4/20/2020	7/16/2020	7/16/2020	10/21/2020
Depth to Water (ft btoc)	86.95	87.13	87.03	13.19	13.50	13.14	56.52	56.24	-	56.34
Temperature (Deg C)	10.8	20.08	17.56	10.9	18.02	22.96	8.51	17.21	-	22.96
Conductivity, Field (µS/cm)	3435	3450	3190	1564	1480	1300	1539	1590	-	1350
Turbidity, Field (NTU)	0.93	0.00	0.0	1.53	0.00	9.2	1.32	0.00	-	0.0
Boron, Total (mg/L)	1.6	-	1.6	0.51	-	0.59	0.63	-	-	0.72
Calcium, Total (mg/L)	519	-	467	184	-	169	182	-	-	163
Chloride (mg/L)	86.6	-	106	64.6	-	65.4	65.9	-	-	68.4
Fluoride (mg/L)	0.77	0.59	0.73	0.30	0.39	0.44	< 0.20	0.44	0.43	0.45
Sulfate, Total (mg/L)	1640	-	1390	428	-	487	469	-	-	494
pH (su)	7.0	-	6.9	7.1	-	7.1	7.3	-	-	7.2
TDS (mg/L)	3000	-	2630	1090	-	1120	1170	-	-	1140
Antimony, Total (mg/L)	-	< 0.0010	-	-	< 0.0010	-	-	< 0.0010	< 0.0010	-
Arsenic, Total (mg/L)	< 0.0010	0.0011	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Barium, Total (mg/L)	< 0.0050	< 0.0050	< 0.0050	0.025	0.027	0.026	0.049	0.047	0.049	0.045
Beryllium, Total (mg/L)	-	0.0011	0.0016	-	< 0.0010	< 0.0010	-	< 0.0010	< 0.0010	< 0.0010
Cadmium, Total (mg/L)	-	< 0.00050	-	-	< 0.00050	-	-	< 0.00050	< 0.00050	-
Chromium, Total (mg/L)	-	< 0.0050	-	-	< 0.0050	-	-	< 0.0050	< 0.0050	-
Cobalt, Total (mg/L)	0.0045	0.0033	0.0023	< 0.0010	< 0.0010	< 0.0010	0.0013	0.0015	0.0015	0.0016
Lead, Total (mg/L)	-	< 0.010	-	-	< 0.010	-	-	< 0.010	< 0.010	-
Lithium, Total (mg/L)	0.14	0.14	0.13	0.017	0.011	0.018	0.019	0.016	0.014	0.020
Mercury, Total (mg/L)	-	< 0.20	-	-	< 0.20	-	-	< 0.20	< 0.20	-
Molybdenum, Total (mg/L)	0.034	0.030	0.027	0.0082	0.0084	0.0089	0.0056	0.0060	0.0060	0.0064
Selenium, Total (mg/L)	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	0.0010	< 0.0010	0.0010
Thallium, Total (mg/L)	-	< 0.0010	-	-	< 0.0010	-	-	< 0.0010	< 0.0010	-
Radium-226 & 228 (pCi/L)	0.587 ± 0.632 (0.824)	1.11 ± 0.802 (1.09)	1.26 +/- 0.621 (0.801)	0.928 ± 0.641 (0.874)	0.344 ± 0.670 (1.14)	0.578 +/- 0.778 (1.29)	0.744 ± 0.601 (0.863)	0.529 ± 0.732 (1.07)	0.534 ± 0.617 (0.958)	0.929 +/- 0.781 (1.13)

**TABLE I**  
**SUMMARY OF ANALYTICAL RESULTS - 2020 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-06-030420	DUP-FAL-030420	FAA-06-061120	FAA-06-091420	DUP-FAL-091420
Sample Date	03/04/2020	03/04/2020	06/11/2020	9/14/2020	9/14/2020
Final Lab Report Date	3/16/2020	3/16/2020	6/23/2020	9/28/2020	9/28/2020
Final Lab Report Revision Date	N/A	N/A	N/A	N/A	N/A
Final Radiation Lab Report Date	3/30/2020	3/30/2020	7/8/2020	10/7/2020	10/7/2020
Final Radiation Lab Report Revision Date	N/A	N/A	N/A	N/A	N/A
Lab Data Reviewed and Accepted	4/20/2020	4/20/2020	7/16/2020	10/21/2020	10/21/2020
Depth to Water (ft btoc)	13.55	-	15.87	14.98	-
Temperature (Deg C)	10.76	-	19.48	18.01	-
Conductivity, Field (µS/cm)	1833	-	1540	1480	-
Turbidity, Field (NTU)	0.95	-	0.00	0.0	-
Boron, Total (mg/L)	<b>2.8</b>	<b>3.3</b>	-	<b>2.9</b>	<b>3.0</b>
Calcium, Total (mg/L)	<b>134</b>	<b>127</b>	-	<b>134</b>	<b>136</b>
Chloride (mg/L)	<b>66.2</b>	<b>65.2</b>	-	<b>66.0</b>	<b>84.5</b>
Fluoride (mg/L)	<b>0.67</b>	<b>0.75</b>	<b>0.63</b>	<b>0.99</b>	<b>0.98</b>
Sulfate, Total (mg/L)	<b>978</b>	<b>1110</b>	-	<b>1230</b>	<b>1250</b>
pH (su)	<b>7.2</b>	<b>7.3</b>	-	<b>7.4</b>	<b>7.3</b>
TDS (mg/L)	<b>1890</b>	<b>2240</b>	-	<b>2160</b>	<b>2140</b>
Antimony, Total (mg/L)	-	-	< 0.0010	-	-
Arsenic, Total (mg/L)	<b>0.0063</b>	<b>0.0075</b>	<b>0.0034</b>	<b>0.0064</b>	<b>0.0066</b>
Barium, Total (mg/L)	<b>0.028</b>	<b>0.026</b>	<b>0.037</b>	<b>0.033</b>	<b>0.034</b>
Beryllium, Total (mg/L)	-	-	< 0.0010	<0.0010	<0.0010
Cadmium, Total (mg/L)	-	-	< 0.00050	-	-
Chromium, Total (mg/L)	-	-	< 0.0050	-	-
Cobalt, Total (mg/L)	<b>0.0018</b>	<b>0.0018</b>	<b>0.0021</b>	<b>0.0015</b>	<b>0.0015</b>
Lead, Total (mg/L)	-	-	< 0.010	-	-
Lithium, Total (mg/L)	<b>0.011</b>	<b>0.011</b>	<b>0.013</b>	<b>0.014</b>	<b>0.016</b>
Mercury, Total (mg/L)	-	-	< 0.20	-	-
Molybdenum, Total (mg/L)	<b>0.38</b>	<b>0.44</b>	<b>0.19</b>	<b>0.40</b>	<b>0.41</b>
Selenium, Total (mg/L)	<b>0.0011</b>	<b>0.0012</b>	<b>0.0010</b>	<b>0.0033</b>	<b>0.0033</b>
Thallium, Total (mg/L)	-	-	< 0.0010	-	-
Radium-226 & 228 (pCi/L)	0.0926 ± 0.475 (0.813)	0.179 ± 0.573 (0.947)	0.580 ± 0.746 (1.46)	0.286 +/- 0.606 (1.05)	0.880 +/- 0.628 (1.04)

**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 2019 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)	0.00372	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)	0.0136	NA
MW-FAA-3		2
MW-FAA-4		2
MW-FAA-6		2
<b>CCR Appendix-IV Cobalt, Total (mg/L)</b>		
MW-FAA-5 (upgradient)	0.0036	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)	1.261	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)	0.183	NA
MW-FAA-3		0.183
MW-FAA-4		0.183
MW-FAA-6		0.183
<b>CCR Appendix-IV Molybdenum, Total (mg/L)</b>		
MW-FAA-5 (upgradient)	0.0699	NA
MW-FAA-3		0.100
MW-FAA-4		0.100
MW-FAA-6 <sup>2,3</sup>	0.929	0.929
<b>CCR Appendix-IV Radium-226 &amp; 228 Combined (pCi/L)</b>		
MW-FAA-5 (upgradient)	1.3	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)	0.00369	NA
MW-FAA-3		0.05
MW-FAA-4		0.05
MW-FAA-6		0.05

**Notes and Abbreviations:**

<sup>1</sup> Interwell background value based on background data collected through September 2018.

<sup>2</sup> Denotes intrawell evaluation for the listed constituent. All other constituents are interwell evaluation.

<sup>3</sup> Intrawell background value based on background data collected through June 2019.

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 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 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 <sup>2,3</sup>	0.929	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 value based on background data collected through March 2020.

<sup>2</sup> Denotes intrawell evaluation for the listed constituent. All other constituents are interwell evaluation.

<sup>3</sup> Interwell background value based on background data collected through June 2019.

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

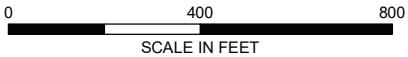


**LEGEND**

-  MONITORING WELL
-  PIEZOMETER OBSERVATION ONLY
-  FLY ASH LANDFILL

**NOTES**

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



EVERGY KANSAS CENTRAL, INC.  
JEFFREY ENERGY CENTER  
ST. MARYS, KANSAS






**FLY ASH LANDFILL  
MONITORING WELL LOCATION MAP**



APRIL 2021



**LEGEND**

- MW\_FAA-4**  
1167.47 WELL NAME WITH GROUNDWATER ELEVATION, (FT AMSL)  
MARCH 2020
-  PIEZOMETER OBSERVATION ONLY
-  MONITORING WELL
-  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 03 MARCH 2020.
3. AMSL = ABOVE MEAN SEA LEVEL
4. AERIAL IMAGERY SOURCE: ESRI, 3 SEPTEMBER 2019

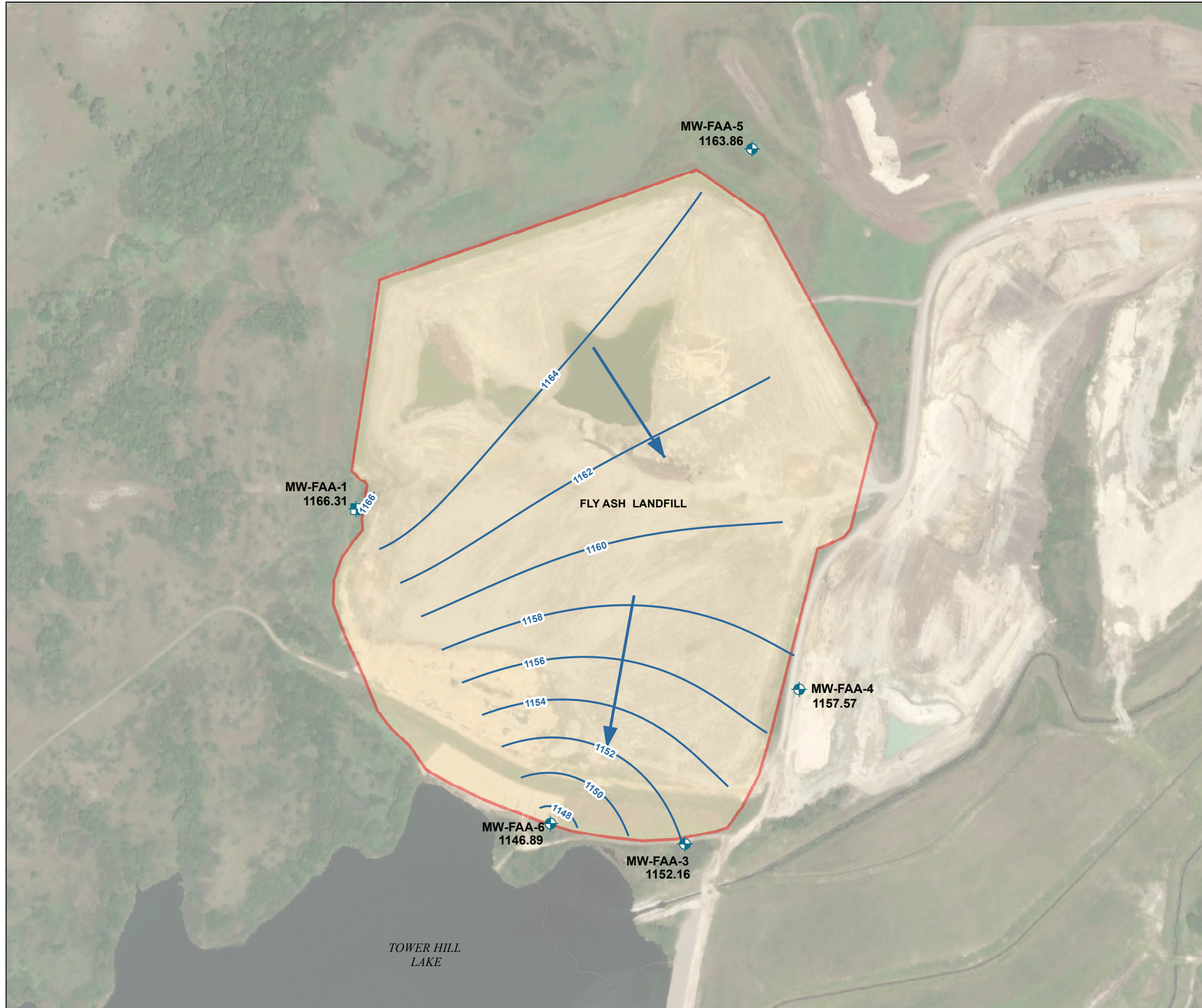


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JEFFREY ENERGY CENTER  
ST. MARYS, KANSAS






FLY ASH LANDFILL  
GROUNDWATER POTENTIOMETRIC  
ELEVATION CONTOUR MAP  
MARCH 3, 2020



APRIL 2021

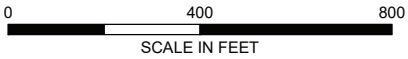


**LEGEND**

- MW\_FAA-4  
1167.47 WELL NAME WITH GROUNDWATER ELEVATION, (FT AMSL)  
JUNE 2020
-  PIEZOMETER OBSERVATION ONLY
-  MONITORING WELL
-  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 11 JUNE 2020.
3. AMSL = ABOVE MEAN SEA LEVEL
4. AERIAL IMAGERY SOURCE: ESRI, 3 SEPTEMBER 2019



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JEFFREY ENERGY CENTER  
ST. MARYS, KANSAS






FLY ASH LANDFILL  
GROUNDWATER POTENTIOMETRIC  
ELEVATION CONTOUR MAP  
JUNE 11, 2020



APRIL 2021

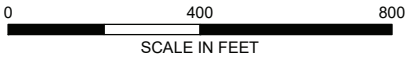


**LEGEND**

- MW\_FAA-4  
1167.47 WELL NAME WITH GROUNDWATER ELEVATION, (FT AMSL)  
SEPTEMBER 2020
-  PIEZOMETER OBSERVATION ONLY
-  MONITORING WELL
-  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 2020.
3. AMSL = ABOVE MEAN SEA LEVEL
4. AERIAL IMAGERY SOURCE: ESRI, 3 SEPTEMBER 2019



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JEFFREY ENERGY CENTER  
ST. MARYS, KANSAS

FLY ASH LANDFILL  
GROUNDWATER POTENTIOMETRIC  
ELEVATION CONTOUR MAP  
SEPTEMBER 14, 2020



APRIL 2021