

2020 ANNUAL GROUNDWATER MONITORING
AND CORRECTIVE ACTION REPORT
FLUE GAS DESULFURIZATION LANDFILL
JEFFREY ENERGY CENTER
ST. MARYS, 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
and Corrective Action Report**

This Annual Groundwater Monitoring and Corrective Action Report documents the groundwater monitoring program for the Jeffrey Energy Center Flue Gas Desulfurization (FGD) Landfill 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 FGD Landfill is, to the best of my knowledge, accurate and complete.

Signed: 
Professional Geologist

Print Name: Mark Nicholls
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Title: Technical Expert 2
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1. Introduction

This 2020 Annual Groundwater Monitoring and Corrective Action Report (Annual Report) addresses the Flue Gas Desulfurization (FGD) Landfill 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 FGD Landfill 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 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 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 FGD Landfill 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 FGD Landfill was operating under a detection monitoring program in compliance with 40 CFR § 257.94.

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):

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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 FGD Landfill was operating under an assessment monitoring program until August 2020. No detection monitoring 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 FGD Landfill with a notification establishing assessment monitoring provided on August 15, 2018 to meet the requirements of 40 CFR § 257.95. The FGD Landfill returned to a detection monitoring program on August 14, 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 FGD Landfill.

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 FGD Landfill was operating under an assessment monitoring program until August 2020 and has since returned to a detection monitoring program.

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 FGD Landfill in 2020; therefore, a public meeting was not held.

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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 FGD Landfill was operating under an assessment monitoring program until August 2020 before returning to a detection monitoring program.

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 FGD Landfill transitioned from an assessment monitoring program to a detection monitoring program in August 2020, and no remedy was required to be selected.

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 FGD Landfill. The FGD Landfill 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 FGD Landfill 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 the calendar year 2020.

2.2.1 Status of the Groundwater Monitoring Program

Concentrations of appendix III and detected appendix IV constituents were shown to be at or below background values for two consecutive sampling events in September 2019 and March 2020. In accordance with 40 CFR § 257.95(e), the FGD Landfill returned to detection monitoring of the CCR unit in August 2020.

2020 Annual Groundwater Monitoring and Corrective Action Report

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.

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 assessment monitoring sampling event.

While statistical evaluation was being completed on analytical data from the March 2020 semi-annual assessment monitoring sampling, an annual assessment monitoring sampling event was completed in June 2020 to identify detected appendix IV constituents for subsequent semi-annual assessment monitoring sampling events planned for September 2020 and March 2021.

In accordance with 40 CFR § 257.95(e), the FGD Landfill returned to a detection monitoring program in August 2020. A semi-annual detection monitoring sampling event was completed in September 2020. Statistical evaluation of the results from the September 2020 semi-annual detection 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

One problem encountered during groundwater monitoring activities in 2020 consisted of laboratory analytical errors that required the laboratory to reanalyze select analytical results. Various appendix III constituents (calcium, chloride, sulfate, and total dissolved solids) were reanalyzed for MW-FGD2, MW-FGD-3, and MW-FGD-4 in April 2020 due to suspected erroneous readings in the March 2020 analytical results. Thallium was also reanalyzed at MW-FGD-6 in June 2020 to improve the dilution factor for the sample. These are the only issues that needed to be addressed at the FGD Landfill in 2020.

2.2.4 Actions to Resolve Problems

The resolution to problems encountered in 2020 included additional laboratory analyses as described above. The analytical results were revised accordingly. No other problems were encountered at the FGD Landfill in 2020; therefore, no actions to resolve problems were required.

2.2.5 Projected 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 detection monitoring analytical data collected in September 2020, semi-annual detection monitoring, and subsequent statistical evaluations.

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 FGD Landfill 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 in 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 § 257.94(b), § 257.95(b), and § 257.95(d)(1), two independent assessment monitoring samples and one independent detection monitoring sample 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 JEC FGD Landfill 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. In accordance with 40 CFR § 257.95(e), the concentrations of appendix III and detected appendix IV constituents at the FGD Landfill were shown to be at or below background values for two consecutive sampling events; therefore, the CCR unit returned to detection monitoring on August 14, 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 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.

No alternate source demonstration or certification was required in 2020; therefore, no 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 had been implemented at the CCR unit since July 17, 2018. The program transitioned back to detection monitoring in August 2020. Two 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 FGD Landfill 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.

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No assessment monitoring alternate source demonstration or certification was required in 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 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 AND DETECTION MONITORING
 EVERGY KANSAS CENTRAL, INC.
 JEFFREY ENERGY CENTER
 FLUE GAS DESULFURIZATION LANDFILL
 ST. MARYS, KANSAS

| Location | Upgradient | | | | | | | Downgradient | | | | | |
|--|----------------------|-----------------------|-----------------------|---------------|---------------------|---------------------|---------------|-----------------------|----------------------|---------------|-----------------------|----------------------|---------------|
| | MW-FGD-1 | | | | MW-FGD-6 | | | MW-FGD-2 | | | MW-FGD-3 | | |
| | 1239.05 | | | | 1277.52 | | | 1184.20 | | | 1186.26 | | |
| Measure Point (TOC) | FGD-01-030520 | DUP-FGD-030520 | FGD-01-061120 | FGD-01-091420 | FGD-06-030520 | FGD-06-061120 | FGD-06-091420 | FGD-02-030520 | FGD-02-061120 | FGD-02-091420 | FGD-03-030520 | FGD-03-061120 | FGD-03-091420 |
| Sample Name | 03/05/2020 | 03/05/2020 | 06/11/2020 | 9/14/2020 | 03/05/2020 | 06/11/2020 | 9/14/2020 | 03/05/2020 | 06/11/2020 | 9/14/2020 | 03/05/2020 | 06/11/2020 | 9/14/2020 |
| Sample Date | Assessment | Assessment | Assessment | Detection | Assessment | Assessment | Detection | Assessment | Assessment | Detection | Assessment | Assessment | Detection |
| Monitoring Program | 3/18/2020 | 3/18/2020 | 6/23/2020 | 9/25/2020 | 3/18/2020 | 6/23/2020 | 9/25/2020 | 3/18/2020 | 6/23/2020 | 9/25/2020 | 3/18/2020 | 6/23/2020 | 9/25/2020 |
| Final Lab Report Date | 4/10/2020 | 4/10/2020 | 6/29/2020 | N/A | 4/10/2020 | 6/29/2020 | N/A | 4/10/2020 | 6/29/2020 | N/A | 4/10/2020 | 6/29/2020 | N/A |
| Final Lab Report Revision Date | 3/30/2020 | 3/30/2020 | 7/8/2020 | N/A | 3/30/2020 | 7/8/2020 | N/A | 3/30/2020 | 7/8/2020 | N/A | 3/30/2020 | 7/8/2020 | N/A |
| Final Radiation Lab Report Date | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Final Radiation Lab Report Revision Date | 4/20/2020 | 4/20/2020 | 7/16/2020 | 10/23/2020 | 4/20/2020 | 7/16/2020 | 10/23/2020 | 4/20/2020 | 7/16/2020 | 10/23/2020 | 4/20/2020 | 7/16/2020 | 10/23/2020 |
| Lab Data Reviewed and Accepted | 72.05 | - | 70.57 | 72.29 | 99.68 | 99.16 | 99.70 | 18.42 | 20.50 | 21.42 | 22.46 | 21.43 | 23.40 |
| Depth to Water (ft btoc) | 9.95 | - | 15.68 | 22.09 | 9.48 | 17.33 | 26.69 | 10.4 | 15.37 | 18.28 | 10.35 | 15.59 | 18.30 |
| Temperature (Deg C) | 846 | - | 913 | 792 | 9323 | 10300 | 8660 | 1397 | 1520 | 1460 | 1619 | 1700 | 1490 |
| Conductivity, Field (µS/cm) | 0.72 | - | 0.0 | 9.5 | 0.61 | 0.0 | 21.8 | 0.86 | 0.0 | 0.0 | 0.81 | 0.0 | 0.0 |
| Turbidity, Field (NTU) | 0.11 | < 0.10 | - | 0.13 | 10.6 | - | 10.9 | 0.21 | - | 0.23 | 0.16 | - | 0.18 |
| Boron, Total (mg/L) | 100 | 100 | - | 99.2 | 650 | - | 586 | 216 | - | 236 | 228 | - | 190 |
| Calcium, Total (mg/L) | 50.6 | 51.5 | - | 50.2 | 2180 | - | 2440 | 62.5 | - | 85.1 | 121 | - | 132 |
| Chloride (mg/L) | 0.31 | 0.33 | 0.36 | 0.41 | 1.2 | 1.1 | 1.6 | 0.22 | 0.35 | 0.33 | < 0.20 | 0.35 | 0.37 |
| Fluoride (mg/L) | 91.5 | 93.9 | - | 106 | 2700 | - | 3030 | 422 | - | 528 | 473 | - | 479 |
| Sulfate (mg/L) | 7.4 | 7.3 | - | 7.3 | 7.0 | - | 7.3 | 7.1 | - | 7.1 | 7.0 | - | 7.1 |
| pH (lab) (su) | 529 | 579 | - | 521 | 8060 | - | 8450 | 1010 | - | 1280 | 1160 | - | 1210 |
| TDS (mg/L) | - | - | < 0.0010 | - | - | < 0.0010 | - | - | < 0.0010 | - | - | < 0.0010 | - |
| Antimony, Total (mg/L) | < 0.0010 | < 0.0010 | < 0.0010 | - | 0.0074 | 0.0075 | - | < 0.0010 | < 0.0010 | - | < 0.0010 | 0.0011 | - |
| Arsenic, Total (mg/L) | 0.28 | 0.28 | 0.30 | - | 0.016 | 0.017 | - | 0.061 | 0.063 | - | 0.074 | 0.089 | - |
| Barium, Total (mg/L) | - | - | < 0.0010 | - | - | < 0.0010 | - | - | < 0.0010 | - | - | < 0.0010 | - |
| Beryllium, Total (mg/L) | - | - | < 0.00050 | - | - | < 0.00050 | - | - | < 0.00050 | - | - | < 0.00050 | - |
| Cadmium, Total (mg/L) | - | - | < 0.0050 | - | - | < 0.0050 | - | - | < 0.0050 | - | - | < 0.0050 | - |
| Chromium, Total (mg/L) | < 0.0010 | < 0.0010 | < 0.0010 | - | < 0.0010 | < 0.0010 | - | 0.0020 | 0.0017 | - | < 0.0010 | < 0.0010 | - |
| Cobalt, Total (mg/L) | - | - | < 0.010 | - | - | < 0.010 | - | - | < 0.010 | - | - | < 0.010 | - |
| Lead, Total (mg/L) | 0.015 | 0.014 | 0.014 | - | 0.45 | 0.45 | - | 0.012 | < 0.010 | - | 0.02 | 0.015 | - |
| Lithium, Total (mg/L) | 0.0013 | 0.0013 | 0.0014 | - | 0.014 | 0.011 | - | 0.0038 | 0.0038 | - | 0.0057 | 0.0060 | - |
| Molybdenum, Total (mg/L) | < 0.0010 | < 0.0010 | < 0.0010 | - | < 0.0010 | < 0.0010 | - | < 0.0010 | < 0.0010 | - | < 0.0010 | < 0.0010 | - |
| Selenium, Total (mg/L) | - | - | < 0.0010 | - | - | < 0.0010 | - | - | < 0.0010 | - | - | < 0.0010 | - |
| Thallium, Total (mg/L) | - | - | < 0.20 | - | - | < 0.20 | - | - | < 0.20 | - | - | < 0.20 | - |
| Mercury, Total (mg/L) | 1.01 ± 0.551 (0.848) | 0.717 ± 0.485 (0.738) | 0.574 ± 0.645 (0.877) | - | 7.24 ± 1.42 (0.785) | 7.34 ± 1.50 (0.992) | - | 0.181 ± 0.468 (0.718) | 0.231 ± 0.818 (1.32) | - | 0.533 ± 0.528 (0.820) | 0.358 ± 0.605 (1.02) | - |
| Radium (pCi/L) | | | | | | | | | | | | | |

TABLE I
SUMMARY OF ANALYTICAL RESULTS - 2020 ASSESSMENT AND DETECTION MONITORING
 EVERGY KANSAS CENTRAL, INC.
 JEFFREY ENERGY CENTER
 FLUE GAS DESULFURIZATION LANDFILL
 ST. MARYS, KANSAS

| Location | Downgradient | | | | | | | |
|--|-----------------------|-----------------------------|-----------------------|---------------|------------------------------|----------------------|---------------|----------------|
| | MW-FGD-4 | | | | MW-FGD-9 | | | |
| Measure Point (TOC) | 1188.43 | | | | 1175.51 | | | |
| Sample Name | FGD-04-030520 | FGD-04-061120 | FGD-DUP-061120 | FGD-04-091420 | FGD-09-030620 | FGD-09-061120 | FGD-09-091420 | DUP-FGD-091420 |
| Sample Date | 03/05/2020 | 06/11/2020 | 06/11/2020 | 9/14/2020 | 03/06/2020 | 06/11/2020 | 9/14/2020 | 9/14/2020 |
| Monitoring Program | Assessment | Assessment | Assessment | Detection | Assessment | Assessment | Detection | Detection |
| Final Lab Report Date | 3/18/2020 | 6/23/2020 | 6/23/2020 | 9/25/2020 | 3/18/2020 | 6/23/2020 | 9/25/2020 | 9/25/2020 |
| Final Lab Report Revision Date | 4/10/2020 | 6/29/2020 | 6/29/2020 | N/A | 4/10/2020 | 6/29/2020 | N/A | N/A |
| Final Radiation Lab Report Date | 3/30/2020 | 7/8/2020 | 7/8/2020 | N/A | 3/30/2020 | 7/8/2020 | N/A | N/A |
| Final Radiation Lab Report Revision Date | 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 | 7/16/2020 | 10/23/2020 | 4/20/2020 | 7/16/2020 | 10/23/2020 | 10/23/2020 |
| Depth to Water (ft btoc) | 30.54 | 30.12 | - | 30.50 | 8.78 | 7.53 | 8.72 | - |
| Temperature (Deg C) | 10.06 | 15.14 | - | 18.53 | 5.84 | 15.28 | 20.86 | - |
| Conductivity, Field (µS/cm) | 1853 | 2350 | - | 2060 | 0.948 | 1030 | 935 | - |
| Turbidity, Field (NTU) | 0.68 | 0.0 | - | 0.0 | 2.15 | 0.0 | 0.0 | - |
| Boron, Total (mg/L) | 0.34 | - | - | 0.40 | 0.42 | - | 0.51 | 0.52 |
| Calcium, Total (mg/L) | 282 | - | - | 322 | 122 | - | 129 | 129 |
| Chloride (mg/L) | 161 | - | - | 166 | 35.7 | - | 31.2 | 34.8 |
| Fluoride (mg/L) | 0.33 | 0.28 | 0.28 | 0.46 | 0.45 | 0.50 | 0.55 | 0.55 |
| Sulfate (mg/L) | 726 | - | - | 690 | 211 | - | 271 | 263 |
| pH (lab) (su) | 7.0 | - | - | 7.1 | 7.2 | - | 7.4 | 7.2 |
| TDS (mg/L) | 1590 | - | - | 1760 | 692 | - | 708 | 702 |
| Antimony, Total (mg/L) | - | < 0.0010 | < 0.0010 | - | - | < 0.0010 | - | - |
| Arsenic, Total (mg/L) | < 0.0010 | < 0.0010 | < 0.0010 | - | 0.0016 | 0.0016 | - | - |
| Barium, Total (mg/L) | 0.054 | 0.058 | 0.059 | - | 0.081 | 0.087 | - | - |
| Beryllium, Total (mg/L) | - | < 0.0010 | 0.0010 | - | - | < 0.0010 | - | - |
| Cadmium, Total (mg/L) | - | < 0.00050 | < 0.00050 | - | - | < 0.00050 | - | - |
| Chromium, Total (mg/L) | - | < 0.0050 | < 0.0050 | - | - | < 0.0050 | - | - |
| Cobalt, Total (mg/L) | < 0.0010 | < 0.0010 | < 0.0010 | - | < 0.0010 | 0.0010 | - | - |
| Lead, Total (mg/L) | - | < 0.010 | < 0.010 | - | - | < 0.010 | - | - |
| Lithium, Total (mg/L) | 0.019 | 0.013 | 0.013 | - | < 0.010 | < 0.010 | - | - |
| Molybdenum, Total (mg/L) | 0.0035 | 0.0036 | 0.0037 | - | 0.0092 | 0.0097 | - | - |
| Selenium, Total (mg/L) | < 0.0010 | < 0.0010 | < 0.0010 | - | < 0.0010 | < 0.0010 | - | - |
| Thallium, Total (mg/L) | - | < 0.0010 | < 0.0010 | - | - | < 0.0010 | - | - |
| Mercury, Total (mg/L) | - | < 0.20 | < 0.20 | - | - | < 0.20 | - | - |
| Radium (pCi/L) | 0.668 ± 0.487 (0.722) | 0.917 ± 0.57 (0.882) | 0.384 ± 0.525 (0.962) | - | 0.952 ± 0.512 (0.810) | 0.195 ± 0.705 (1.15) | - | - |

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
 FLUE GAS DESULFURIZATION LANDFILL
 ST. MARYS, KANSAS

| Well Number | Background Value ¹ | GWPS |
|--|-------------------------------|--------|
| CCR Appendix-IV Arsenic, Total (mg/L) | | |
| MW-FGD-1 (upgradient) | 0.017 | NA |
| MW-FGD-6 (upgradient) | | |
| MW-FGD-2 | | 0.017 |
| MW-FGD-3 | | 0.017 |
| MW-FGD-4 | | 0.017 |
| MW-FGD-9 | | 0.017 |
| CCR Appendix-IV Barium, Total (mg/L) | | |
| MW-FGD-1 (upgradient) | 0.310 | NA |
| MW-FGD-6 (upgradient) | | |
| MW-FGD-2 | | 2 |
| MW-FGD-3 | | 2 |
| MW-FGD-4 | | 2 |
| MW-FGD-9 | | 2 |
| CCR Appendix-IV Cobalt, Total (mg/L) | | |
| MW-FGD-1 (upgradient) | 0.0087 | NA |
| MW-FGD-6 (upgradient) | | |
| MW-FGD-2 | | 0.0087 |
| MW-FGD-3 | | 0.0087 |
| MW-FGD-4 | | 0.0087 |
| MW-FGD-9 | | 0.0087 |
| CCR Appendix-IV Fluoride, Total (mg/L) | | |
| MW-FGD-1 (upgradient) | 1.800 | NA |
| MW-FGD-6 (upgradient) | | |
| MW-FGD-2 | | 4.0 |
| MW-FGD-3 | | 4.0 |
| MW-FGD-4 | | 4.0 |
| MW-FGD-9 | | 4.0 |
| CCR Appendix-IV Lithium, Total (mg/L) | | |
| MW-FGD-1 (upgradient) | 0.450 | NA |
| MW-FGD-6 (upgradient) | | |
| MW-FGD-2 | | 0.450 |
| MW-FGD-3 | | 0.450 |
| MW-FGD-4 | | 0.450 |
| MW-FGD-9 | | 0.450 |
| CCR Appendix-IV Molybdenum, Total (mg/L) | | |
| MW-FGD-1 (upgradient) | 0.520 | NA |
| MW-FGD-6 (upgradient) | | |
| MW-FGD-2 | | 0.520 |
| MW-FGD-3 | | 0.520 |
| MW-FGD-4 | | 0.520 |
| MW-FGD-9 | | 0.520 |
| CCR Appendix-IV Radium-226 & 228 Combined (pCi/L) | | |
| MW-FGD-1 (upgradient) | 4.92 | NA |
| MW-FGD-6 (upgradient) | | |
| MW-FGD-2 | | 5 |
| MW-FGD-3 | | 5 |
| MW-FGD-4 | | 5 |
| MW-FGD-9 | | 5 |
| CCR Appendix-IV Selenium, Total (mg/L) | | |
| MW-FGD-1 (upgradient) | 0.0046 | NA |
| MW-FGD-6 (upgradient) | | |
| MW-FGD-2 | | 0.05 |
| MW-FGD-3 | | 0.05 |
| MW-FGD-4 | | 0.05 |
| MW-FGD-9 | | 0.05 |

Notes and Abbreviations:

¹ Based on background data collected through March 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

TABLE III
ASSESSMENT GROUNDWATER MONITORING - DETECTED APPENDIX IV GWPS
MARCH 2020 SAMPLING EVENT
JEFFREY ENERGY CENTER
FLUE GAS DESULFURIZATION LANDFILL
ST. MARYS, KANSAS

| Well Number | Background Value ¹ | GWPS |
|--|-------------------------------|--------|
| CCR Appendix-IV Arsenic, Total (mg/L) | | |
| MW-FGD-1 (upgradient) | 0.019 | NA |
| MW-FGD-6 (upgradient) | | |
| MW-FGD-2 | | 0.019 |
| MW-FGD-3 | | 0.019 |
| MW-FGD-4 | | 0.019 |
| MW-FGD-9 | | 0.019 |
| CCR Appendix-IV Barium, Total (mg/L) | | |
| MW-FGD-1 (upgradient) | 0.310 | NA |
| MW-FGD-6 (upgradient) | | |
| MW-FGD-2 | | 2 |
| MW-FGD-3 | | 2 |
| MW-FGD-4 | | 2 |
| MW-FGD-9 | | 2 |
| CCR Appendix-IV Cobalt, Total (mg/L) | | |
| MW-FGD-1 (upgradient) | 0.0087 | NA |
| MW-FGD-6 (upgradient) | | |
| MW-FGD-2 | | 0.0087 |
| MW-FGD-3 | | 0.0087 |
| MW-FGD-4 | | 0.0087 |
| MW-FGD-9 | | 0.0087 |
| CCR Appendix-IV Fluoride, Total (mg/L) | | |
| MW-FGD-1 (upgradient) | 3.400 | NA |
| MW-FGD-6 (upgradient) | | |
| MW-FGD-2 | | 4.0 |
| MW-FGD-3 | | 4.0 |
| MW-FGD-4 | | 4.0 |
| MW-FGD-9 | | 4.0 |
| CCR Appendix-IV Lithium, Total (mg/L) | | |
| MW-FGD-1 (upgradient) | 0.450 | NA |
| MW-FGD-6 (upgradient) | | |
| MW-FGD-2 | | 0.450 |
| MW-FGD-3 | | 0.450 |
| MW-FGD-4 | | 0.450 |
| MW-FGD-9 | | 0.450 |
| CCR Appendix-IV Molybdenum, Total (mg/L) | | |
| MW-FGD-1 (upgradient) | 0.520 | NA |
| MW-FGD-6 (upgradient) | | |
| MW-FGD-2 | | 0.520 |
| MW-FGD-3 | | 0.520 |
| MW-FGD-4 | | 0.520 |
| MW-FGD-9 | | 0.520 |
| CCR Appendix-IV Radium-226 & 228 Combined (pCi/L) | | |
| MW-FGD-1 (upgradient) | 9.02 | NA |
| MW-FGD-6 (upgradient) | | |
| MW-FGD-2 | | 9.02 |
| MW-FGD-3 | | 9.02 |
| MW-FGD-4 | | 9.02 |
| MW-FGD-9 | | 9.02 |
| CCR Appendix-IV Selenium, Total (mg/L) | | |
| MW-FGD-1 (upgradient) | 0.0046 | NA |
| MW-FGD-6 (upgradient) | | |
| MW-FGD-2 | | 0.05 |
| MW-FGD-3 | | 0.05 |
| MW-FGD-4 | | 0.05 |
| MW-FGD-9 | | 0.05 |

Notes and Abbreviations:

¹ Based on background data collected through March 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
-  FGD LANDFILL
-  FUTURE FGD LANDFILL DISPOSAL AREA

NOTES

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

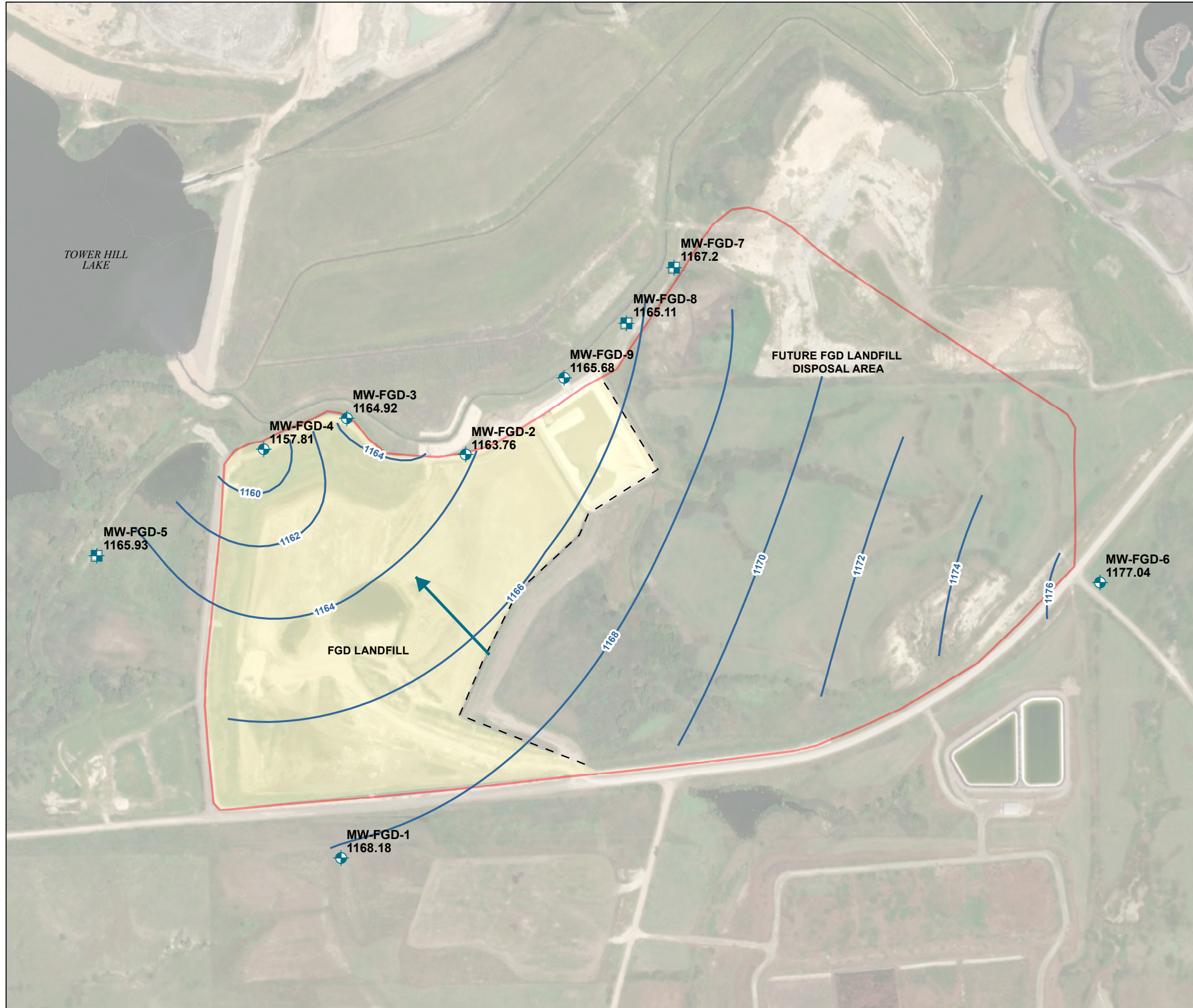


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ST. MARYS, KANSAS

**FGD LANDFILL MONITORING
WELL LOCATION MAP**



APRIL 2021

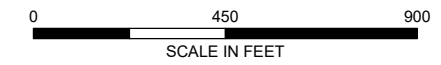


LEGEND

- MW-FGD-6 1168.88 MARCH 2020
- MONITORING WELL
- PIEZOMETER OBSERVATION ONLY
- GROUNDWATER POTENTIOMETRIC ELEVATION CONTOUR, 2-FT INTERVAL (AMSL)
- APPROXIMATE GROUNDWATER FLOW DIRECTION
- FGD LANDFILL
- FUTURE FGD LANDFILL DISPOSAL

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. GROUNDWATER POTENTIOMETRIC ELEVATIONS WERE MEASURED 03 MARCH 2020.
3. FGD LANDFILL BOUNDARY REPRESENTATIVE OF ACTIVE UNIT OPERATIONS, AS OUTLINED IN THE 2020 ANNUAL REPORT.
4. AMSL = ABOVE MEAN SEA LEVEL
5. AERIAL IMAGERY SOURCE: ESRI, SEPTEMBER 3, 2019



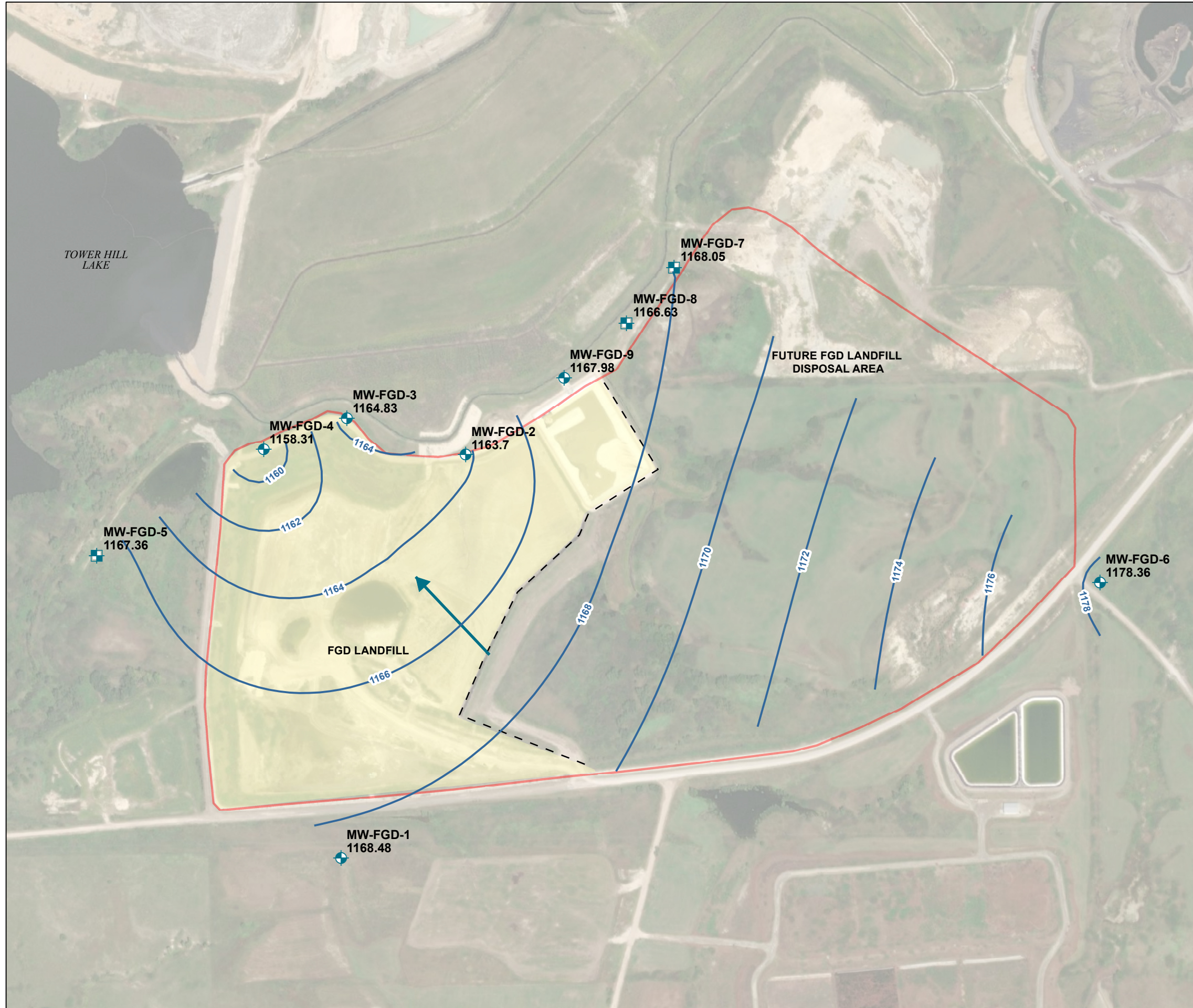
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FGD LANDFILL
GROUNDWATER POTENTIOMETRIC
ELEVATION CONTOUR MAP
MARCH 3, 2020









APRIL 2021

FIGURE 2

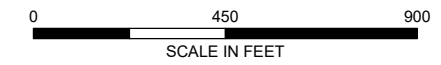


LEGEND

- MW-FGD-6 1168.88 WELL NAME WITH GROUNDWATER ELEVATION, (FT AMSL) JUNE 2020
-  MONITORING WELL
-  PIEZOMETER OBSERVATION ONLY
-  GROUNDWATER POTENTIOMETRIC ELEVATION CONTOUR, 2-FT INTERVAL (AMSL)
-  APPROXIMATE GROUNDWATER FLOW DIRECTION
-  FGD LANDFILL
-  FUTURE FGD LANDFILL DISPOSAL

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. GROUNDWATER POTENTIOMETRIC ELEVATIONS WERE MEASURED 11 JUNE 2020.
3. FGD LANDFILL BOUNDARY REPRESENTATIVE OF ACTIVE UNIT OPERATIONS, AS OUTLINED IN THE 2020 ANNUAL REPORT.
4. AMSL = ABOVE MEAN SEA LEVEL
5. AERIAL IMAGERY SOURCE: ESRI, SEPTEMBER 3, 2019

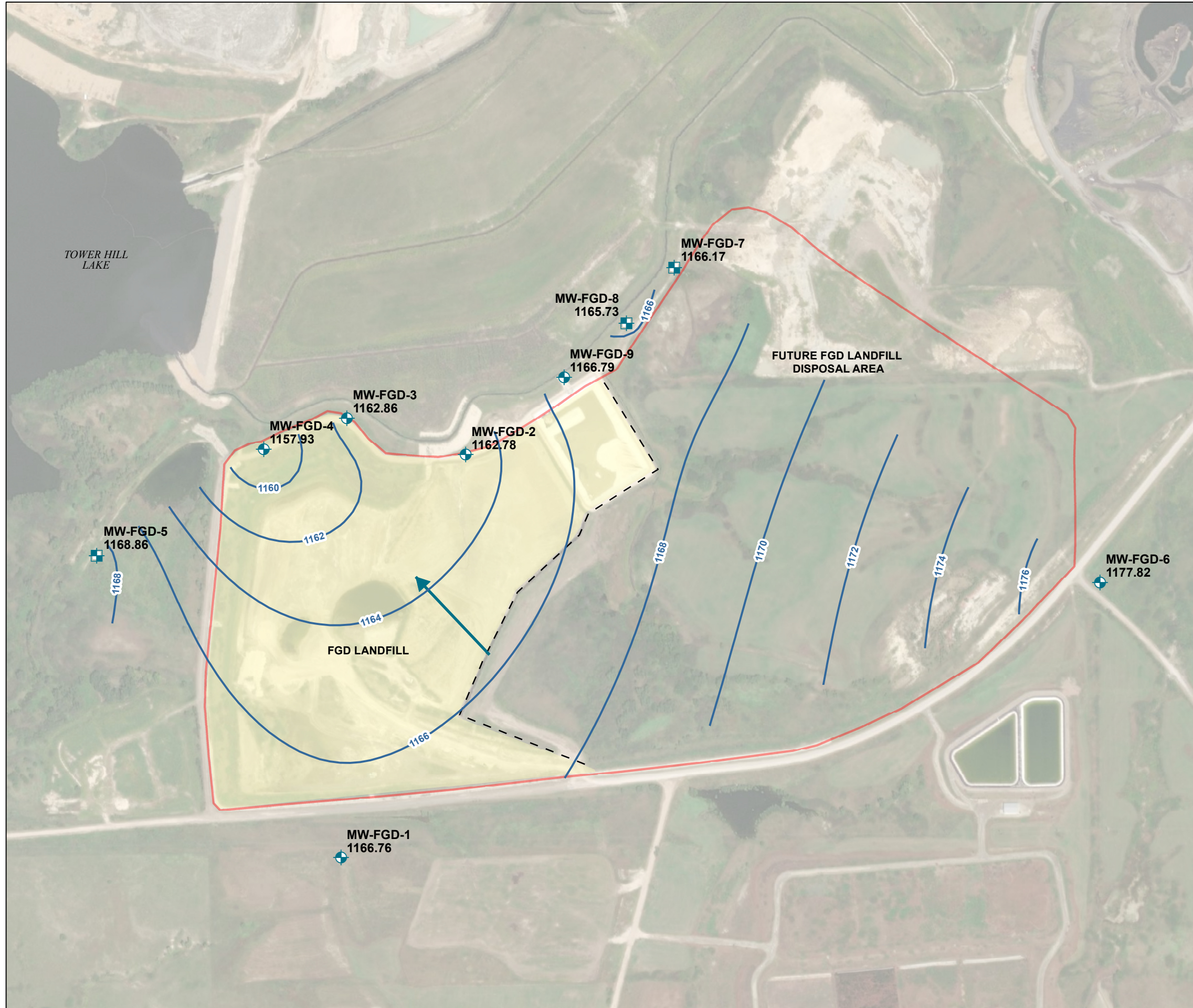


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FGD LANDFILL
GROUNDWATER POTENTIOMETRIC
ELEVATION CONTOUR MAP
JUNE 11, 2020



APRIL 2021

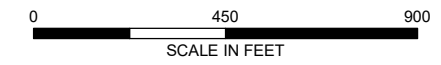


LEGEND

- MW-FGD-6 1168.88 WELL NAME WITH GROUNDWATER ELEVATION, (FT AMSL) SEPTEMBER 2020
-  MONITORING WELL
-  PIEZOMETER OBSERVATION ONLY
-  GROUNDWATER POTENTIOMETRIC ELEVATION CONTOUR, 2-FT INTERVAL (AMSL)
-  APPROXIMATE GROUNDWATER FLOW DIRECTION
-  FGD LANDFILL
-  FUTURE FGD LANDFILL DISPOSAL

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. GROUNDWATER POTENTIOMETRIC ELEVATIONS WERE MEASURED 14 SEPTEMBER 2020.
3. FGD LANDFILL BOUNDARY REPRESENTATIVE OF ACTIVE UNIT OPERATIONS, AS OUTLINED IN THE 2020 ANNUAL REPORT.
4. AMSL = ABOVE MEAN SEA LEVEL
5. AERIAL IMAGERY SOURCE: ESRI, SEPTEMBER 3, 2019



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FGD LANDFILL
GROUNDWATER POTENTIOMETRIC
ELEVATION CONTOUR MAP
SEPTEMBER 14, 2020



APRIL 2021