January 30, 2026

Ms. Lori Babcock
Michigan Department of Environment, Great Lakes, and Energy
Materials Management Division
Bay City District Office
401 Ketchum St, Suite B
Bay City, Michigan 48708

SUBJECT: 2025 Annual Groundwater Monitoring and Corrective Action Report
DE Karn Lined Impoundment Coal Combustion Residuals (CCR) Unit

Dear Ms. Babcock:

On April 17, 2015, the United States Environmental Protection Agency (USEPA) published the final rule for the regulation and management of Coal Combustion Residuals (CCR) under the Resource Conservation and Recovery Act (RCRA) (the CCR Rule) (USEPA, April 2015, as amended). Standards for groundwater monitoring and corrective action codified in the CCR Rule (40 CFR 257.90-98), apply to the Consumers Energy Company (Consumers Energy) Lined Impoundment at the DE Karn Power Plant Site. Pursuant to the CCR Rule, the owner or operator of a CCR unit must prepare an annual groundwater monitoring and corrective action report for the CCR unit documenting the status of groundwater monitoring and corrective action for the preceding year in accordance with §257.90(e). On behalf of Consumers Energy, TRC has prepared this Annual Groundwater Monitoring Report for the Karn Lined Impoundment to cover the period of January 1, 2025 to December 31, 2025.

One groundwater monitoring event was completed for the Karn Lined Impoundment CCR Unit in March 2025. This letter and one groundwater monitoring report (Enclosure 2) collectively comprise the 2025 Annual Groundwater Monitoring and Corrective Action Report and meet the requirements of §257.90(e) as documented in the enclosed checklist (Enclosure 1).

Groundwater Monitoring and Unit Closure

After Consumers Energy established the groundwater monitoring system and detection monitoring project pursuant to the requirements and schedule of §257.90 - §257.94, the State of Michigan enacted Public Act No. 640 of 2018 (PA 640) on December 28, 2018 to amend the Natural Resources and Environmental Protection Act, also known as Part 115 of PA 451 of 1994, as amended (a.k.a., Michigan Part 115 Solid Waste Management). The December 2018 amendments to Part 115 were developed to provide the State of Michigan oversight of CCR impoundments and landfills and to better align existing state solid waste management rules and statutes with the CCR Rule. This alignment would ensure compliance with the CCR standards through a state-approved permitting program that would be deemed to be "equivalent to" or "as protective as" through an administrative application that would be reviewed and authorized by U.S. EPA.

On November 6, 2020, Consumers Energy submitted the Karn Lined Impoundment Hydrogeological Monitoring Plan (November 2020 HMP) to the Michigan Department of Environment, Great Lakes, and Energy (EGLE) to comply with the requirements of Part 115, Rule 299.4905, and the CCR Rule. The HMP was approved by the EGLE on November 13, 2020. The Karn Lined Impoundment remained in detection monitoring, based on groundwater compliance monitoring completed in accordance with the HMP, during the active life of the CCR unit (June 2018 through August 2024). Closure of the Karn Lined Impoundment was initiated in August 2024 and completed in September 2024.

In accordance with the Closure Plan and § 257.102(c)[1]: closure by removal of CCR, groundwater monitoring was conducted post-CCR removal to document that constituent concentrations throughout the CCR unit do not exceed the groundwater protection standards established per 40 CFR 257.95(h) for two consecutive groundwater monitoring events. Post-excavation groundwater monitoring events were completed in October 2024 and March 2025. Statistical evaluation of the post-excavation events indicated no exceedances of the GWPS that were attributed to the Karn Lined Impoundment.[2]

In 2025, Consumers Energy asserted an Alternate Source Demonstration (ASD), for the following exceedances of the groundwater protection standards (GWPS):

- Boron at OW-10;
- Iron[3] at DEK-MW-18001, OW-10, DEK-MW-22003 and DEK-MW-22006
- Calcium at OW-10, DEK-MW-22003, and DEK-MW_22006;
- Sulfate at DEK-MW-22003 and DEK-MW-22006;
- Total dissolved solids at DEK-MW-18001, OW-10, DEK-MW-22003, and DEK-MW-2006; and
- Lithium at DEK-MW-2006.
- Vanadium[3] at OW-10.

As detailed in the ASD report (Enclosure 3), a source other than the Karn Lined Impoundment CCR Unit caused the exceedances.

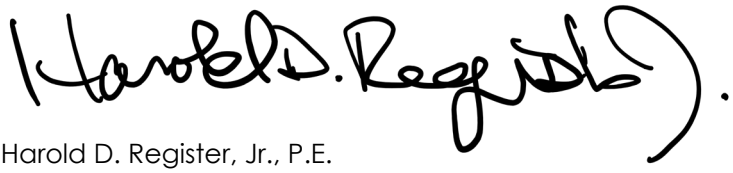
[1] The closure requirements of § 257.102(c) are equivalent to Section 11519(b)(9)(a) of Part 115.

[2] TRC. 2025. Closure Completion: Statistical Groundwater Evaluation. July 25.

[3] Iron is a Michigan Part 115 detection monitoring parameter and vanadium is a Michigan Part 115 assessment monitoring parameter; iron and vanadium are not included in the CCR Rule Appendix III or IV parameter lists.

As such, closure of the Karn Lined Impoundment was certified as complete on July 25, 2025.[4] The EGLE approved the closure certification on September 3, 2025. No corrective actions were performed in 2025. As the Karn Lined Impoundment is closed, no further groundwater monitoring will be completed, and no future annual reports will be required.

Sincerely,



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cc: Mr. Jim Ferritto, EGLE Bay City District Office
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Ms. Kristin Lowery, TRC
Mr. Andrew Whaley, TRC

Enclosures: 1) CCR Annual Groundwater Report Requirements: § 257.90(e). Checklist for the Karn Lined Impoundment CCR Unit.

2) First Quarter 2025 Hydrogeological Monitoring Report, DE Karn Lined Impoundment CCR Unit, Essexville, Michigan. (TRC, April 30, 2025)

3) Closure Alternate Source Demonstration, Karn Lined Impoundment Consumers Energy Company, Essexville, Michigan. (TRC. July 25, 2025)

[4] Consumers Energy. 2025. DE Karn Lined Impoundment Closure by Removal Certification 40 CFR 257.102(c). July 25.

Enclosure 1
CCR Annual Groundwater Report Requirements: § 257.90(e). Checklist for the Karn Lined Impoundment CCR Unit.

CCR Annual Groundwater Report Requirements: § 257.90(e)
Checklist for the Karn Lined Impoundment CCR Unit
2025 Annual Report

Requirement	Reference
At a minimum, the annual groundwater monitoring and corrective action report must contain the following information, to the extent available:	
(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;	Figure 2 [(2)]
(2) Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken;	Section 3.1[(2)]
(3) In addition to all the monitoring data obtained under §§ 257.90 through 257.98, a summary including the number of groundwater samples that were collected for analysis for each background and downgradient well, the dates the samples were collected, and whether the sample was required by the detection monitoring or assessment monitoring programs;	Section 3.2 [(2)]
(4) A narrative discussion of any transition between monitoring programs (e.g., the date and circumstances for transitioning from detection monitoring to assessment monitoring in addition to identifying the constituent(s) detected at a statistically significant increase over background levels); and	Annual Report Cover Letter[(1)]; Section 1.2 Program Summary [(2)]
(5) Other information required to be included in the annual report as specified in §§ 257.90 through 257.98.	Certified ASD[(3)]
(6) A section at the beginning of the annual report that provides an overview of the current status of groundwater monitoring and corrective action programs for the CCR unit. At a minimum, the summary must specify all of the following:	
(i) 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;	Annual Report Cover Letter[(1)]; Section 1.2 Program Summary [(2)]
(ii) 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;	Annual Report Cover Letter[(1)]; Section 1.2 Program Summary [(2)]
(iii) 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):	Not Applicable; Unit Closed
(A) Identify those constituents listed in appendix III to this part and the names of the monitoring wells associated with such an increase; and	Not Applicable; Unit Closed
(B) Provide the date when the assessment monitoring program was initiated for the CCR unit.	Not Applicable; Unit Closed
(iv) 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:	Annual Report Cover Letter[(1)]; Certified ASD[(3)]
(A) Identify those constituents listed in appendix IV to this part and the names of the monitoring wells associated with such an increase;	Annual Report Cover Letter[(1)]; Certified ASD[(3)]
(B) Provide the date when the assessment of corrective measures was initiated for the CCR unit;	Not Applicable; Unit Closed
(C) Provide the date when the public meeting was held for the assessment of corrective measures for the CCR unit; and	Not Applicable; Unit Closed
(D) Provide the date when the assessment of corrective measures was completed for the CCR unit.	Not Applicable; Unit Closed
(v) Whether a remedy was selected pursuant to § 257.97 during the current annual reporting period, and if so, the date of remedy selection; and	Not Applicable; Unit Closed
(vi) Whether remedial activities were initiated or are ongoing pursuant to § 257.98 during the current annual reporting period.	Not Applicable; Unit Closed

Notes:

(1) *2025 Annual Groundwater Monitoring and Corrective Action Report Karn Lined Impoundment Coal Combustion Residuals CCR Unit.* Consumers Energy. January 30, 2026.

(2) *First Quarter 2025 Hydrogeological Monitoring Report, DE Karn Lined Impoundment CCR Unit, Essexville, Michigan.* TRC. April 30, 2025.

(3) Closure Alternate Source Demonstration, Karn Lined Impoundment Consumers Energy Company, Essexville, Michigan TRC. July 25, 2025.

Enclosure 2
First Quarter 2025 Hydrogeological Monitoring Report, DE Karn Lined Impoundment CCR Unit, Essexville, Michigan. (TRC; April 30, 2025)

First Quarter 2025 Hydrogeological Monitoring Report

DE Karn Lined Impoundment CCR Unit

Essexville, Michigan

April 2025

Prepared For:

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TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

1.0 Introduction

Pursuant to the Federal CCR Rule[1], Consumers Energy initiated a detection monitoring program for the Karn Lined Impoundment that went into service on June 7, 2018. After Consumers Energy established the groundwater monitoring system and detection monitoring program pursuant to the requirements and schedule of §257.90 - §257.94, the State of Michigan enacted Public Act No. 640 of 2018 (PA 640) on December 28, 2018, to amend the Natural Resources and Environmental Protection Act, also known as Part 115 of PA 451 of 1994, as amended (a.k.a., Michigan Part 115 Solid Waste Management). The amendments to the solid waste statute amended state groundwater monitoring requirements for coal ash impoundments; therefore, Consumers Energy submitted the *Karn Lined Impoundment Hydrogeological Monitoring Plan* (HMP) to the Michigan Department of Environment, Great Lakes, and Energy (EGLE) to comply with the requirements of Part 115, Rule 299.4905, and the CCR Rule. The HMP was approved by the EGLE on November 13, 2020, and incorporated, by reference, in Solid Waste Disposal Area Operating License No. 9629 issued on December 10, 2020.

1.1 Statement of Adherence to Approved Hydrogeological Monitoring Plan

This First Quarter 2025 Karn Lined Impoundment Hydrogeological Monitoring Report (Report) has been prepared by TRC on behalf of Consumers Energy to satisfy quarterly groundwater monitoring requirements during the life of the coal ash impoundment. This Report was prepared in accordance with the items listed in Appendix A (Solid Waste Monitoring Submittal Components) of the May 15, 2015 Michigan Department of Environmental Quality (MDEQ) – Office of Waste Management and Radiological Protection, now the EGLE Materials Management Division (MMD), communication prescribing the format for solid waste disposal facility monitoring submittals as published in OWMRP-115-29, *Format for Solid Waste Disposal Facility Monitoring Submittals*, dated July 5, 2013. All references herein to the EGLE are inclusive of the MDEQ. Information contained in this report was prepared in adherence to the facility's approved HMP that was approved by the EGLE on November 13, 2020. This HMP is compliant with the requirements set forth in PA 640.

1.2 Program Summary

This Report provides results and summarizes the monitoring activities completed in the first quarter 2025 at the Karn Lined Impoundment CCR unit located at 2742 Weadock Highway in Essexville, Michigan (Figure 1). Groundwater in the vicinity of the Karn Lined Impoundment has been documented to be affected by the management of CCR prior to the construction of the unit (TRC, 2019). Given that the constituents associated with CCR currently managed at the Karn Lined Impoundment are indistinguishable from the constituents already present in groundwater from past operation of the former Karn Bottom Ash Pond, the compliance monitoring program for the Karn Lined Impoundment CCR unit consists of two parts to evaluate if there are new releases from the unit:

1. Monitoring of secondary collection system flow rates and water quality to detect leaks in the liner; and

[1] USEPA final rule for the regulation and management of Coal Combustion Residuals (CCR) under the Resource Conservation and Recovery Act (RCRA) published April 17, 2015, as amended.

2. Groundwater monitoring to determine if there are potential new releases from the Karn Lined Impoundment.

The Karn Lined Impoundment remained in detection monitoring, based on groundwater compliance monitoring completed in accordance with the HMP, during the active life of the CCR unit (June 2018 through August 2024). Closure of the Karn Lined Impoundment was initiated in August 2024 in accordance with the EGLE-approved *D.E. Karn Generating Facility, Karn Lined Impoundment Closure Plan* (Closure Plan) (Golder, 2018). Consumers Energy also prepared a *Closure Work Plan* (WSP, 2023) that was submitted to EGLE to provides additional details for excavation and confirmation that coal ash has been removed.[2]

In August and September 2024, the Karn Lined Impoundment was dewatered and hydraulic structures were removed. The remaining CCR, the geosynthetic liner systems, and all areas within the limits of the Karn Lined Impoundment that were in contact with CCR were removed, as documented in the *D.E. Karn Generating Facility, Karn Lined Impoundment Decommissioning Report* (WSP, 2024). Since closure by removal activities were completed in September 2024, the fourth quarter sampling event (October 2024) was the first post-excavation groundwater monitoring sampling event. This first quarter sampling event (March 2025) is the second post-excavation groundwater monitoring sampling event. In accordance with the Closure Plan and § 257.102(c)[3]: Closure by removal of CCR, groundwater monitoring will be conducted post-CCR removal to document that constituent concentrations throughout the CCR unit do not exceed the groundwater protection standards established per 40 CFR 257.95(h) for two consecutive groundwater monitoring events.

1.3 Site Overview

The Karn Lined Impoundment CCR unit is located within the DE Karn Power Plant site (Site) located north of the former JC Weadock Power Plant, east of the Saginaw River, south and west of Saginaw Bay (Figure 1). Two coal-fired power generating units (Karn Units 1 & 2) began generating electricity in 1958 and 1959, respectively. Consumers Energy permanently ceased the operation Karn Units 1 & 2 at the Site in May 2023 and has commenced decommissioning activities for both coal-fired generating units. Karn Units 3 & 4, co-located with the coal-fired generating units, are oil- and natural gas-fueled and will continue to operate. Two other areas of coal ash management within the Site are the former Karn Bottom Ash Pond that was closed by removal under the CCR Rule and the Karn Landfill that was certified closed under Part 115 by constructing a final cover system and is currently in post-closure care.

The Karn Lined Impoundment was put into service in June 2018 to replace the former Karn Bottom Ash Pond that directly supported Karn 1&2 power generation operations. The Karn Lined Impoundment served a twofold purpose for treatment pursuant to National Pollutant Discharge Elimination System (NPDES) Permit N0. MI0001678 and as temporary storage for bottom ash prior to removal and disposal in the JC Weadock Solid Waste Disposal Area

[2] The Federal CCR rule requirements are self-implementing and need to be coordinated with state requirements. Therefore, submittal of the Closure Plan and Closure Work Plan to the EGLE meets both the state and federal requirements.
[3] The closure requirements of § 257.102(c) are equivalent to Section 11519(b)(9)(a) of Part 115.

(Weadock Landfill) governed by Solid Waste Disposal Area Operating License No. 9640 issued on March 11, 2021. On July 7, 2023, Consumers Energy submitted a Closure Work Plan for the Karn Lined Impoundment to the EGLE that details a plan for closure by removal of CCR in accordance with 257.102(c) of the self-implementing requirements of the CCR Rule. By reference, performance of this work would also satisfy state requirements pursuant to Section 11519b(9) of Part 115, Solid Waste Management, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, MCL 324.11501 et seq. EGLE provided written concurrence with the Closure Work Plan on October 25, 2023.

1.4 Geology/Hydrogeology

The majority of the Karn Lined Impoundment area is comprised of surficial CCR and sand fill, as described in the HMP. USGS topographic maps and aerial photographs dating back to 1938, in addition to field descriptions of subsurface soil at the Site, indicate that the site was largely developed by reclaiming low-lands through construction of perimeter dikes and subsequent ash filling (AECOM, 2009).

The surficial fill consists of a mixture of varying percentages of ash, sand, and clay-rich fill ranging from 5 to 15 feet thick. Below the surficial fill, native alluvium and lacustrine soils are present at varying depths. Generally, there is a well graded sand unit present to depths of 10 to 30 feet below ground surface (ft bgs) overlying a clay till which is observed at depths ranging from 25 to 75 ft bgs. In general, the alluvium soils (sands) are deeper along the Saginaw River and there are shallower lacustrine deposits (clays, silts and sands deposited in or on the shores of glacial lakes) at other areas. The clay till acts as a hydraulic barrier that separates the shallow groundwater from the underlying sandstone. A sandstone unit, which is part of the Saginaw formation, is generally encountered at 80 to 90 ft bgs.

The Site is bound by several surface water features (Figures 1 and 2): the Saginaw River to the west, Saginaw Bay (Lake Huron) to the north and east, and a discharge channel to the south. In general, shallow groundwater is encountered at a similar or slightly higher elevation relative to the surrounding surface water features. Groundwater flow in the upper aquifer is largely controlled by the surface water elevations of Saginaw River and Saginaw Bay. In the vicinity of the Karn Lined Impoundment, the shallow groundwater flow is generally radial, with a potentiometric high point near DEK-MW-18001, flowing outward toward the surrounding surface water bodies.

2.0 Second Collection System Monitoring

Consumers Energy initiated secondary collection system (SCS) flow monitoring to comply with the EGLE-approved HMP in December 2020. The SCS served as a leak detection system and the SCS flow rate data were used to demonstrate compliance with Part 115. During the active life of the unit, Consumers Energy complied with the requirements for unmonitorable units under Rule 437 of the Part 115 Rules. The SCS flow was monitored for the end-of-life CCRs and NPDES decant water that remained in the CCR unit the closure activities commenced in August 2024.

There are no secondary collection system monitoring data to report for the First Quarter 2025, as impoundment closure and removal activities have been completed.

3.0 Groundwater Monitoring

3.1 Monitoring Well Network

In accordance with §257.91, Consumers Energy developed a groundwater monitoring system for the Karn Lined Impoundment prior to the initial receipt of waste in the CCR unit (TRC, 2019). Given the radial groundwater flow direction and that constituents associated with CCR formerly managed at the Karn Lined Impoundment CCR unit are indistinguishable from the constituents already present in groundwater from past operation of the Karn Bottom Ash Pond, the groundwater monitoring system design incorporates an intrawell statistical approach for detection monitoring as described in the HMP and in accordance with the "Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities – Unified Guidance" (USEPA, 2009). Five monitoring wells that are screened in the uppermost saturated unit were selected for the Karn Lined Impoundment HMP detection monitoring (DEK-MW-15003, DEK-MW-18001, OW-10, OW-11, and OW-12). Monitoring well locations are shown on Figure 2.

Due to the proximity of OW-12 to the Karn Lined Impoundment, the compliance monitoring well was decommissioned to allow for removal of the hydraulic structures and geosynthetic liner systems.

3.2 March 2025 Post-Excavation Monitoring Event

In accordance with the HMP, TRC conducted the first quarter 2025 monitoring event for the Karn Lined Impoundment on March 3 and 4, 2025. As mentioned above, OW-12 was decommissioned and therefore was not sampled. Additionally, due to decreasing water levels following discontinuation of loading to the NPDES discharge ditch, water levels observed at OW-11 indicated that the well would not yield a sufficient volume of water for the required sample analysis.

Groundwater samples collected during the first quarter 2025 event were submitted to Consumers Energy Laboratory Services in Jackson, Michigan for analysis of total metals and inorganic indicator constituents. Monitoring constituents include:

Section 11511a(3)(c) – Detection Monitoring Constituents	Section 11519b(2) – Assessment Monitoring Constituents		
Boron	Antimony	Fluoride	Thallium
Calcium	Arsenic	Lead	Vanadium
Chloride	Barium	Lithium	Zinc
Fluoride	Beryllium	Mercury	Radium 226/228
Iron	Cadmium	Molybdenum	
pH	Chromium, total	Nickel	
Sulfate	Cobalt	Selenium	
Total Dissolved Solids (TDS)	Copper	Silver	

Samples were also analyzed for additional constituents including magnesium, sodium, potassium, bicarbonate, carbonate, and total alkalinity to provide further evaluation of groundwater chemistry. Analytical results from this event monitoring event are included in the attached laboratory reports (Appendix A).

Static water level measurements were collected at all locations after equilibration to atmospheric pressure and immediately prior to purging. The depth to water was recorded to the nearest 0.01-ft in accordance with the procedures in the HMP. Groundwater purging and sampling were conducted in accordance with low-flow sampling protocol. Static water elevation data are included in the attached field records (Appendix B).

Monitoring wells were purged with peristaltic pumps utilizing low-flow sampling methodology. Field parameters were stabilized at each monitoring well prior to collecting groundwater samples. Stabilized field parameters for each monitoring well are summarized in Table 2. Field notes are included as Appendix B. The samples were collected in vendor-provided, nitric acid pre-preserved (metals only) and unpreserved sample containers and submitted to the laboratory for analysis. Groundwater sample preparation and analyses were performed in accordance with SW-846 “Test Methods for Evaluation Solid Waste – Chemical / Physical Methods,” USEPA (latest revision). TRC followed chain of custody procedures to document the sample handling sequence.

TRC also collected quality assurance/quality control (QA/QC) samples during the groundwater sampling event. The QA/QC samples consisted of a field matrix spike/matrix spike duplicate sample collected at DEK-MW-18001.

3.2.1 Data Quality Review

Data were evaluated for completeness, overall quality and usability, method-specified sample holding times, precision and accuracy, and potential sample contamination. The data were found to be complete and usable for the purposes of the HMP program.

The data quality reviews for the Karn Lined Impoundment network wells are summarized in Appendix C.

3.2.2 Groundwater Flow Rate and Direction

Groundwater elevation data collected during this groundwater monitoring event are provided in Table 1. The data were used to construct the groundwater contour map (Figure 3).

Groundwater elevations measured at the site in March 2025 are generally within the range of 578 to 584 feet above mean sea level (ft NAVD88) and groundwater is typically encountered at equal elevation relative to the surrounding surface water features measured by the NOAA gauging station data or within approximately 6 feet higher, flowing toward the bounding surface water features.

Although the point source discharge of sluiced bottom ash into the former Karn Bottom Ash Pond historically created localized mounding of the potentiometric surface, the Karn Lined Impoundment went into service on June 7, 2018, and continuously collected the process water

and bottom ash that went into the former bottom ash pond. Since the former bottom ash pond is no longer being hydraulically loaded with sluiced ash and has been dewatered by gravity, the characteristic groundwater mound centered within the former surface pool area is no longer present. The groundwater elevation data collected in the vicinity of the former Karn Bottom Ash Pond in March 2025 demonstrate a reduction in groundwater elevation measurements by several feet when compared to the measurements collected prior to June 2018, when active loading was occurring to the bottom ash pond. Groundwater at the Site is locally influenced by incidental infiltration from precipitation over the uncovered acreage and the unlined low volume miscellaneous wastewater conveyance associated with the permitted NPDES discharge system, which is located just north of the former Karn Lined Impoundment.

Monitoring well DEK-MW-15003 had been at or near the local high point of mounded groundwater at the Karn site following the discontinuing of loading to the Karn Bottom Ash Pond. However, in late 2023, the Karn Generating Facility stopped operating and consequently stopped routine discharge to the discharge ditch north of the Karn Lined Impoundment. The conveyance ditch was observed to be dry in March 2025 as wastewater is not being generated due to the cessation of operations of Karn Units 1 & 2. This operational change triggered a decrease in groundwater elevation at DEK-MW-15003 and OW-11 and additional flattening of the mounded groundwater. The groundwater elevation high point has recently shifted to the south, towards DEK-MW-18001, with groundwater generally flowing radially towards the adjacent surface water features from this potentiometric “high”, as illustrated in Figure 3.

The average hydraulic gradient observed on March 3, 2025, in the vicinity of the former Karn Bottom Ash Pond and former Karn Lined Impoundment is estimated at 0.0037 ft/ft. The gradients were calculated using the monitoring well pairs DEK-MW-15004/DEK-MW-15005 and OW-11/MW-08, as well as the monitoring well water elevation difference and distance between DEK-MW-18001 and the discharge channel. The discharge channel surface water elevation was taken from the NOAA gauging station data on the same date as the water level measurements. Using the mean hydraulic conductivity of 15 ft/day (ARCADIS, 2016) and an assumed effective porosity of 0.3, the estimated average seepage velocity was calculated to be 0.19 ft/day or 69 ft/year in March 2025 which is reduced relative to previous estimated seepage velocities (e.g., 0.33 ft/day or 120 ft/year in August 2018).

Due to the operational changes of the former bottom ash pond in 2018 and 2019, the completion of the landfill capping activities in 2020, and the cessation of NDPES discharge in 2023, the gradient between the area of the former Karn Bottom Ash Pond and former Karn Lined Impoundment and the surrounding surface water bodies is flattening out as compared to previous quarters and is also attempting to reach a new equilibrium, as expected. The general radial flow direction relative to the former Karn Lined Impoundment is similar to that identified in previous monitoring rounds and continues to demonstrate that the downgradient wells are appropriately positioned to detect the presence of Appendix III/IV parameters that could potentially migrate from the Karn Lined Impoundment.

4.0 Data Evaluation

Although the Karn Lined Impoundment CCR unit has remained in detection monitoring throughout its operation, to certify completion of closure per 257.102(c) and to achieve equivalency for closure pursuant to Section 11519(b)(9)(a) of Part 115, the owner/operator must demonstrate that the groundwater concentrations of Appendix IV constituents do not exceed the groundwater protection standards (GWPS) established for the Karn Lined Impoundment CCR unit per 40 CFR 257.95(h) for two consecutive sampling events. This March 2025 event is the second post-excavation sampling event.

Water quality data are included in the attached laboratory reports (Appendix A). Groundwater analytical data for the most recent quarterly monitoring event is summarized in Table 3 along with the associated Part 201 generic drinking water criteria and the generic GSI criteria. GSI compliance is evaluated through monitoring performed at the Karn Landfill in accordance with the EGLE-approved Consumers Energy's revised Karn Landfill HMP (Hydrogeological Monitoring Plan, Rev. 3, DE Karn Solid Waste Disposal Area) dated December 19, 2017, and in accordance with the October 4, 2024, mixing zone determination.

4.1 Data Discussion

Groundwater quality is generally consistent with previous monitoring events. Groundwater in the vicinity of the Karn Lined Impoundment has been affected by CCR management before commencement of operation, as documented in the HMP. Consumers Energy will formally establish GWPS and compare the GWPS with the Appendix IV groundwater data from the Karn Lined Impoundment CCR unit compliance well network following this second post-excavation groundwater sampling event. As a part of the post-excavation groundwater data evaluation and closure demonstration, the data will be analyzed in the context of the Site hydrogeologic characteristics, and an assessment made as to whether concentrations that exceed GWPS, if identified, are from a possible release from the Karn Lined Impoundment or attributed to another on-site source or sources.

4.2 Alternate Source Demonstration

At this time, Consumers Energy is not asserting an Alternate Source Demonstration (ASD) for any Statistically Significant Increases (SSI) from this reporting period.

5.0 Conclusions and Recommendations

Closure of the Karn Lined Impoundment was initiated in August 2024 and completed in September 2024 in accordance with the EGLE-approved *D.E. Karn Generating Facility, Karn Lined Impoundment Closure Plan* (Closure Plan) (Golder, 2018). Consumers Energy will continue the groundwater monitoring program for the Karn Lined Impoundment CCR unit in conformance with the Karn Lined Impoundment HMP to assess post-excavation groundwater conditions in support of closure by removal per 257.102(c) and to achieve equivalency for closure pursuant to Section 11519(b)(9)(a) of Part 115. Although the Karn Lined Impoundment CCR unit has remained in detection monitoring throughout its operation, to certify completion of closure, the owner/operator must demonstrate that the groundwater concentrations of Appendix IV constituents do not exceed the GWPS established for the Karn Lined Impoundment CCR unit per 40 CFR 257.95(h) for two consecutive sampling events.

Consumers Energy will formally establish GWPS and compare the GWPS with the Appendix IV groundwater data from the Karn Lined Impoundment CCR unit compliance well network following this second post-excavation groundwater sampling event.. As a part of the post-closure excavation groundwater data evaluation and closure demonstration, the data will be analyzed in the context of the Site hydrogeologic characteristics, and an assessment made as to whether concentrations that exceed GWPS, if identified, are from a possible release from the Karn Lined Impoundment or attributed to another on-site source or sources.

6.0 References

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TRC. 2020. Karn Lined Impoundment Hydrogeological Monitoring Plan for the DE Karn Power Plant Lined Impoundment, Essexville, Michigan. Prepared for Consumers Energy Company. November.

TRC. 2023. Fourth Quarter 2022 Hydrogeological Monitoring Report for the DE Karn Lined Impoundment CCR Unit, Essexville, Michigan. Prepared for Consumers Energy Company. January.

USEPA. 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA facilities, Unified Guidance. Office of Conservation and Recovery. EPA 530/R-09-007.

WSP. 2023. Closure Work Plan, D.E. Karn Generating Facility Karn Lined Impoundment. June.

WSP. 2024. D.E. Karn Generating Facility, Karn Lined Impoundment Decommissioning Report. October 30.

Tables

Table 1

Summary of Groundwater Elevation Data

DE Karn Lined Impoundment – Hydrogeological Monitoring Program

Essexville, Michigan

Well Location	TOC Elevation (ft)	Geologic Unit of Screen Interval	Screen Interval Elevation (ft)	March 3rd and 4th, 2025	
				Depth to Water (ft BTOC)	Groundwater Elevation (ft)
DE Karn Bottom Ash Pond					
DEK-MW-15002	590.87	Sand	578.3 to 575.3	8.20	582.67
DEK-MW-15005	589.72	Sand	572.3 to 567.3	11.38	578.34
DEK-MW-15006	589.24	Sand	573.0 to 568.0	11.08	578.16
DE Karn Bottom Ash Pond & Karn Lined Impoundment					
DEK-MW-18001	593.47	Sand	579.2 to 574.2	9.80	583.67
Karn Lined Impoundment					
DEK-MW-15003	602.74	Sand	578.8 to 574.8	20.05	582.69
OW-10	591.58	Silty Sand and Silty Clay	576.0 to 571.0	8.15	583.43
OW-11	607.90	Silt/Fly Ash	587.5 to 582.5	25.25	582.65
OW-12	603.10	Silty Sand	584.2 to 579.2	NM(1)	
DE Karn Nature and Extent					
DEK-MW-15004	611.04	Sand	576.6 to 571.6	30.05	580.99
MW-01	597.02	Sand	573.0 to 570.0	18.90	578.12
MW-03	597.30	Sand	569.8 to 566.8	19.22	578.08
MW-06	589.44	Sand and Silty Sand	578.5 to 563.5	10.71	578.73
MW-08	598.78	Sand and Silty Clay	580.9 to 570.9	18.20	580.58
MW-10	596.97	Sand	582.5 to 572.5	17.39	579.58
MW-12	598.60	Sand	583.9 to 573.9	19.69	578.91
MW-14	594.37	Sand and Silty Clay	584.7 to 574.7	15.40	578.97
MW-16	595.80	Sand and Sand/Bottom Ash	584.1 to 574.1	17.72	578.08
MW-22	598.99	Ash/Sand	571.4 to 568.4	18.00	580.99
MW-23	595.57	Ash/Sand	576.9 to 571.9	DRY	
DE Karn Static Water Level					
MW-02	597.34	Sand and Silty Clay	572.5 to 567.5	19.22	578.12
MW-04	598.01	NR	569.5 to 564.5	19.94	578.07
MW-17	597.91	Sand	577.0 to 574.0	14.83	583.08
MW-18	609.22	Silty Sand and Silty Clay	575.8 to 573.8	27.90	581.32
MW-19	597.28	NR	572.1 to 567.1	18.70	578.58
MW-20	632.75	Sand	582.3 to 579.3	54.33	578.42
MW-21	632.91	Sand	587.1 to 584.1	52.50	580.41
OW-01	631.33	NR	572.5 to 567.5	52.92	578.41
OW-02	598.01	Fly Ash	579.4 to 576.4	16.93	581.08
OW-03	597.94	Fly Ash and Sand	573.6 to 568.6	18.04	579.90
OW-04	590.21	Sand and Bottom/Fly Ash	579.1 to 574.1	11.25	578.96
OW-05	593.53	Sand	576.9 to 571.9	15.00	578.53
OW-06	603.95	NR	580.9 to 575.9	23.25	580.70
OW-07	596.41	Ash	583.3 to 580.3	16.23	580.18
OW-08	593.93	NR	581.0 to 576.0	11.28	582.65
OW-09	593.45	NR	585.5 to 580.5	10.45	583.00
OW-13	588.52	NR	579.5 to 574.5	5.40	583.12
OW-15	587.75	NR	572.8 to 567.8	3.50	584.25

Notes:

Survey data from: Rowe Professional Services Company (Nov. 2015) and Consumers Energy Company drawings: SG-21733, Sheet 1, Rev. G (Karn, 11/27/18); and SG=21733, Sheet 2, Rev. C (Weadock, 11/27/18).

Elevation in feet relative to North American Vertical Datum 1988 (NAVD 88).

TOC: Top of well casing.

ft BTOC: Feet below top of well casing.

NM: Not Measured NR: Not Recorded

(1) OW-12 was decommissioned as part of the Karn Lined Impoundment closure activities in September 2024.

Table 2
Summary of Field Parameters
DE Karn Lined Impoundment - Hydrogeological Monitoring Program
Essexville, Michigan

Sample Location	Sample Date	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	pH (SU)	Specific Conductivity (umhos/cm)	Temperature (°C)	Turbidity (NTU)
DE Karn Lined Impoundment							
DEK-MW-15003	3/4/2025	3.69(1)	-98.5	8.5	311	13.0	1.9
DEK-MW-18001	3/4/2025	0.54	117.6	7.4	651	10.0	2.5
OW-10	3/4/2025	3.70(1)	-61.1	7.4	996	10.5	6.3

Notes:
mg/L -Milligrams per Liter.
mV - Millivolts.
SU - Standard Units.
umhos/cm - Micromhos per centimeter.
°C - Degrees Celsius.
NTU - Nephelometric Turbidity Unit
(1) The water quality meter used at this well location was determined to have a bias towards elevated dissolved oxygen readings.

Table 3
Summary of Groundwater Sampling Results (Analytical)
DE Karn Lined Impoundment - Hydrogeological Monitoring Program
Essexville, Michigan

					Sample Location:	**DEK-MW-15003**	**DEK-MW-18001**	**OW-10**
					Sample Date:	3/4/2025	3/4/2025	3/4/2025
Constituent	Unit	EPA MCL	MI Residential*	MI Non-Residential*	MI GSI^	Downgradient		
Appendix III(1)								
Boron	ug/L	NC	**500**	**500**	4,000	**729**	**973**	**1,610**
Calcium	mg/L	NC	NC	NC	500EE	32.3	55.3	193
Chloride	mg/L	250**	250E	250E	**50**	**60.2**	**71.5**	**97.6**
Fluoride	ug/L	4,000	NC	NC	NC	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	250**	250E	250E	500EE	37	182	< 1
Total Dissolved Solids	mg/L	**500****	**500E**	**500E**	**500**	290	**618**	**930**
pH, Field	SU	6.5 - 8.5**	6.5 - 8.5E	6.5 - 8.5E	6.5 - 9.0	8.5	7.4	7.4
Appendix IV(1)								
Antimony	ug/L	6	6.0	6.0	2.0	< 1	< 1	< 1
Arsenic	ug/L	**10**	**10**	**10**	**10**	**358**	**393**	2
Barium	ug/L	2,000	2,000	2,000	1,200	47	147	218
Beryllium	ug/L	4	4.0	4.0	33	< 1	< 1	< 1
Cadmium	ug/L	5	5.0	5.0	2.5	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	100	100	11	< 1	< 1	1
Cobalt	ug/L	NC	40	100	100	< 6	< 6	< 6
Fluoride	ug/L	4,000	NC	NC	NC	< 1,000	< 1,000	< 1,000
Lead	ug/L	NC	4.0	4.0	14	< 1	< 1	< 1
Lithium	ug/L	NC	170	350	440	21	17	40
Mercury	ug/L	2	2.0	2.0	0.20#	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	NC	73	210	120	23	8	< 5
Radium-226	pCi/L	NC	NC	NC	NC	--	--	--
Radium-228	pCi/L	NC	NC	NC	NC	--	--	--
Radium-226/228	pCi/L	5	NC	NC	NC	--	--	--
Selenium	ug/L	50	50	50	5.0	2	2	2
Thallium	ug/L	2	2.0	2.0	2.0	< 2	< 2	< 2
Additional MI Part 115(2)								
Iron	ug/L	**300****	**300E**	**300E**	500,000EE	138	**716**	**5,410**
Copper	ug/L	1,000**	1,000E	1,000E	20	< 1	< 1	2
Nickel	ug/L	NC	100	100	120	< 2	2	6
Silver	ug/L	100**	34	98	0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	NC	4.5	62	27	2	< 2	3
Zinc	ug/L	5,000**	2,400	5,000E	260	< 10	< 10	< 10

Notes:

ug/L - micrograms per liter; mg/L - milligrams per liter.

pCi/L - picocuries per liter; SU - standard units; pH is a field parameter.

MCL - Maximum Contaminant Level, EPA Drinking Water Standards and Health Advisories, April, 2012.

NC - no criteria; -- - not analyzed.

* - Michigan Part 201 Generic Drinking Water Cleanup Criteria, December 30, 2013, updated October 12, 2023.

** - Secondary Maximum Contaminant Level (SMCL), EPA Secondary Drinking Water Regulations (SDWR) April, 2012.

^ - Michigan Part 201 Groundwater Surface Water Interface (GSI) Criteria. Hardness-dependent criteria calculated using hardness of 258 mg CaCO3/L (average of SW-01 [Lake Huron] and SW-02 [Saginaw River] collected in April 2018) per footnote {G} of Michigan Part 201 criteria tables. Chromium GSI criterion based on hexavalent chromium per footnote {H}. GSI criterion is protective for surface water used as a drinking water source as described in footnote {X}. GSI criterion for chloride is 50 mg/L when the discharge is to the Great Lakes or connecting waters per footnote {FF}

- If detected above 0.20 ug/L, further evaluation of low-level mercury may be necessary to evaluate the GSI pathway per Michigan Part 201 and MDEQ policy and procedure 09-014 dated June 20, 2012.

E - Criterion is the aesthetic drinking water value per footnote {E}.

EE - Criterion is based on the total dissolved solids GSI value per footnote {EE}.

(1) 40 CFR Part 257 Appendix III Detection Monitoring Constituents and Appendix IV Assessment Monitoring Constituents.

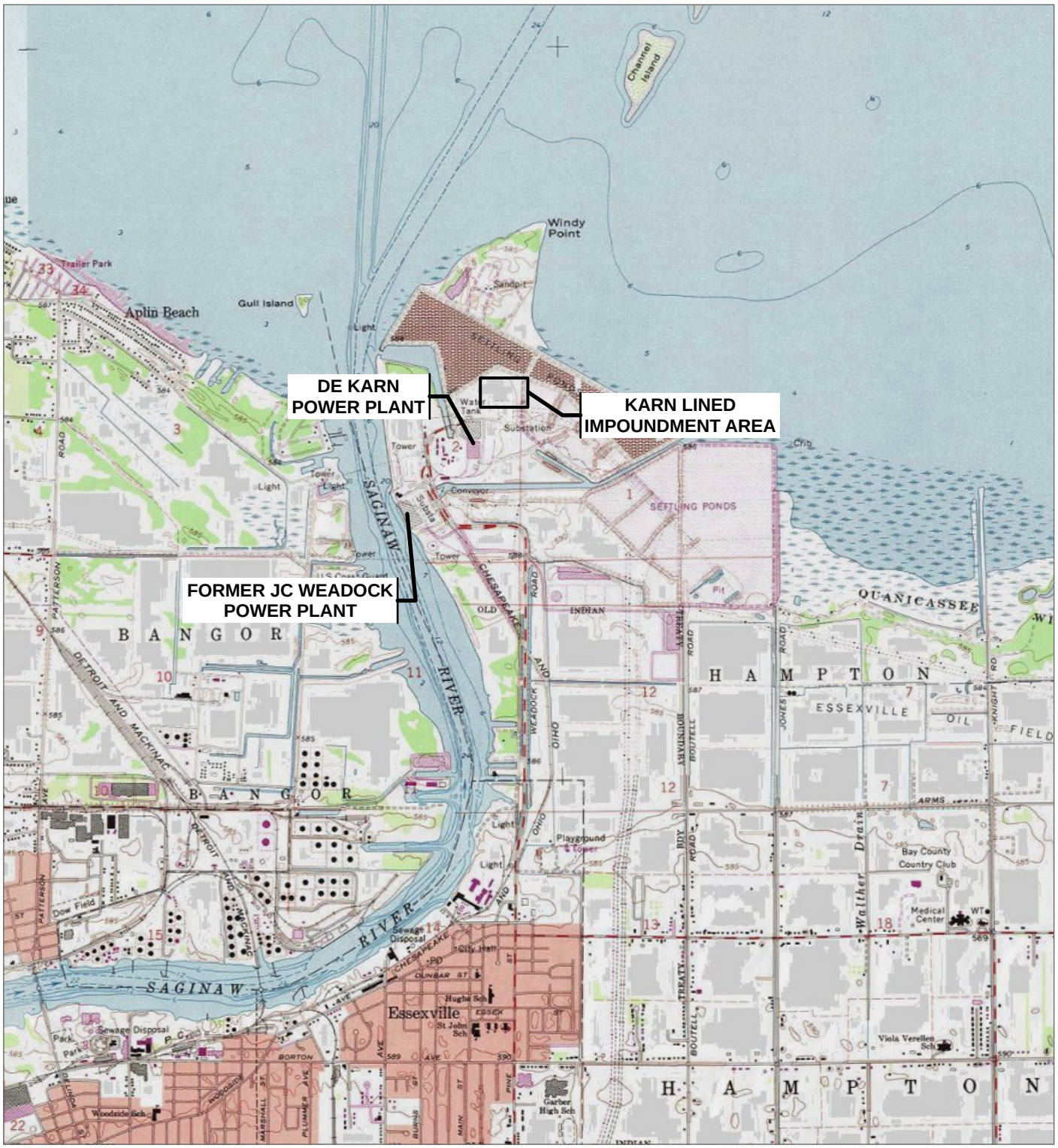
(2) Per Michigan Part 115 Amendment - Public Act No. 640 of 2018 Section 11511a(3)(c) and 11519b(2) additional detection monitoring constituent (iron) and assessment monitoring constituents (copper, nickel, silver, vanadium, and zinc) are reported.

BOLD value indicates an exceedance of one or more of the listed criteria.

RED value indicates an exceedance of the MCL.

All metals were analyzed as total unless otherwise specified.

Figures



BASE MAP: USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE SERIES.

N

0 1,500 3,000

FEET

1:36,000 1" = 3,000'

PROJECT:
CONSUMERS ENERGY COMPANY
DE KARN AND JC WEADOCK POWER PLANTS
ESSEXVILLE, MICHIGAN

TITLE:
SITE LOCATION MAP

DRAWN BY:	A. ADAIR	PROJ. NO.:	553814.0001
CHECKED BY:	A. WHALEY		
APPROVED BY:	D. LITZ		FIGURE 1
DATE:	JANUARY 2025		

TRC
1540 EISENHOWER PLACE
ANN ARBOR, MI 48108-3284
PHONE: 734.971.7080

FILE: DEKARN

COORDINATE SYSTEM: NAD 1983 STATEPLANE MICHIGAN SOUTH FIPS 2113 FEET; MAP ROTATION: 0
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LEGEND

- DEK BOTTOM ASH POND MONITORING WELL
- DEK LINED IMPOUNDMENT MONITORING WELL
- DECOMMISSIONED MONITORING WELL
- MONITORING WELL (STATIC WATER LEVEL ONLY)
- NATURE AND EXTENT WELL
- SURFACE WATER GAUGING STATION
- SLURRY WALL (APPROXIMATE)
- LINED IMPOUNDMENT (COVENANT BOUNDARY)

NOTES

1. BASE MAP IMAGERY FROM GOOGLE SATELLITE IMAGERY, (04/05/2024).
2. WELL LOCATIONS SURVEYED BY ROWE PROFESSIONAL SERVICES COMPANY ON 11/4/2015.
3. NOAA/NATIONAL OCEANIC SERVICE GREAT LAKES GAUGING STATION, ESSEXVILLE, MI (ID: 9075035).
4. A SINGLE WELL SYMBOL IS SHOWN FOR WELL PAIRS MW-01/MW-02 AND MW-03/MW-04 AS THE WELLS ARE LOCATED WITHIN 3-FT OF EACH OTHER.

1:7,200
1" = 600'

0 600 1,200 FEET

PROJECT: CONSUMERS ENERGY COMPANY
DE KARN POWER PLANT
ESSEXVILLE, MICHIGAN

TITLE: SITE LAYOUT MAP

DRAWN BY:	A. ADAIR	PROJ. NO.:	634695.0000
CHECKED BY:	J. KRENZ		FIGURE 2
APPROVED BY:	D. LITZ		
DATE:	APRIL 2025		

TRC
1540 EISENHOWER PLACE
ANN ARBOR, MI 48108-3284
PHONE: 734.971.7080

FILE: 464095_DEKARN.aprx

Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl. Map Rotation: 0
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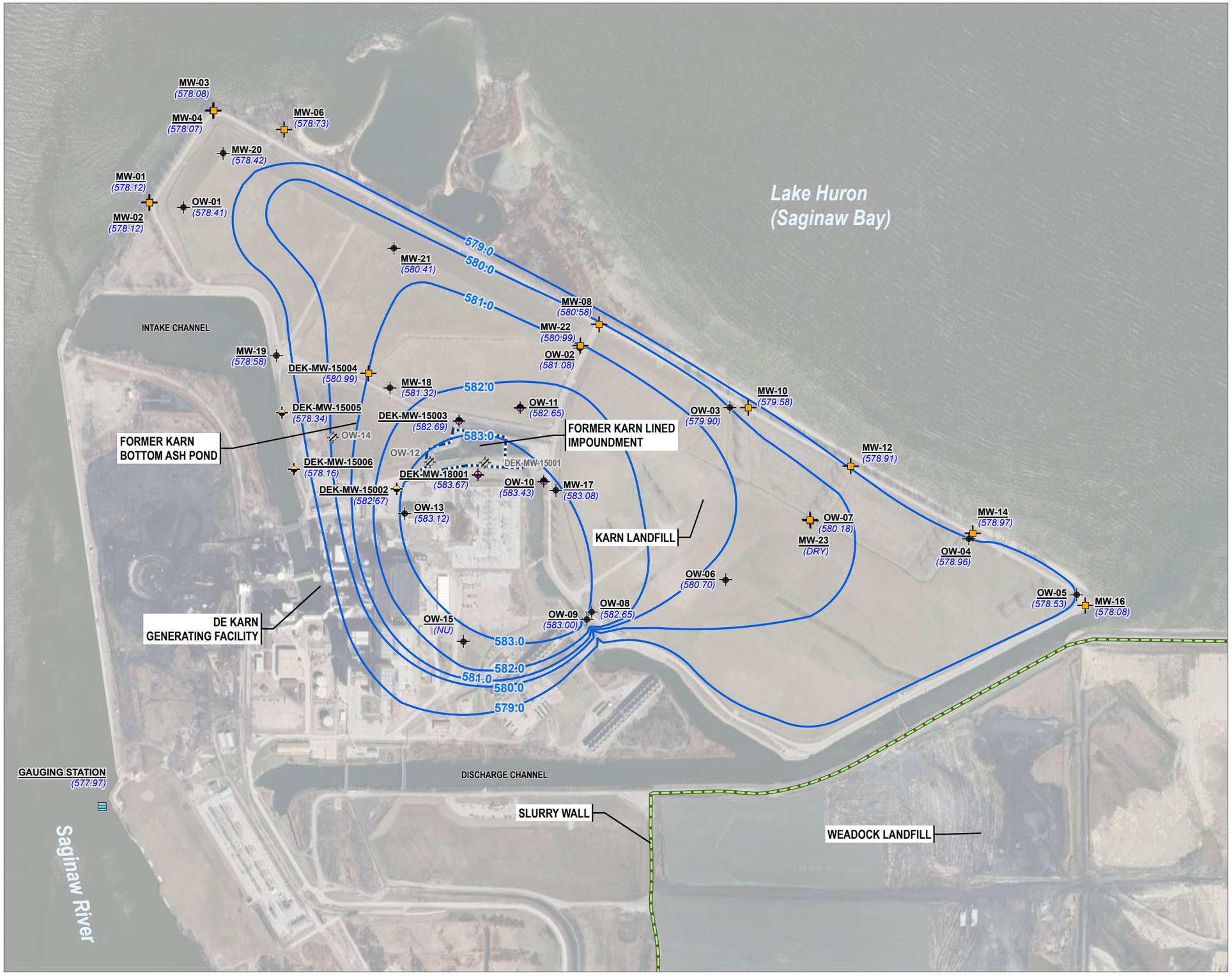

LEGEND

- DEK BOTTOM ASH POND & LINED IMPOUNDMENT MONITORING WELL
- DEK BOTTOM ASH POND MONITORING WELL
- DEK LINED IMPOUNDMENT MONITORING WELL
- DECOMMISSIONED MONITORING WELL
- MONITORING WELL (STATIC WATER LEVEL ONLY)
- NATURE AND EXTENT WELL
- SURFACE WATER GAUGING STATION
- LINED IMPOUNDMENT (COVENANT BOUNDARY)
- SLURRY WALL (APPROXIMATE)
- GROUNDWATER ELEVATION CONTOUR (1' INTERVAL, DASHED WHERE INFERRED)
- (580.21) GROUNDWATER ELEVATION (FEET)
- (NU) NOT USED

NOTES

1. BASE MAP IMAGERY FROM GOOGLE SATELLITE, (4/5/2024).
2. WELL LOCATIONS SURVEYED BY ROWE PROFESSIONAL SERVICES COMPANY ON 11/4/2015.
3. NOAA/NATIONAL OCEANIC SERVICE GREAT LAKES GAUGING STATION, ESSEXVILLE, MI (ID: 9075035).
4. A SINGLE WELL SYMBOL IS SHOWN FOR WELL PAIRS MW-01/MW-02 AND MW-03/MW-04 AS THE WELLS ARE LOCATED WITHIN 3-FT OF EACH OTHER.
5. GROUNDWATER ELEVATIONS DISPLAYED IN FEET RELATIVE TO THE NORTH AMERICAN VERTICAL DATUM OF 1988.

1:7,200
1" = 600'
0 600 1,200 FEET

PROJECT:
CONSUMERS ENERGY COMPANY
DE KARN POWER PLANT
ESSEXVILLE, MICHIGAN

TITLE:
SHALLOW GROUNDWATER CONTOUR MAP
MARCH 2025

DRAWN BY:	A. ADAIR	PROJ. NO.:	634695.0000
CHECKED BY:	J. KRENZ		
APPROVED BY:	D. LITZ		**FIGURE 3**
DATE:	APRIL 2025		

TRC
1540 EISENHOWER PLACE
ANN ARBOR, MI 48108-3284
PHONE: 734.971.7080

FILE: 464095_DEKARN.aprx

Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl; Map Rotation: 0
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Appendix A
Laboratory Analytical Reports

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135 W. Trail St.
Jackson, MI 49201
phone 517-788-1251
fax 517-788-2533

To: JJFirlit, Karn/Weadock

From: EBlaj, T-258

Date: March 18, 2025

Subject: RCRA GROUNDWATER MONITORING – KARN BAP & LINED IMP. WELLS – 2025 Q1

CC: HDRegister, P22-521

Darby Litz, Project Manager
TRC Companies, Inc.
1540 Eisenhower Place
Ann Arbor, MI 48108

Chemistry Project: 25-0101

TRC Environmental, Inc. conducted groundwater monitoring at the DEKarn Bottom Ash Pond and Lined Impoundment Wells area during the week of 03/03/2025, for the 1st Quarter requirement, as specified in the Sampling and Analysis Plan for the site. The samples were received for analysis by the Chemistry department of Laboratory Services on 03/05/2025.

Samples for Total Sulfide have been subcontracted to Merit Laboratories, Inc. and the results are listed under the analyst initials "Merit". Please note that the subcontracted work is not reported under the CE laboratory scope of accreditation.

With the exception noted above, the report that follows presents the results of the requested analytical testing; the results apply only to the samples, as received. All samples have been analyzed in accordance with the 2016 TNI Standard and the applicable A2LA accreditation scope for Laboratory Services. Any exceptions to applicable test method criteria and standard compliance are noted in the Case Narrative or flagged with applicable qualifiers in the analytical results section.

Reviewed and approved by:

Emil Blaj
Sr. Technical Analyst
Project Lead

ilac-MRA A2LA ACCREDITED Certificate #1097.04

Testing performed in accordance with the A2LA scope of accreditation specified in the listed certificate.
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CASE NARRATIVE

I. Sample Receipt

All samples were received within hold time and in good conditions; no anomalies were noted on the attached Sample Log-In Shipment Inspection Form during sample check-in. Identification of all samples included in the work order/project is provided in the sample summary section. All sample preservation and temperature upon receipt was verified by the sample custodian and confirmed to meet method requirements.

II. Methodology

Unless otherwise indicated, sample preparation and analysis was performed in accordance with the corresponding test methods from "Methods for the Determination of Inorganic Substances in Environmental Samples (EPA/600/R-93/100); SW-846, "Test Methods for Evaluating Solid Waste – Physical/Chemical Methods", USEPA (latest revisions), and Standard Methods for the Examination of Water and Wastewater, APHA-AWWA-WPCF, 22nd Edition, 2012.

III. Results/Quality Control

Analytical results for this report are presented by laboratory sample ID, container, & aliquot number. Results for the field blanks, field duplicates, and recoveries of the field matrix spike & matrix spike duplicate samples are included in the results section; all other quality control data is listed in the Quality Control Summary associated with the particular test method, as appropriate. Unless specifically noted in the case narrative, all method quality control requirements have been met. If any results are qualified, the corresponding data flags/qualifiers are listed on the last page of the results section. Any additional information on method performance, when applicable, is presented in this section of the case narrative. When data flags are not needed, the qualifiers text box on the last page is left blank, and a statement confirms that no exceptions occurred.

NOTE: Field Matrix Spike analyte recoveries for Arsenic, Barium, and Iron, were found outside QA/QC limits due to non-homogeneous sample concentration background; the affected analytes have been flagged accordingly in the analytical results section.

DEFINITIONS / QUALIFIERS

The following qualifiers and/or acronyms are used in the report, where applicable:

Acronym	Description
RL	Reporting Limit
ND	Result not detected or below Reporting Limit
NT	Non TNI analyte
LCS	Laboratory Control Sample
LRB	Laboratory Reagent Blank (also referred to as Method Blank)
DUP	Duplicate
MS	Matrix Spike
MSD	Matrix Spike Duplicate
RPD	Relative Percent Difference
MDL	Method Detection Limit

PQL	Practical Quantitation Limit
TDL	Target Detection Limit
SM	Standard Methods Compendium

Qualifier	Description
*	Generic data flag, applicable description added in the corresponding notes section
B	The analyte was detected in the LRB at a level which is significant relative to sample result
D	Reporting limit elevated due to dilution
E	Estimated due to result exceeding the linear range of the analyzer
H	The maximum recommended hold time was exceeded
I	Dilution required due to matrix interference; reporting limit elevated
J	Estimated due to result found above MDL but below PQL (or RL)
K	Reporting limit raised due to matrix interference
M	The precision for duplicate analysis was not met; RPD outside acceptance criteria
N	Non-homogeneous sample made analysis questionable
PI	Possible interference may have affected the accuracy of the laboratory result
Q	Matrix Spike or Matrix Spike Duplicate recovery outside acceptance criteria
R	Result confirmed by new sample preparation and reanalysis
X	Other notation required; comment listed in sample notes and/or case narrative

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Work Order Sample Summary

Customer Name: Karn/Weadock Complex
Work Order ID: Q1-2025 DEK Bottom Ash Pond & Lined Impoundment
Date Received: 3/5/2025
Chemistry Project: 25-0101

Sample #	Field Sample ID	Matrix	Sample Date	Site
25-0101-01	DEK-MW-18001	Groundwater	03/04/2025 08:33	DEK Bottom Ash Pond & Lined Impoundment
25-0101-02	DEK-MW-18001 MS	Groundwater	03/04/2025 08:33	DEK Bottom Ash Pond & Lined Impoundment
25-0101-03	DEK-MW-18001 MSD	Groundwater	03/04/2025 08:33	DEK Bottom Ash Pond & Lined Impoundment

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Work Order Sample Summary

Customer Name: Karn/Weadock Complex
Work Order ID: Q1-2025 DEK Bottom Ash Pond & Lined Impoundment
Date Received: 3/5/2025
Chemistry Project: 25-0101

Sample #	Field Sample ID	Matrix	Sample Date	Site
25-0101-01	DEK-MW-18001	Groundwater	03/04/2025 08:33	DEK Bottom Ash Pond & Lined Impoundment
25-0101-02	DEK-MW-18001 MS	Groundwater	03/04/2025 08:33	DEK Bottom Ash Pond & Lined Impoundment
25-0101-03	DEK-MW-18001 MSD	Groundwater	03/04/2025 08:33	DEK Bottom Ash Pond & Lined Impoundment

Sample Site: **DEK Bottom Ash Pond & Lined Impoundment**
Field Sample ID: **DEK-MW-18001**
Lab Sample ID: 25-0101-01
Matrix: Groundwater

Laboratory Project: **25-0101**
Collect Date: 03/04/2025
Collect Time: 08:33 AM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 25-0101-01-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/09/2025	AB25-0309-02
Arsenic	393		ug/L	1.0	03/09/2025	AB25-0309-02
Barium	147		ug/L	5.0	03/09/2025	AB25-0309-02
Beryllium	ND		ug/L	1.0	03/09/2025	AB25-0309-02
Boron	973		ug/L	20.0	03/09/2025	AB25-0309-02
Cadmium	ND		ug/L	0.2	03/09/2025	AB25-0309-02
Calcium	55300		ug/L	1000.0	03/09/2025	AB25-0309-02
Chromium	ND		ug/L	1.0	03/09/2025	AB25-0309-02
Cobalt	ND		ug/L	6.0	03/09/2025	AB25-0309-02
Copper	ND		ug/L	1.0	03/09/2025	AB25-0309-02
Iron	716		ug/L	20.0	03/09/2025	AB25-0309-02
Lead	ND		ug/L	1.0	03/09/2025	AB25-0309-02
Lithium	17		ug/L	10.0	03/09/2025	AB25-0309-02
Magnesium	11300		ug/L	1000.0	03/09/2025	AB25-0309-02
Manganese	140		ug/L	5.0	03/09/2025	AB25-0309-02
Molybdenum	8		ug/L	5.0	03/09/2025	AB25-0309-02
Nickel	2		ug/L	2.0	03/09/2025	AB25-0309-02
Potassium	5270		ug/L	100.0	03/09/2025	AB25-0309-02
Selenium	2		ug/L	1.0	03/09/2025	AB25-0309-02
Silver	ND		ug/L	0.2	03/09/2025	AB25-0309-02
Sodium	122000		ug/L	1000.0	03/09/2025	AB25-0309-02
Thallium	ND		ug/L	2.0	03/09/2025	AB25-0309-02
Vanadium	ND		ug/L	2.0	03/09/2025	AB25-0309-02
Zinc	ND		ug/L	10.0	03/09/2025	AB25-0309-02

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 25-0101-01-C01-A02 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/11/2025	AB25-0310-05

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 25-0101-01-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	ND		ug/L	100.0	03/05/2025	AB25-0305-06
Nitrite	ND		ug/L	100.0	03/05/2025	AB25-0305-06

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 25-0101-01-C02-A02 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	71500		ug/L	1000.0	03/10/2025	AB25-0310-01

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Analytical Report

Report Date: 03/18/25

Sample Site: **DEK Bottom Ash Pond & Lined Impoundment**
Field Sample ID: **DEK-MW-18001**
Lab Sample ID: 25-0101-01
Matrix: Groundwater

Laboratory Project: **25-0101**
Collect Date: 03/04/2025
Collect Time: 08:33 AM

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 25-0101-01-C02-A02 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	03/05/2025	AB25-0310-01
Sulfate	182000		ug/L	1000.0	03/10/2025	AB25-0310-01

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 25-0101-01-C03-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	2090		ug/L	25.0	03/12/2025	AB25-0312-09

Total Dissolved Solids by SM 2540C

Aliquot #: 25-0101-01-C04-A01 **Analyst: LMO**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	618		mg/L	10.0	03/06/2025	AB25-0306-03

Alkalinity by SM 2320B

Aliquot #: 25-0101-01-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	186000		ug/L	10000.0	03/10/2025	AB25-0310-04
Alkalinity Bicarbonate	186000		ug/L	10000.0	03/10/2025	AB25-0310-04
Alkalinity Carbonate	ND		ug/L	10000.0	03/10/2025	AB25-0310-04

Sulfide, Total by SM 4500 S2D

Aliquot #: 25-0101-01-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	110		ug/L	20.0	03/11/2025	AB25-0312-01

Sample Site: **DEK Bottom Ash Pond & Lined Impoundment**
Field Sample ID: **DEK-MW-18001 MS**
Lab Sample ID: 25-0101-02
Matrix: Groundwater

Laboratory Project: **25-0101**
Collect Date: 03/04/2025
Collect Time: 08:33 AM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 25-0101-02-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	107		%	1.0	03/09/2025	AB25-0309-02
Arsenic	225	Q	%	1.0	03/09/2025	AB25-0309-02
Barium	129	Q	%	5.0	03/09/2025	AB25-0309-02
Beryllium	99		%	1.0	03/09/2025	AB25-0309-02
Boron	106		%	20.0	03/09/2025	AB25-0309-02
Cadmium	111		%	0.2	03/09/2025	AB25-0309-02
Calcium	99.0		%	1000.0	03/09/2025	AB25-0309-02
Chromium	100		%	1.0	03/09/2025	AB25-0309-02
Cobalt	101		%	6.0	03/09/2025	AB25-0309-02
Copper	98		%	1.0	03/09/2025	AB25-0309-02
Iron	963	Q	%	20.0	03/09/2025	AB25-0309-02
Lead	99		%	1.0	03/09/2025	AB25-0309-02
Lithium	97		%	10.0	03/09/2025	AB25-0309-02
Magnesium	103		%	1000.0	03/09/2025	AB25-0309-02
Manganese	105		%	5.0	03/09/2025	AB25-0309-02
Molybdenum	114		%	5.0	03/09/2025	AB25-0309-02
Nickel	100		%	2.0	03/09/2025	AB25-0309-02
Potassium	101		%	100.0	03/09/2025	AB25-0309-02
Selenium	101		%	1.0	03/09/2025	AB25-0309-02
Silver	104		%	0.2	03/09/2025	AB25-0309-02
Sodium	107		%	1000.0	03/09/2025	AB25-0309-02
Thallium	101		%	2.0	03/09/2025	AB25-0309-02
Vanadium	105		%	2.0	03/09/2025	AB25-0309-02
Zinc	102		%	10.0	03/09/2025	AB25-0309-02

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 25-0101-02-C01-A02 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	100.0		%	0.2	03/11/2025	AB25-0310-05

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 25-0101-02-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	97		%	100.0	03/05/2025	AB25-0305-06
Nitrite	103		%	100.0	03/05/2025	AB25-0305-06

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 25-0101-02-C02-A02 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	108		%	1000.0	03/10/2025	AB25-0310-01

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Analytical Report

Report Date: 03/18/25

Sample Site:	**DEK Bottom Ash Pond & Lined Impoundment**	Laboratory Project:	**25-0101**
Field Sample ID:	**DEK-MW-18001 MS**	Collect Date:	03/04/2025
Lab Sample ID:	25-0101-02	Collect Time:	08:33 AM
Matrix:	Groundwater		

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 25-0101-02-C02-A02 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	93		%	1000.0	03/05/2025	AB25-0310-01
Sulfate	114		%	1000.0	03/10/2025	AB25-0310-01

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 25-0101-02-C03-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	95		%	25.0	03/12/2025	AB25-0312-09

Alkalinity by SM 2320B

Aliquot #: 25-0101-02-C04-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	95.7		%	10000.0	03/10/2025	AB25-0310-04

Sulfide, Total by SM 4500 S2D

Aliquot #: 25-0101-02-C06-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	110		%	20.0	03/11/2025	AB25-0312-01

Sample Site: **DEK Bottom Ash Pond & Lined Impoundment**
Field Sample ID: **DEK-MW-18001 MSD**
Lab Sample ID: 25-0101-03
Matrix: Groundwater

Laboratory Project: **25-0101**
Collect Date: 03/04/2025
Collect Time: 08:33 AM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 25-0101-03-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	107		%	1.0	03/09/2025	AB25-0309-02
Arsenic	98		%	1.0	03/09/2025	AB25-0309-02
Barium	106		%	5.0	03/09/2025	AB25-0309-02
Beryllium	97		%	1.0	03/09/2025	AB25-0309-02
Boron	106		%	20.0	03/09/2025	AB25-0309-02
Cadmium	111		%	0.2	03/09/2025	AB25-0309-02
Calcium	98.6		%	1000.0	03/09/2025	AB25-0309-02
Chromium	99		%	1.0	03/09/2025	AB25-0309-02
Cobalt	101		%	6.0	03/09/2025	AB25-0309-02
Copper	96		%	1.0	03/09/2025	AB25-0309-02
Iron	94		%	20.0	03/09/2025	AB25-0309-02
Lead	98		%	1.0	03/09/2025	AB25-0309-02
Lithium	98		%	10.0	03/09/2025	AB25-0309-02
Magnesium	102		%	1000.0	03/09/2025	AB25-0309-02
Manganese	100		%	5.0	03/09/2025	AB25-0309-02
Molybdenum	113		%	5.0	03/09/2025	AB25-0309-02
Nickel	98		%	2.0	03/09/2025	AB25-0309-02
Potassium	100		%	100.0	03/09/2025	AB25-0309-02
Selenium	99		%	1.0	03/09/2025	AB25-0309-02
Silver	104		%	0.2	03/09/2025	AB25-0309-02
Sodium	104		%	1000.0	03/09/2025	AB25-0309-02
Thallium	101		%	2.0	03/09/2025	AB25-0309-02
Vanadium	105		%	2.0	03/09/2025	AB25-0309-02
Zinc	101		%	10.0	03/09/2025	AB25-0309-02

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 25-0101-03-C01-A02 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	100.0		%	0.2	03/11/2025	AB25-0310-05

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 25-0101-03-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	97		%	100.0	03/05/2025	AB25-0305-06
Nitrite	104		%	100.0	03/05/2025	AB25-0305-06

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 25-0101-03-C02-A02 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	108		%	1000.0	03/10/2025	AB25-0310-01

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Analytical Report

Report Date: 03/18/25

Sample Site:	**DEK Bottom Ash Pond & Lined Impoundment**	Laboratory Project:	**25-0101**
Field Sample ID:	**DEK-MW-18001 MSD**	Collect Date:	03/04/2025
Lab Sample ID:	25-0101-03	Collect Time:	08:33 AM
Matrix:	Groundwater		

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 25-0101-03-C02-A02 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	93		%	1000.0	03/05/2025	AB25-0310-01
Sulfate	114		%	1000.0	03/10/2025	AB25-0310-01

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 25-0101-03-C03-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	96		%	25.0	03/12/2025	AB25-0312-09

Alkalinity by SM 2320B

Aliquot #: 25-0101-03-C04-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	95.3		%	10000.0	03/10/2025	AB25-0310-04

Sulfide, Total by SM 4500 S2D

Aliquot #: 25-0101-03-C06-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	115		%	20.0	03/11/2025	AB25-0312-01

Data Qualifiers	Exception Summary
Q = Field Matrix Spike recovery outside acceptance criteria.	No other exceptions occurred.

General Standard Operating Procedure

TITLE: SAMPLE LOG-IN – SHIPMENT INSPECTION FORM

Project Number: 25-0101 **Inspection Date:** 3.05.25 **Inspection By:** LMO

Sample Origin/Project Name: Q1-2025 DEK Bottom Ash Pond - Lined Impound

Shipment Delivered By: Enter the type of shipment carrier.

Inter-Company Mail_____ FedEx ✓ UPS _____ USPS _____

Tracking Number: 2860 7423 1924 Other/Carry In (whom) _____

Shipping Containers: Enter the type and number of shipping containers received.

Cooler ✓ Cardboard Box _____ Custom Case _____ Envelope/Mailer _____

Loose/Unpackaged Containers _____ Other _____

Condition of Shipment: Enter the as-received condition of the shipment container.

Damaged Shipment Observed: None ✓ Dented _____ Leaking _____

Other _____

Shipment Security: Enter if any of the shipping containers were opened before receipt.

Shipping Containers Received: Opened _____ Sealed ✓ N/A _____

Enclosed Documents: Enter the type of documents enclosed with the shipment.

CoC ✓ Work Request _____ Air Data Sheet_____ Other_____

Temperature of Containers: Measure the temperature of several sample containers.

As-Received Temperature Range 0.9-1.4 °C Samples Received on Ice: Yes ✓ No_____

M&TE # and Expiration 45028757 / 1.16.25

Number and Type of Containers: Enter the type and total number of sample containers received.

Container Type	Water	Soil	Other	Broken	Leaking
VOA (40mL or 60mL)	6				
Quart/Liter (g / p)					
9-oz (amber glass jar)					
2-oz (amber glass)					
125 mL (plastic)	12				
24 mL vial (glass)					
250 mL (plastic)	1				
Other					

All sample pH meeting criteria? Yes ✓ No___ N/A___ **pH paper lot #** 210224 **Exp. Date** 12.01.26

Indicate if an Exception Report (Page 2 of 2) is needed: Yes _____ No ✓

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Page 1 of 1

SAMPLING SITE / CUSTOMER: Q1-2025 DEK Bottom Ash Pond & Lined Impound.	PROJECT NUMBER: 25-0101
	SAP CC or WO#:
	REQUESTER: Harold Register
SAMPLING TEAM:	TURNAROUND TIME REQUIRED: ☐ 24 HR ☐ 48 HR ☐ 3 DAYS ☐ STANDARD ☒ OTHER _____
SEND REPORT TO: Joseph Firlit	email: phone:
COPY TO: Harold Register; TRC	

MATRIX CODES: GW = Groundwater; WW = Wastewater; W = Water / Aqueous Liquid; S = Soil / General Solid; O = Oil; OX = Other _____; SL = Sludge; A = Air; WP = Wipe; WT = General Waste

LAB SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	MATRIX	FIELD SAMPLE ID / LOCATION	CONTAINERS TOTAL #	PRESERVATIVE None	HNO_3	H_2SO_4	NaOH	HCl	MeOH	Other	Total Metals	Anions	Ammonia	TDS	Alkalinity	Sulfide			
25-0101-01	3-4-25	0833	GW	DEK-MW-18001	7	4	1	1	1				x	x	x	x	x	x			
-02	↓	0833	GW	DEK-MW-18001 MS	6	3	1	1	1				x	x	x		x	x			
-03	↓	0833	GW	DEK-MW-18001 MSD	6	3	1	1	1				x	x	x		x	x			

ANALYSIS REQUESTED (Attach List if More Space is Needed)

QA REQUIREMENT:
☐ NPDES
☒ TNI
☐ ISO 17025
☐ 10 CFR 50 APP. B
☐ INTERNAL INFO
☐ OTHER _____

REMARKS

RELINQUISHED BY:	DATE/TIME: 3-4-25 / 1645	RECEIVED BY: Fed Ex
RELINQUISHED BY: Fed Ex	DATE/TIME: 03-05-25 / 10:29	RECEIVED BY:

COMMENTS:

Received on Ice? ☑ Yes ☐ No M&TE #: LS028757

Temperature: 0.9 - 1.4 °C Cal. Due Date: 01-16-26

Analytical Laboratory Report

Report ID: S72101.01(01)
Generated on 03/12/2025

Report to

Attention: Emil Blaj
Consumers Energy Company
135 West Trail Street
Jackson, MI 49201

Phone: D:517-788-5888 C:517-684-9467 FAX:
Email: emil.blaj@cmsenergy.com

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S72101.01-S72101.03
Project: 25-0101 PR#25030245
Collected Date(s): 03/04/2025
Submitted Date/Time: 03/06/2025 15:27
Sampled by: Unknown
P.O. #: 4400131511

Table of Contents

Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Starred (*) analytes are not NY NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.
All accreditations/certifications held by this laboratory are listed on page 3. Not all accreditations/certifications are applicable to this report.
For a specific list of accredited analytes, please feel free to contact the laboratory or visit https://www.meritlabs.com/certifications.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Accreditations (For Reference Only)

Authority	Accreditation ID
Michigan DEQ	#9956
DOD ELAP & ISO/IEC 17025:2017	#69699 PJLA Testing
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
o	Associated EIS outside of control limits
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
q	Qualifier ion ratio outside of control limits
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
SM4500-S2 D	Standard Method 4500 S2 D 2021

Analytical Laboratory Report

Sample Summary (3 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S72101.01	DEK-MW-18001 (25-0101-01)	Groundwater	03/04/25 08:33
S72101.02	DEK-MW-18001 Field MS (25-0101-02)	Groundwater	03/04/25 08:33
S72101.03	DEK-MW-18001 Field MSD (25-0101-03)	Groundwater	03/04/25 08:33

Analytical Laboratory Report

Lab Sample ID: S72101.01
Sample Tag: DEK-MW-18001 (25-0101-01)
Collected Date/Time: 03/04/2025 08:33
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125mL Plastic	NaOH/Zn Acetate	Yes	4.4	IR

Inorganics

Method: SM4500-S2 D, Run Date: 03/11/25 14:49, Analyst: MDG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	0.11	0.02		mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S72101.02
Sample Tag: DEK-MW-18001 Field MS (25-0101-02)
Collected Date/Time: 03/04/2025 08:33
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125mL Plastic	NaOH/Zn Acetate	Yes	4.4	IR

Inorganics

Method: SM4500-S2 D, Run Date: 03/11/25 14:56, Analyst: MDG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	0.33	0.02		mg/L	1	18496-25-8	1

1-*Sample Spiked @ 0.200ppm level

Analytical Laboratory Report

Lab Sample ID: S72101.03
Sample Tag: DEK-MW-18001 Field MSD (25-0101-03)
Collected Date/Time: 03/04/2025 08:33
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125mL Plastic	NaOH/Zn Acetate	Yes	4.4	IR

Inorganics

Method: SM4500-S2 D, Run Date: 03/11/25 15:03, Analyst: MDG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	0.34	0.02		mg/L	1	18496-25-8	1

1-*Sample Spiked @ 0.200ppm level

Merit Laboratories Login Checklist

Lab Set ID: S72101
Client: CONSUMERS (Consumers Energy Company)
Project: 25-0101 PR#25030245
Submitted: 03/06/2025 15:27 Login User: MMC

Attention: Emil Blaj
Address: Consumers Energy Company
135 West Trail Street
Jackson, MI 49201

Phone: D:517-788-5888 FAX:
Email: emil.blaj@cmsenergy.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 4.4
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[X] Yes	[ ] No	[ ] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[ ] Yes	[X] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC, TOX, DO or Alkalinity bottles contain	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories Bottle Preservation Check

Lab Set ID: S72101 Submitted: 03/06/2025 15:27

Client: CONSUMERS (Consumers Energy Company)

Project: 25-0101 PR#25030245

Initial Preservation Check: 03/06/2025 16:11 MMC

Preservation Recheck (E200.8): N/A

Attention: Emil Blaj
Address: Consumers Energy Company
135 West Trail Street
Jackson, MI 49201

Phone: D:517-788-5888 FAX:
Email: emil.blaj@cmsenergy.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S72101.01	125mL Plastic NaOH/Zn Acetate	>12			
S72101.02	125mL Plastic NaOH/Zn Acetate	>12			
S72101.03	125mL Plastic NaOH/Zn Acetate	>12			

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Emil Blaj
COMPANY: Consumers Energy
ADDRESS: 135 W. Trail Street
CITY: Jackson STATE: MI ZIP CODE: 49201
PHONE NO.: 517-788-5888 FAX NO.: 517-788-2533 P.O. NO.: 4400131511
E-MAIL ADDRESS: emil.blaj@cmsenergy.com QUOTE NO.:

INVOICE TO

CONTACT NAME: ☒ SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

PROJECT NO./NAME: 25-0101 PR#25030245
SAMPLER(S) - PLEASE PRINT/SIGN NAME: N/A

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES

Project Locations: ☐ Detroit ☐ New York ☐ Other

MERIT LAB NO. FOR LAB USE ONLY	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	Total Sulfide	Special Instructions
72101.01	03/04/25	0833	DEK-MW-18001 (25-0101-01)	GW	1					1			✓	preserved with NaOH/ZnAcetate
.02	03/04/25	0833	DEK-MW-18001 Field MS (25-0101-02)	GW	1					1			✓	"
.03	03/04/25	0833	DEK-MW-18001 Field MSD (25-0101-03)	GW	1					1			✓	"
														Please spike MS/MSD and report
														spike concentration, or % recov.

RELINQUISHED BY: SIGNATURE/ORGANIZATION	CONSUMERS ENERGY ☐ Sampler	DATE 03-06-25	TIME 1527	
RECEIVED BY: SIGNATURE/ORGANIZATION	M Chilcote	DATE 3/6/25	TIME 1527	
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME	
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME	

RELINQUISHED BY: SIGNATURE/ORGANIZATION			DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION			DATE	TIME
SEAL NO.	SEAL INTACT YES☐ NO☐	INITIALS	NOTES:	TEMP. ON ARRIVAL 4.4
SEAL NO.	SEAL INTACT YES☐ NO☐	INITIALS		

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

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135 W. Trail St.
Jackson, MI 49201
phone 517-788-1251
fax 517-788-2533

To: JJFirlit, Karn/Weadock

From: EBlaj, T-258

Date: March 18, 2025

Subject: RCRA GROUNDWATER MONITORING – KARN LINED IMPOUNDMENT – 2025 Q1

CC: HDRegister, P22-521

Darby Litz, Project Manager
TRC Companies, Inc.
1540 Eisenhower Place
Ann Arbor, MI 48108

Chemistry Project: 25-0102R

TRC Environmental, Inc. conducted groundwater monitoring at the DE Karn Lined Impoundment area during the week of 03/05/2025 for the 1st Quarter requirement, as specified in the Sampling and Analysis Plan for the site. The samples were received for analysis by the Chemistry department of Laboratory Services on 03/05/2025.

Samples for Total Sulfide have been subcontracted to Merit Laboratories, Inc. and the results are listed under the analyst initials "Merit". Please note that the subcontracted work is not reported under the CE laboratory scope of accreditation.

With the exception noted above, the report that follows presents the results of the requested analytical testing; the results apply only to the samples as received. All samples have been analyzed in accordance with the 2016 TNI Standard and the applicable A2LA accreditation scope for Laboratory Services. Any exceptions to applicable test method criteria and standard compliance are noted in the Case Narrative or flagged with applicable qualifiers in the analytical results section.

Reviewed and approved by:

Digitally signed
by Emil Blaj
Date: 2025.04.28
21:57:31 -04'00'

Emil Blaj
Sr. Technical Analyst
Project Lead

ilac-MRA A2LA ACCREDITED Certificate #1097.04

Testing performed in accordance with the A2LA scope of accreditation specified in the listed certificate.
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CASE NARRATIVE

I. Sample Receipt

All samples were received within hold time and in good conditions; no anomalies were noted in the attached Sample Log-In Shipment Inspection Form during sample check-in. Identification of all samples included in the work order/project is provided in the sample summary section. All sample preservation and temperature upon receipt was verified by the sample custodian and confirmed to meet method requirements.

II. Methodology

Unless otherwise indicated, sample preparation and analysis was performed in accordance with the corresponding test methods from "Methods for the Determination of Inorganic Substances in Environmental Samples (EPA/600/R-93/100); SW-846, "Test Methods for Evaluating Solid Waste – Physical/Chemical Methods", USEPA (latest revisions), and Standard Methods for the Examination of Water and Wastewater, APHA-AWWA-WPCF, 22nd Edition, 2012.

III. Results/Quality Control

Analytical results for this report are presented by laboratory sample ID, container, & aliquot number. Results for the field blanks, field duplicates, and recoveries of the field matrix spike & matrix spike duplicate samples are included in the results section; all other quality control data is listed in the Quality Control Summary associated with the particular test method, as appropriate. Unless specifically noted in the case narrative, all method quality control requirements have been met. If any results are qualified, the corresponding data flags/qualifiers are listed on the last page of the results section. Any additional information on method performance, when applicable, is presented in this section of the case narrative. When data flags are not needed, the qualifiers text box on the last page is left blank, and a statement confirms that no exceptions occurred.

DEFINITIONS / QUALIFIERS

The following qualifiers and/or acronyms are used in the report, where applicable:

Acronym	Description
RL	Reporting Limit
ND	Result not detected or below Reporting Limit
NT	Non TNI analyte
LCS	Laboratory Control Sample
LRB	Laboratory Reagent Blank (also referred to as Method Blank)
DUP	Duplicate
MS	Matrix Spike
MSD	Matrix Spike Duplicate
RPD	Relative Percent Difference
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
TDL	Target Detection Limit
SM	Standard Methods Compendium

Qualifier	Description
*	Generic data flag, applicable description added in the corresponding notes section
B	The analyte was detected in the LRB at a level which is significant relative to sample result
D	Reporting limit elevated due to dilution
E	Estimated due to result exceeding the linear range of the analyzer
H	The maximum recommended hold time was exceeded
I	Dilution required due to matrix interference; reporting limit elevated
J	Estimated due to result found above MDL but below PQL (or RL)
K	Reporting limit raised due to matrix interference
M	The precision for duplicate analysis was not met; RPD outside acceptance criteria
N	Non-homogeneous sample made analysis questionable
PI	Possible interference may have affected the accuracy of the laboratory result
Q	Matrix Spike or Matrix Spike Duplicate recovery outside acceptance criteria
R	Result confirmed by new sample preparation and reanalysis
X	Other notation required; comment listed in sample notes and/or case narrative

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Work Order Sample Summary

Customer Name: Karn/Weadock Complex
Work Order ID: Q1-2025 DEK Lined Impoundment
Date Received: 3/5/2025
Chemistry Project: 25-0102

Sample #	Field Sample ID	Matrix	Sample Date	Site
25-0102-01	DEK-MW-15003	Groundwater	03/04/2025 14:08	DEK Lined Impoundment
25-0102-02	OW-10	Groundwater	03/04/2025 12:51	DEK Lined Impoundment
25-0102-03	OW-11	Not Collected		DEK Lined Impoundment
25-0102-06	DUP-KLI	Groundwater	03/04/2025 00:00	DEK Lined Impoundment
25-0102-07	EB-KLI	Water	03/04/2025 14:13	DEK Lined Impoundment
25-0102-08	FB-KLI	Water	03/04/2025 12:51	DEK Lined Impoundment

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Analytical Report

Report Date: 03/18/25

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **DEK-MW-15003**
Lab Sample ID: 25-0102-01
Matrix: Groundwater

Laboratory Project: **25-0102**
Collect Date: 03/04/2025
Collect Time: 02:08 PM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 25-0102-01-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/09/2025	AB25-0309-02
Arsenic	358		ug/L	1.0	03/09/2025	AB25-0309-02
Barium	47		ug/L	5.0	03/09/2025	AB25-0309-02
Beryllium	ND		ug/L	1.0	03/09/2025	AB25-0309-02
Boron	729		ug/L	20.0	03/09/2025	AB25-0309-02
Cadmium	ND		ug/L	0.2	03/09/2025	AB25-0309-02
Calcium	32300		ug/L	1000.0	03/09/2025	AB25-0309-02
Chromium	ND		ug/L	1.0	03/09/2025	AB25-0309-02
Cobalt	ND		ug/L	6.0	03/09/2025	AB25-0309-02
Copper	ND		ug/L	1.0	03/09/2025	AB25-0309-02
Iron	138		ug/L	20.0	03/09/2025	AB25-0309-02
Lead	ND		ug/L	1.0	03/09/2025	AB25-0309-02
Lithium	21		ug/L	10.0	03/09/2025	AB25-0309-02
Magnesium	4800		ug/L	1000.0	03/09/2025	AB25-0309-02
Manganese	63		ug/L	5.0	03/09/2025	AB25-0309-02
Molybdenum	23		ug/L	5.0	03/09/2025	AB25-0309-02
Nickel	ND		ug/L	2.0	03/09/2025	AB25-0309-02
Potassium	4540		ug/L	100.0	03/09/2025	AB25-0309-02
Selenium	2		ug/L	1.0	03/09/2025	AB25-0309-02
Silver	ND		ug/L	0.2	03/09/2025	AB25-0309-02
Sodium	56100		ug/L	1000.0	03/09/2025	AB25-0309-02
Thallium	ND		ug/L	2.0	03/09/2025	AB25-0309-02
Vanadium	2		ug/L	2.0	03/09/2025	AB25-0309-02
Zinc	ND		ug/L	10.0	03/09/2025	AB25-0309-02

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 25-0102-01-C01-A02 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/11/2025	AB25-0310-05

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 25-0102-01-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	ND		ug/L	100.0	03/05/2025	AB25-0305-06
Nitrite	ND		ug/L	100.0	03/05/2025	AB25-0305-06

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 25-0102-01-C02-A02 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	60200		ug/L	1000.0	03/10/2025	AB25-0310-01

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Analytical Report

Report Date: 03/18/25

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **DEK-MW-15003**
Lab Sample ID: 25-0102-01
Matrix: Groundwater

Laboratory Project: **25-0102**
Collect Date: 03/04/2025
Collect Time: 02:08 PM

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 25-0102-01-C02-A02 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	03/05/2025	AB25-0310-01
Sulfate	37000		ug/L	1000.0	03/10/2025	AB25-0310-01

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 25-0102-01-C03-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	1880		ug/L	25.0	03/12/2025	AB25-0312-09

Total Dissolved Solids by SM 2540C

Aliquot #: 25-0102-01-C04-A01 **Analyst: LMO**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	290		mg/L	10.0	03/06/2025	AB25-0306-03

Alkalinity by SM 2320B

Aliquot #: 25-0102-01-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	102000		ug/L	10000.0	03/12/2025	AB25-0312-03
Alkalinity Bicarbonate	102000		ug/L	10000.0	03/12/2025	AB25-0312-03
Alkalinity Carbonate	ND		ug/L	10000.0	03/12/2025	AB25-0312-03

Sulfide, Total by SM 4500 S2D

Aliquot #: 25-0102-01-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	370		ug/L	20.0	03/11/2025	AB25-0312-01

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Analytical Report

Report Date: 03/18/25

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **OW-10**
Lab Sample ID: 25-0102-02
Matrix: Groundwater

Laboratory Project: **25-0102**
Collect Date: 03/04/2025
Collect Time: 12:51 PM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 25-0102-02-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/09/2025	AB25-0309-02
Arsenic	2		ug/L	1.0	03/09/2025	AB25-0309-02
Barium	218		ug/L	5.0	03/09/2025	AB25-0309-02
Beryllium	ND		ug/L	1.0	03/09/2025	AB25-0309-02
Boron	1610		ug/L	20.0	03/09/2025	AB25-0309-02
Cadmium	ND		ug/L	0.2	03/09/2025	AB25-0309-02
Calcium	193000		ug/L	1000.0	03/09/2025	AB25-0309-02
Chromium	1		ug/L	1.0	03/09/2025	AB25-0309-02
Cobalt	ND		ug/L	6.0	03/09/2025	AB25-0309-02
Copper	2		ug/L	1.0	03/09/2025	AB25-0309-02
Iron	5410		ug/L	20.0	03/09/2025	AB25-0309-02
Lead	ND		ug/L	1.0	03/09/2025	AB25-0309-02
Lithium	40		ug/L	10.0	03/09/2025	AB25-0309-02
Magnesium	36300		ug/L	1000.0	03/09/2025	AB25-0309-02
Manganese	998		ug/L	5.0	03/09/2025	AB25-0309-02
Molybdenum	ND		ug/L	5.0	03/09/2025	AB25-0309-02
Nickel	6		ug/L	2.0	03/09/2025	AB25-0309-02
Potassium	7690		ug/L	100.0	03/09/2025	AB25-0309-02
Selenium	2		ug/L	1.0	03/09/2025	AB25-0309-02
Silver	ND		ug/L	0.2	03/09/2025	AB25-0309-02
Sodium	81600		ug/L	1000.0	03/09/2025	AB25-0309-02
Thallium	ND		ug/L	2.0	03/09/2025	AB25-0309-02
Vanadium	3		ug/L	2.0	03/09/2025	AB25-0309-02
Zinc	ND		ug/L	10.0	03/09/2025	AB25-0309-02

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 25-0102-02-C01-A02 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/11/2025	AB25-0310-05

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 25-0102-02-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	ND		ug/L	100.0	03/05/2025	AB25-0305-06
Nitrite	ND		ug/L	100.0	03/05/2025	AB25-0305-06

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 25-0102-02-C02-A02 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	97600		ug/L	1000.0	03/10/2025	AB25-0310-01

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Analytical Report

Report Date: 03/18/25

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **OW-10**
Lab Sample ID: 25-0102-02
Matrix: Groundwater

Laboratory Project: **25-0102**
Collect Date: 03/04/2025
Collect Time: 12:51 PM

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 25-0102-02-C02-A02 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	03/05/2025	AB25-0310-01
Sulfate	ND		ug/L	1000.0	03/10/2025	AB25-0310-01

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 25-0102-02-C03-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	4560		ug/L	25.0	03/12/2025	AB25-0312-09

Total Dissolved Solids by SM 2540C

Aliquot #: 25-0102-02-C04-A01 **Analyst: LMO**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	930		mg/L	10.0	03/06/2025	AB25-0306-03

Alkalinity by SM 2320B

Aliquot #: 25-0102-02-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	738000		ug/L	10000.0	03/12/2025	AB25-0312-03
Alkalinity Bicarbonate	738000		ug/L	10000.0	03/12/2025	AB25-0312-03
Alkalinity Carbonate	ND		ug/L	10000.0	03/12/2025	AB25-0312-03

Sulfide, Total by SM 4500 S2D

Aliquot #: 25-0102-02-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	110		ug/L	20.0	03/11/2025	AB25-0312-01

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Analytical Report

Report Date: 03/18/25

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **DUP-KLI**
Lab Sample ID: 25-0102-06
Matrix: Groundwater

Laboratory Project: **25-0102**
Collect Date: 03/04/2025
Collect Time: 12:00 AM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 25-0102-06-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/09/2025	AB25-0309-02
Arsenic	379		ug/L	1.0	03/09/2025	AB25-0309-02
Barium	48		ug/L	5.0	03/09/2025	AB25-0309-02
Beryllium	ND		ug/L	1.0	03/09/2025	AB25-0309-02
Boron	724		ug/L	20.0	03/09/2025	AB25-0309-02
Cadmium	ND		ug/L	0.2	03/09/2025	AB25-0309-02
Calcium	31600		ug/L	1000.0	03/09/2025	AB25-0309-02
Chromium	ND		ug/L	1.0	03/09/2025	AB25-0309-02
Cobalt	ND		ug/L	6.0	03/09/2025	AB25-0309-02
Copper	ND		ug/L	1.0	03/09/2025	AB25-0309-02
Iron	132		ug/L	20.0	03/09/2025	AB25-0309-02
Lead	ND		ug/L	1.0	03/09/2025	AB25-0309-02
Lithium	21		ug/L	10.0	03/09/2025	AB25-0309-02
Magnesium	4790		ug/L	1000.0	03/09/2025	AB25-0309-02
Manganese	68		ug/L	5.0	03/09/2025	AB25-0309-02
Molybdenum	24		ug/L	5.0	03/09/2025	AB25-0309-02
Nickel	ND		ug/L	2.0	03/09/2025	AB25-0309-02
Potassium	4550		ug/L	100.0	03/09/2025	AB25-0309-02
Selenium	1		ug/L	1.0	03/09/2025	AB25-0309-02
Silver	ND		ug/L	0.2	03/09/2025	AB25-0309-02
Sodium	56800		ug/L	1000.0	03/09/2025	AB25-0309-02
Thallium	ND		ug/L	2.0	03/09/2025	AB25-0309-02
Vanadium	2		ug/L	2.0	03/09/2025	AB25-0309-02
Zinc	ND		ug/L	10.0	03/09/2025	AB25-0309-02

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 25-0102-06-C01-A02 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/11/2025	AB25-0310-05

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 25-0102-06-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	ND		ug/L	100.0	03/05/2025	AB25-0305-06
Nitrite	ND		ug/L	100.0	03/05/2025	AB25-0305-06

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 25-0102-06-C02-A02 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	59800		ug/L	1000.0	03/10/2025	AB25-0310-01

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Analytical Report

Report Date: 03/18/25

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **DUP-KLI**
Lab Sample ID: 25-0102-06
Matrix: Groundwater

Laboratory Project: **25-0102**
Collect Date: 03/04/2025
Collect Time: 12:00 AM

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous

Aliquot #: 25-0102-06-C02-A02 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	03/05/2025	AB25-0310-01
Sulfate	37000		ug/L	1000.0	03/10/2025	AB25-0310-01

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 25-0102-06-C03-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	1950		ug/L	25.0	03/12/2025	AB25-0312-09

Total Dissolved Solids by SM 2540C

Aliquot #: 25-0102-06-C04-A01 **Analyst: LMO**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	286		mg/L	10.0	03/06/2025	AB25-0306-03

Alkalinity by SM 2320B

Aliquot #: 25-0102-06-C05-A01 **Analyst: DLS**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	103000		ug/L	10000.0	03/12/2025	AB25-0312-03
Alkalinity Bicarbonate	103000		ug/L	10000.0	03/12/2025	AB25-0312-03
Alkalinity Carbonate	ND		ug/L	10000.0	03/12/2025	AB25-0312-03

Sulfide, Total by SM 4500 S2D

Aliquot #: 25-0102-06-C07-A01 **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	460		ug/L	40.0	03/11/2025	AB25-0312-01

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Analytical Report

Report Date: 03/18/25

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **EB-KLI**
Lab Sample ID: 25-0102-07
Matrix: Water

Laboratory Project: **25-0102**
Collect Date: 03/04/2025
Collect Time: 02:13 PM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 25-0102-07-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/09/2025	AB25-0309-02
Arsenic	ND		ug/L	1.0	03/09/2025	AB25-0309-02
Barium	ND		ug/L	5.0	03/09/2025	AB25-0309-02
Beryllium	ND		ug/L	1.0	03/09/2025	AB25-0309-02
Boron	ND		ug/L	20.0	03/09/2025	AB25-0309-02
Cadmium	ND		ug/L	0.2	03/09/2025	AB25-0309-02
Calcium	ND		ug/L	1000.0	03/09/2025	AB25-0309-02
Chromium	ND		ug/L	1.0	03/09/2025	AB25-0309-02
Cobalt	ND		ug/L	6.0	03/09/2025	AB25-0309-02
Copper	4		ug/L	1.0	03/09/2025	AB25-0309-02
Iron	ND		ug/L	20.0	03/09/2025	AB25-0309-02
Lead	ND		ug/L	1.0	03/09/2025	AB25-0309-02
Lithium	ND		ug/L	10.0	03/09/2025	AB25-0309-02
Magnesium	ND		ug/L	1000.0	03/09/2025	AB25-0309-02
Manganese	ND		ug/L	5.0	03/09/2025	AB25-0309-02
Molybdenum	ND		ug/L	5.0	03/09/2025	AB25-0309-02
Nickel	ND		ug/L	2.0	03/09/2025	AB25-0309-02
Potassium	ND		ug/L	100.0	03/09/2025	AB25-0309-02
Selenium	ND		ug/L	1.0	03/09/2025	AB25-0309-02
Silver	ND		ug/L	0.2	03/09/2025	AB25-0309-02
Sodium	ND		ug/L	1000.0	03/09/2025	AB25-0309-02
Thallium	ND		ug/L	2.0	03/09/2025	AB25-0309-02
Vanadium	ND		ug/L	2.0	03/09/2025	AB25-0309-02
Zinc	15		ug/L	10.0	03/09/2025	AB25-0309-02

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 25-0102-07-C01-A02 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/11/2025	AB25-0310-05

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 25-0102-07-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	ND		ug/L	100.0	03/05/2025	AB25-0305-06
Nitrite	ND		ug/L	100.0	03/05/2025	AB25-0305-06

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 25-0102-07-C03-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	ND		ug/L	25.0	03/12/2025	AB25-0312-09

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Analytical Report

Report Date: 03/18/25

Sample Site:	**DEK Lined Impoundment**	Laboratory Project:	**25-0102**
Field Sample ID:	**EB-KLI**	Collect Date:	03/04/2025
Lab Sample ID:	25-0102-07	Collect Time:	02:13 PM
Matrix:	Water		

Sulfide, Total by SM 4500 S2D — **Aliquot #: 25-0102-07-C04-A01** — **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	20.0	03/11/2025	AB25-0312-01

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Analytical Report

Report Date: 03/18/25

Sample Site: **DEK Lined Impoundment**
Field Sample ID: **FB-KLI**
Lab Sample ID: 25-0102-08
Matrix: Water

Laboratory Project: **25-0102**
Collect Date: 03/04/2025
Collect Time: 12:51 PM

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp

Aliquot #: 25-0102-08-C01-A01 **Analyst: EB**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	03/09/2025	AB25-0309-02
Arsenic	ND		ug/L	1.0	03/09/2025	AB25-0309-02
Barium	ND		ug/L	5.0	03/09/2025	AB25-0309-02
Beryllium	ND		ug/L	1.0	03/09/2025	AB25-0309-02
Boron	ND		ug/L	20.0	03/09/2025	AB25-0309-02
Cadmium	ND		ug/L	0.2	03/09/2025	AB25-0309-02
Calcium	ND		ug/L	1000.0	03/09/2025	AB25-0309-02
Chromium	ND		ug/L	1.0	03/09/2025	AB25-0309-02
Cobalt	ND		ug/L	6.0	03/09/2025	AB25-0309-02
Copper	4		ug/L	1.0	03/09/2025	AB25-0309-02
Iron	ND		ug/L	20.0	03/09/2025	AB25-0309-02
Lead	ND		ug/L	1.0	03/09/2025	AB25-0309-02
Lithium	ND		ug/L	10.0	03/09/2025	AB25-0309-02
Magnesium	ND		ug/L	1000.0	03/09/2025	AB25-0309-02
Manganese	ND		ug/L	5.0	03/09/2025	AB25-0309-02
Molybdenum	ND		ug/L	5.0	03/09/2025	AB25-0309-02
Nickel	ND		ug/L	2.0	03/09/2025	AB25-0309-02
Potassium	ND		ug/L	100.0	03/09/2025	AB25-0309-02
Selenium	ND		ug/L	1.0	03/09/2025	AB25-0309-02
Silver	ND		ug/L	0.2	03/09/2025	AB25-0309-02
Sodium	ND		ug/L	1000.0	03/09/2025	AB25-0309-02
Thallium	ND		ug/L	2.0	03/09/2025	AB25-0309-02
Vanadium	ND		ug/L	2.0	03/09/2025	AB25-0309-02
Zinc	ND		ug/L	10.0	03/09/2025	AB25-0309-02

Mercury by EPA 7470A, Total, Aqueous

Aliquot #: 25-0102-08-C01-A02 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	03/11/2025	AB25-0310-05

Anions by EPA 300.0 Aqueous, NO2, NO3

Aliquot #: 25-0102-08-C02-A01 **Analyst: KDR**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	ND		ug/L	100.0	03/05/2025	AB25-0305-06
Nitrite	ND		ug/L	100.0	03/05/2025	AB25-0305-06

Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL

Aliquot #: 25-0102-08-C03-A01 **Analyst: CLE**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	ND		ug/L	25.0	03/12/2025	AB25-0312-09

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Analytical Report

Report Date: 03/18/25

Sample Site:	**DEK Lined Impoundment**	Laboratory Project:	**25-0102**
Field Sample ID:	**FB-KLI**	Collect Date:	03/04/2025
Lab Sample ID:	25-0102-08	Collect Time:	12:51 PM
Matrix:	Water		

Sulfide, Total by SM 4500 S2D — **Aliquot #: 25-0102-08-C04-A01** — **Analyst: Merit**

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	20.0	03/11/2025	AB25-0312-01

Data Qualifiers	Exception Summary
	No exceptions occurred.

General Standard Operating Procedure

TITLE: SAMPLE LOG-IN – SHIPMENT INSPECTION FORM

Project Number: 25-0102 **Inspection Date:** 3·5·25 **Inspection By:** KDR

Sample Origin/Project Name: Q1-2025 DEK Lined Impoundment

Shipment Delivered By: Enter the type of shipment carrier.

Inter-Company Mail_____ FedEx ✓ UPS _____ USPS _____

Tracking Number: _____ Other/Carry In (whom) _____

Shipping Containers: Enter the type and number of shipping containers received.

Cooler ✓ Cardboard Box _____ Custom Case _____ Envelope/Mailer _____

Loose/Unpackaged Containers _____ Other _____

Condition of Shipment: Enter the as-received condition of the shipment container.

Damaged Shipment Observed: None ✓ Dented _____ Leaking _____

Other _____

Shipment Security: Enter if any of the shipping containers were opened before receipt.

Shipping Containers Received: Opened _____ Sealed ✓ N/A _____

Enclosed Documents: Enter the type of documents enclosed with the shipment.

CoC ✓ Work Request _____ Air Data Sheet_____ Other_____

Temperature of Containers: Measure the temperature of several sample containers.

As-Received Temperature Range 1.8 - 4.9 °C Samples Received on Ice: Yes ✓ No____

M&TE # and Expiration LS028757 / 1·16·26

Number and Type of Containers: Enter the type and total number of sample containers received.

Container Type	Water	Soil	Other	Broken	Leaking
VOA (40mL or 60mL)	10				
Quart/Liter (g / p)					
9-oz (amber glass jar)					
2-oz (amber glass)					
125 mL (plastic)	28				
24 mL vial (glass)					
250 mL (plastic)	5				
Other					

All sample pH meeting criteria? Yes ✓ No___ N/A___ **pH paper lot #** 210224 **Exp. Date** 12·1·26

Indicate if an Exception Report (Page 2 of 2) is needed: Yes____ No ✓

CHAIN OF CUSTODY

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135 WEST TRAIL ST., JACKSON, MI 49201 • (517) 788-1251

Page 1 of 1

SAMPLING SITE / CUSTOMER: Q1-2025 DEK Lined Impoundment

PROJECT NUMBER: 25-0102

SAP CC or WO#:

REQUESTER: Harold Register

SAMPLING TEAM:

TURNAROUND TIME REQUIRED: ☐ 24 HR ☐ 48 HR ☐ 3 DAYS ☐ STANDARD ☒ OTHER _____

SEND REPORT TO: Joseph Firlit — email: — phone:

COPY TO: Harold Register; TRC

MATRIX CODES: GW = Groundwater; WW = Wastewater; W = Water / Aqueous Liquid; S = Soil / General Solid; O = Oil; OX = Other _____; SL = Sludge; A = Air; WP = Wipe; WT = General Waste

ANALYSIS REQUESTED (Attach List if More Space is Needed)

QA REQUIREMENT: ☐ NPDES ☒ TNI ☐ ISO 17025 ☐ 10 CFR 50 APP. B ☐ INTERNAL INFO ☐ OTHER _____

LAB SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	MATRIX	FIELD SAMPLE ID / LOCATION	CONTAINERS TOTAL #	PRESERVATIVE None	HNO_3	H_2SO_4	NaOH	HCl	MeOH	Other	Total Metals	Anions	Ammonia	TDS	Alkalinity	Sulfide	REMARKS
25-0102-01	3/4/25	1408	GW	DEK-MW-15003	7	4	1	1	1				x	x	x	x	x	x	
-02	3/4/25	1251	GW	OW-10	7	4	1	1	1				x	x	x	x	x	x	
-03			GW	~~OW-11~~	7	4	1	1	1				x	x	x	x	x	x	
-04		1529	GW	~~DEK-MW-22003~~	7	4	1	1	1				x	x	x	x	x	x	
-05		1134	GW	~~DEK-MW-22006~~	7	4	1	1	1				x	x	x	x	x	x	
-06		—	GW	DUP-KLI	7	4	1	1	1				x	x	x	x	x	x	
-07		1413	W	EB-KLI	4	1	1	1	1				x	x	x			x	
-08		1251	W	FB-KLI	4	1	1	1	1				x	x	x			x	

Monitoring Wells not included in KLI HMP Well Network

RELINQUISHED BY: [signature] DATE/TIME: 3-4-25 1645 RECEIVED BY: Fedex

RELINQUISHED BY: Fed Ex DATE/TIME: 03.04-25 / 10:29 RECEIVED BY: [signature]

COMMENTS:

Received on Ice? ☑ Yes ☐ No M&TE #: LS028757

Temperature: 1.8 - 4.9 °C Cal. Due Date: 01-16-26

Analytical Laboratory Report

Report ID: S72099.01(01)
Generated on 03/12/2025

Report to

Attention: Emil Blaj
Consumers Energy Company
135 West Trail Street
Jackson, MI 49201

Phone: D:517-788-5888 C:517-684-9467 FAX:
Email: emil.blaj@cmsenergy.com

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S72099.01-S72099.07
Project: 25-0102 PR#25030245
Collected Date(s): 03/04/2025
Submitted Date/Time: 03/06/2025 15:27
Sampled by: Unknown
P.O. #: 4400131511

Table of Contents

Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Starred (*) analytes are not NY NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.
All accreditations/certifications held by this laboratory are listed on page 3. Not all accreditations/certifications are applicable to this report.
For a specific list of accredited analytes, please feel free to contact the laboratory or visit https://www.meritlabs.com/certifications.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Accreditations (For Reference Only)

Authority	Accreditation ID
Michigan DEQ	#9956
DOD ELAP & ISO/IEC 17025:2017	#69699 PJLA Testing
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
o	Associated EIS outside of control limits
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
q	Qualifier ion ratio outside of control limits
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
SM4500-S2 D	Standard Method 4500 S2 D 2021

Analytical Laboratory Report

Sample Summary (7 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S72099.01	DEK-MW-15003 (25-0102-01)	Groundwater	03/04/25 14:08
S72099.02	OW-10 (25-0102-02)	Groundwater	03/04/25 12:51
~~S72099.03~~	~~DEK-MW-22003 (25-0102-04)~~	~~Groundwater~~	~~03/04/25 15:29~~
~~S72099.04~~	~~DEK-MW-22006 (25-0102-05)~~	~~Groundwater~~	~~03/04/25 14:34~~
S72099.05	DUP-KLI (25-0102-06)	Groundwater	03/04/25 00:01
S72099.06	EB-KLI (25-0102-07)	Groundwater	03/04/25 14:13
S72099.07	FB-KLI (25-0102-08)	Groundwater	03/04/25 12:51

Monitoring Wells not included in KLI HMP Well Network

Analytical Laboratory Report

Lab Sample ID: S72099.01
Sample Tag: DEK-MW-15003 (25-0102-01)
Collected Date/Time: 03/04/2025 14:08
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125mL Plastic	NaOH/Zn Acetate	Yes	4.4	IR

Inorganics

Method: SM4500-S2 D, Run Date: 03/11/25 12:29, Analyst: MDG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	0.37	0.02		mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S72099.02
Sample Tag: OW-10 (25-0102-02)
Collected Date/Time: 03/04/2025 12:51
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125mL Plastic	NaOH/Zn Acetate	Yes	4.4	IR

Inorganics

Method: SM4500-S2 D, Run Date: 03/11/25 12:33, Analyst: MDG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	0.11	0.02		mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S72099.05
Sample Tag: DUP-KLI (25-0102-06)
Collected Date/Time: 03/04/2025 00:01
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125mL Plastic	NaOH/Zn Acetate	Yes	4.4	IR

Inorganics

Method: SM4500-S2 D, Run Date: 03/11/25 13:00, Analyst: MDG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	0.46	0.04		mg/L	2	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S72099.06
Sample Tag: EB-KLI (25-0102-07)
Collected Date/Time: 03/04/2025 14:13
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125mL Plastic	NaOH/Zn Acetate	Yes	4.4	IR

Inorganics

Method: SM4500-S2 D, Run Date: 03/11/25 13:06, Analyst: MDG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02		mg/L	1	18496-25-8	

Analytical Laboratory Report

Lab Sample ID: S72099.07
Sample Tag: FB-KLI (25-0102-08)
Collected Date/Time: 03/04/2025 12:51
Matrix: Groundwater
COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125mL Plastic	NaOH/Zn Acetate	Yes	4.4	IR

Inorganics

Method: SM4500-S2 D, Run Date: 03/11/25 14:05, Analyst: MDG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02		mg/L	1	18496-25-8	

Merit Laboratories Login Checklist

Lab Set ID: S72099
Client: CONSUMERS (Consumers Energy Company)
Project: 25-0102 PR#25030245
Submitted: 03/06/2025 15:27 Login User: MMC

Attention: Emil Blaj
Address: Consumers Energy Company
135 West Trail Street
Jackson, MI 49201

Phone: D:517-788-5888 FAX:
Email: emil.blaj@cmsenergy.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 4.4
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[X] Yes	[ ] No	[ ] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[ ] Yes	[X] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC, TOX, DO or Alkalinity bottles contain	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories Bottle Preservation Check

Lab Set ID: S72099 Submitted: 03/06/2025 15:27

Client: CONSUMERS (Consumers Energy Company)

Project: 25-0102 PR#25030245

Initial Preservation Check: 03/06/2025 16:11 MMC

Preservation Recheck (E200.8): N/A

Attention: Emil Blaj
Address: Consumers Energy Company
135 West Trail Street
Jackson, MI 49201

Phone: D:517-788-5888 FAX:
Email: emil.blaj@cmsenergy.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S72099.01	125mL Plastic NaOH/Zn Acetate	>12			
S72099.02	125mL Plastic NaOH/Zn Acetate	>12			
S72099.03	125mL Plastic NaOH/Zn Acetate	>12			
S72099.04	125mL Plastic NaOH/Zn Acetate	>12			
S72099.05	125mL Plastic NaOH/Zn Acetate	>12			
S72099.06	125mL Plastic NaOH/Zn Acetate	>12			
S72099.07	125mL Plastic NaOH/Zn Acetate	>12			

Prepared by Merit Laboratories

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Emil Blaj
COMPANY: Consumers Energy
ADDRESS: 135 W. Trail Street
CITY: Jackson | STATE: MI | ZIP CODE: 49201
PHONE NO.: 517-788-5888 | FAX NO.: 517-788-2533 | P.O. NO.: 4400131511
E-MAIL ADDRESS: emil.blaj@cmsenergy.com | QUOTE NO.:

INVOICE TO

CONTACT NAME | ☒ SAME
COMPANY
ADDRESS
CITY | STATE | ZIP CODE
PHONE NO. | E-MAIL ADDRESS

PROJECT NO./NAME: 25-0102 PR#25030245
SAMPLER(S) - PLEASE PRINT/SIGN NAME: N/A

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER _____

DELIVERABLES REQUIRED ☐ STD ☒ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER _____

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications: ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES
Project Locations: ☐ Detroit ☐ New York ☐ Other _____

MERIT LAB NO. FOR LAB USE ONLY	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	Total Sulfide	Special Instructions
72099.01	03/04/25	1408	DEK-MW-15003 (25-0102-01)	GW	1					1			✓	preserved with NaOH/ZnAcetate
.02	03/04/25	1251	OW-10 (25-0102-02)	GW	1					1			✓	"
.03	03/04/25	1529	~~DEK-MW-22003 (25-0102-04)~~	~~GW~~	~~1~~					1			✓	"
.04	03/04/25	1434	~~DEK-MW-22006 (25-0102-05)~~	~~GW~~	~~1~~					1			✓	"
.05	03/04/25	-	DUP-KLI (25-0102-06)	GW	1					1			✓	"
.06	03/04/25	1413	EB-KLI (25-0102-07)	GW	1					1			✓	"
.07	03/04/25	1251	FB-KLI (25-0102-08)	GW	1					1			✓	"

Wells not included in KLI HMP Well Network

RELINQUISHED BY: SIGNATURE/ORGANIZATION: CONSUMERS ENERGY ☐ Sampler DATE: 03-06-25 TIME: 1527
RECEIVED BY: SIGNATURE/ORGANIZATION: M Dilcolo DATE: 3/6/25 TIME: 1527
RELINQUISHED BY: SIGNATURE/ORGANIZATION DATE TIME
RECEIVED BY: SIGNATURE/ORGANIZATION DATE TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION DATE TIME
RECEIVED BY: SIGNATURE/ORGANIZATION DATE TIME

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 4.4

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Appendix B
Field Notes

TRC

PROJECT NAME:	CEC Karn BAP/LI: 2025 GW Compliance
PROJECT NUMBER:	634695.0000.00000
PROJECT MANAGER:	Darby Litz
SITE LOCATION:	2742 Weadock Hwy Essexville, MI 48732
DATES OF FIELDWORK:	~~TO~~ 3-4-25 to 3-5-25
PURPOSE OF FIELDWORK:	Fourth Quarter 2024 Groundwater Sampling
WORK PERFORMED BY:	J. Jasso, J. Krenz, A. Kast

J. Jasso 3-6-25
SIGNED DATE

Darby Litz 3/6/25
CHECKED BY DATE

TRC

GENERAL NOTES

PROJECT NAME: CEC Karn LF: 2025 GW Complian	DATE: 3/4/25	TIME ARRIVED: 8:02
PROJECT NUMBER: 634694.0000.0000	AUTHOR: JK, JJ, (AK)	TIME LEFT: 4:15

WEATHER

TEMPERATURE: 35-45 °F WIND: 10-15 MPH VISIBILITY: Clear/overcast

WORK / SAMPLING PERFORMED

Arrive on-site @ 8:02, check in w/ security
Meet with Jake, give him LaMotte 2020, set up to sample MW-18; halted due to training @ 9:00.
Set up to sample MW-18 @ 10:30, sample, MW-19, OW-10, DEK-MW-1500 3

PROBLEMS ENCOUNTERED	CORRECTIVE ACTION TAKEN

COMMUNICATION

NAME	REPRESENTING	SUBJECT / COMMENTS
Darby Litz	TRC	PM/Updates
Jon Gaeth	Consumers	Site Contact

INVESTIGATION DERIVED WASTE SUMMARY

WASTE MATRIX	QUANTITY	COMMENTS
Groundwater	NM	To Ground

SIGNED DATE

CHECKED BY 3-6-25 DATE

TRC

GENERAL NOTES

PROJECT NAME:	CEC Karn BAP/LI: 2025 GW Comp	DATE: 3-4-25	TIME ARRIVED: 0730
PROJECT NUMBER:	634695.0000.00000	AUTHOR: JK JJ, AK	TIME LEFT: ~~1610~~ 1615

WEATHER

TEMPERATURE: 48 °F WIND: 10-15 MPH VISIBILITY: cloudy

WORK / SAMPLING PERFORMED

Sampled monitoring wells DEK-MW-15002, -15006, -15005, -22006, ~~and~~ -22003, and -18001

Received annual safety orientation

OW-13 ~~DTB~~ DTW: 5.04 DTB: 14.57

PROBLEMS ENCOUNTERED	CORRECTIVE ACTION TAKEN

COMMUNICATION

NAME	REPRESENTING	SUBJECT / COMMENTS
Darby Litz	TRC	PM - Updates
Jon Gaeth	Consumers	Site Contact

INVESTIGATION DERIVED WASTE SUMMARY

WASTE MATRIX	QUANTITY	COMMENTS
Groundwater	NM	Purge to Ground

SIGNED 7-6-25 DATE

CHECKED BY 3/6/25 DATE

TRC

GENERAL NOTES

PROJECT NAME:	CEC Weadock LF: 2025 GW Com	DATE: 3/5/25	TIME ARRIVED: 0540
PROJECT NUMBER:	634698.0000.0000	AUTHOR: AW JK JJ	TIME LEFT: 1200

WEATHER		
TEMPERATURE: 40 °F	WIND: 30 MPH	VISIBILITY: Overcast

WORK / SAMPLING PERFORMED

Well Sampled JCW-MW-18001, 0a. 57 Rout JCW MW18004, Dup #02, FB, E.B, MW-15019 MW-15008, MW-15002, MW-15016, EB.

PROBLEMS ENCOUNTERED	CORRECTIVE ACTION TAKEN

COMMUNICATION

NAME	REPRESENTING	SUBJECT / COMMENTS
Darby Litz	TRC	PM/Updates
Jon Gaeth	Consumers	Site Contact

INVESTIGATION DERIVED WASTE SUMMARY

WASTE MATRIX	QUANTITY	COMMENTS
Groundwater	NM	To Ground

SIGNED 3/6/25 DATE

CHECKED BY 3-6-25 DATE

TRC

EQUIPMENT SUMMARY

PROJECT NAME:	CEC Karn BAP/LI: 2025 GW	SAMPLER NAME:	~~J. Jasso~~, J. Krenz, A. Kast
PROJECT NO.:	634695.0000.00000		

WATER LEVEL MEASUREMENTS COLLECTED WITH:

HERON DIPPER-T	TRC A2
NAME AND MODEL OF INSTRUMENT	SERIAL NUMBER (IF APPLICABLE)

PRODUCT LEVEL MEASUREMENTS COLLECTED WITH:

NA	NA
NAME AND MODEL OF INSTRUMENT	SERIAL NUMBER (IF APPLICABLE)

DEPTH TO BOTTOM OF WELL MEASUREMENTS COLLECTED WITH:

HERON DIPPER-T	TRC A2
NAME AND MODEL OF INSTRUMENT	SERIAL NUMBER (IF APPLICABLE)

PURGING METHOD

PERISTALTIC PUMP	TRC A2
NAME AND MODEL OF PUMP OR TYPE OF BAILER	SERIAL NUMBER (IF APPLICABLE)

SAMPLING METHOD

PERISTALTIC PUMP	TRC A2
NAME AND MODEL OF PUMP OR TYPE OF BAILER	SERIAL NUMBER (IF APPLICABLE)
~~GEOTECH DISPOSABLE FILTER~~ (JK)	~~0.45 MICRON~~ (JK)
NAME AND MODEL OF FILTERATION DEVICE	FILTER TYPE AND SIZE
DEDICATED POLY TUBING	☑ LOW-FLOW SAMPLING EVENT
TUBING TYPE	

PURGE WATER DISPOSAL METHOD

☑ GROUND ☐ DRUM ☐ POTW ☐ POLYTANK ☐ OTHER _____

DECONTAMINATION AND FIELD BLANK WATER SOURCE

STORE BOUGHT	LABORATORY PROVIDED
POTABLE WATER SOURCE	DI WATER SOURCE
JC JK 3-6-25	3/6/25
SIGNED / DATE	CHECKED BY / DATE

REVISED 04/2019

TRC

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME:	CEC Karn LF: 2025 GW Compliance	MODEL:	AK Aqua Troll 600	SAMPLER:	JK, JJ (AK)
PROJECT NO.:	634694.0000.0000	SERIAL #:	Ann Arbor	DATE:	3/4/25

PH CALIBRATION CHECK

pH 7 (LOT #): 46H0553 (EXP. DATE): AUG/26 POST-CAL. READING / STANDARD	pH 4 / 10 (LOT #): 46I0445 (EXP. DATE): SEP/26 POST-CAL. READING / STANDARD	CAL. RANGE	TIME
7.08 / 7.00	4.00 / 4.00	☒ WITHIN RANGE	7:20
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	

SPECIFIC CONDUCTIVITY CALIBRATION CHECK

CAL. READING (LOT #): 46K1199 (EXP. DATE): NOV/25 POST-CAL. READING / STANDARD	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
964 / 964	4.99	☒ WITHIN RANGE	7:22
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

ORP CALIBRATION CHECK

CAL. READING (LOT #): 23610046 (EXP. DATE): 2028-07-04 POST-CAL. READING / STANDARD	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
248 / 245	7.19	☒ WITHIN RANGE	7:25
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

D.O. CALIBRATION CHECK

CAL. READING D.I POST-CAL. READING /SATURATED AIR	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
12.40 / 12.40	5.11	☒ WITHIN RANGE	7:27
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

TURBIDITY CALIBRATION CHECK

CALIBRATION READING (NTU) (LOT #): A3097 (EXP. DATE): APR-25 POST-CAL. READING / STANDARD	CALIBRATION READING (NTU) (LOT #): (EXP. DATE): POST-CAL. READING / STANDARD	CAL. RANGE	TIME
100 / 100	/	☒ WITHIN RANGE	7:29
/	10.0 / 10.0	☒ WITHIN RANGE	10:28
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	

COMMENTS

☐ AUTOCAL SOLUTION (LOT #): (EXP. DATE):

☑ STANDARD SOLUTION (S) — LIST LOT NUMBERS AND EXPIRATION DATES UNDER CALIBRATION CHECK

CALIBRATED PARAMETERS	CALIBRATION RANGES (1)
☐ pH	pH: +/- 0.2 S.U.
☐ COND	COND: +/- 1% OF CAL. STANDARD
☐ ORP	ORP: +/- 25 mV
☐ D.O.	D.O.: VARIES
☐ TURB	TURB: +/- 5% OF CAL. STANDARD
☐ _____	(1) CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE WATER QUALITY METER
☐ _____	

NOTES

Switched to LaMotte ~~2000~~ 2020 for turbidity; In-situ RDO sensor expired

PROBLEMS ENCOUNTERED	CORRECTIVE ACTIONS
In-situ turbidity readings were fluctuating between 0 NTU & 5,000 NTU	Switched to LaMotte 2020

Ashley Hart 3/6/25
SIGNED DATE

CHECKED BY 3-6-25
DATE

TRC

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME:	CEC Karn BAP/LI: 2025 GW Compliance	MODEL: YSI PRO DSS	SAMPLER: (JK) JJ, AK
PROJECT NO.:	634695.0000.00000	SERIAL #: Ann Arbor	DATE: 3-4-25

PH CALIBRATION CHECK

pH 7 (LOT #): 4GH0553 (EXP. DATE): Aug/26 — POST-CAL. READING / STANDARD	pH 4 / 10 (LOT #): 4GI0445 (EXP. DATE): Sep/26 — POST-CAL. READING / STANDARD	CAL. RANGE	TIME
7.03 / 7.03	4.00 / 4.00	☒ WITHIN RANGE	0752
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	

SPECIFIC CONDUCTIVITY CALIBRATION CHECK

CAL. READING (LOT #): 465005G (EXP. DATE): Oct/25 — POST-CAL. READING / STANDARD	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
1260 / 1260	19.0	☒ WITHIN RANGE	0745
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

ORP CALIBRATION CHECK

CAL. READING (LOT #): 24B100690 (EXP. DATE): 3-6-29 — POST-CAL. READING / STANDARD	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
237.2 / 237.2	15.3	☒ WITHIN RANGE	0757
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

D.O. CALIBRATION CHECK

CAL. READING — POST-CAL. READING /SATURATED AIR	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
10.92 / 10.92	10.4	☒ WITHIN RANGE	0802
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

TURBIDITY CALIBRATION CHECK

CALIBRATION READING (NTU) (LOT #): N/A (EXP. DATE): — POST-CAL. READING / STANDARD	(LOT #): (EXP. DATE): — POST-CAL. READING / STANDARD	CAL. RANGE	TIME
10.03 / 10.0	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	

COMMENTS

☐ AUTOCAL SOLUTION (LOT #): (EXP. DATE):	☑ STANDARD SOLUTION (S) — LIST LOT NUMBERS AND EXPIRATION DATES UNDER CALIBRATION CHECK
CALIBRATED PARAMETERS	CALIBRATION RANGES [1]
☐ pH	pH: +/- 0.2 S.U.
☐ COND	COND: +/- 1% OF CAL. STANDARD
☐ ORP	ORP: +/- 25 mV
☐ D.O.	D.O.: VARIES
☐ TURB	TURB: +/- 5% OF CAL. STANDARD
☐ _____	[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE WATER QUALITY METER
☐ _____	

NOTES

PROBLEMS ENCOUNTERED	CORRECTIVE ACTIONS

SIGNED: [signature] 3-6-25 DATE

CHECKED BY: [signature] 3/6/25 DATE

TRC

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME:	CEC Weadock LF: 2025 GW Compliance	MODEL: YSI Pro DSS	SAMPLER: JJ
PROJECT NO.:	634698.0000.0000	SERIAL #: TRC A2	DATE: 2/5/25

PH CALIBRATION CHECK

pH 7 (LOT #): 46H0553 (EXP. DATE): 8/26 POST-CAL. READING / STANDARD	pH 4 / 10 (LOT #): 46F0445 (EXP. DATE): 9/26 POST-CAL. READING / STANDARD	CAL. RANGE	TIME
700 / 700	400 / 400	☑ WITHIN RANGE	0800
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	

SPECIFIC CONDUCTIVITY CALIBRATION CHECK

CAL. READING (LOT #): 46I0154 (EXP. DATE): 9/25 POST-CAL. READING / STANDARD	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
1309 / 1409	21	☑ WITHIN RANGE	0800
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

ORP CALIBRATION CHECK

CAL. READING (LOT #): 240100751 (EXP. DATE): 4/26 POST-CAL. READING / STANDARD	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
223 / 229	23	☑ WITHIN RANGE	0800
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

D.O. CALIBRATION CHECK

CAL. READING POST-CAL. READING /SATURATED AIR	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
837 / 831	23	☑ WITHIN RANGE	0800
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	
/		☐ WITHIN RANGE	

TURBIDITY CALIBRATION CHECK

CALIBRATION READING (NTU) (LOT #): AU1854 (EXP. DATE): 6/26 POST-CAL. READING / STANDARD	(LOT #): (EXP. DATE): POST-CAL. READING / STANDARD	CAL. RANGE	TIME
0 / 0	/	☑ WITHIN RANGE	0800
100 / 100	/	☑ WITHIN RANGE	0800
/	/	☐ WITHIN RANGE	
/	/	☐ WITHIN RANGE	

COMMENTS

☐ AUTOCAL SOLUTION (LOT #): (EXP. DATE):	☑ STANDARD SOLUTION (S) LIST LOT NUMBERS AND EXPIRATION DATES UNDER CALIBRATION CHECK
CALIBRATED PARAMETERS	CALIBRATION RANGES [1]
☐ pH	pH: +/- 0.2 S.U.
☐ COND	COND: +/- 1% OF CAL. STANDARD
☐ ORP	ORP: +/- 25 mV
☐ D.O.	D.O.: VARIES
☐ TURB	TURB: +/- 5% OF CAL. STANDARD
☐ _____	[1] CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE WATER QUALITY METER
☐ _____	

NOTES

PROBLEMS ENCOUNTERED	CORRECTIVE ACTIONS

SIGNED: [signature] DATE: 3/6/25

CHECKED BY: [signature] DATE: 3-6-25

TRC

WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2025 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	634695.0000.00000	BY: (JK) JJ, AK	DATE: 3-4-25	BY: AH	DATE: 3/6/25

SAMPLE ID: DEK-MW-18001 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 0812	DATE: 3-4-25	SAMPLE	TIME: 0833	DATE: 3-4-25

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 9.85 T/ PVC

DEPTH TO BOTTOM: 19.68 T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 8 ☑ LITERS ☐ GALLONS

COLOR: Clear ODOR: none

TURBIDITY ☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER

PH: 7.36 SU CONDUCTIVITY: 651 umhos/cm

ORP: 117.6 mV DO: 0.54 mg/L

TURBIDITY: 2.48 NTU

☒ NONE ☐ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 10.0 °C ~~FERROUS Fe mg/L~~

COLOR: Clear ODOR: None

FILTRATE (0.45 um) ☐ YES ☒ NO

FILTRATE COLOR: — FILTRATE ODOR: —

QC SAMPLE: ☒ MS/MSD ☐ DUP-

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
0813	400	6.87	919	152.2	3.24	57.3	9.2	10.02	INITIAL
0818	400	7.39	646	127.9	0.82	12.7	9.8	10.02	2
0823	400	7.37	648	123.9	0.66	6.92	9.8	10.02	4
0828	400	7.37	649	122.1	0.61	2.83	9.9	10.02	6
0833	400	7.36	651	117.6	0.54	2.48	10.0	10.02	8

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250 mL	PLASTIC	A	☐ Y ☒ N	3	125 mL	PLASTIC	D	☐ Y ☒ N
3	125 mL	PLASTIC	A	☐ Y ☒ N	~~—~~	~~40 mL~~	VOA	~~E~~	~~☐ Y ☐ N~~
6	60 mL	VOA	A	☐ Y ☒ N	2	1 L	PLASTIC	B	☐ Y ☒ N
3	125 mL	PLASTIC	B	☐ Y ☒ N					☐ Y ☐ N
3	125 mL	PLASTIC	C	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	FedEx	DATE SHIPPED:	3-4-25	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:		DATE SIGNED:	3-6-25

TRC

WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2025 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	634695.0000.00000	BY: JK, JJ, (AK)	DATE: 3/4/25	BY: DK	DATE: 3-6-25

SAMPLE ID: OW-10 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1211	DATE: 3/4/25	SAMPLE	TIME: 1251	DATE: 3/4/25

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 8.65 T/ PVC

DEPTH TO BOTTOM: 18.94 T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 5.75 ☑ LITERS ☐ GALLONS

COLOR: cloudy ODOR: slight

TURBIDITY ☐ NONE ☒ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER

PH: 7.37 SU CONDUCTIVITY: 995.82 umhos/cm

ORP: -61.1 mV DO: 3.70 mg/L

TURBIDITY: 6.27 NTU

☐ NONE ☒ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 10.52 °C FERROUS Fe — mg/L

COLOR: clear ODOR: slight

FILTRATE (0.45 um) ☐ YES ☒ NO

FILTRATE COLOR: — FILTRATE ODOR: —

QC SAMPLE: ☐ MS/MSD ☐ DUP-

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
12:11	100	7.45	983.63	12.2	4.08	36.09	10.12	8.65	INITIAL
12:16	150	7.40	979.25	-17.5	3.76	20.16	10.13	8.78	.5
12:21		7.40	985.94	-37.6	3.74	14.85	9.96	8.72	1.25
12:26		7.39	982.87	-47.7	3.71	8.57	10.21	8.72	2
12:31		7.38	994.50	-54.5	3.70	8.33	10.16	8.78	2.75
12:36		7.38	997.17	-56.1	3.71	7.98	10.22	8.82	3.5
12:41		7.38	990.87	-60.9	3.70	6.76	10.27	8.78	4.25
12:46		7.37	994.07	-57.8	3.70	6.56	10.34	8.76	5
12:51		7.37	995.82	-61.1	3.70	6.27	10.52	8.76	5.75
			SAMPLE						

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
1	250 mL	PLASTIC	A	☐ Y ☒ N	1	125 mL	PLASTIC	D	☐ Y ☒ N
1	125 mL	PLASTIC	A	☐ Y ☒ N	~~1~~	~~40 mL~~	~~VOA~~	~~E~~	~~☐ Y ☐ N~~
2	60 mL	VOA	A	☐ Y ☒ N	2	1 L	PLASTIC	B	☐ Y ☒ N
1	125 mL	PLASTIC	B	☐ Y ☒ N					☐ Y ☐ N
1	125 mL	PLASTIC	C	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	Fedex	DATE SHIPPED:	3-4-25	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:	[signature]	DATE SIGNED:	3/6/25

TRC

WATER SAMPLE LOG

PROJECT NAME:	CEC Karn BAP/LI: 2025 GW C	PREPARED		CHECKED	
PROJECT NUMBER:	634695.0000.00000	BY: JK, JJ, AK	DATE: 3/4/25	BY: JK	DATE: 3-6-25

SAMPLE ID: DEK-MW-15003 | WELL DIAMETER: ☑ 2" ☐ 4" ☐ 6" ☐ OTHER

WELL MATERIAL: ☑ PVC ☐ SS ☐ IRON ☐ GALVANIZED STEEL ☐ OTHER

SAMPLE TYPE: ☑ GW ☐ WW ☐ SW ☐ DI ☐ LEACHATE ☐ OTHER

PURGING	TIME: 1328	DATE: 3/4/25	SAMPLE	TIME: 1408	DATE: 3/4/25

PURGE METHOD: ☑ PUMP PERISTALTIC PUMP ☐ BAILER

DEPTH TO WATER: 20.24 T/ PVC

DEPTH TO BOTTOM: 28.98 T/ PVC

WELL VOLUME: NA ☐ LITERS ☐ GALLONS

VOLUME REMOVED: 4.5 ☑ LITERS ☐ GALLONS

COLOR: Clear w/ particulate ODOR: Slight

TURBIDITY ☐ NONE ☒ SLIGHT ☐ MODERATE ☐ VERY

DISPOSAL METHOD: ☑ GROUND ☐ DRUM ☐ OTHER

PH: 8.52 SU | CONDUCTIVITY: 311.12 umhos/cm

ORP: -98.5 mV | DO: 3.69 mg/L

TURBIDITY: 1.87 NTU

☐ NONE ☒ SLIGHT ☐ MODERATE ☐ VERY

TEMPERATURE: 13.02 °C | FERROUS Fe — mg/L

COLOR: Clear | ODOR: very Slight

FILTRATE (0.45 um) ☐ YES ☒ NO

FILTRATE COLOR: — | FILTRATE ODOR: —

QC SAMPLE: ☐ MS/MSD ☒ DUP- KLI

COMMENTS:

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GAL OR L)
13:28	200	8.71	284.15	29.1	4.28	4.24	13.62	20.24	INITIAL
13:33	100	8.70	308.77	-30.9	3.97	4.20	12.21	20.72	1
1338		8.68	309.13	-52.5	3.92	2.67	12.05	20.78	1.5
1343		8.62	310.55	-68.4	3.82	2.17	12.57	20.86	2
1348		8.62	310.72	-83.4	3.75	2.50	12.76	20.89	2.5
1353		8.62	310.29	-89.8	3.73	2.31	12.70	20.91	3
1358		8.58	311.51	-94.5	3.70	1.80	12.90	20.95	3.5
1403		8.56	310.56	-97.9	3.69	1.99	12.94	20.97	4
1408		8.52	311.12	-98.5	3.69	1.87	13.02	20.99	4.5
					SAMPLE				

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- **0.1** COND.: +/- **3 %** ORP: +/- **10** D.O.: +/- **0.3** TURB: +/- **10 %** or </= **10** TEMP.: +

BOTTLES FILLED — PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____

NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED
2	250 mL	PLASTIC	A	☐ Y ☑ N	2	125 mL	PLASTIC	D	☐ Y ☒ N
2	125 mL	PLASTIC	A	☐ Y ☑ N	~~—~~	~~40 mL~~	~~VOA~~	~~E~~	~~☐ Y ☐ N~~
4	60 mL	VOA	A	☐ Y ☒ N	4	1 L	PLASTIC	B	☐ Y ☒ N
2	125 mL	PLASTIC	B	☐ Y ☒ N					☐ Y ☐ N
2	125 mL	PLASTIC	C	☐ Y ☒ N					☐ Y ☐ N

SHIPPING METHOD:	FedEx	DATE SHIPPED:	3-4-25	AIRBILL NUMBER:	—
COC NUMBER:	—	SIGNATURE:		DATE SIGNED:	3/6/25

CHAIN OF CUSTODY

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Page 1 of 1

SAMPLING SITE / CUSTOMER: Q1-2025 DEK Bottom Ash Pond & Lined Impound.

PROJECT NUMBER: 25-0101

SAP CC or WO#:

REQUESTER: Harold Register

SAMPLING TEAM:

TURNAROUND TIME REQUIRED: ☐ 24 HR ☐ 48 HR ☐ 3 DAYS ☐ STANDARD ☒ OTHER

SEND REPORT TO: Joseph Firlit — email: — phone:

COPY TO: Harold Register; TRC

MATRIX CODES: GW = Groundwater; WW = Wastewater; W = Water / Aqueous Liquid; S = Soil / General Solid; O = Oil; OX = Other; SL = Sludge; A = Air; WP = Wipe; WT = General Waste

ANALYSIS REQUESTED (Attach List if More Space is Needed)

QA REQUIREMENT: ☐ NPDES ☒ TNI ☐ ISO 17025 ☐ 10 CFR 50 APP. B ☐ INTERNAL INFO ☐ OTHER

LAB SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	MATRIX	FIELD SAMPLE ID / LOCATION	CONTAINERS TOTAL #	PRESERVATIVE None	HNO_3	H_2SO_4	NaOH	HCl	MeOH	Other	Total Metals	Anions	Ammonia	TDS	Alkalinity	Sulfide				REMARKS
25-0101-01	3-4-25	0833	GW	DEK-MW-18001	7	4	1	1	1				x	x	x	x	x	x				
-02	↓	0833	GW	DEK-MW-18001 MS	6	3	1	1	1				x	x	x		x	x				
-03	↓	0833	GW	DEK-MW-18001 MSD	6	3	1	1	1				x	x	x		x	x				

RELINQUISHED BY: [signature] DATE/TIME: 3-4-25 / 1645 RECEIVED BY: Fed Ex

RELINQUISHED BY: Fed Ex DATE/TIME: 03-05-25 / 10:29 RECEIVED BY: [signature]

COMMENTS:

Received on Ice? ☑ Yes ☐ No M&TE #: LS028757

Temperature: 0.9 - 1.4 °C Cal. Due Date: 01-16-26

13 of 13

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Page 1 of 1

AMPLING SITE / CUSTOMER: 1-2025 DEK Lined Impoundment	PROJECT NUMBER: 25-0102	SAP CC or WO#:	
AMPLING TEAM:	TURNAROUND TIME REQUIRED: ☐ 24 HR ☐ 48 HR ☐ 3 DAYS ☐ STANDARD ☒ OTHER	REQUESTER: Harold Register	
END REPORT TO: Joseph Firlit	email:	phone:	
COPY TO: Harold Register; TRC			

MATRIX CODES: GW = Groundwater; WW = Wastewater; W = Water / Aqueous Liquid; S = Soil / General Solid; O = Oil; OX = Other; SL = Sludge; A = Air; WP = Wipe; WT = General Waste

LAB SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	MATRIX	FIELD SAMPLE ID / LOCATION	CONTAINERS TOTAL #	PRESERVATIVE None	HNO_3	H_2SO_4	NaOH	HCl	MeOH	Other	Total Metals	Anions	Ammonia	TDS	Alkalinity	Sulfide	REMARKS
25-0102-01	3/4/25	1408	GW	DEK-MW-15003	7	4	1	1	1				x	x	x	x	x	x	
-02	3/4/25	1251	GW	OW-10	7	4	1	1	1				x	x	x	x	x	x	
~~-03~~			~~GW~~	~~OW-11~~	~~7~~	~~4~~	~~1~~	~~1~~	~~1~~				~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	AW 4/28/2025
~~-04~~		~~1529~~	~~GW~~	~~DEK-MW-22003~~	~~7~~	~~4~~	~~1~~	~~1~~	~~1~~				~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	
~~-05~~		~~1134~~	~~GW~~	~~DEK-MW-22006~~	~~7~~	~~4~~	~~1~~	~~1~~	~~1~~				~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	
-06		—	GW	DUP-KLI	7	4	1	1	1				x	x	x	x	x	x	
-07		1413	W	EB-KLI	4	1	1	1	1				x	x	x			x	
-08		1251	W	FB-KLI	4	1	1	1	1				x	x	x			x	

QA REQUIREMENT: ☐ NPDES ☒ TNI ☐ ISO 17025 ☐ 10 CFR 50 APP. B ☐ INTERNAL INFO ☐ OTHER

ANALYSIS REQUESTED (Attach List if More Space is Needed)

RELINQUISHED BY:	DATE/TIME:	RECEIVED BY:
[signature]	3-4-25 1645	FedEx
Fed Ex	03-04-25 / 10:29	[signature]

COMMENTS:

Received on Ice? ☑ Yes ☐ No M&TE #: LS028757

Temperature: 1.8 - 4.9 °C Cal. Due Date: 01-16-26

TRC

PROJECT NAME:	CEC Wendock LF: 2025 GW Compliance CEC Karn LF: 2025 GW Compliance CEC Karn BAP/LI: 2025 GW Compliance
PROJECT NUMBER:	634698.0000.0000 634694.0000.0000 634695.0000.0000
PROJECT MANAGER:	Darby Litz
SITE LOCATION:	2742 Weadock Hwy Essexville, MI 48732
DATES OF FIELDWORK:	3/3/25 TO 3/3/25
PURPOSE OF FIELDWORK:	First Quarter Sampling Event 2025 Water levels
WORK PERFORMED BY:	~~Jake Krenz~~, Javier Jasso ~~Ashlyn Kast~~

3/6/25
SIGNED DATE

3-6-25
CHECKED BY DATE

TRC

GENERAL NOTES

PROJECT NAME: CEC Karn LF: 2025 GW Complian	DATE: 3/3/25	TIME ARRIVED: 0930
PROJECT NUMBER: 634694.0000.0000	AUTHOR: JK, JJ, AK	TIME LEFT: 1430

WEATHER

TEMPERATURE: 20 °F WIND: 10 MPH VISIBILITY: Overcast

WORK / SAMPLING PERFORMED

Water levels

sitewide for Karn and Weadock JK 3-6-25

PROBLEMS ENCOUNTERED	CORRECTIVE ACTION TAKEN

COMMUNICATION

NAME	REPRESENTING	SUBJECT / COMMENTS
Darby Litz	TRC	PM/Updates
Jon Gaeth	Consumers	Site Contact

INVESTIGATION DERIVED WASTE SUMMARY

WASTE MATRIX	QUANTITY	COMMENTS
Groundwater	NM	To Ground

SIGNED 3/4/25 DATE

CHECKED BY 3-6-25 DATE

TRC

WATER LEVEL DATA

PROJECT NAME: CEC Karn/Weadock: ~~2024~~ 2025 GW Compliance	DATE: 3/3/25
PROJECT NUMBER: 634694 / 634695 / 634698	AUTHOR: ~~AW~~ (JJ) ~~JK~~

WELL LOCATION	TIME	REFERENCE	DEPTH TO WATER (FEET)	DEPTH TO BOTTOM (FEET)	DEPTH TO PRODUCT (FEET)	WATER ELEVATION
MW-01	1101	TOC	18.90	24.26	NA	NM
MW-02	1100	TOC	19.22	30.30	NA	NM
MW-03	1106	TOC	19.28	30.75	NA	NM
MW-04	1107	TOC	19.94	33.80	NA	NM
MW-06	1120	TOC	10.71	24.74	NA	NM
MW-08	1143	TOC	18.20	27.50	NA	NM
MW-10	1208	TOC	17.39	24.85	NA	NM
MW-12	1236	TOC	19.69	23.85	NA	NM
MW-14	1300	TOC	15.40	19.23	NA	NM
MW-16	1312	TOC	17.72	21.23	NA	NM
MW-17	1348	TOC	14.83	24.34	NA	NM
MW-18	0954	TOC	27.90	39.65	NA	NM
MW-19	1016	TOC	18.70	30.00	NA	NM
MW-20	1031	TOC	54.33	72.00	NA	NM
MW-21	1022	TOC	52.50	60.58	NA	NM
MW-22	1146	TOC	18.00	29.59	NA	NM
MW-23	1035	TOC	DRY ~~32.90~~	~~64.05~~ 1305	NA	NM
OW-01	1230	TOC	52.93	64.00	NA	NM
OW-02	1148	TOC	16.93	21.95	NA	NM
OW-03	1201	TOC	18.04	28.78	NA	NM
OW-04	1257	TOC	11.25	16.26	NA	NM
OW-05	1310	TOC	15.00	19.00	NA	NM
OW-06	1336	TOC	23.21	24.86	NA	NM
OW-07	1332	TOC	16.23	23.91	NA	NM
OW-08	1332	TOC	11.28	17.96	NA	NM

ALL WATER LEVELS MUST INCLUDE REFERENCE POINT AND TAPE CORRECTION FACTOR (E.G., 1.1 + 0.00 T/PVC).

SIGNED 3/4/25 DATE

CHECKED 3-6-25 DATE

REVISED 04/2019

TRC

WATER LEVEL DATA

PROJECT NAME: CEC Karn/Weadock: ~~2024~~ 2025 GW Compliance	DATE: 3/7/25
PROJECT NUMBER: 634694 / 634695 / 634698	AUTHOR: Jake Krenz, Javier Jasso, Anc

WELL LOCATION	TIME	REFERENCE	DEPTH TO WATER (FEET)	DEPTH TO BOTTOM (FEET)	DEPTH TO PRODUCT (FEET)	WATER ELEVATION
OW-09	1330	TOC	10.45	12.77	NA	NM
OW-10	1355	TOC	8.11	13.95	NA	NM
OW-11	0948	TOC	25.05	25.56	NA	NM
OW-12		TOC	Decommissioned		NA	NM
~~OW-13~~		~~TOC~~			~~NA~~	~~NM~~
OW-15	0937	TOC	3.50	19.75	NA	NM
EW-01	1205	TOC	14.35	DRY	NA	NM
EW-02	1215	TOC	16.15		NA	NM
EW-03	1227	TOC	15.78		NA	NM
EW-04	1244	TOC	15.80		NA	NM
EW-05	1252	TOC	15.05		NA	NM
EW-06	1302	TOC	11.38		NA	NM
PZ-01	1154	TOC	13.76	14.10	NA	NM
PZ-02	1158	TOC	15.68	23.10	NA	NM
PZ-03	1210	TOC	15.68	19.60	NA	NM
PZ-04	1217	TOC	15.74	20.95	NA	NM
PZ-05	1223	TOC	14.75	21.18	NA	NM
PZ-06	1246	TOC	16.38	23.35	NA	NM
PZ-07	1246	TOC	16.00	21.00	NA	NM
PZ-08	1248	TOC	15.71	20.54	NA	NM
PZ-09	1255	TOC	16.35	21.61	NA	NM
PZ-10	1305	TOC	11.88	17.74	NA	NM
PZ-11	1307	TOC	14.80	18.10	NA	NM

ALL WATER LEVELS MUST INCLUDE REFERENCE POINT AND TAPE CORRECTION FACTOR (E.G., 1.1 + 0.00 T/PVC).

3/6/25 — SIGNED — DATE

3-6-25 — CHECKED — DATE

REVISED 08/2019

TRC

WATER LEVEL DATA

PROJECT NAME: CEC Karn/Weadock: ~~2024~~ 2025 GW Compliance	DATE: 3/3/25
PROJECT NUMBER: 634695/634698/634694	AUTHOR: J. Jasso

WELL LOCATION	TIME	REFERENCE	DEPTH TO WATER (FEET)	DEPTH TO BOTTOM (FEET)	DEPTH TO PRODUCT (FEET)	WATER ELEVATION
DEK-MW-18001	0943		9.80	19.76		
~~DEK-MW-15002~~						
DEK-MW-15003	0956		20.05	27.69		
DEK-MW-15004	0957		30.05	41.70		
DEK-MW-15005	1000		11.38	22.30		
~~DEK-MW-15006~~						
DEK-MW-22001	1003		11.58	24.15		
DEK-MW-22002	1012		13.05	26.85		
DEK-MW-22003	1011		13.00	24.40		
DEK-MW-22004	1005		11.57	22.40		
DEK-MW-22005	1007		10.00	2030		
DEK-MW-22006	1009		10.65	17.10		
~~MW-15002~~						
~~MW-15008~~						
~~MW-15016~~						
~~MW-15019~~						
TW-21-003	1040		19.70	26.20		
TW-21-002	1050		14.48	30.51		
TW-21-001	1054		14.35	17.59		
TW-21-013	1109		24.54	36.50		
TW-21-012S	1114		21.20	27.85		
TW-21-012I	1115		21.50	36.62		
TW-21-012D	1117		21.85	54.82		
TW-21-011S	1122		22.90	27.60		
TW-21-011I	1123		22.68	35.30		

ALL WATER LEVELS MUST INCLUDE REFERENCE POINT AND TAPE CORRECTION FACTOR (E.G., 1.1 + 0.00 T/PVC).

3/6/25
SIGNED DATE

3-6-25
CHECKED DATE

REVISED 04/2019

TRC

WATER LEVEL DATA

PROJECT NAME: CEC KARN LF ~~2023~~ 2025 GW COMLPIANCE	DATE: 3/3/25
PROJECT NUMBER: ~~514404.0000.0000~~ 634694	AUTHOR: J JASSO

WELL LOCATION	TIME	REFERENCE	DEPTH TO WATER (FEET)	DEPTH TO BOTTOM (FEET)	DEPTH TO PRODUCT (FEET)	WATER ELEVATION
TW-21-011D	1124		23.29	52.35		
TW-21-010	1128		20.93	28.60		
TW-21-009	1131		21.06	27.91		
TW-21-008	1316		15.45	19.80		
TW-21-007	1318		14.30	18.80		
TW-21-006	1321		11.48	13.50		
TW-21-005	1325		12.17	14.80		
TW-21-004	1327		14.65	16.60		
~~DEK-MW~~						
DEK-MW-15002		TOC	8.20	15.72		
DEK-MW-15006		TOC	11.08	~~14.5~~ 21.50		
OW-13		TOC	5.40	~~21.50~~ 14.57		
Water levels collected 3-4-25						
unable to access gated demolition area						
on 3-3-24 (JK)						

ALL WATER LEVELS MUST INCLUDE REFERENCE POINT AND TAPE CORRECTION FACTOR (E.G., 1.1 + 0.00 T/PVC).

SIGNED 3/4/25 DATE

CHECKED 3-6-25 DATE

REVISED 04/2019

TRC

WATER LEVEL DATA

PROJECT NAME: CEC Weadock LF: ~~2024~~ 2025 GW Compliance	DATE: 3/3/25
PROJECT NUMBER: ~~553828.0000.0000~~ 634698	AUTHOR: Javier Jasso

WELL LOCATION	TIME	REFERENCE	DEPTH TO WATER (FEET)	DEPTH TO BOTTOM (FEET)	DEPTH TO PRODUCT (FEET)	WATER ELEVATION
JCW-MW-18001	0641	TOC	18.60	23.7 T	NA	NM
JCW-MW-18004	0723	TOC	13.10	14.72	NA	NM
JCW-MW-18005	0624	TOC	9.52	16.24	NA	NM
JCW-MW-18006	0643	TOC	15.1T	53.68	NA	NM
JCW-OW-18001	0643	TOC	7.33	20.5 T	NA	NM
JCW-OW-18002	0648	TOC	7.32	19.76	NA	NM
JCW-OW-18003	0701	TOC	8.70	DNM	NA	NM
JCW-OW-18004	0725	TOC	6.71	14.87	NA	NM
JCW-OW-18006	0644	TOC	10.0 T	2345	NA	NM
LH-103R	0731	TOC	22.50	3346	NA	NM
LH-104	0816	TOC	7.8T	14.00	NA	NM
~~JCW~~-MW-20	0826	TOC	6.40	14.00	NA	NM
MW-50	0646	TOC	15.00	19.40	NA	NM
MW-51	0691	TOC	15.73	20.00	NA	NM
MW-52	0700	TOC	16.30	19.74	NA	NM
MW-53	0702	TOC	14.40	18.18	NA	NM
MW-53R	0711	TOC	15.14	18.80	NA	NM
MW-54R	0716	TOC	14.46	17.22	NA	NM
MW-55	0659	TOC	14.60	16.38	NA	NM
MW-58	0709	TOC	5.7T	18.23	NA	NM
OW-51	0653	TOC	9.04	17.26	NA	NM
OW-53	0708	TOC	7.46	18.00	NA	NM
OW-54	0717	TOC	6.85	16.48	NA	NM
OW-55	0821	TOC	6.00	1842	NA	NM
OW-56	0824	TOC	5.4T	19.27	NA	NM

ALL WATER LEVELS MUST INCLUDE REFERENCE POINT AND TAPE CORRECTION FACTOR (E.G., 1.1 + 0.00 T/PVC).

SIGNED 3/4/25 DATE

CHECKED 3-6-25 DATE

REVISED 04/2019

TRC

WATER LEVEL DATA

PROJECT NAME:	CEC Weadock LF: ~~2024~~ 2025 GW Compliance	DATE: 3/3/25
PROJECT NUMBER:	~~553828.0000.0000~~ 634698	AUTHOR: Javier Jasso

WELL LOCATION	TIME	REFERENCE	DEPTH TO WATER (FEET)	DEPTH TO BOTTOM (FEET)	DEPTH TO PRODUCT (FEET)	WATER ELEVATION
OW-56R	0830	TOC	5.45	20.23	NA	NM
OW-57 IN	0837	TOC	5.65	19.60	NA	NM
OW-57R IN	0838	TOC	5.44	20.18	NA	NM
OW-57 OUT	0834	TOC	9.50	20.20	NA	NM
OW-57R OUT	0836	TOC	10.90	19.46	NA	NM
JCW-MW-15007	0611	TOC	4.20	8.95	NA	NM
JCW-MW-15009	0621	TOC	10.40	13.00	NA	NM
JCW-MW-15010	0627	TOC	14.95	19.57	NA	NM
JCW-MW-15028	0615	TOC	6.98	25.10	NA	NM
MW-106B	0617		9.58	41.15		
JCW-MW15002	0622		8.75	DNM		
MW-107	0634		10.38	DNM		
JCW MW15023	0703		15.84	DNM		
JCW MW-15026	0713		14.03	DNM		
MW-16	0716		14.70	DNM		
JCW MW15021	0728		9.85	DNM		
MW-19	0850		10.18	20.83		
MW-15008	0901		4.60	17.40		
MW-15020	0902		5.38	17.80		
MW-116B	0906		5.60	38.80		
MW-15024	0911		6.44	17.17		
MW-15019	0914		5.87	16.85		
MW-15018	0916		5.96	9.94		
MW-15002	0921		7.20	16.80		
JCW MW15001	0922		8.00	DNM		

ALL WATER LEVELS MUST INCLUDE REFERENCE POINT AND TAPE CORRECTION FACTOR (E.G., 1.1 + 0.00 T/PVC).

SIGNED 3/6/25 DATE

CHECKED 3-6-25 DATE

REVISED 04/2019

TRC

WATER LEVEL DATA

PROJECT NAME: CEC WEADOCK LF ~~2023~~ 2025 GW COMLPIANCE	DATE: 3/3/25
PROJECT NUMBER: ~~514404.0000.0000~~ 634698	AUTHOR: J JASSO

WELL LOCATION	TIME	REFERENCE	DEPTH TO WATER (FEET)	DEPTH TO BOTTOM (FEET)	DEPTH TO PRODUCT (FEET)	WATER ELEVATION
MW 150bb	0925	TOC	3.90	8.10	———	———

ALL WATER LEVELS MUST INCLUDE REFERENCE POINT AND TAPE CORRECTION FACTOR (E.G., 1.1 + 0.00 T/PVC).

SIGNED 3/6/25 DATE

CHECKED 3-6-25 DATE

REVISED 04/2019

Appendix C
Data Quality Reviews

Laboratory Data Quality Review
Groundwater Monitoring Event March 2025
DE Karn Lined Impoundment

Groundwater samples were collected by TRC for the March 2025 sampling event. The samples were analyzed for total metals, anions, total dissolved solids, ammonia, and alkalinity by Consumers Energy (CE) Laboratory Services in Jackson, Michigan. The sulfide analysis was subcontracted to Merit Laboratories, Inc. (Merit) in East Lansing, Michigan. The laboratory analytical results were reported in laboratory sample delivery groups (SDGs) 25-0102 and S72099.01(01).

During the March 2025 sampling event, groundwater samples were collected from the following wells:

- DEK-MW-15003
- OW-10

The samples were analyzed for the following constituents:

Analyte Group	Method
Anions (Fluoride, Chloride, Sulfate, Nitrate, Nitrite)	EPA 300.0
Total Dissolved Solids (TDS)	SM 2540C
Total Metals	SW-846 6020B/7470A
Alkalinity (Bicarbonate, Carbonate, and Total)	SM 2320B
Ammonia	SM 4500 NH3(h)
Sulfide	SM 4500 S2D

TRC reviewed the laboratory data to assess data usability. The following sections summarize the data review procedure and the results of the review.

Data Usability Review Procedure

The analytical data were reviewed using the USEPA National Functional Guidelines for Inorganic Superfund Methods Data Review (USEPA, 2020). The following items were included in the evaluation of the data:

- Chain-of-custody (COC) and data completeness;
- Sample receipt, as noted in the cover page or case narrative
- Technical holding times for analyses;
- Reporting limits (RLs) compared to project-required RLs;
- Data for method blanks, equipment blanks, and field blanks, where applicable. Method blanks are used to assess potential contamination arising from laboratory sample preparation and/or analytical procedures. Field and equipment blanks are used to assess potential contamination arising from field procedures;

- Data for laboratory control samples (LCSs) and laboratory control sample duplicates (LCSDs), when performed. The LCSs and/or LCSDs are used to assess the accuracy of the analytical method using a clean matrix;
- Percent recoveries for matrix spike (MS) and matrix spike duplicates (MSD), when performed on project samples. Percent recoveries are calculated for each analyte spiked and used to assess bias due to sample matrix effects;
- Data for laboratory duplicates, when performed on project samples. The laboratory duplicates are replicate analyses of one sample and are used to assess the precision of the analytical method;
- Data for blind field duplicates, when collected. Field duplicate samples are used to assess variability introduced by the sampling and analytical processes; and overall usability of the data.

It should be noted that results for method blanks and LCSs were not provided for review by CE Laboratory Services and Merit. Therefore, potential contamination arising from laboratory sample preparation and/or analytical procedures and the accuracy of the analytical method using a clean matrix could not be evaluated for the total metals, anions, ammonia, TDS, alkalinity, and sulfide analyses.

This data usability report addresses the following items:

- Usability of the data if quality control (QC) results suggest potential problems with all or some of the data;
- Actions regarding specific QC criteria exceedances.

Review Summary

The data quality objectives and laboratory completeness goals for the project were met, and the data are usable for their intended purpose. A summary of the data quality review, including non-conformances and issues identified in this evaluation, are noted below.

- The reviewed Appendix III and IV constituents, optional Piper Diagram analyses, additional Part 115 constituents, as well as additional geochemistry parameters will be utilized for the purposes of a hydrogeological monitoring program (HMP).
- Data are usable for the purposes of the HMP.
- When the data are evaluated through a detection or assessment monitoring statistical program, findings below may be used to support the removal of outliers.

QA/QC Sample Summary

- Sample reports were checked to verify that the results corresponded to analytical requests as designated on the COC. No issues were noted.
- The preservation was assumed to be acceptable based on case narrative and COC preservation information; the cooler temperatures were between 0-6°C and acid was used for sample preservation, as applicable.
- The preparation times and dates for all analyses were provided in the electronic data deliverable (EDD) for this data set. All preparation and analysis holding time requirements were met.

- One equipment blank (EB-KLI) and one field blank (FB-KLI) were collected. Target analytes were not detected in these blank samples with the following exceptions.
  - Copper (4 µg/L) and zinc (15 µg/L) were detected in sample EB-KLI at the listed concentrations. In addition, copper (4 µg/L) was detected in sample FB-KLI at the listed concentration. Potential false positive exists for positive copper results that were associated with these blanks that were less than 10x the blank concentration, as summarized in Attachment A. There is no impact on data usability for nondetect results for copper and zinc.
- MS and MSD analyses were not performed on a sample in this data set.
- Laboratory duplicate analyses were not performed on a sample in this data set.
- Samples DUP-KLI/DEK-MW-15003 were submitted as the field duplicate pair with this data set; all criteria were met.
- The RLs met the project requirements and were deemed suitable for data use.
- Dilution factors for all analyses were provided in the EDD for this data set; all dilution factors were listed as 1-fold with the following exception.
  - Sample DUP-KLI was analyzed at a 2-fold dilution for sulfide likely due to the concentration of sulfide which exceeded the calibration range when analyzed undiluted. There is no impact on data usability due to this issue since sulfide was detected above the RL in this sample.

Attachment A

Summary of Data Non-Conformances for Groundwater Analytical Data

DE Karn Lined Impoundment

Essexville, Michigan

Samples	Collection Date	Analyte	Non-Conformance/Issue
OW-10	3/4/2025	Copper	Equipment blank and field blank contamination; potential false positive exists for the listed results.

Laboratory Data Quality Review
Groundwater Monitoring Event March 2025
DE Karn Bottom Ash Pond and Lined Impoundment

A groundwater sample was collected by TRC for the March 2025 sampling event. The sample was analyzed for total metals, anions, total dissolved solids, ammonia, and alkalinity by Consumers Energy (CE) Laboratory Services in Jackson, Michigan. The sulfide analysis was subcontracted to Merit Laboratories, Inc. (Merit) in East Lansing, Michigan. The laboratory analytical results were reported in laboratory sample delivery groups (SDGs) 25-0101 and S72101.01(01).

During the March 2025 sampling event, a groundwater sample was collected from the following well:

- DEK-MW-18001

The sample was analyzed for the following constituents:

Analyte Group	Method
Anions (Fluoride, Chloride, Sulfate, Nitrate, Nitrite)	EPA 300.0
Total Dissolved Solids (TDS)	SM 2540C
Total Metals	SW-846 6020B/7470A
Alkalinity (Bicarbonate, Carbonate, and Total)	SM 2320B
Ammonia	SM 4500 NH3(h)
Sulfide	SM 4500 S2D

TRC reviewed the laboratory data to assess data usability. The following sections summarize the data review procedure and the results of the review.

Data Usability Review Procedure

The analytical data were reviewed using the USEPA National Functional Guidelines for Inorganic Superfund Methods Data Review (USEPA, 2020). The following items were included in the evaluation of the data:

- Chain-of-custody and data completeness;
- Sample receipt, as noted in the cover page or case narrative
- Technical holding times for analyses;
- Reporting limits (RLs) compared to project-required RLs;
- Data for method blanks, equipment blanks, and field blanks, where applicable. Method blanks are used to assess potential contamination arising from laboratory sample preparation and/or analytical procedures. Field and equipment blanks are used to assess potential contamination arising from field procedures;

- Data for laboratory control samples (LCSs) and laboratory control sample duplicates (LCSDs), when performed. The LCSs and/or LCSDs are used to assess the accuracy of the analytical method using a clean matrix;
- Percent recoveries for matrix spike (MS) and matrix spike duplicates (MSD), when performed on project samples. Percent recoveries are calculated for each analyte spiked and used to assess bias due to sample matrix effects;
- Data for laboratory duplicates, when performed on project samples. The laboratory duplicates are replicate analyses of one sample and are used to assess the precision of the analytical method;
- Data for blind field duplicates, when collected. Field duplicate samples are used to assess variability introduced by the sampling and analytical processes; and
- Overall usability of the data.

It should be noted that results for method blanks and LCSs were not provided for review by CE Laboratory Services and Merit. Therefore, potential contamination arising from laboratory sample preparation and/or analytical procedures and the accuracy of the analytical method using a clean matrix could not be evaluated for the total metals, anions, ammonia, TDS, alkalinity, and sulfide analyses.

This data usability report addresses the following items:

- Usability of the data if quality control (QC) results suggest potential problems with all or some of the data;
- Actions regarding specific QC criteria exceedances.

Review Summary

The data quality objectives and laboratory completeness goals for the project were met, and the data are usable for their intended purpose. A summary of the data quality review, including non-conformances and issues identified in this evaluation, are noted below.

- The reviewed Appendix III and IV constituents, optional Piper Diagram analyses, additional Part 115 constituents, additional geochemistry parameters, as well as manganese will be utilized for the purposes of a hydrogeological monitoring program (HMP).
- Data are usable for the purposes of the HMP.
- When the data are evaluated through a detection or assessment monitoring statistical program, findings below may be used to support the removal of outliers.

QA/QC Sample Summary

- Sample reports were checked to verify that the results corresponded to analytical requests as designated on the COC. No issues were noted.
- The preservation was assumed to be acceptable based on case narrative and COC preservation information; the cooler temperatures were between 0-6°C and acid was used for sample preservation, as applicable.

- The preparation times and dates for all analyses were provided in the electronic data deliverable (EDD) for this data set. All preparation and analysis holding time requirements were met.
- Field blanks and equipment blanks were not collected with this data set.
- MS and MSD analyses were performed on sample DEK-MW-18001 for total metals, anions, ammonia, total alkalinity, and sulfide. The recoveries were within the acceptance limits, except as noted below. Relative percent differences (RPDs) for all parameters were not originally provided by the laboratory; further, with the exception of sulfide, MS/MSD concentrations were not originally provided by the laboratory.
    - Arsenic (225%), iron (963%), and barium (129%) recovered above the acceptance criteria (75-125%) in the MS performed on sample DEK-MW-18001. Upon request during this review, the laboratory confirmed these high MS recoveries and provided spike concentrations and RPDs for the metals MS/MSD as supplemental information to the laboratory report. The MS/MSD RPDs for arsenic (79%) and iron (165%) also exceeded the acceptance limit (20%). Therefore, the positive results for arsenic and iron should be considered potentially uncertain, and the positive result for barium should be considered potentially biased high in sample DEK-MW-18001, as summarized in Attachment A.
- A field duplicate pair was not collected with this data set.
- Laboratory duplicate analyses were not performed on the sample from this data set.
- The RLs met the project requirements and were deemed suitable for data use.
- Dilution factors for all analyses were provided in the EDD for this data set; all dilution factors were listed as 1-fold.

Attachment A

Summary of Data Non-Conformances for Groundwater Analytical Data
DE Karn Bottom Ash Pond and Lined Impoundment
Essexville, Michigan

Samples	Collection Date	Analyte	Non-Conformance/Issue
DEK-MW-18001	3/4/2025	Barium	High recovery in matrix spike (MS); potential high bias exists for the listed result.
		Arsenic, Iron	High recoveries in MS and MS/MS duplicate variability; potential uncertainty exists for the listed results.

Enclosure 3
Closure Alternate Source Demonstration, Karn Lined Impoundment Consumers Energy Company, Essexville, Michigan. (TRC. July 25, 2025)

1540 Eisenhower Pl.
Ann Arbor, MI 48108

T 734.971.7080

Technical Memorandum

Date:	July 25, 2025
To:	JR Register, Consumers Energy
From:	Darby Litz, TRC Kristin Lowery, TRC
cc:	Graham Crockford, TRC
Project No.:	634695.0000.0000 Phase 3
Subject:	Closure Alternate Source Demonstration Karn Lined Impoundment, Consumers Energy Company, Essexville, Michigan

The evaluation of data collected post-removal of coal combustion residuals (CCR) from the Karn Lined Impoundment indicated that multiple detection monitoring constituents are present at concentrations above the groundwater protections standard (GWPS). In addition, two assessment monitoring constituents, lithium and vanadium, were detected above the GWPS, each in one of the compliance monitoring wells.

The post-removal groundwater sampling events showed the following exceedances of the GWPSs on a direct comparison basis:

- Boron at OW-10;
- Calcium at OW-10, DEK-MW-22003, and DEK-MW-22006;
- Iron[1] at DEK-MW-18001, OW-10, DEK-MW-22003 and DEK-MW-22006;
- Sulfate at DEK-MW-22003 and DEK-MW-22006;
- Total dissolved solids at DEK-MW-18001, OW-10, DEK-MW-22003, and DEK-MW-22006;
- Lithium at DEK-MW-22006; and
- Vanadium[2] at OW-10.

There are several lines of evidence to demonstrate that concentrations of boron, calcium, lithium, sulfate, total dissolved solids, iron, and vanadium are attributable to other sources onsite and not related to the operation of the Karn Lined Impoundment.

1. Groundwater quality has been affected by site operations that pre-date operation of the Karn Lined Impoundment.

[1] Michigan Part 115 detection monitoring parameter.
[2] Michigan Part 115 assessment monitoring parameter.

2. The Karn Lined Impoundment was designed as a double-lined system to contain CCR materials and the leak detection system operated as designed for the active life of the system and the unit remained in detection monitoring.
3. The water quality data from the Karn Lined Impoundment secondary collection system (KLI-SCS) demonstrates that the monitored constituents are generally present at concentrations below the GWPS. In cases where elevated concentrations are observed, they appear to reflect the quality of influent water rather than the CCR material.

This Technical Memorandum provides these lines of evidence to document an Alternate Source Demonstration in support of certifying closure of the Karn Lined Impoundment in accordance with Section 11519b(9) of Act No. 640 of 2018 (2018 Amendment) on December 28, 2018, to amend the Natural Resources and Environmental Protection Act, also known as Part 115 of PA 451 of 1994, as amended (MCL 324.11519b(9)).

Pre-Existing Groundwater Conditions

Groundwater quality has been affected by site operations that pre-date the operation of the Karn Lined Impoundment. The footprint of the Karn Lined Impoundment is immediately adjacent to the pre-existing Karn Bottom Ash Pond and Karn Landfill (Figure 1). As reported in the 2017 Annual Groundwater Monitoring Report: DE Karn Bottom Ash Pond CCR Unit,[3] potential statistically significant increases (SSIs) over background limits were noted for boron, fluoride, pH, and sulfate in one or more downgradient wells during the September 2017 detection monitoring event. Although the CCR material associated with the operation of the Karn Bottom Ash Pond has been removed;[4] the groundwater in the vicinity of the Karn Bottom Ash Pond is documented to have been affected by CCR prior to the existence of the Karn Lined Impoundment and the selection of a groundwater remedy has not yet been completed.

Although concentrations of boron, calcium, iron, sulfate, and total dissolved solids at the Karn Lined Impoundment wells exceed the GWPS established based on background/baseline concentrations at DEK-MW-15003, concentrations at other wells in the vicinity of the Karn Bottom Ash Pond (DEK-MW-15002, DEK-MW-15004, DEK-MW-15005, DEK-MW-15006) are comparable to the Karn Lined Impoundment compliance wells (Attachment 1, Charts 1-5). Furthermore, boron concentrations at OW-10 have consistently been higher than the boron concentrations at DEK-MW-15003, including the period before the Karn Lined Impoundment began operation, providing additional evidence that boron in groundwater is not a result of the Karn Lined Impoundment's operation, as shown in the boron time series plot in Attachment 1 (Chart 6). Concentrations of total dissolved solids and their component constituents (calcium, iron, and sulfate) are generally higher at DEK-MW-22003 and DEK-MW-22006 than the other Karn Lined Impoundment compliance wells (Attachment 1, Charts 2-5). These two wells are located within the footprint of the former Karn Bottom Ash Pond and were installed after CCR was removed. The disturbance of native soils can affect the quality and quantity of infiltration, causing changes in general groundwater chemistry, e.g. total dissolved solids. Similar concentrations of total dissolved solids, calcium, iron and sulfate, are observed at other wells within the former bottom ash

[3] TRC. 2018. Annual Groundwater Monitoring Report – DE Karn Power Plant Bottom Ash Pond CCR Unit. January.

[4] Consumers Energy. 2019. D.E. Karn Generating Facility Bottom Ash Pond CCR Removal Documentation Report. October 30.

pond footprint (Attachment 1, Charts 7-10). The presence of elevated total dissolved solids and associated constituents in DEK-MW-22003 and DEK-MW-22006, combined with the absence of elevated boron concentrations further supports the influence of a source other than CCR on groundwater quality.

Additionally, as documented in the Karn Lined Impoundment Hydrogeological Monitoring Plan (HMP),[5] the site development included reclaiming low-lands with ash fill. The presence of ash is documented in the boring logs for the Karn Lined Impoundment and Karn Bottom Ash Pond monitoring wells. Ash fill present in this area of the Site provides an additional influence on groundwater quality that is unrelated to the operation of the Karn Lined Impoundment as the presence of ash fill pre-dates construction and operation of the impoundment. Ash fill has been noted to have been historically placed beneath the secondary liner of the Karn Lined Impoundment[6].

Karn Lined Impoundment Unit Construction

The liner system for the Karn Lined Impoundment was designed as a double composite liner system, with the primary and secondary composite liners each consisting of 60-mil high-density polyethylene (HDPE) geomembrane (GM) overlaying a 236-mil geosynthetic clay liner (GCL). This liner system was constructed consistent with the liner design requirements of §257.70 and §257.72.[7] The secondary collection system (SCS) serves as a leak detection system, and the SCS flow rate data is used to demonstrate compliance under Michigan's Natural Resources and Environmental Protection Act, also known as Part 115 of PA 451 of 1994, as amended (a.k.a., Michigan Part 115 Solid Waste Management). The flow rate is calculated each time the SCS is evacuated and provided to the Department of Environment, Great Lakes, and Energy (EGLE) on a quarterly basis.

Increased average daily SCS flow rates noted for a brief period from December 10, 2020 – January 6, 2021 triggered investigations by Consumers Energy that quickly identified deficiencies in the liner system and prompted actions to address the damaged liner. Consumers provided a proactive notification and a preliminary written assessment of the flow rate exceedances to the EGLE on January 15, 2021 and January 22, 2021, respectively. Remedial actions performed in response to the increased flow rates are documented in the First Quarter 2021 Hydrogeological Monitoring Report prepared for the DE Karn Lined Impoundment CCR Unit.[8] Following repairs to the liner in 2021, the daily average flow rates were reduced, and the three-month average dropped below the response action flow rate of 25 gallons per acre per day (GPAD). Since early 2021, the SCS flow rate has consistently been below the state-established response action flow of 25 gallons per acre per day (GPAD) and the action flow rate of 5 GPAD, indicating that the liner is not leaking following the repairs. The SCS flow rate was monitored for the end-of-life CCRs and NPDES decant water that remained in the CCR unit until closure activities commenced in August 2024.

The double composite liner system construction of the Karn Lined Impoundment and the SCS flow rate monitoring for leak detection functioned as designed during the operation of the CCR unit and indicate

[5] TRC. 2020. Karn Lined Impoundment Hydrogeological Monitoring Plan. November.
[6] WSP. 2024. D.E. Karn Generating Facility Karn Lined Impoundment Decommissioning Report. October.
[7] Golder Associates, Inc. 2018. D. E. Karn Generating Facility Bottom Ash Lined Impoundment Liner System Design Certification Report. April.
[8] TRC. 2021. First Quarter 2021 Hydrogeological Monitoring Report, DE Karn Lined Impoundment CCR Unit. April.

liquids managed within the unit did not migrate past the liner system and affect groundwater quality. Furthermore, as documented in the CCR Removal Documentation Report,[9] the primary sand drainage layer contained less than 2% microscopic estimation of particles of CCR intermixed in the soil by weight, providing another line of evidence that CCR-affected material did not migrate into the liner system. Groundwater monitoring performed in accordance with the Karn Lined Impoundment HMP demonstrated that the CCR unit remained in detection monitoring throughout its operation.

Karn Lined Impoundment Collection System Water Quality Data

In response to the prior exceedance of the SCS Response Action Flow Rate, Consumers Energy initiated sampling from the surface water of the primary collection system (KLI-PCS) and from the secondary leachate collection system sump (KLI-SCS) to compare leachate chemistry to groundwater chemistry. The KLI-PCS and KLI-SCS data are compared to the GWPS in a series of time-series plots are included in Attachment 2.

These time-series plots demonstrate that each monitored constituent is generally present in the secondary collection system (KLI-SCS) at concentrations less than the GWPS, except for calcium, iron, sulfate, TDS, and vanadium. The calcium, iron, TDS, and sulfate concentrations in the secondary collection system are more closely linked to water coming through the system from the intake water than as a byproduct of the commingled ash and other waste products.

Although vanadium is detected in the secondary collection system, it is generally not detected in groundwater near the Karn Lined Impoundment, except for at two monitoring wells. Vanadium is detected intermittently in groundwater at OW-10 and has historically been detected at OW-11. Vanadium is not detected elsewhere in the groundwater monitoring network, including at DEK-MW-15003 and DEK-MW-18001 which are located closer to the Karn Lined Impoundment than OW-10 and OW-11, and historically at OW-12 which is located closest to the observed deficiencies in the liner system and is most likely to have been impacted by unit operation (Attachment 1, Charts 11-13). Concentrations of vanadium at OW-11 are more than an order of magnitude greater than concentrations in the PCS and SCS, indicating the source of vanadium in groundwater is a local source rather than impact of leachate from the Karn Lined Impoundment.

Lastly, while lithium concentrations are detected above the GWPS (46 ug/L) at DEK-MW-22006 (51 ug/L on 9/30/2024 and 60 ug/L on 3/4/2025), lithium concentrations in the PCS and SCS have been non-detect or slightly above the laboratory reporting limit (10 ug/L) for the life of monitoring (Attachment 1, Chart 14).[10] Therefore, leachate from the Karn Lined Impoundment is not the source of lithium detected at DEK-MW-22006.

Conclusions and Recommendations

Based on the multiple lines of evidence presented above, the concentrations of boron, calcium, lithium, sulfate, total dissolved solids, iron, and vanadium are not attributed to the Karn Lined Impoundment:

---

[9] WSP. 2024. D.E. Karn Generating Facility Karn Lined Impoundment Decommissioning Report. October.

[10] Lithium was detected in the PCS at an elevated concentration (57 ug/L) in a single event in July 2023. This was the first sample collected after operation of the Karn Units 1&2 ceased and is likely a result of changes in the miscellaneous low-volume waste being placed in the Karn Lined Impoundment rather than the ash management. Similar temporary increases were observed for other constituents during this event.

1. Groundwater quality has been affected by site operations that pre-date operation of the Karn Lined Impoundment.
2. The Karn Lined Impoundment was designed as a double-lined system to contain CCR materials and the leak detection system operated as designed for the active life of the system and the unit remained in detection monitoring.
3. The water quality data from the Karn Lined Impoundment secondary collection system (KLI-SCS) demonstrates that the monitored constituents are generally present at concentrations below the GWPS. In cases where elevated concentrations are observed, they appear to reflect the quality of influent water rather than the CCR material.

The information provided in this technical memorandum serves as the ASD for the Karn Lined Impoundment. This ASD was prepared in accordance with 40 CFR 257.94(e)(2) of the CCR Rule and the HMP and demonstrates that these concentrations are due to pre-existing groundwater conditions and regional changes in geochemistry.

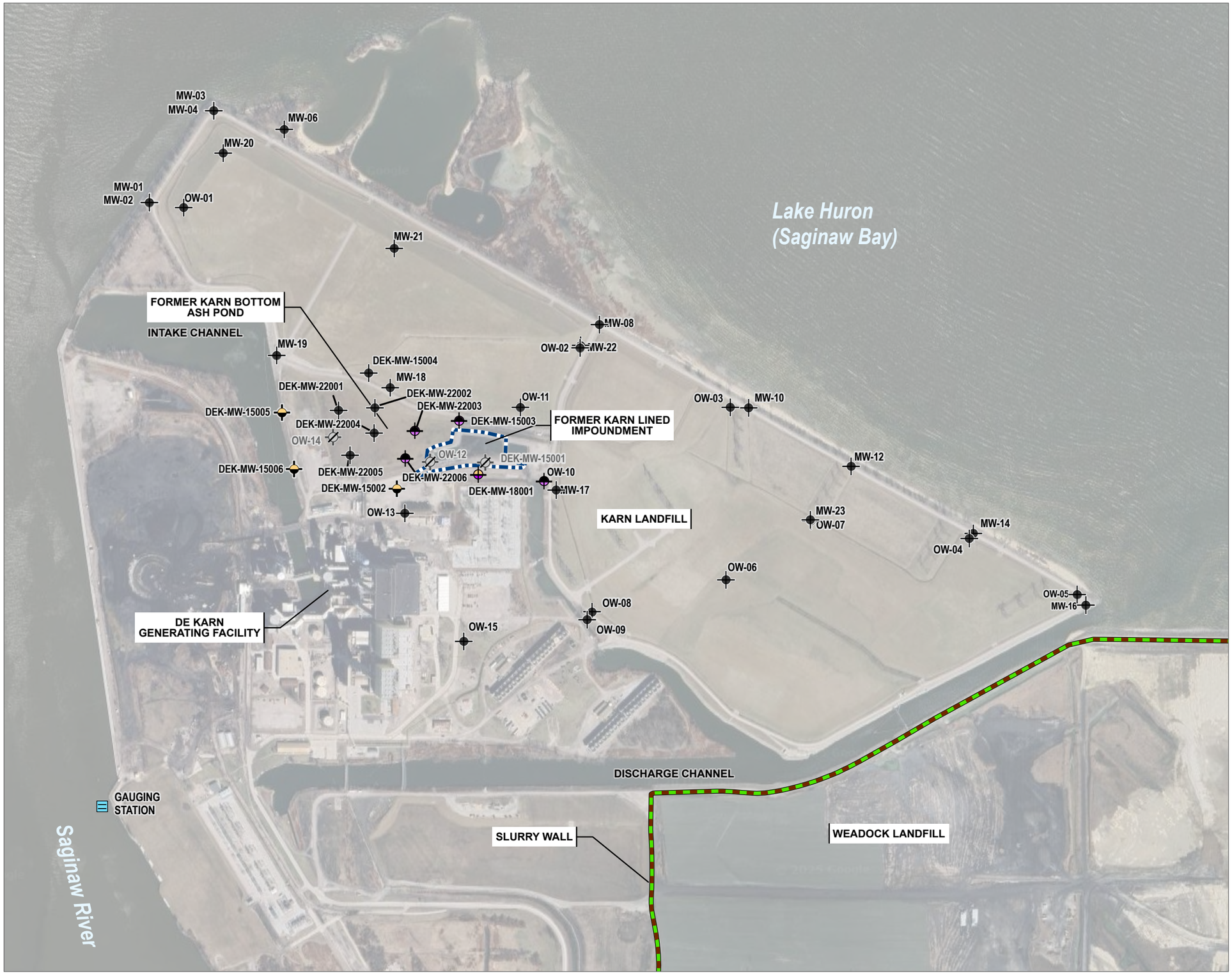
Attachments

Figure 1 Site Layout Map

Attachment 1 Groundwater Data Evaluation

Attachment 2 Karn Lined Impoundment Collection System Water Chemistry

Figure



LEGEND

- DEK BOTTOM ASH POND & LINED IMPOUNDMENT MONITORING WELL
- DEK BOTTOM ASH POND MONITORING WELL
- DEK LINED IMPOUNDMENT MONITORING WELL
- DECOMMISSIONED MONITORING WELL
- MONITORING WELL (STATIC WATER LEVEL ONLY); NATURE AND EXTENT WELL
- SURFACE WATER GAUGING STATION
- SLURRY WALL (APPROXIMATE)
- LINED IMPOUNDMENT (COVENANT BOUNDARY)

NOTES

1. BASE MAP IMAGERY FROM GOOGLE SATELLITE IMAGERY, (04/05/2024).
2. WELL LOCATIONS SURVEYED BY ROWE PROFESSIONAL SERVICES COMPANY ON 11/4/2015.
3. NOAA/NATIONAL OCEANIC SERVICE GREAT LAKES GAUGING STATION, ESSEXVILLE, MI (ID: 9075035).
4. A SINGLE WELL SYMBOL IS SHOWN FOR WELL PAIRS MW-01/MW-02 AND MW-03/MW-04 AS THE WELLS ARE LOCATED WITHIN 3-FT OF EACH OTHER.

1:7,200

1" = 600'

0 600 1,200 FEET

PROJECT:	CONSUMERS ENERGY COMPANY DE KARN POWER PLANT ESSEXVILLE, MICHIGAN
TITLE:	SITE LAYOUT MAP
DRAWN BY: A. ADAIR	PROJ. NO.: 634695.0000
CHECKED BY: K. LOWERY	FIGURE 1
APPROVED BY: D. LITZ	
DATE: JUNE 2025	

TRC
1540 EISENHOWER PLACE
ANN ARBOR, MI 48108-3284
PHONE: 734.971.7080

FILE: 464095_DEKARN.aprx

Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl; Map Rotation: 0
Saved By AADAIR on 6/12/2025, 08:29:53 AM; File Path: T:\PROJECTS\Consumers_Energy\464095_DEKARN\2-APRX\464095_DEKARN.aprx; Layout Name: KLL-Closure-2025Line

Attachment 1
Groundwater Data Evaluation

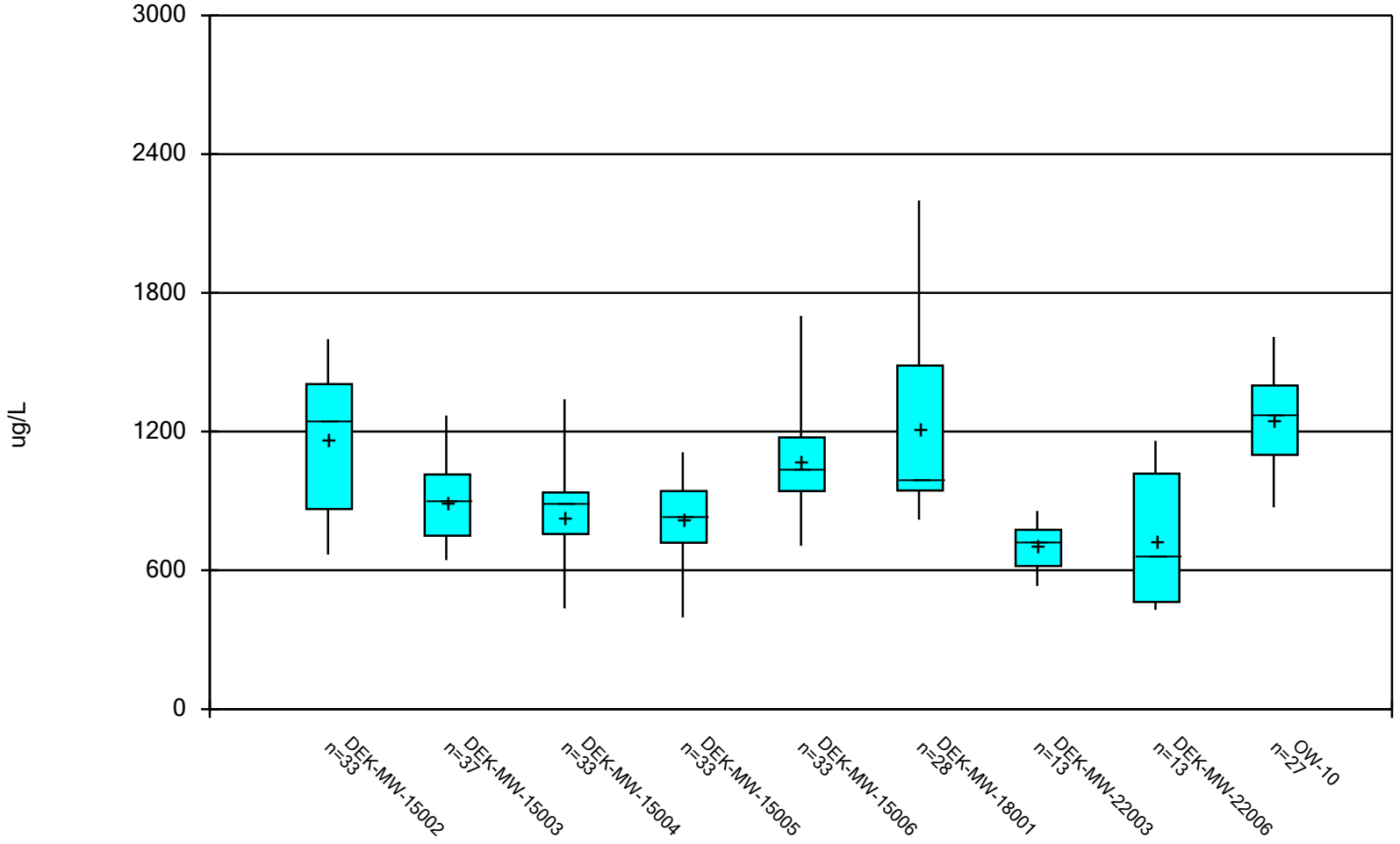
Sanitas™ v.10.0.26 Sanitas software licensed to Consumers Energy. UG

Chart 1

Boron Box & Whiskers Plot

Karn Bottom Ash Pond Wells

December 2015 - March 2025



Constituent: Boron, Total Analysis Run 6/16/2025 10:17 AM

Client: Consumers Energy Data: DEK KLI CCR Sanitas_25Q1

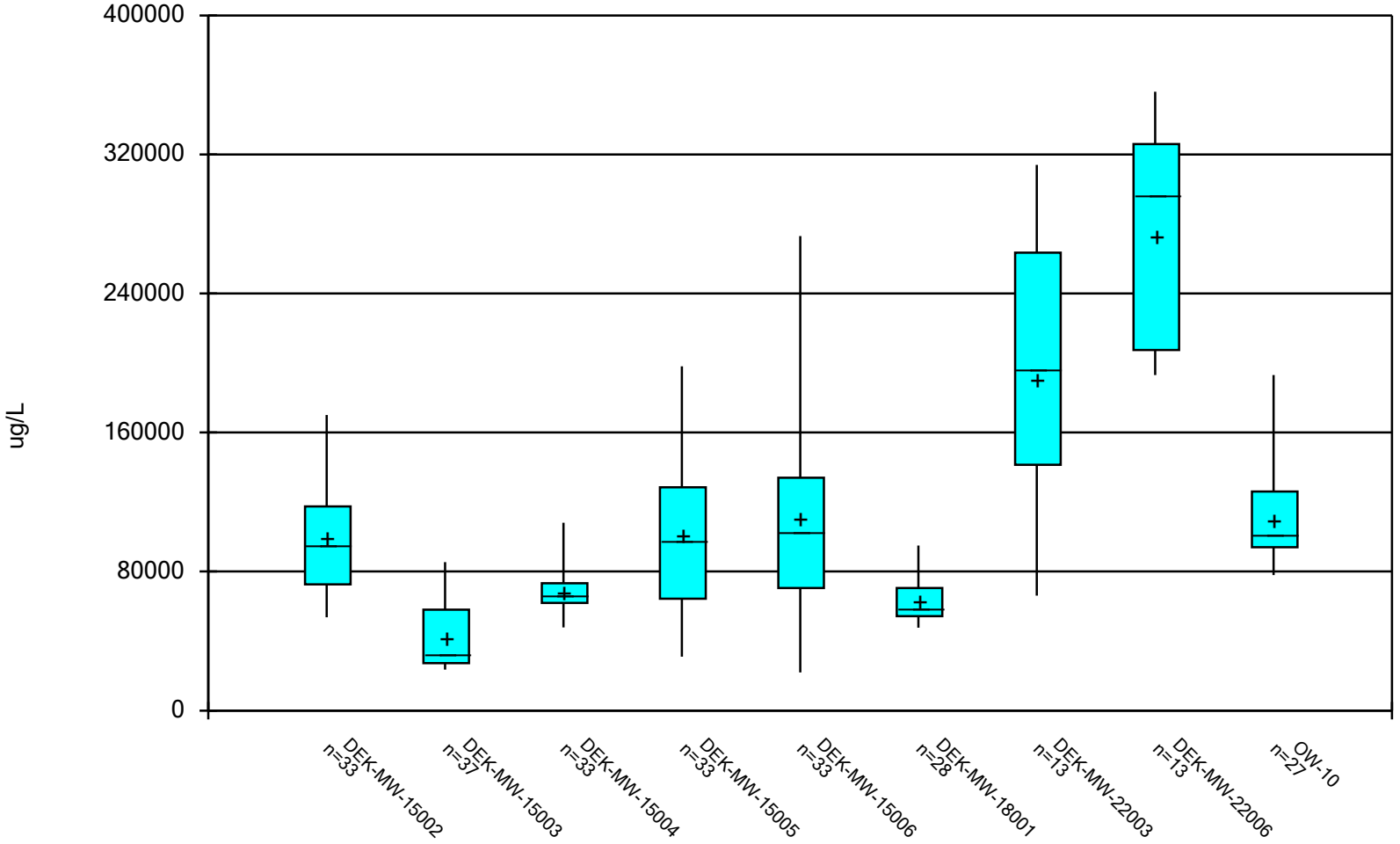
Sanitas™ v.10.0.26 Sanitas software licensed to Consumers Energy. UG

Chart 2

Calcium Box & Whiskers Plot

Karn Bottom Ash Pond Wells

December 2015 - March 2025



Constituent: Calcium, Total Analysis Run 6/16/2025 10:19 AM

Client: Consumers Energy Data: DEK KLI CCR Sanitas_25Q1

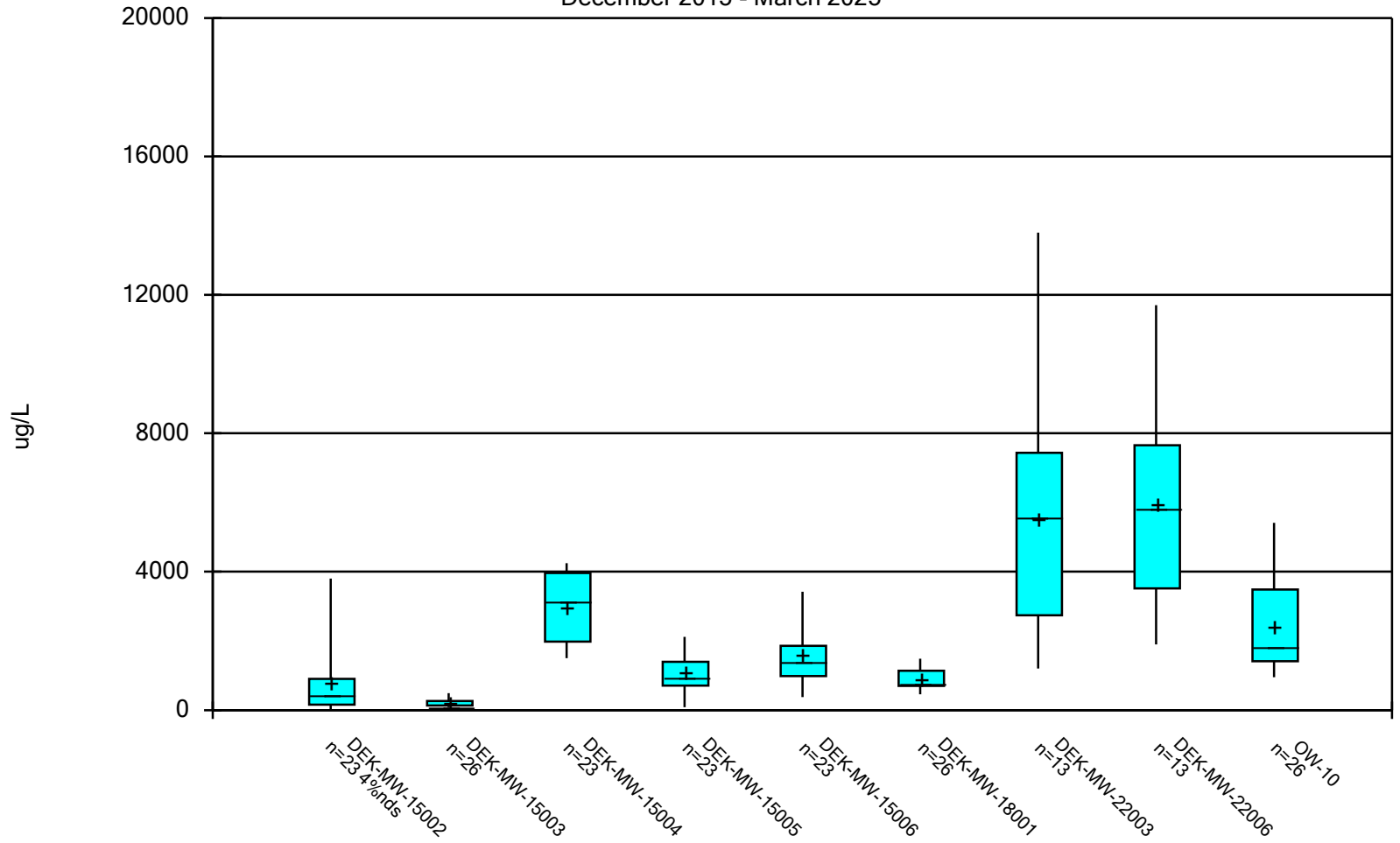
Sanitas™ v.10.0.26 Sanitas software licensed to Consumers Energy. UG

Chart 3

Iron Box & Whiskers Plot

Karn Bottom Ash Pond Wells

December 2015 - March 2025



Constituent: Iron, Total Analysis Run 6/16/2025 10:21 AM

Client: Consumers Energy Data: DEK KLI CCR Sanitas_25Q1

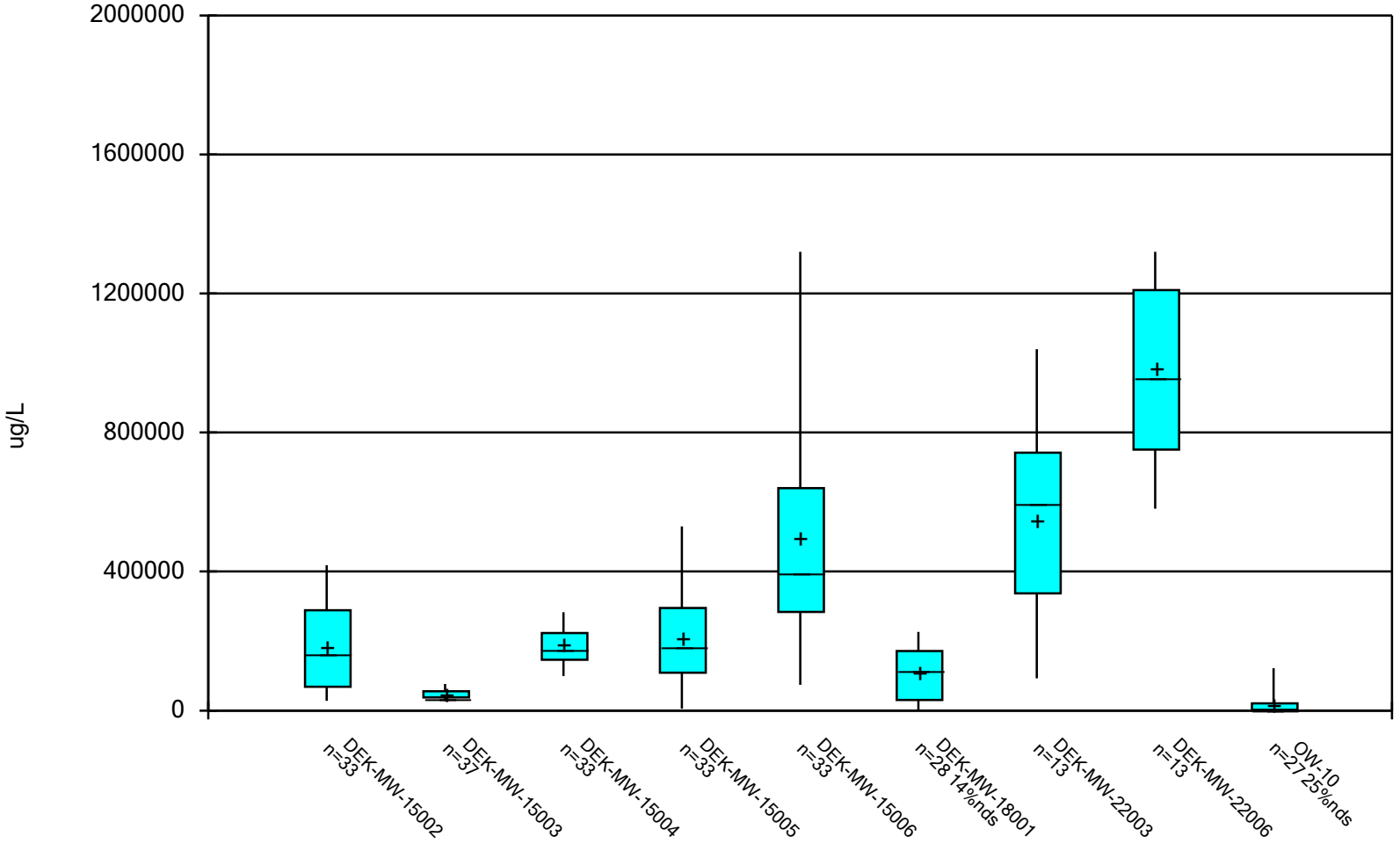
Sanitas™ v.10.0.26 Sanitas software licensed to Consumers Energy. UG

Chart 4

Sulfate Box & Whiskers Plot

Karn Bottom Ash Pond Wells

December 2015 - March 2025



Constituent: Sulfate Analysis Run 6/16/2025 10:23 AM

Client: Consumers Energy Data: DEK KLI CCR Sanitas_25Q1

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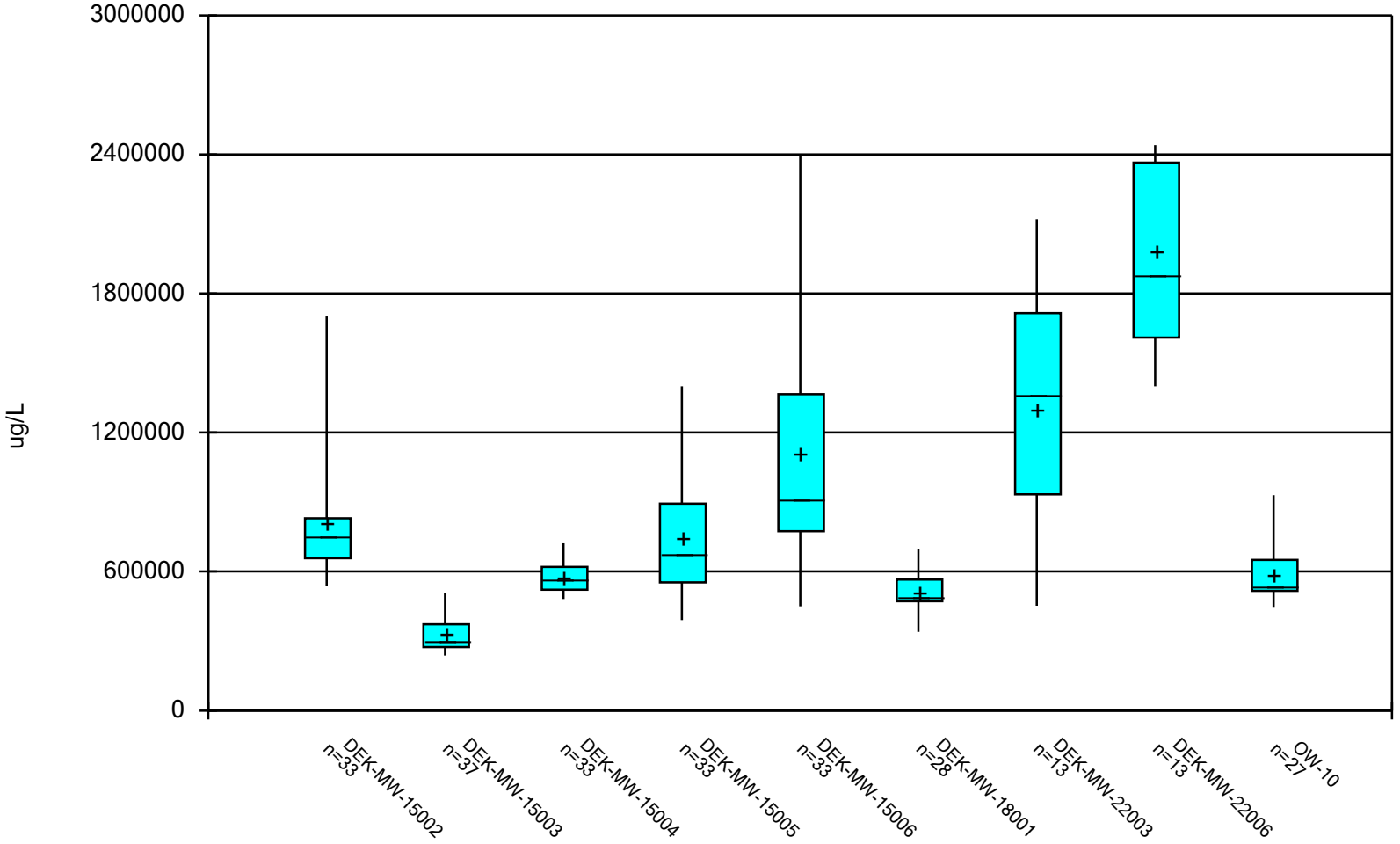
Chart 5

Total Dissolved Solids Box & Whiskers Plot

Karn Bottom Ash Pond Wells

December 2015 - March 2025



Constituent: Total Dissolved Solids Analysis Run 6/16/2025 10:25 AM

Client: Consumers Energy Data: DEK KLI CCR Sanitas_25Q1

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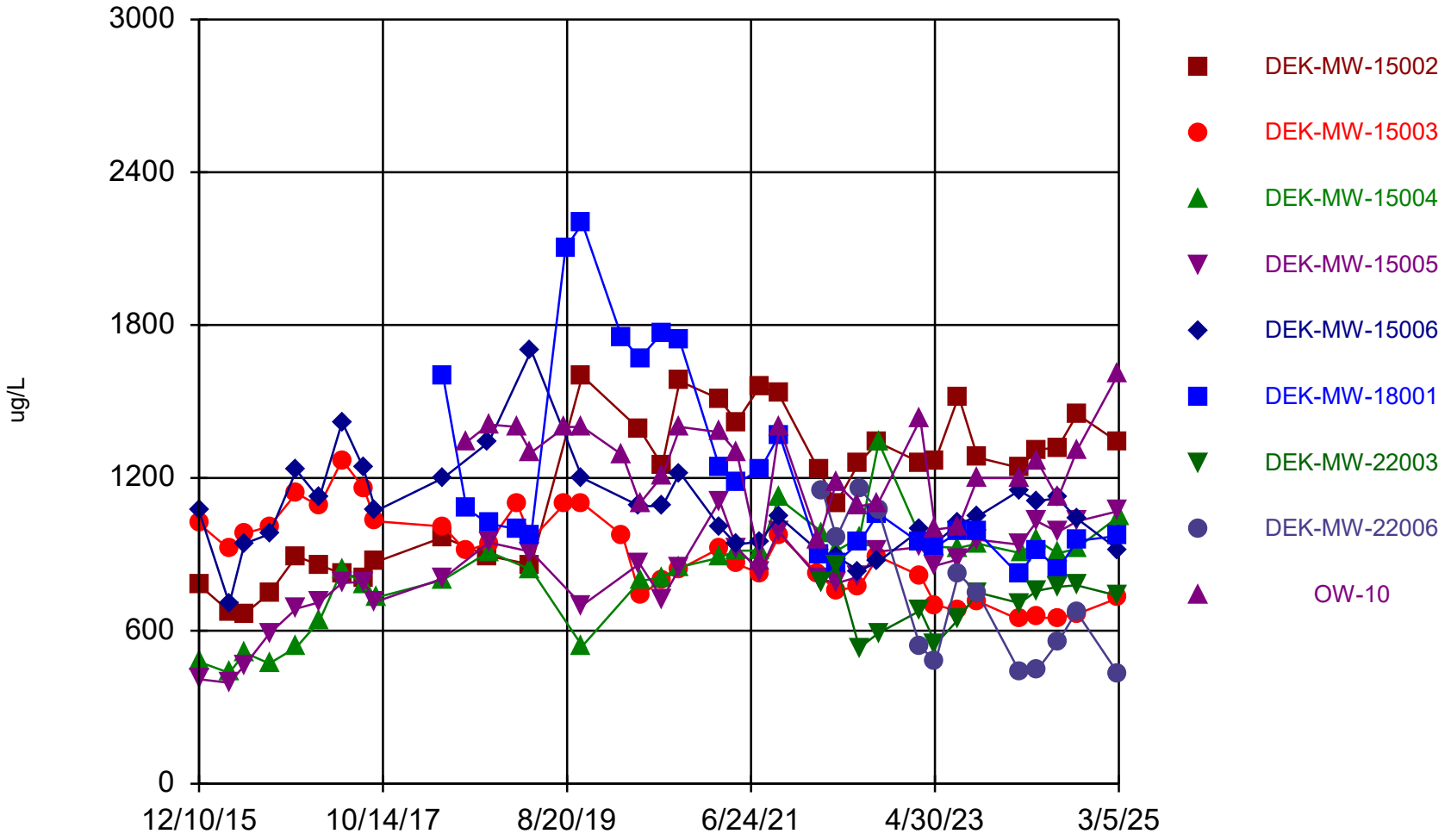
Chart 6

Boron Time Series



Constituent: Boron, Total Analysis Run 6/16/2025 10:30 AM

Client: Consumers Energy Data: DEK KLI CCR Sanitas_25Q1

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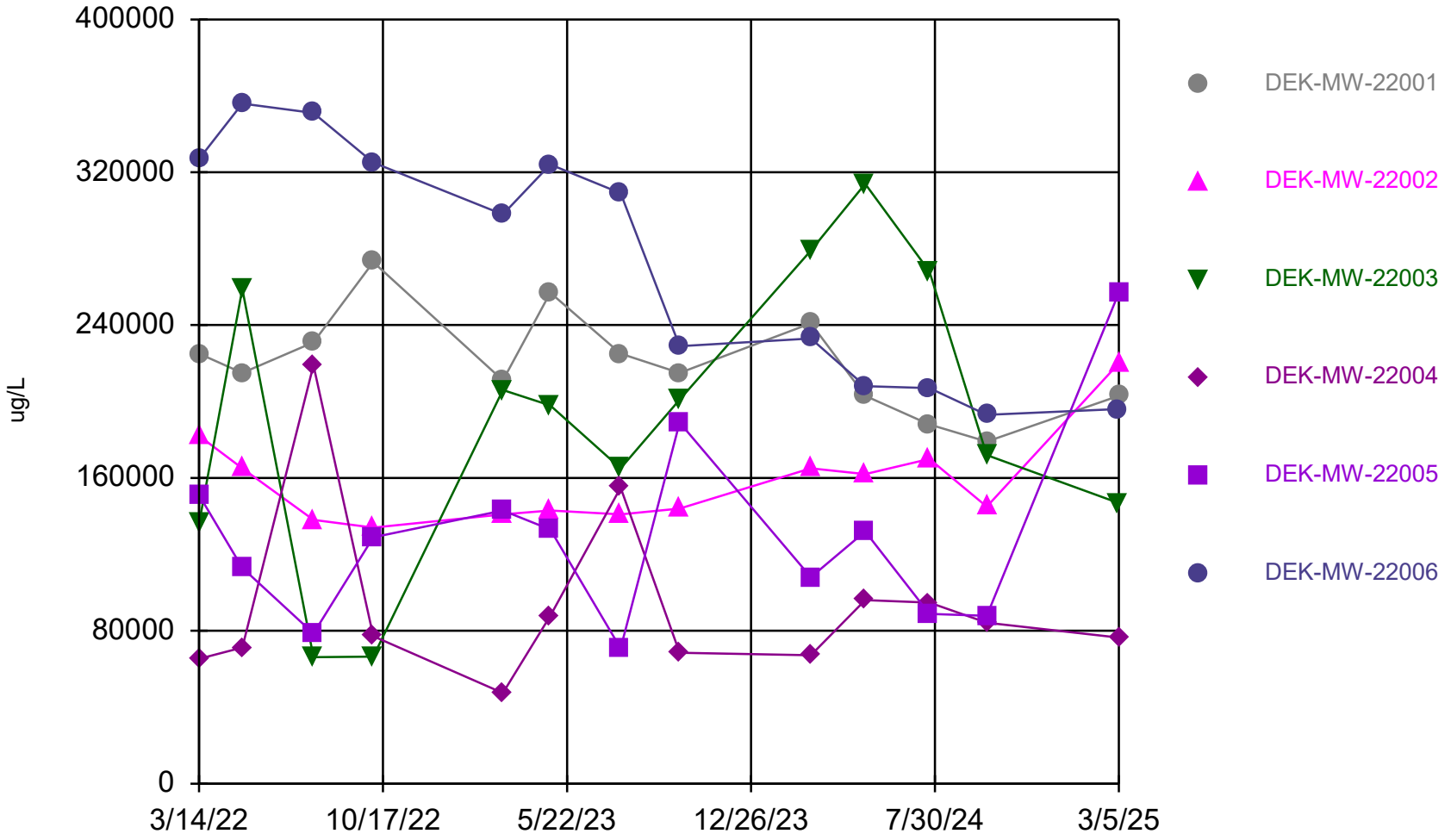
Chart 7

Calcium Time Series



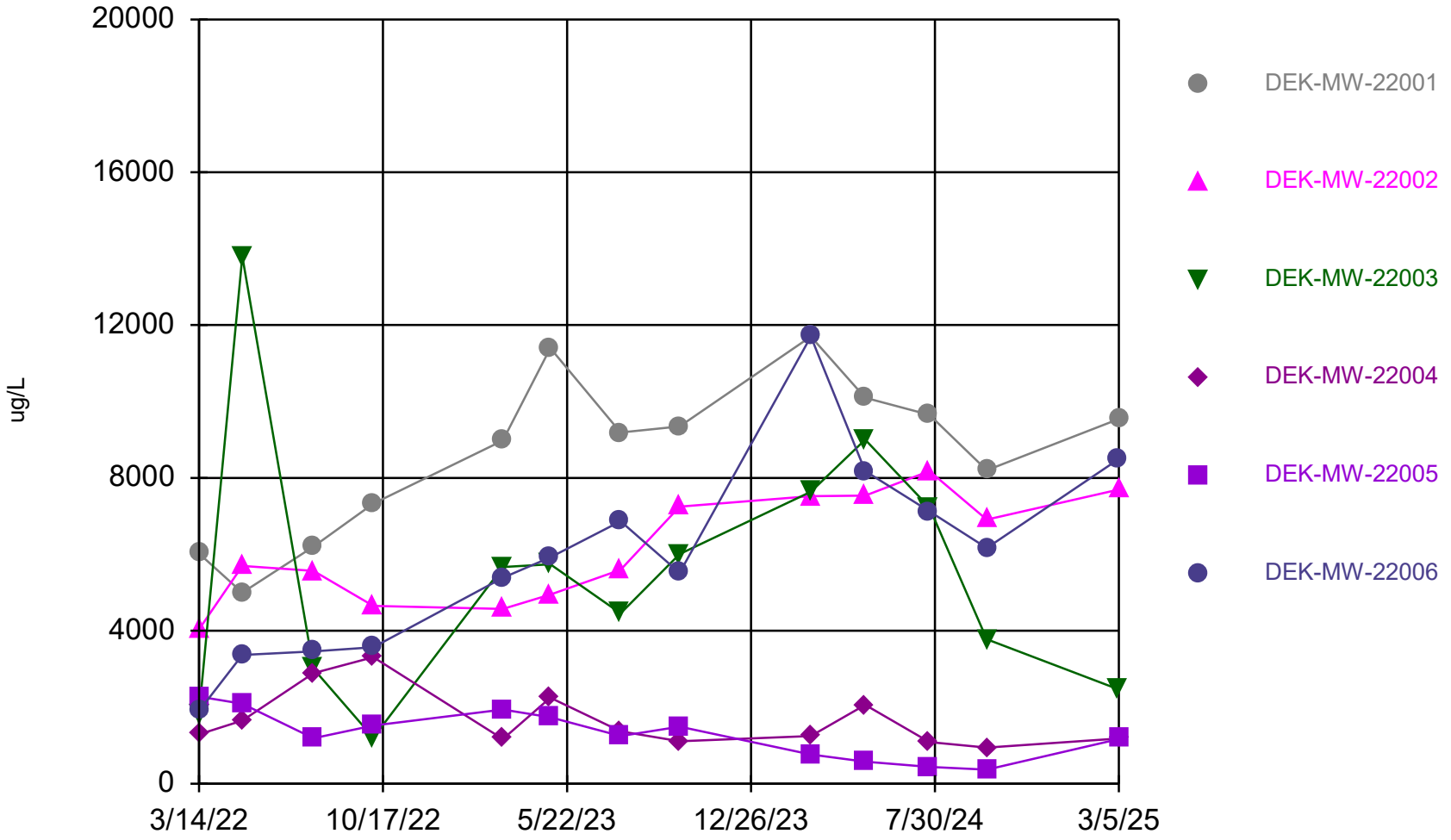
Constituent: Calcium, Total Analysis Run 6/16/2025 10:36 AM

Client: Consumers Energy Data: DEK KLI CCR Sanitas_25Q1

Sanitas™ v.10.0.26 Sanitas software licensed to Consumers Energy. UG

Chart 8

Iron Time Series



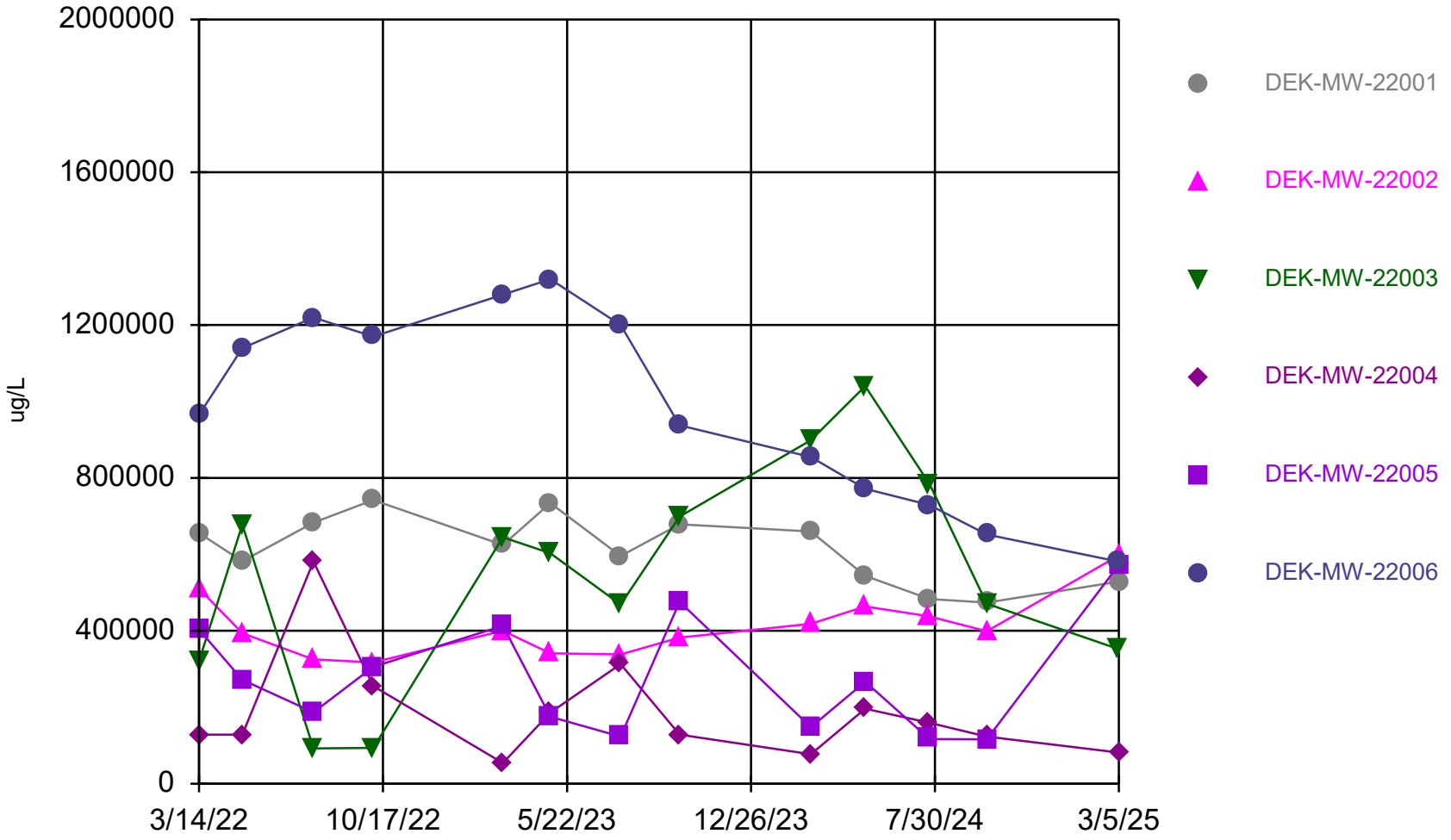
Constituent: Iron, Total Analysis Run 6/16/2025 10:36 AM

Client: Consumers Energy Data: DEK KLI CCR Sanitas_25Q1

Sanitas™ v.10.0.26 Sanitas software licensed to Consumers Energy. UG

Chart 9

Sulfate Time Series



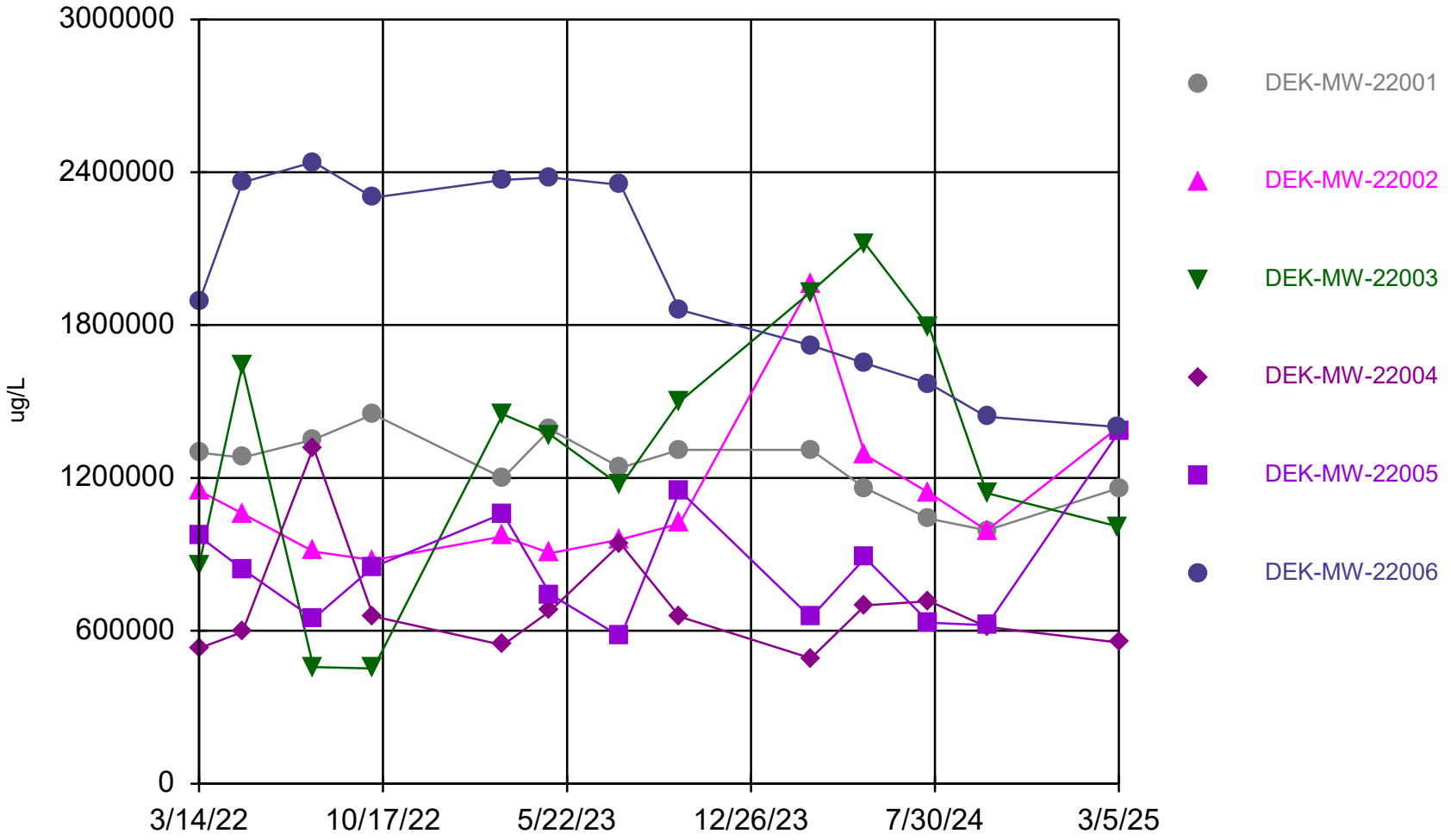
Constituent: Sulfate Analysis Run 6/16/2025 10:36 AM

Client: Consumers Energy Data: DEK KLI CCR Sanitas_25Q1

Sanitas™ v.10.0.26 Sanitas software licensed to Consumers Energy. UG

Chart 10

Total Dissolved Solids Time Series



Constituent: Total Dissolved Solids Analysis Run 6/16/2025 10:36 AM

Client: Consumers Energy Data: DEK KLI CCR Sanitas_25Q1

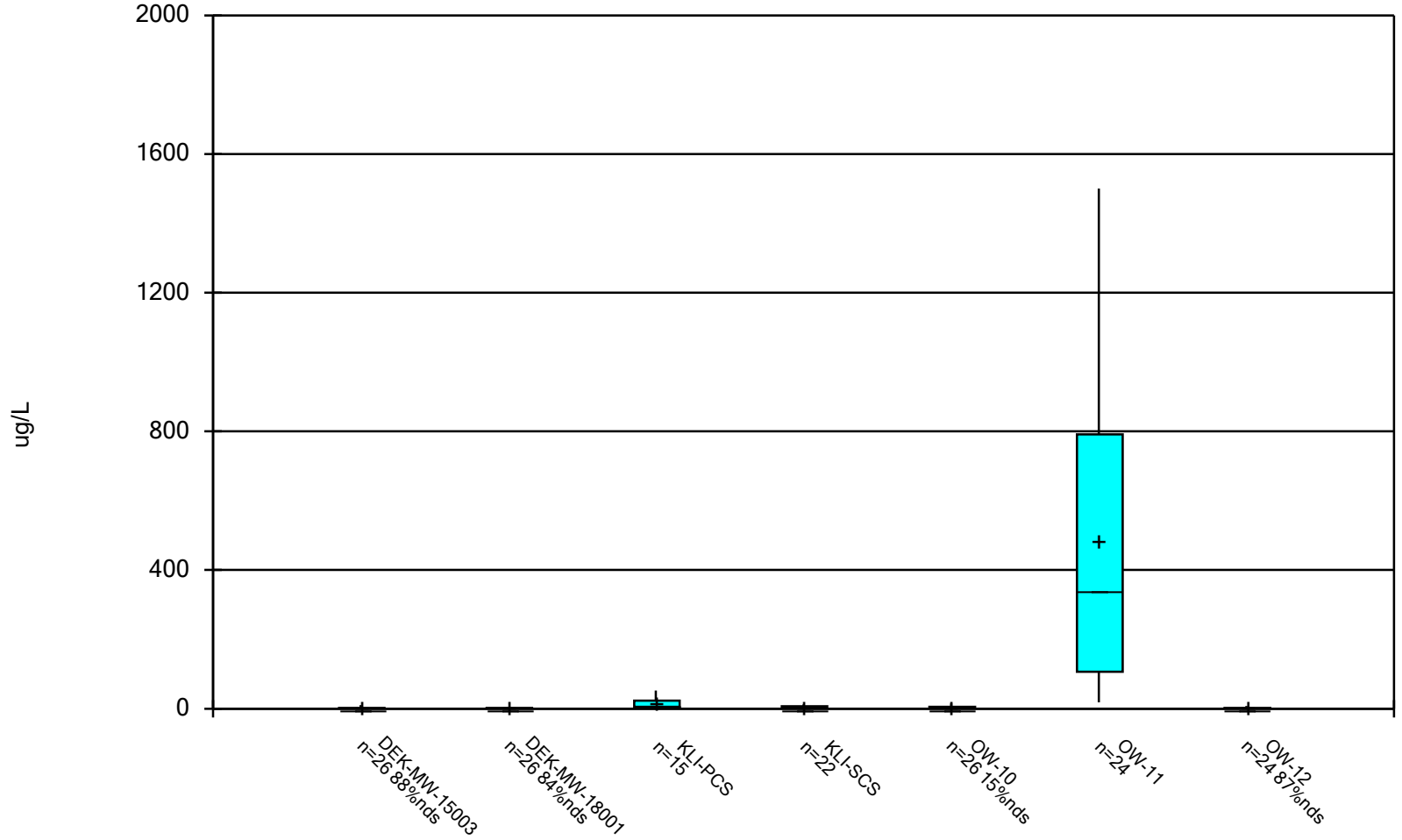
Sanitas™ v.10.0.26 Sanitas software licensed to Consumers Energy. UG

Chart 11

Vanadium Box & Whiskers Plot

Karn Lined Impoundment

November 2018 - March 2025

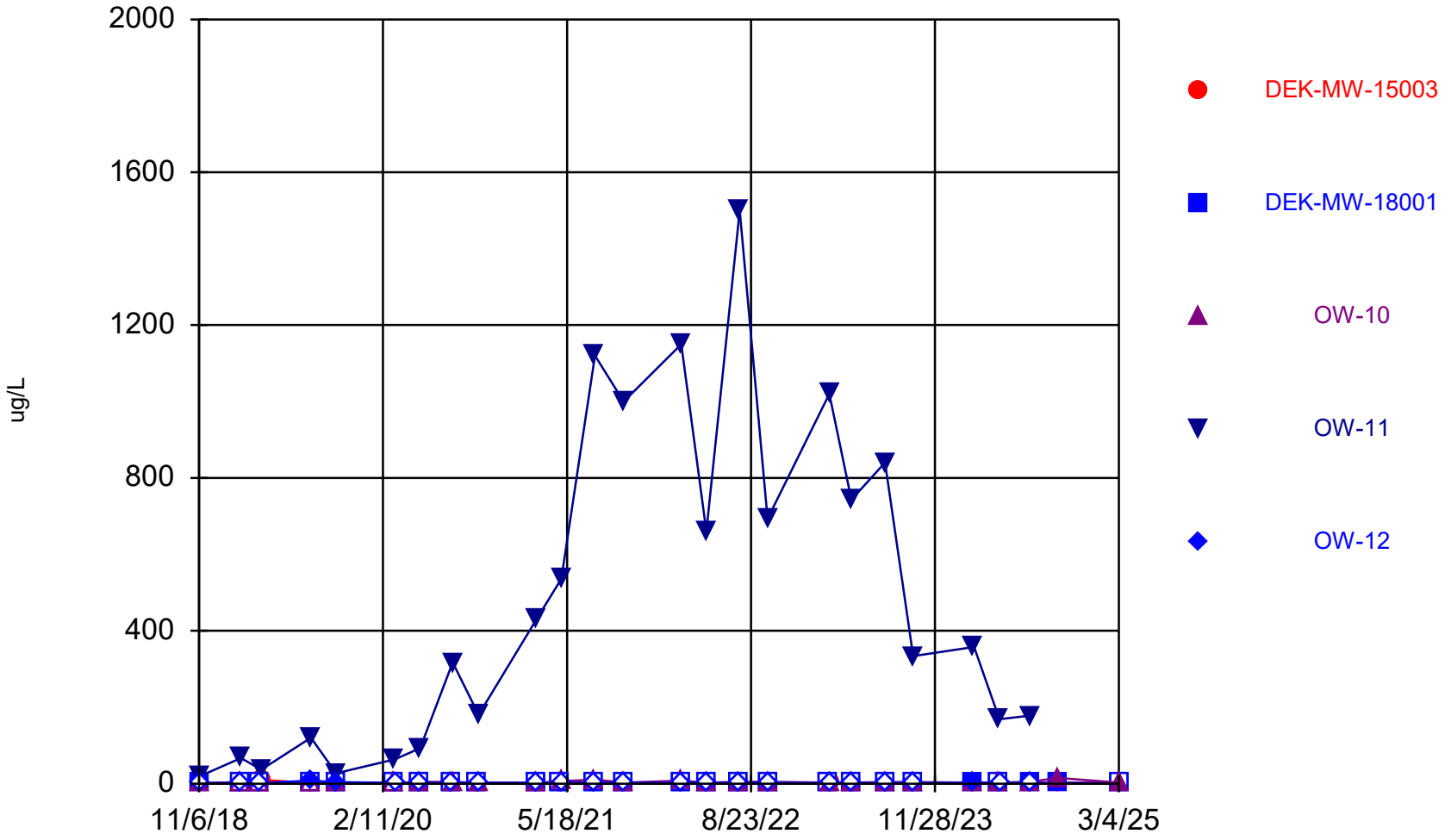


Constituent: Vanadium, Total Analysis Run 6/16/2025 11:17 AM

Client: Consumers Energy Data: DEK KLI CCR Sanitas_25Q1

Sanitas™ v.10.0.26 Sanitas software licensed to Consumers Energy. EPA
Hollow symbols indicate censored values.

Chart 12
Vanadium Concentrations - KLI Monitoring Network



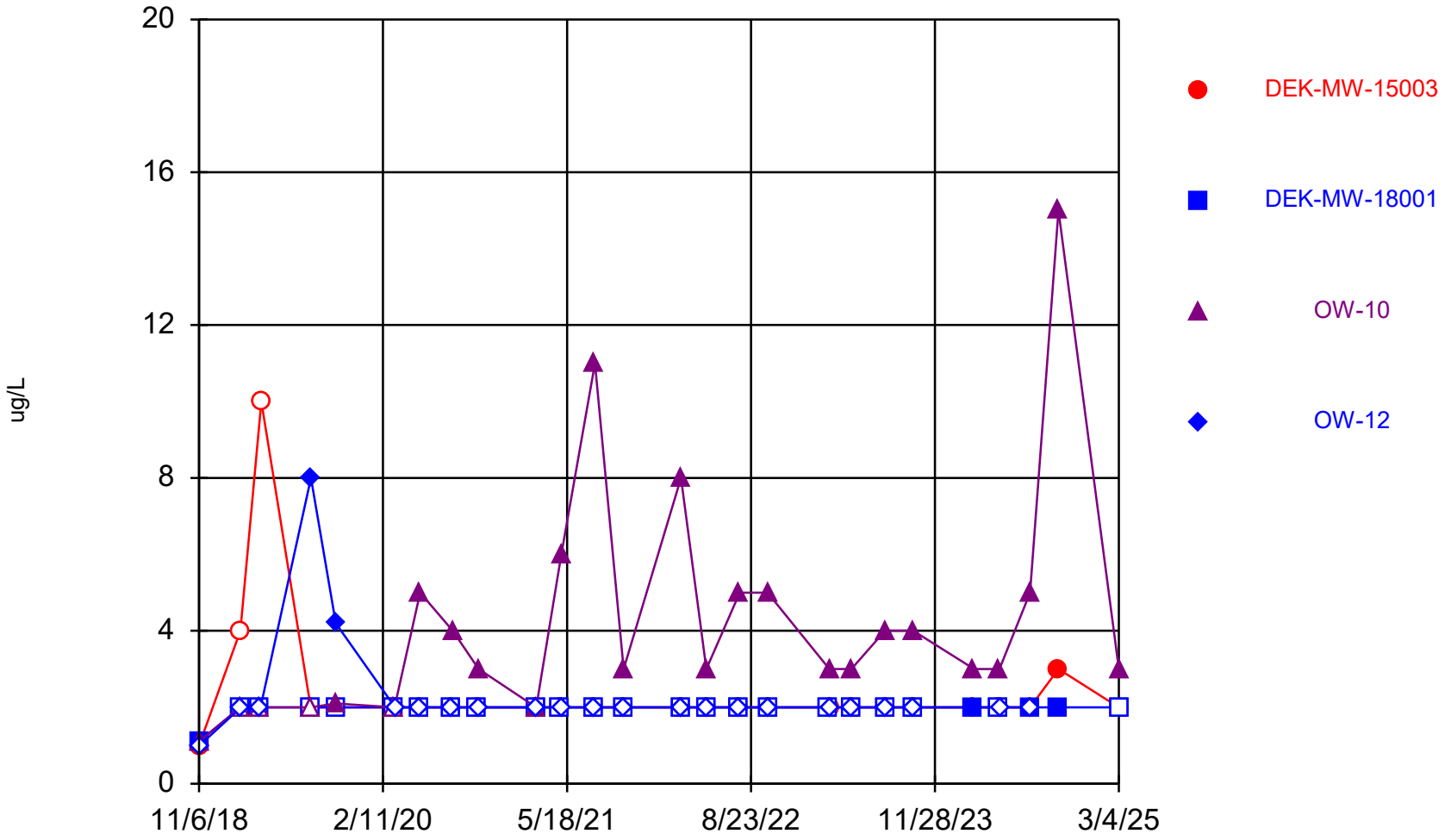
Constituent: Vanadium, Total Analysis Run 6/9/2025 8:52 AM

Client: Consumers Energy Data: DEK KLI CCR Sanitas_25Q1

Sanitas™ v.10.0.26 Sanitas software licensed to Consumers Energy. EPA
Hollow symbols indicate censored values.

Chart 13

Vanadium Concentrations - KLI Monitoring Network



Constituent: Vanadium, Total Analysis Run 6/9/2025 8:53 AM

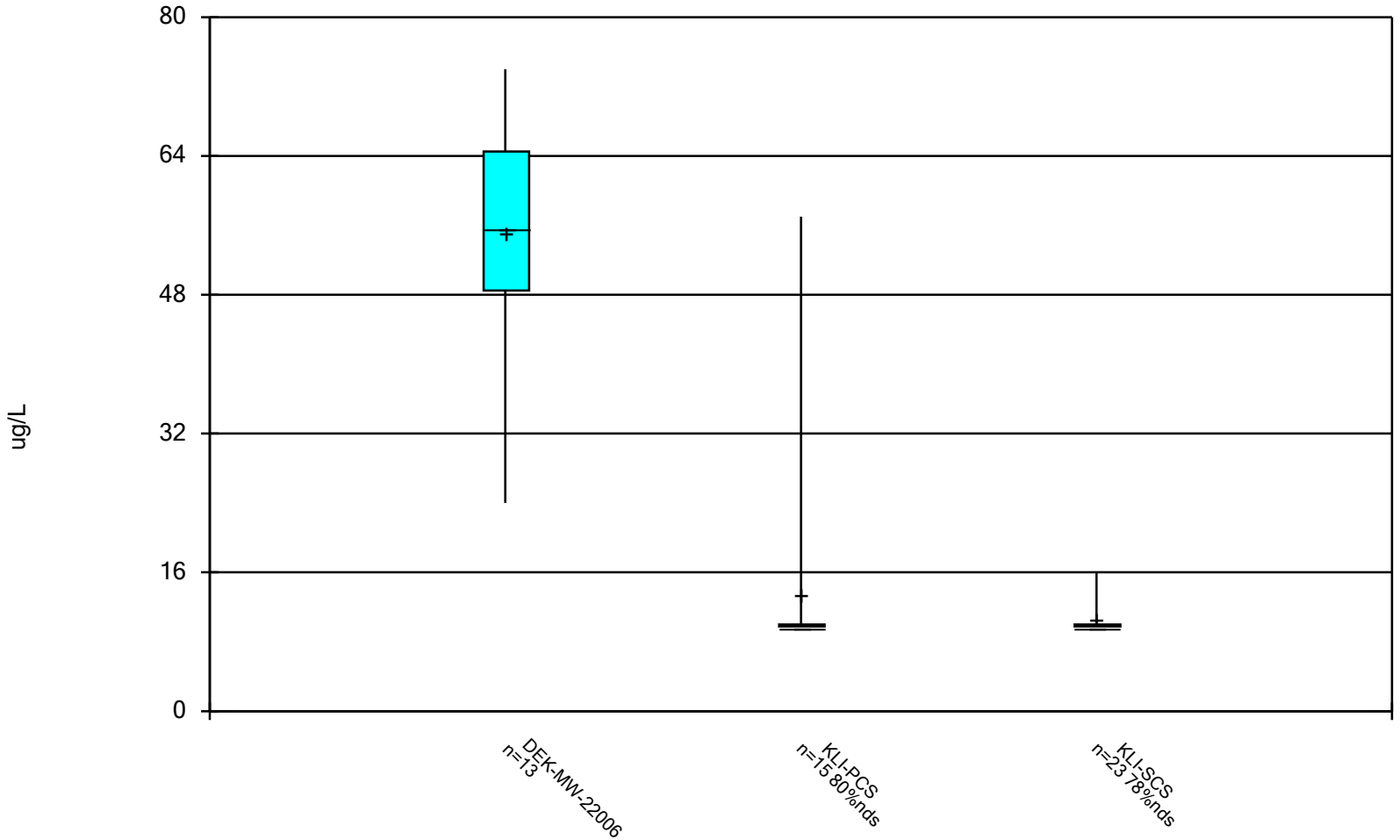
Client: Consumers Energy Data: DEK KLI CCR Sanitas_25Q1

Sanitas™ v.10.0.26 Sanitas software licensed to Consumers Energy. EPA

Chart 14

Lithium Box & Whiskers Plot

March 2021 - March 2025

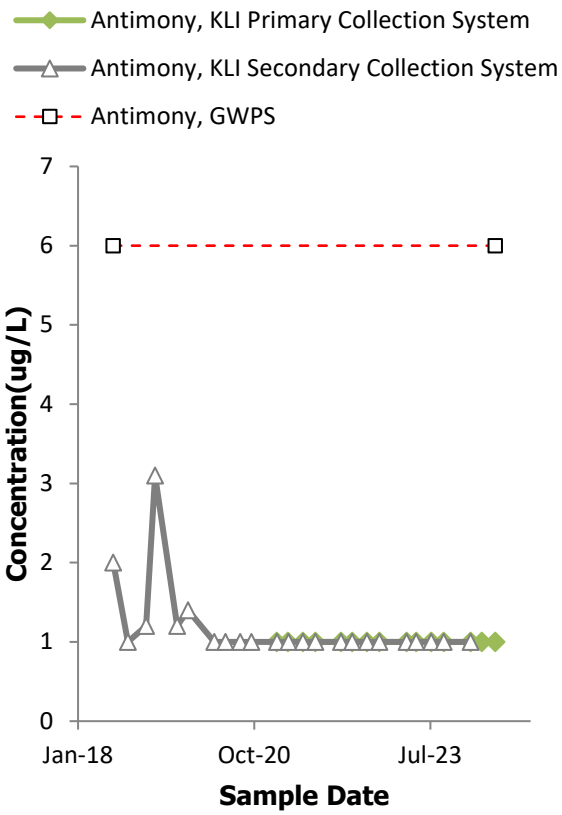


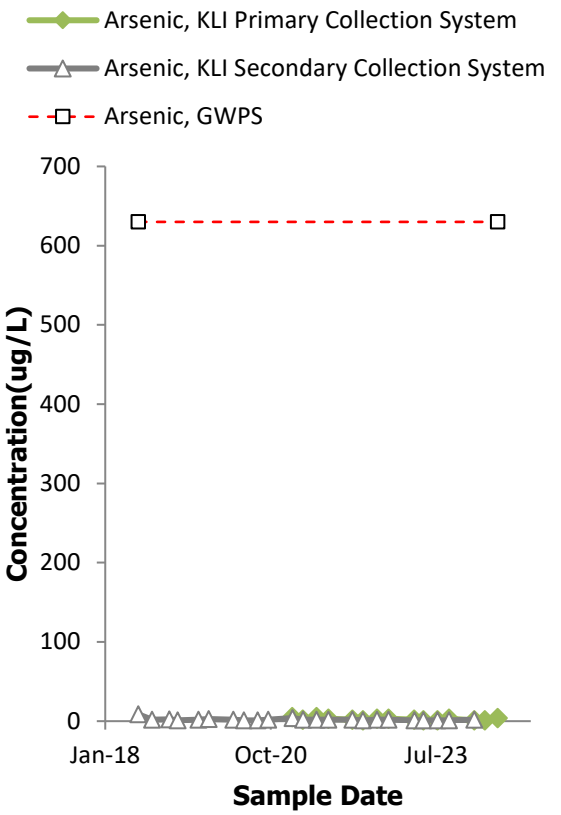
Constituent: Lithium, Total Analysis Run 6/5/2025 1:22 PM

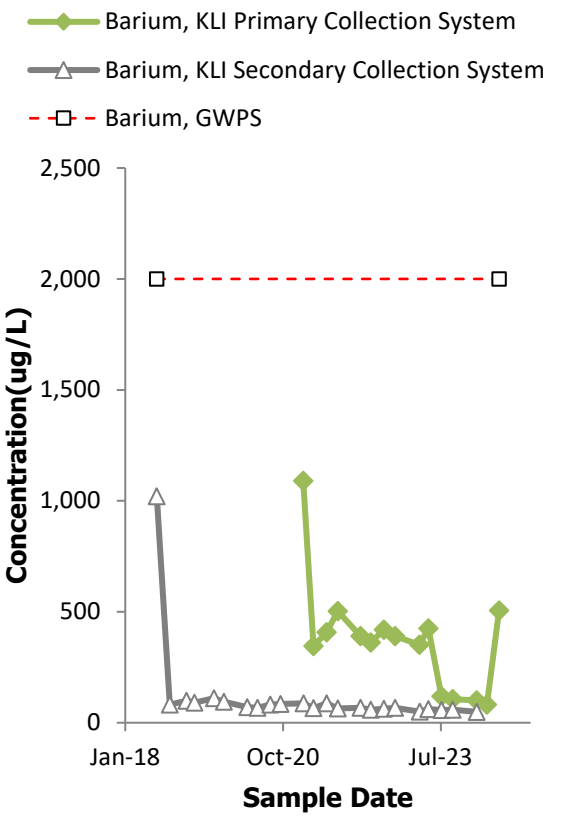
Client: Consumers Energy Data: DEK KLI CCR Sanitas_25Q1

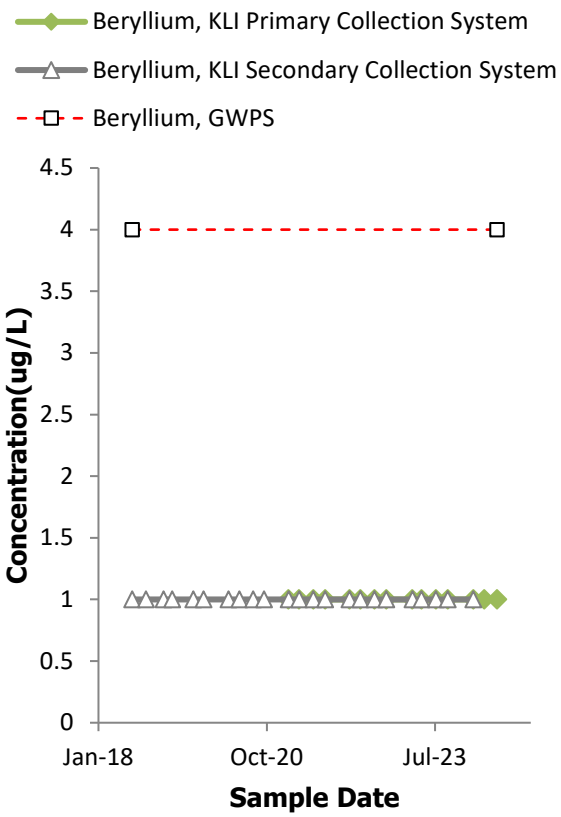
Attachment 2
Karn Lined Impoundment Collection System Water Chemistry

Karn Lined Impoundment Collection System
Water Quality Time Series

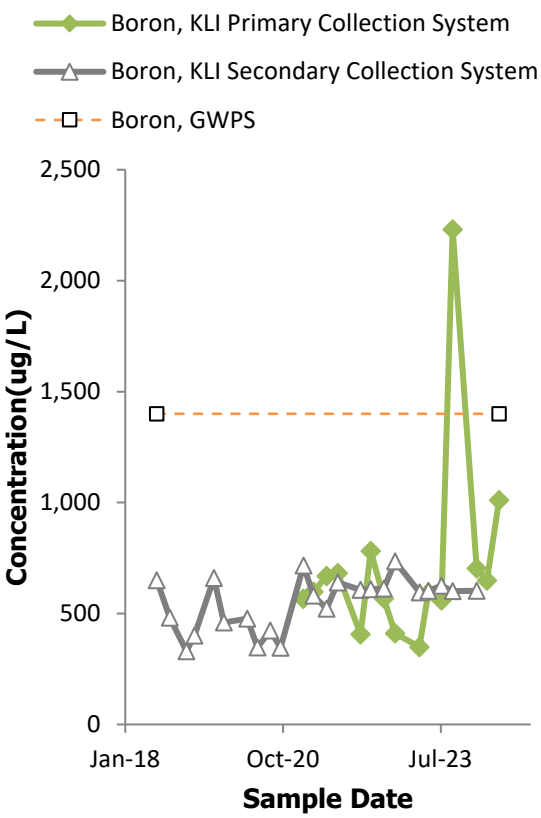


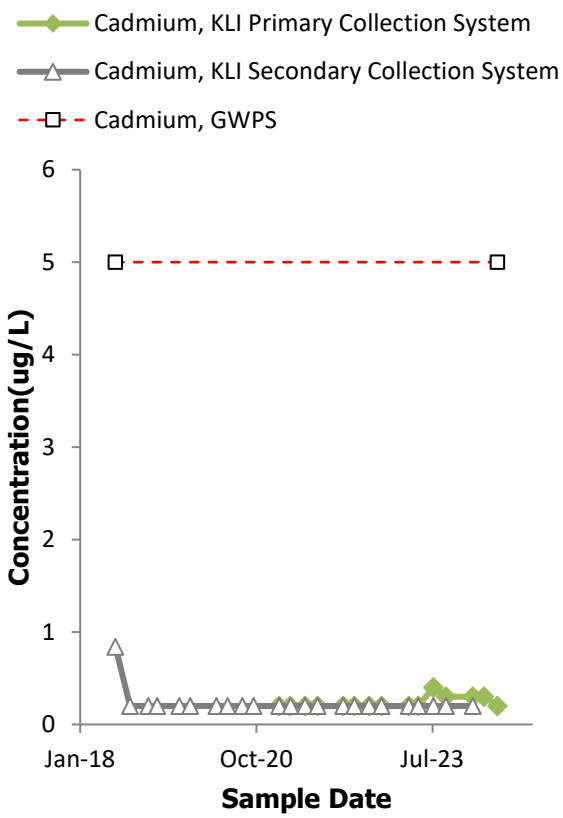


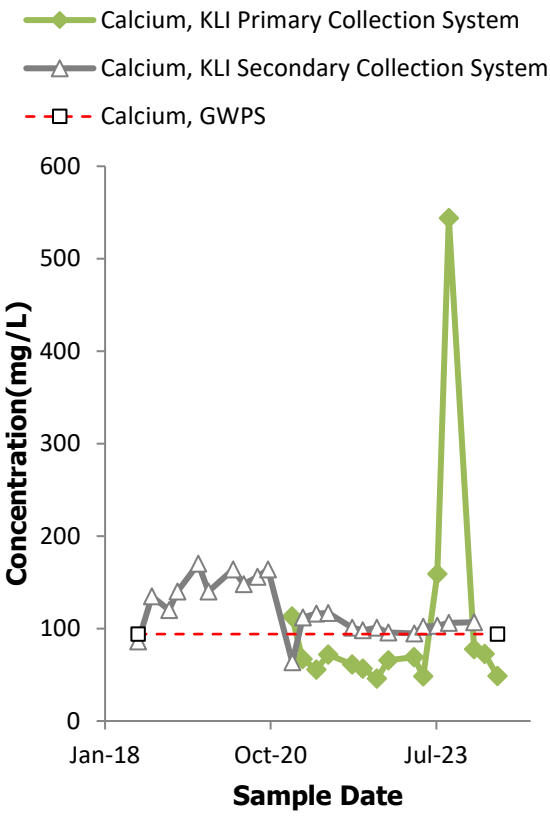


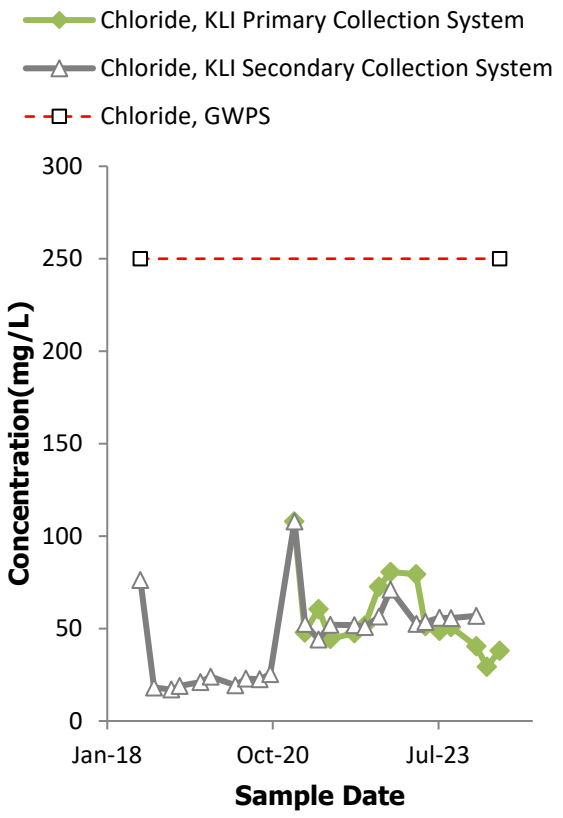


Karn Lined Impoundment Collection System
Water Quality Time Series

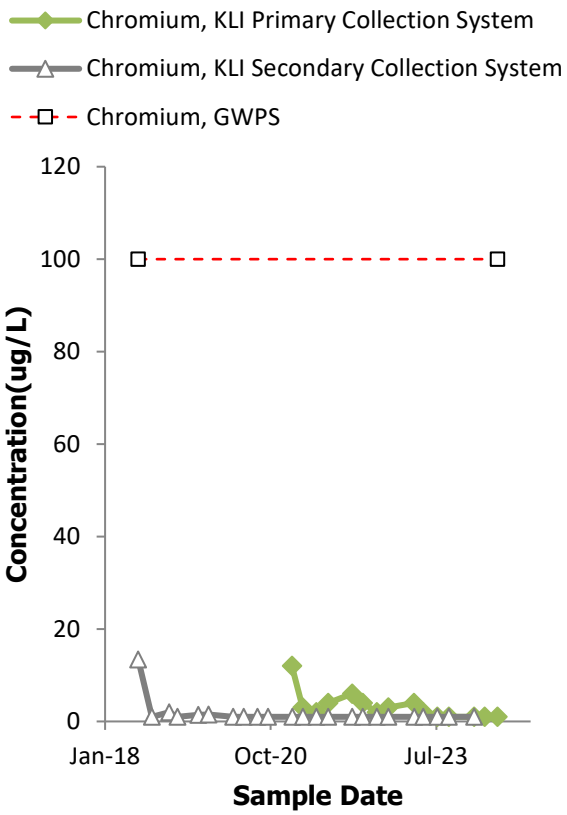


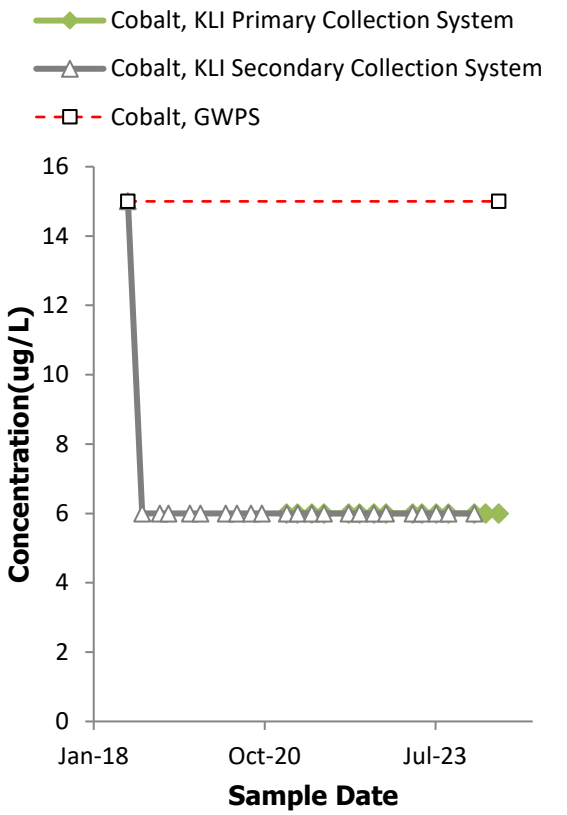


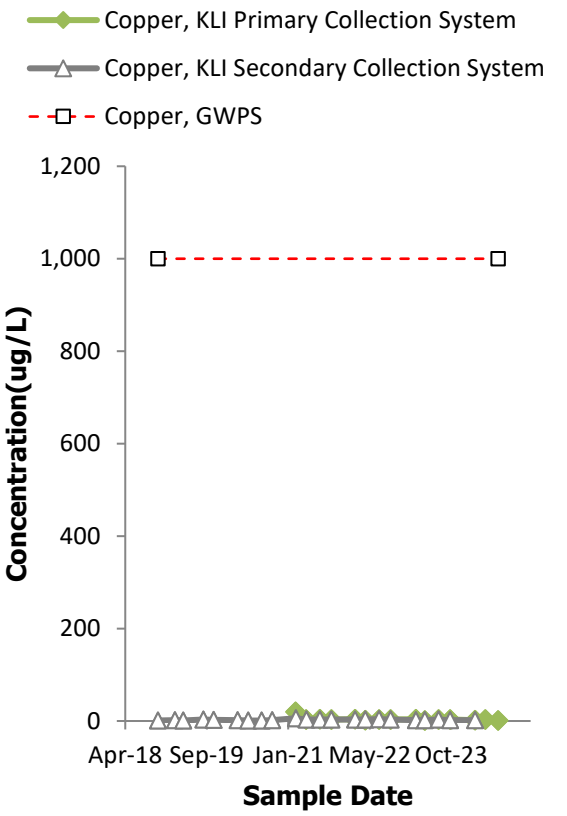


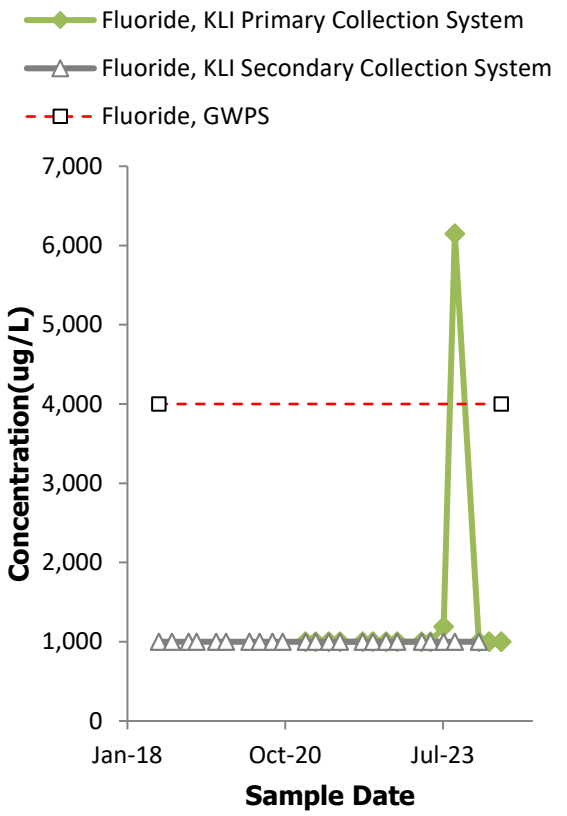


Karn Lined Impoundment Collection System
Water Quality Time Series

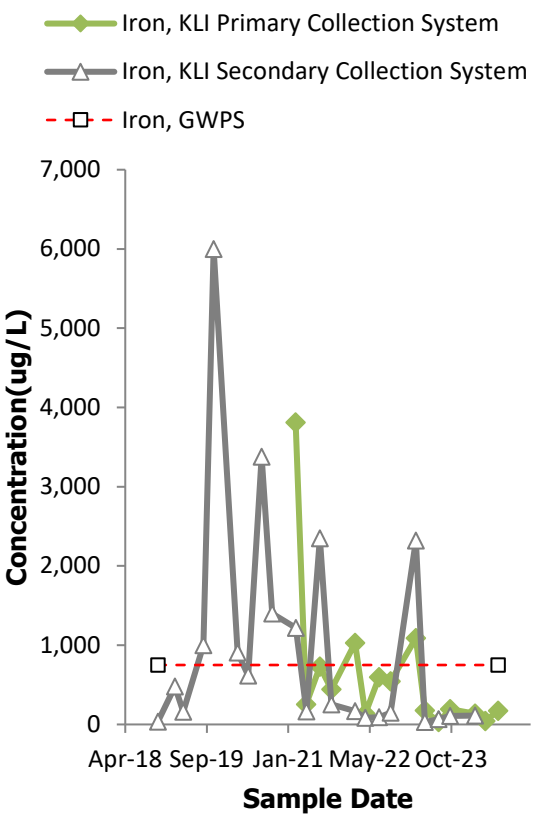


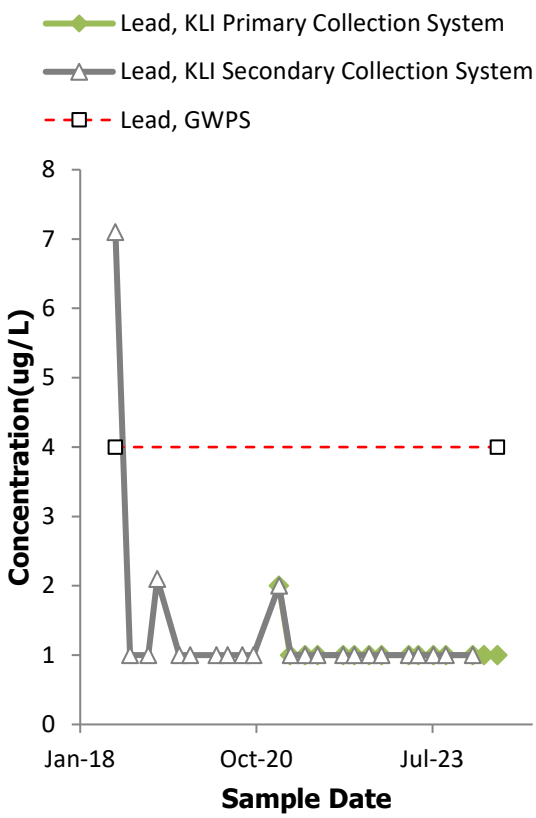


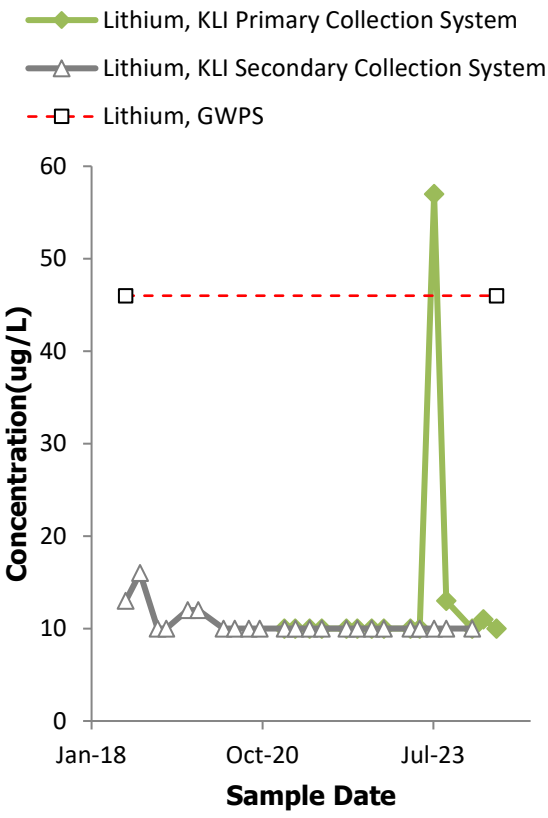


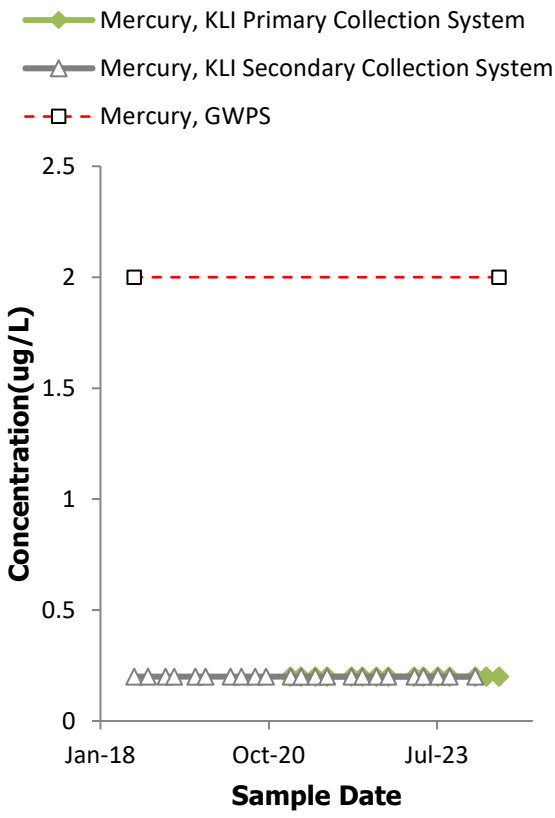


Karn Lined Impoundment Collection System
Water Quality Time Series

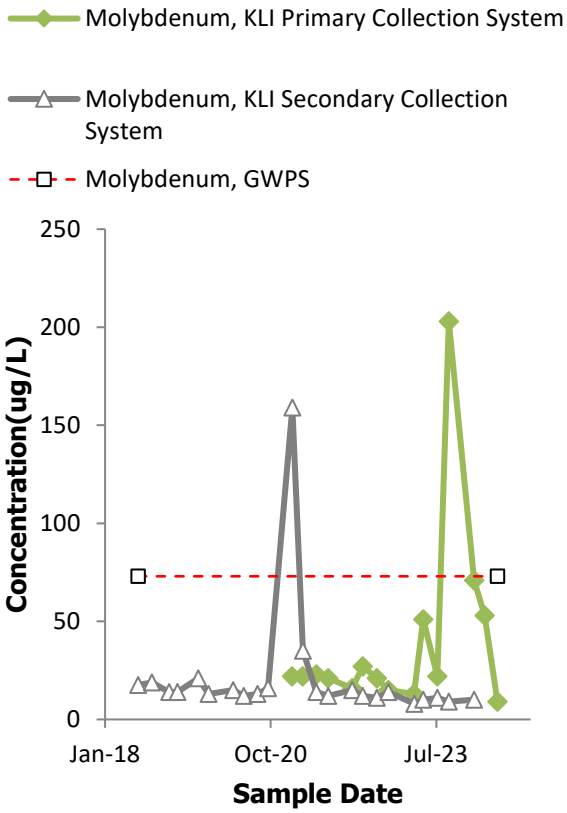


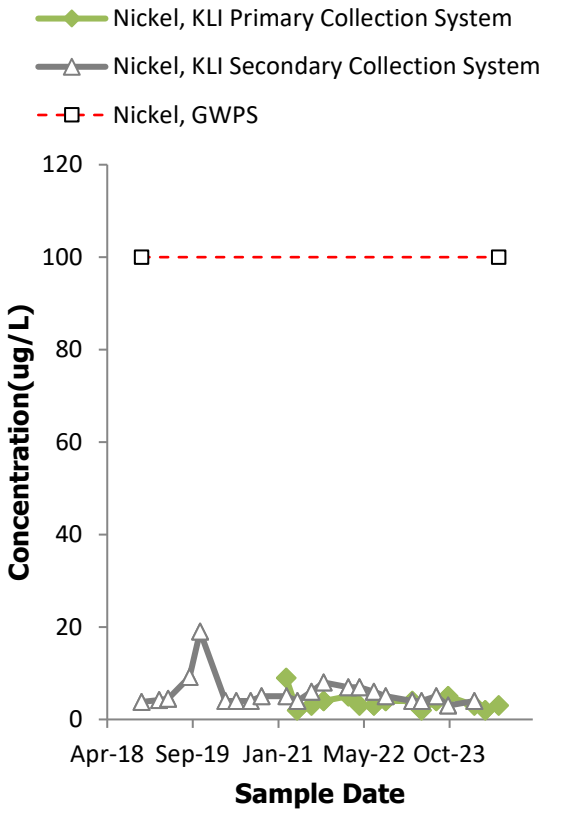


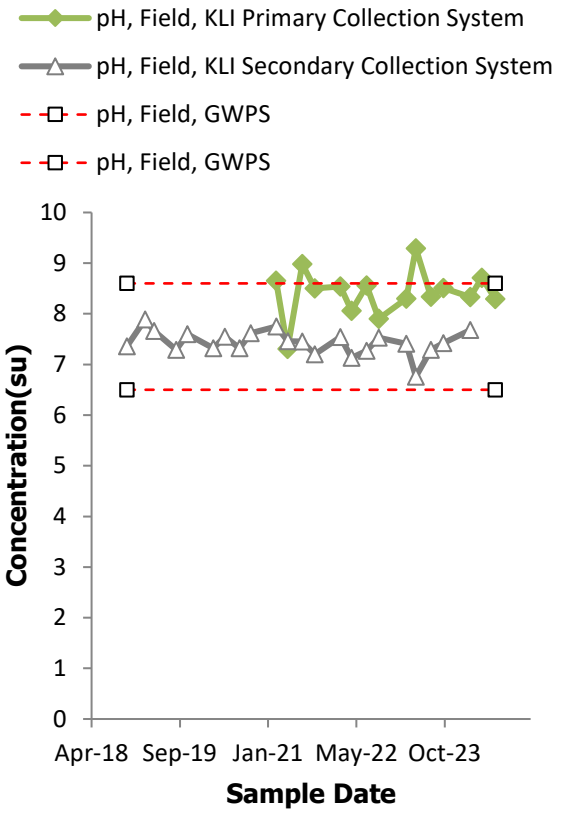


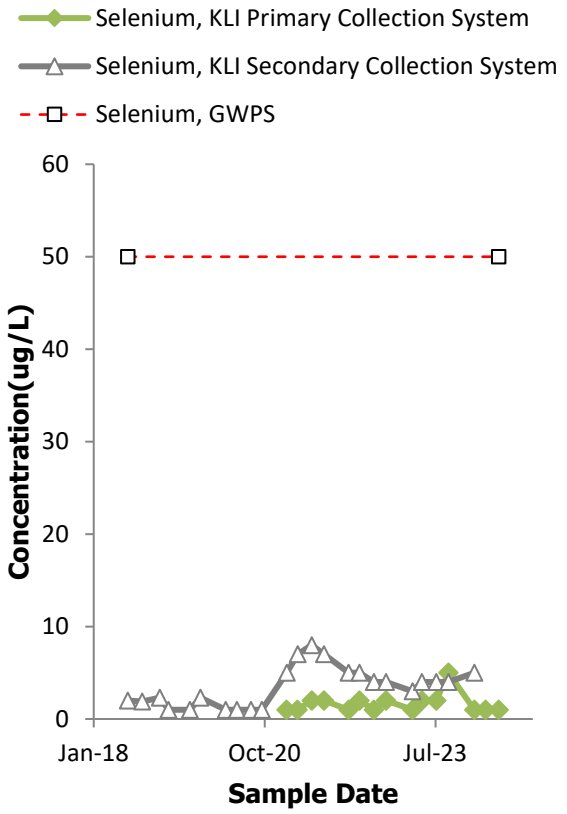


Karn Lined Impoundment Collection System
Water Quality Time Series

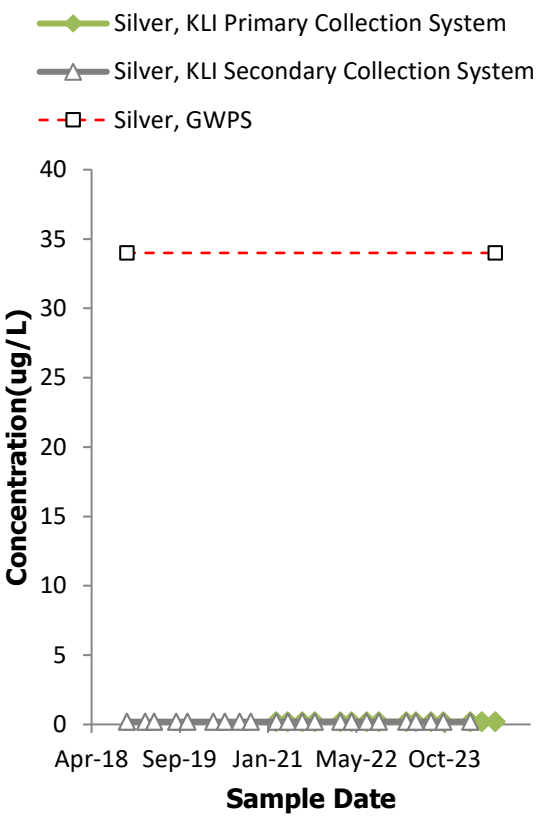


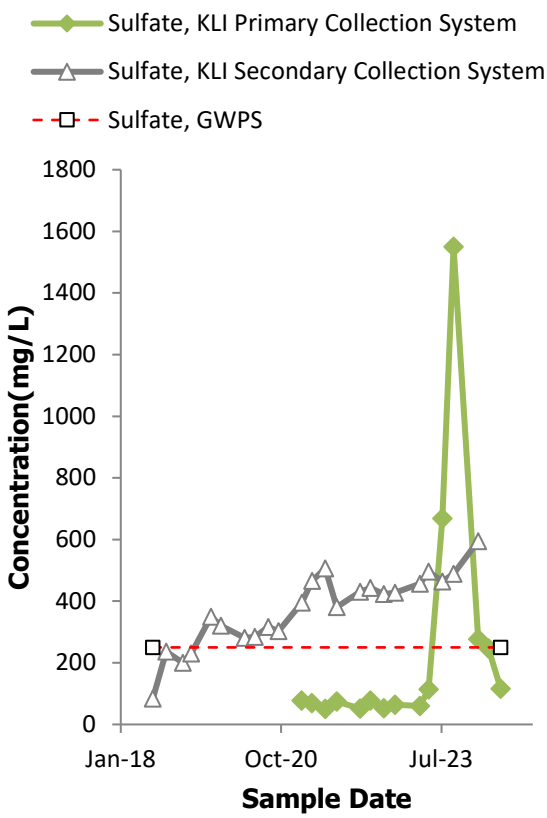


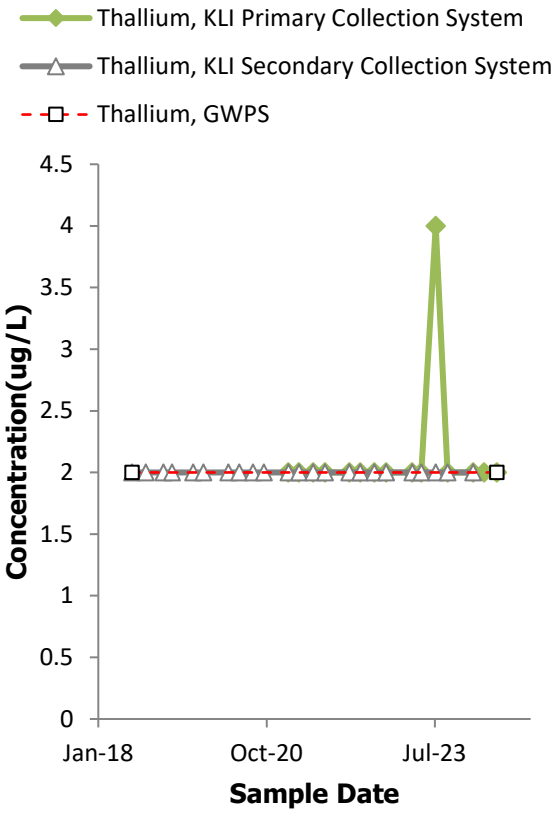


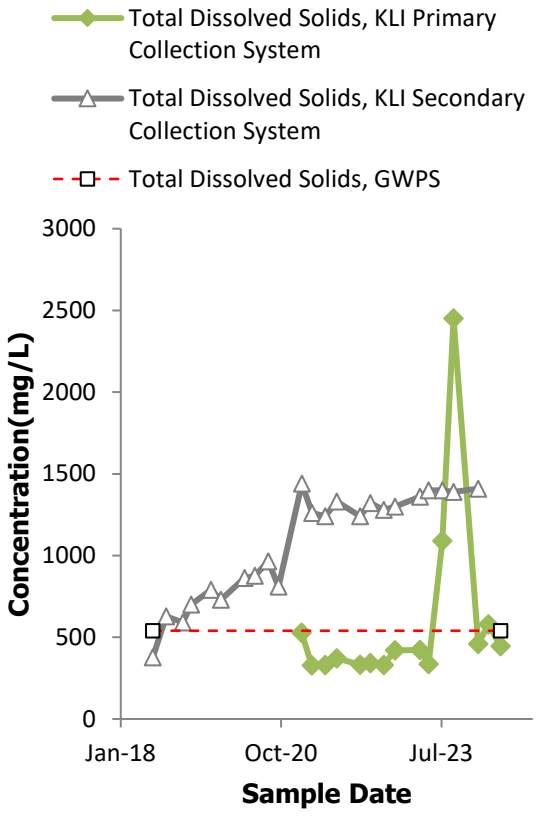


Karn Lined Impoundment Collection System
Water Quality Time Series









Karn Lined Impoundment Collection System
Water Quality Time Series