

January 30, 2023

TRANSMITTAL VIA EMAIL 01/30/2023

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

SUBJECT: 2022 Annual Groundwater Monitoring and Corrective Action Report §257.90(e)

inclusive of the Semiannual Progress Report §257.97(a)

DE Karn Bottom Ash Pond 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 – 257.98), apply to the Consumers Energy Company (Consumers Energy) Bottom Ash Pond CCR Unit at the DE Karn Power Plant Site. Pursuant to the CCR Rule, no later than January 31, 2018, and annually thereafter, 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). This 2021 Annual Groundwater Monitoring and Corrective Action report documents activities from January 2022 through December 2022.

This letter along with the May 2022 and October 2022 semiannual groundwater sampling reports for the Karn Bottom Ash Pond (Enclosures 2 and 3) and a technical memorandum discussing the nature and extent of contamination characterization (Enclosure 4) collectively comprise the 2022 Annual Groundwater Monitoring and Corrective Action Report and meet the requirements of §257.90(e) as documented in the enclosed checklist (Enclosure 1).

The Karn Bottom Ash Pond was in assessment monitoring at the beginning and at the end of the period covered by this report. Consumers Energy will continue to evaluate corrective measures per §257.96 and §257.97 and is continuing semiannual assessment monitoring in accordance with §257.95.

Karn Bottom Ash Pond Assessment Activities

Consumers Energy prepared and submitted to the Michigan Department of Environment, Great Lakes, and Energy (EGLE) a closure work plan for the Karn Bottom Ash Pond (Karn Bottom Ash Pond Work Plan) and a Response Action Plan developed in accordance with Part 115 dated November 30, 2018 and March 15, 2019, respectively. These plans were developed in anticipation of supporting the Assessment of Corrective Measures that would be necessary for evaluating and selecting a remedy for the Karn Bottom Ash Pond. Consumers Energy provided notification of exceeding a Groundwater Protection

DE Karn Bottom Ash Pond Annual Groundwater Monitoring and Corrective Action Report Ms. Lori Babcock January 30, 2023



Standard (GWPS), per §257.95(g) on January 14, 2019, that indicated arsenic was present at statistically significant levels above the GWPS in five of six downgradient wells at the Karn Bottom Ash Pond.

EGLE approved the Karn Bottom Ash Pond Work Plan on December 20, 2018 based on expectation that a report documenting the removal activities and certifying solid waste has been removed in accordance with the work plan would be submitted at the completion of activities. Subsequently, EGLE approved the Response Action Plan on May 14, 2019 based on the anticipated submittal of the Assessment of Corrective Measures. Consumers Energy submitted for review and approval, <u>D.E. Karn Generating Facility Bottom Ash Pond CCR Removal Documentation Report</u> (Karn Bottom Ash Pond Closure Report) on October 30, 2019 to satisfy requirements for completing the removal of solid waste which rendered the need for a solid waste operating license was unnecessary.

This Semiannual Progress Report, prepared as a requirement of §257.97(a) of the Federal Coal Combustion Residual (CCR) Rule, describes progress towards selecting and implementing any additional remedy for the Karn Bottom Ash Pond after the completion of the <u>Assessment of Corrective Measures, DE Karn Bottom Ash Pond Coal Combustion Residual Unit</u>, dated September 11, 2019 (Karn Bottom Ash Pond ACM) (TRC, 2019). Groundwater management alternatives considered to be technically feasible following source removal activities that could potentially address the residual arsenic under <u>known</u> groundwater conditions were identified in the report as: 1) Post-remedy monitoring, 2) Groundwater capture/control, 3) Impermeable barrier, 4) Active geochemical sequestration, and 5) Passive geochemical sequestration.

Results of the May 2022 and October 2022 Sampling Events

Statistical analysis from the May and October 2022 assessment groundwater monitoring events verified that the only constituent of concern that is present at statistically significant levels above the established Groundwater Protection Standard (GWPS) is arsenic. Results are presented in the enclosed May 2022 Assessment Monitoring Data Summary and Statistical Evaluation Consumers Energy, DE Karn Site, Bottom Ash Pond CCR Unit (Enclosure 2) and October 2022 Assessment Monitoring Data Summary and Statistical Evaluation Consumers Energy, DE Karn Site, Bottom Ash Pond CCR Unit (Enclosure 3). Additionally, monitoring performed under the Karn Groundwater Surface-Water Interface (GSI) Compliance Plan demonstrates protection of human health and the environment with criteria determined to be protective at the point of exposure. These results are depicted in Figure 2 of the Second Semiannual 2022 Nature and Extent Data Summary, DE Karn, Consumers Energy, Essexville, Michigan (Enclosure 4).

Significant observations from the event summaries are as follows:

- No additional Appendix IV constituents have been observed at statistically significant levels above GWPS for the Karn Bottom Ash Pond groundwater monitoring system since Assessment Monitoring commenced in April 2018;
- Regionally, radial flow is observed with a new "high" point shifted to the east of the former Karn Bottom Ash Pond geographically centered around monitoring well DEK-MW-15003;
- ➤ Redox conditions continue to demonstrate that groundwater redox chemistry equilibrium is continuing to shift back to pre-source removal conditions as reflected in the trends for dissolved oxygen reverting back to primarily anoxic concentrations (e.g.

DE Karn Bottom Ash Pond Annual Groundwater Monitoring and Corrective Action Report Ms. Lori Babcock January 30, 2023



less than 0.5 mg/L) and electrical potential primarily returning to negative potential; and

Arsenic has been the only constituent to have triggered corrective action. The decrease in concentrations of arsenic at DEK-MW-15002, DEK-MW-15003, and DEK-MW-18001 indicate that discontinuing the hydraulic loading to the Karn Bottom Ash Pond and the completed source removal of CCR was successful in removing a source of arsenic.

Conclusions

Source removal activities for the Karn Bottom Ash Pond were completed and documented in the Karn Bottom Ash Pond Closure Report submitted to EGLE on October 30, 2019. Improvements in groundwater quality have been observed in the groundwater monitoring system, but observations of ongoing changes in groundwater potentiometric surface that may influence groundwater flow characteristics and/or alter groundwater redox conditions at monitoring locations that could influence constituent concentrations, still require further evaluation before a final remedy can be selected. To aid in the further evaluation, Consumers Energy installed additional monitoring wells within the former Karn Bottom Ash Pond area and has included these locations for collecting field parameters and water elevation and analyzing for select constituents. A sufficient set of sampling events for data comparison analysis are necessary prior to including one or more of the additional monitoring wells into the groundwater monitoring system. The additional sampling and analysis will inform the on-going improvements and retention of monitoring-only, passive, or active remedial options following the source removal. As conditions continue to be evaluated post-source removal, the drinking water and groundwater-surface water interface (GSI) pathway are protected by quarterly monitoring performed under the Michigan-approved hydrogeological monitoring plan that includes a GSI Compliance Monitoring Program.

The final remedy for the Karn Bottom Ash Pond will be formally selected per §257.97 and Michigan Solid Waste requirements once the selected option is reviewed and commented on by EGLE and a public meeting is conducted at least 30-days prior to the final selection as required under §257.96(e).

The next semiannual progress report will be submitted in six months by July 28, 2023. Please feel free to contact me with any questions or clarifications.

Sincerely,

Harold D. Register, Jr., P.E.

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DE Karn Bottom Ash Pond Annual Groundwater Monitoring and Corrective Action Report Ms. Lori Babcock January 30, 2023



cc: Mr. Phil Roycraft, EGLE Saginaw Bay District Office

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Enclosures:

- 1) CCR Annual Groundwater Report Requirements: § 257.90(e). Checklist for the Karn Bottom Ash Pond CCR Unit.
- 2) May 2022 Assessment Monitoring Data Summary and Statistical Evaluation Consumers Energy, DE Karn Site, Bottom Ash Pond CCR Unit. (TRC, July 29, 2022).
- 3) October 2022 Assessment Monitoring Data Summary and Statistical Evaluation Consumers Energy, DE Karn Site, Bottom Ash Pond CCR Unit. (TRC, January 30, 2023).
- 4) Second Semiannual 2022 Nature and Extent Data Summary, DE Karn, Consumers Energy, Essexville, Michigan. (TRC, January 30, 2023).

CCR Annual Groundwater Report Requirements: § 257.90(e) Checklist for the Karn Bottom Ash Pond CCR Unit 2022 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 ⁽³⁾
(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;	Not Applicable - no installation or decommissioning
(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 2.2 Assessment Monitoring (2),(3)
(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	Corrective Action Progress Report ⁽¹⁾ ; Section 1.1 Program Summary ^{(2),(3)}
(5) Other information required to be included in the annual report as specified in §§ 257.90 through 257.98.	Nature and Extent Data Summary (4)
(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;	Corrective Action Progress Report ⁽¹⁾ ; Section 1.1 Program Summary ^{(2),(3)}
(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;	Corrective Action Progress Report ⁽¹⁾ ; Section 1.1 Program Summary ^{(2),(3)}
(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):	Section 1.1 Program Summary (2),(3)
(A) Identify those constituents listed in appendix III to this part and the names of the monitoring wells associated with such an increase; and	Section 1.1 Program Summary (2),(3)
(B) Provide the date when the assessment monitoring program was initiated for the CCR unit.	Section 1.1 Program Summary (2),(3)
(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:	Corrective Action Progress Report ⁽¹⁾ ; Section 1.1 Program Summary ^{(2),(3)}
(A) Identify those constituents listed in appendix IV to this part and the names of the monitoring wells associated with such an increase;	Section 1.1 Program Summary (2),(3)
(B) Provide the date when the assessment of corrective measures was initiated for the CCR unit;	Section 1.1 Program Summary (2),(3)
(C) Provide the date when the public meeting was held for the assessment of corrective measures for the CCR unit; and	Not Applicable - final remedy still under evaluation
(D) Provide the date when the assessment of corrective measures was completed for the CCR unit.	Corrective Action Progress Report (1); Section 1.1 Program Summary (2),(3)
(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	Corrective Action Progress Report ⁽¹⁾ ; final remedy still under evaluation
(vi) Whether remedial activities were initiated or are ongoing pursuant to § 257.98 during the current annual reporting period.	Corrective Action Progress Report ⁽¹⁾ ; final remedy still under evaluation

Notes:

- (1) 2022 Annual Groundwater Monitoring and Corrective Action Report DE Karn Bottom Ash Pond Coal Combustion Residuals CCR Units. Consumers Energy. January 30, 2023.
- (2) May 2022 Assessment Monitoring Data Summary and Statistical Evaluation Consumers Energy, DE Karn Site, Bottom Ash Pond CCR Unit. TRC. July 29, 2022.
- (3) October 2022 Assessment Monitoring Data Summary and Statistical Evaluation Consumers Energy, DE Karn Site, Bottom Ash Pond CCR Unit. TRC. January 30, 2023.
- (4) Second Semiannual 2023 Nature and Extent Data Summary, DE Karn, Consumers Energy, Essexville, Michigan. TRC. January 30, 2023.



May 2022 Assessment Monitoring Data Summary and Statistical Evaluation

DE Karn, Bottom Ash Pond CCR Unit

Essexville, Michigan

July 2022

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TABLE OF CONTENTS

1.0	Intro	ductionduction	.1
	1.1	Program Summary	.1
	1.2	Site Overview	.3
	1.3	Geology/Hydrogeology	.4
2.0	Grou	ndwater Monitoring	.6
	2.1	Monitoring Well Network	.6
	2.2	May 2022 Assessment Monitoring	.6
		2.2.1 Groundwater Flow Rate and Direction	.7
		2.2.2 Data Quality	.8
3.0	Asse	ssment Monitoring Statistical Evaluation	.9
	3.1	Establishing Groundwater Protection Standards	.9
	3.2	Data Comparison to Groundwater Protection Standards	.9
4.0	Conc	lusions and Recommendations1	11
5.0	Refe	rences1	12
- 40	. =0		
TAB		0 (0 1 5 7 5	
Table Table		Summary of Groundwater Elevation Data Summary of Field Parameter Results	
Table		Summary of Background Wells Groundwater Sampling Results (Analytical)	
Table		Summary of Groundwater Sampling Results (Analytical)	
Table	9 5	Summary of Groundwater Protection Standard Exceedances – May 2022	
FIGL	JRES		
Figur		Site Location Map	
Figur Figur		Karn and Weadock Complex Map Shallow Groundwater Contour Map – May 2022	
i igui	0 0	Granow Groundwater Contour Map - May 2022	
APP	ENDI	CES	
	ndix A		
	ndix E ndix C	•	



1.0 Introduction

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), as amended. Standards for groundwater monitoring and corrective action codified in the CCR Rule (40 CFR 257.90 – 257.98) apply to the DE Karn Bottom Ash Pond CCR Unit (Karn Bottom Ash Pond).

Consumers Energy is continuing semiannual assessment monitoring in accordance with §257.95 of the CCR Rule for the Karn Bottom Ash Pond located in Essexville, Michigan. This report has been prepared to provide the summary of the May 2022 assessment groundwater monitoring results, data quality review, and statistical data evaluation for the Karn Bottom Ash Pond groundwater monitoring system.

1.1 Program Summary

Groundwater monitoring for the Karn Bottom Ash Pond commenced after the installation of the monitoring well network in December 2015 to establish background conditions. Detection monitoring was initiated on October 17, 2017 in conformance with the self-implementing schedule in the CCR Rule.

Consumers Energy first reported the potential for statistically significant increases (SSIs) for Appendix III constituents in the *Annual Groundwater Monitoring Report DE Karn Power Plant Bottom Ash Pond CCR Unit* (TRC, January 2018). The statistical evaluation of the Appendix III indicator parameters confirming statistically significant increases (SSIs) over background were as follows:

- Boron at DEK-MW-15001, DEK-MW-15002, DEK-MW-15003, DEK-MW-15004, DEK-MW-15005, DEK-MW-15006;
- Fluoride at DEK-MW-15001;
- Field pH at DEK-MW-15001, DEK-MW-15002, DEK-MW-15003, DEK-MW-15005, DEK-MW-15006; and
- Sulfate at DEK-MW-15006.

On April 25, 2018, Consumers Energy entered assessment monitoring upon determining that an Alternate Source Demonstration for the Appendix III constituents was not successful. After subsequent sampling for Appendix IV constituents, Consumers Energy provided notification that arsenic was present at statistically significant levels above the Ground Water Protection Standards (GWPS) established at 21 ug/L (Consumers Energy, January 2019) in five of the six downgradient monitoring wells at the Karn Bottom Ash Pond as follows:

Arsenic at DEK-MW-15001, DEK-MW-15002, DEK-MW-15003, DEK-MW-15004, and DEK-MW-15005.

The notification of the GWPS exceedance on January 14, 2019 was followed up with a Response Action Plan submitted to the Michigan Department of Environment, Great Lakes, and Energy (EGLE) on March 15, 2019 laying out the preliminary understanding of water quality and



actions that were underway to mitigate or eliminate unacceptable risk associated with the identified release from the CCR unit. The *Assessment of Corrective Measures* (ACM) (TRC, September 2019) was initiated on April 14, 2019 and submitted on September 11, 2019 in accordance with the schedule in §257.96 and the requirements of the Response Action Plan.

The ACM documents that the groundwater nature and extent has been defined, as required in §257.95(g)(1). Although arsenic concentrations exceed the GWPS in on-site groundwater monitoring locations, arsenic is delineated within the limits of the property owned by Consumers Energy and there are **currently no adverse effects on human health or the environment** from either surface water or groundwater due to CCR management at the Karn Bottom Ash Pond. Per §257.96(b), Consumers Energy is continuing to monitor groundwater in accordance with the assessment monitoring program as specified in §257.95.

Evaluation of groundwater under the CCR Rule focused on the following constituents that were collected *unfiltered* in the field:

CCR Rule Monitoring Constituents						
Appendix III	Apper	ndix IV				
Boron	Antimony	Mercury				
Calcium	Arsenic	Molybdenum				
Chloride	Barium	Radium 226/228				
Fluoride	Beryllium	Selenium				
рН	Cadmium	Thallium				
Sulfate	Chromium					
Total Dissolved Solids (TDS)	Cobalt					
	Fluoride					
	Lead					
	Lithium					



Prior to remedy selection, Consumers Energy will also collect a sufficient number of samples to evaluate Michigan state-specific constituents as follows:

Additional Monitoring Constituents (Michigan Part 115/PA 640¹)						
Detection Monitoring	Assessment Monitoring					
Iron	Copper					
	Nickel					
	Silver					
	Vanadium					
	Zinc					

Consumers Energy will continue to evaluate corrective measures for the Karn Bottom Ash Pond per §257.96 and §257.97 and is continuing semiannual assessment monitoring in accordance with §257.95.

1.2 Site Overview

The Karn Bottom Ash Pond is located within the DE Karn Power Plant site, which is located north of the 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. Karn Units 3 & 4, co-located with the coal-fired generating units, are oil- and natural gas-fueled. Two other areas of coal ash management within the Karn site are the Karn Landfill and the Karn Lined Impoundment. The Karn Landfill has been certified closed and is now in post-closure care and is being monitored in accordance with the EGLE-approved *Hydrogeological Monitoring Plan, Rev. 3, DE Karn Solid Waste Disposal Area* (December 19, 2017). The Karn Lined Impoundment has been licensed to operate by the EGLE under Part 115 (License Number 9629) and is being monitored in accordance with the EGLE-approved *Karn Lined Impoundment Hydrogeological Monitoring Plan* (November 13, 2020). The locations of the Karn Landfill, the Karn Lined Impoundment, and the Karn Bottom Ash Pond are shown on Figure 2.

Previously, the Karn Bottom Ash Pond was used for wet ash dewatering and was the primary settling/detention structure for the National Pollutant Discharge Elimination System (NPDES) treatment system prior to discharge. Consumers Energy provided notification of initiation of closure on October 12, 2018 to implement the certified closure plan by removal of CCR under the self-implementing requirements and schedule of the CCR Rule. In preparation for removal of the Karn Bottom Ash Pond, a new lined impoundment (Karn Lined Impoundment) was constructed meeting the requirements of the CCR Rule and the operational needs at the Karn

¹ On December 28, 2018, the State of Michigan enacted Public Act No. 640 of 2018 (PA 640) 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.



Power Plant. The Karn Lined Impoundment began receipt of CCR and non-CCR on June 7, 2018 when it replaced the Karn Bottom Ash Pond operations.

Consumers Energy has completed the removal of CCR consistent with the timeline for closure of the Karn Bottom Ash Pond under the DE Karn Bottom Ash Pond Closure Plan (Golder, January 2018; Revised April 2018) and the CCR Rule's closure by removal provisions in §257.102(c). Consumers Energy ceased hydraulic loading to the Karn Bottom Ash Pond in June 2018 and allowed the area to dewater by gravity. Consumers Energy then operated a construction dewatering system to allow for excavation of the vertical and lateral extent of CCR that commenced on March 20, 2019 and has operated through the construction and restoration period. The excavation extended to six inches below known CCR elevations established from previous investigations. Excavated CCR has been placed in the neighboring Weadock Landfill that is constructed with of a fully encapsulation soil-bentonite slurry wall keyed into a competently confining clay unit. The Karn Bottom Ash Pond has been restored by backfilling and grading the surface with clean fill in accordance with the plan to promote stormwater drainage, minimize ponding of surface water, and to reduce the potential of infiltration and migration of residual arsenic and any future constituents of concern (COCs). With the CCR removal complete, Consumers Energy submitted the DE Karn Generating Facility Bottom Ash Pond CCR Removal Documentation Report (Golder, October 2019) on October 30, 2019. EGLE approved the documentation removal report on December 1, 2020. Groundwater conditions post-CCR removal continue to be monitored.

1.3 Geology/Hydrogeology

The majority of the Karn Bottom Ash Pond area is comprised of surficial CCR and sand fill. 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, was generally encountered at 80 to 90 ft bgs.

The DE Karn Power Plant site is bounded by several surface water features (Figure 1): 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 Bottom Ash Pond, the shallow groundwater flow is



generally to the west, toward the intake channel.



2.0 Groundwater Monitoring

2.1 Monitoring Well Network

In accordance with 40 CFR 257.91, Consumers Energy established a groundwater monitoring system for the Karn Bottom Ash Pond, which consists of 10 monitoring wells (four background monitoring wells and six downgradient monitoring wells) that are screened in the uppermost aquifer. The monitoring well locations are shown on Figure 2.

Groundwater around the Karn Bottom Ash Pond was initially characterized as radial based on the eight initial background sampling events prior to commencing detection monitoring; therefore, the six downgradient wells (DEK-MW-15001 through DEK-MW-15006) that were installed and spaced along the circumference of the Karn Bottom Ash Pond continued to accurately represent the quality of groundwater passing the waste boundary that ensures detection of groundwater contamination such that all potential contaminant pathways are monitored. Monitoring well DEK-MW-15001 was decommissioned on April 18, 2018 due to the installation of the new Karn Lined Impoundment, which is a new double composite lined CCR unit constructed as a replacement to the Karn Bottom Ash Pond. Monitoring well DEK-MW-18001 was installed on May 21, 2018 approximately 80 feet southeast of DEK-MW-15001 to maintain the perimeter downgradient monitoring well network.

Groundwater flow direction near the former pond has changed as a result of the pond decommissioning and monitoring wells DEK-MW-15003 and DEK-MW-15004 are no longer located downgradient of the unit (Figure 3). These two wells were removed from the certified downgradient monitoring well network. The recertification was included in Appendix D of the October 2021 Assessment Monitoring Data Summary and Statistical Evaluation (TRC, January 2022).

Four monitoring wells located south of the Karn Bottom Ash Pond on the JC Weadock Power Plant site provide data on background groundwater quality that has not been affected by the CCR unit (MW-15002, MW-15008, MW-15016, and MW-15019). Analysis for the establishment of these wells as background is detailed in the *Groundwater Statistical Evaluation Plan* for the Karn Bottom Ash Pond, dated October 17, 2017.

2.2 May 2022 Assessment Monitoring

Per §257.95, all wells in the CCR unit groundwater monitoring program must be sampled semiannually. TRC conducted the first semiannual assessment monitoring event of 2022 for Appendix III and IV constituents at the Karn Bottom Ash Pond CCR Unit in accordance with the DE Karn Monitoring Program Sample Analysis Plan (ARCADIS, May 2016) (SAP). The semiannual assessment monitoring event was performed on May 2 through 4, 2022.

The May 2022 sampling event included collection of static water level measurements from the Karn Bottom Ash Pond groundwater monitoring system and other site wells to support preparation of a groundwater contour map. Static water elevation data are summarized in Table 1 and groundwater elevation data are shown on Figure 3. The Karn Bottom Ash Pond monitoring wells (DEK-MW-15002, DEK-MW-15005, DEK-MW-15006 and DEK-MW-18001) and



background monitoring wells (MW-15002, MW-15008, MW-15016, and MW-15019) 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.

The groundwater samples were analyzed by the Consumers Energy Trail Street Laboratory for Appendix III and IV constituents in accordance with the SAP. Radium analyses were completed by Eurofins TestAmerica Inc. (TestAmerica). The analytical results for the background wells are summarized in Table 3, and the analytical results for the downgradient monitoring wells are summarized in Table 4. Analytical results from the May 2022 monitoring event are included in the attached laboratory reports (Appendix C).

2.2.1 Groundwater Flow Rate and Direction

Groundwater elevation data collected during the May 2022 assessment monitoring event are provided in Table 1. These data were used to construct the groundwater contour map (Figure 3). Groundwater elevations measured at the site in May 2022 are generally within the range of 580 to 585 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 or within approximately 6 feet higher, flowing toward the bounding surface water features.

Although historically the point source discharge of sluiced bottom ash into the Karn Bottom Ash Pond created localized mounding of the potentiometric surface, the new Karn Lined Impoundment went into service on June 7, 2018 and has been continuously collecting 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 pooled area is no longer present. The groundwater elevation data collected from the groundwater monitoring system of the former bottom ash pond in May 2022 demonstrate a reduction in groundwater elevation measurements by several feet when compared to groundwater elevations measured prior to June 2018. Due to the operational changes of the bottom ash pond and the completion of the landfill capping activities, the gradient between the bottom ash pond area and the surrounding surface water bodies is flattening out as compared to previous quarters as the groundwater elevations are reaching a new equilibrium, as expected. Groundwater at the facility is locally influenced by incidental infiltration from precipitation over the uncovered acreage. Monitoring Wells OW-11, OW-12, and DEK-MW-15003 delineate the newly established groundwater elevation high point with porewater flow generally flowing radially towards the adjacent surface water features from this newly established potentiometric "high", as illustrated in Figure 3. As such, the groundwater flow across the footprint of the former bottom ash pond is generally to the west.

The average hydraulic gradient observed on May 2, 2022 in the Karn Bottom Ash Pond area during these events is estimated at 0.0051 ft/ft. The gradient was calculated using the monitoring well pairs DEK-MW-15004/DEK-MW-15005 and DEK-MW-15003/DEK-MW-15006. 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 0.25 ft/day or 92 ft/year.

2.2.2 Data Quality

Analytical data were found to be usable for assessment monitoring and were generally consistent with previous sampling events. The Data Quality Reviews are included as Appendix A.



3.0 Assessment Monitoring Statistical Evaluation

Assessment monitoring is continuing at the Karn Bottom Ash Pond while Consumers Energy further evaluates corrective measures in accordance with §257.96 and §257.97 as outlined in the ACM. The following section summarizes the statistical approach applied to assess the October 2021 groundwater data in accordance with the assessment monitoring program.

3.1 Establishing Groundwater Protection Standards

The GWPSs are used to assess whether Appendix IV constituent concentrations are present in groundwater at unacceptable levels as a result of CCR Unit operations by statistically comparing concentrations in the downgradient wells to the GWPSs for each Appendix IV constituent. In accordance with §257.95(h) and the Stats Plan, GWPSs were established for the Appendix IV constituents following the preliminary assessment monitoring event as documented in the Groundwater Protection Standards technical memorandum (Appendix C of the 2018 Annual Groundwater Monitoring Report, TRC, January 2019). The GWPS is established as the higher of the EPA Maximum Contaminant Level (MCL) or statistically derived background level for constituents with MCLs and the higher of the EPA Regional Screening Levels (RSLs) or background level for constituents without an established MCL.

3.2 Data Comparison to Groundwater Protection Standards

The compliance well groundwater concentrations for Appendix IV constituents were compared to the GWPSs to determine if a statistically significant exceedance had occurred in accordance with §257.95. Consistent with the *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance* (Unified Guidance) (USEPA, 2009), the preferred method for comparisons to a fixed standard are confidence limits. An exceedance of the standard occurs when the 99 percent lower confidence level of the downgradient monitoring well data exceeds the GWPS of any Appendix IV constituent. As documented in the January 14, 2019 *Notification of Appendix IV Constituent Exceeding Groundwater Protection Standard per §257.95(g)*, arsenic was present at statistically significant levels above the federal GWPS in five of the six downgradient wells at the Karn Bottom Ash Pond.

Confidence intervals were established per the statistical methods detailed in the *Statistical Evaluation of May 2022 Assessment Monitoring Sampling Event* technical memorandum provided in Appendix B. For each Appendix IV constituent, the concentrations were first compared directly to their respective GWPS. Constituent-well combinations that included a direct exceedance of the GWPSs were retained for further statistical analysis using confidence limits.

Due to changes in groundwater flow direction on site, monitoring wells DEK-MW-15003 and DEK-MW-15004 are no longer located downgradient of the unit and were determined to be no longer indicative of groundwater conditions influenced by the Karn Bottom Ash Pond. Therefore, monitoring wells DEK-MW-15003 and DEK-MW-15004 are no longer included for assessment monitoring statistical analysis. The monitoring well network for statistical evaluation consists of the four monitoring wells located downgradient of the bottom ash pond (DEK-MW-15002, DEK-MW-15005, DEK-MW-15006, and DEK-MW-18001). Overall, the assessment



monitoring statistical evaluations have confirmed that arsenic is the only Appendix IV constituent present at statistically significant levels above the GWPS. The statistical evaluation of the May 2022 semiannual assessment monitoring event data indicate that arsenic is present at statistically significant levels exceeding the GWPS in downgradient monitoring wells at the Karn Bottom Ash Pond:

Constituent	GWPS	#Downgradient Wells Observed
Arsenic	21 ug/L	2 of 4

Previously, arsenic was present in downgradient well DEK-MW-15002 at a statistically significant level; however, the statistical evaluations of the October 2020 through October 2021 data show that the lower confidence limit for arsenic is below the GWPS. A summary of the confidence intervals for May 2022 is provided in Table 5.

Arsenic concentrations at DEK-MW-15002 appear to exhibit a downward trend on the timeseries chart (Appendix B: Attachment 1). This data set was tested further in Sanitas™ utilizing Sen's Slope to estimate the average rate of change in concentration over time and utilizing the Mann-Kendall trend test to test for significance of the trend at the 98% confidence level. The trend test showed that arsenic concentrations are generally decreasing with time, as evidenced by the negative Sen's Slope, and that the downward trend of arsenic at DEK-MW-15002 is statistically significant.



4.0 Conclusions and Recommendations

Corrective action has been triggered and assessment monitoring is ongoing at the Karn Bottom Ash Pond CCR unit. A summary of the May 2022 assessment monitoring event is presented in this report.

Overall, the statistical assessments have confirmed that arsenic is the only Appendix IV constituent present at statistically significant levels above the GWPS. Consumers Energy has completed the removal of CCR consistent with the timeline for closure of the Karn Bottom Ash Pond under the *DE Karn Bottom Ash Pond Closure Plan* (Golder, January 2018; Revised April 2018) and the CCR Rule's closure by removal provisions in §257.102(c).

The ACM Report provided a high-level assessment of groundwater remediation technologies that could potentially address site-specific COCs (i.e., arsenic) under known groundwater conditions. Groundwater chemistry already appears to be improving as a result of discontinuing the hydraulic loading to the Karn Bottom Ash Pond and the completed source removal of CCR, as shown by the decreasing concentration of arsenic at DEK-MW-15002; however, attainment of the GWPS at all of the Bottom Ash Pond compliance wells may not be feasible due to influences other than the former pond, such as the presence and former operation of the nearby Karn Landfill. Redox conditions, which affect contaminant transport, are still stabilizing following pond removal and will continue to be evaluated further.

Consumers Energy will continue assessment monitoring and evaluate corrective measures in accordance with §257.96 and §257.97 as outlined in the Karn Bottom Ash Pond ACM. The groundwater management remedy for the Karn Bottom Ash Pond will be selected as soon as feasible to meet the federal standards of §257.96(b) of the CCR Rule. Consumers Energy will continue executing the self-implementing groundwater compliance schedule in conformance with §257.90 - §257.98. The next semiannual monitoring event is tentatively scheduled for the fourth calendar guarter of 2022.



5.0 References

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Tables

Table 1

Summary of Groundwater Elevation Data DE Karn – RCRA CCR Monitoring Program Essexville, Michigan

	тос		Screen Interval	May 2, 2022		
Well Location	Flevation Flevation			Depth to Water (ft BTOC)	Groundwater Elevation (ft)	
Background			!	(112100)	(**)	
MW-15002	587.71	Sand	580.9 to 570.9	6.61	581.10	
MW-15008	585.36	Sand with clay	578.7 to 568.7	4.38	580.98	
MW-15016	586.49	Sand	581.2 to 578.2	3.66	582.83	
MW-15019	586.17	Sand and Sand/Clay	579.5 to 569.5	5.31	580.86	
DEK Bottom Ash Pond			0.000 10 00010			
DEK-MW-15002	590.87	Sand	578.3 to 575.3	6.50	584.37	
DEK-MW-15005	589.72	Sand	572.3 to 567.3	9.64	580.08	
DEK-MW-15006	589.24	Sand	573.0 to 568.0	9.12	580.12	
DEK Bottom Ash Pond				****		
DEK-MW-18001	593.47	Sand	579.2 to 574.2	8.10	585.37	
Karn Lined Impoundm		Janu	0.0.2 10 0.1.2			
DEK-MW-15003	602.74	Sand	578.8 to 574.8	16.80	585.94	
OW-10	591.58	Silty Sand and Silty Clay	576.0 to 571.0	6.43	585.15	
OW-11	607.90	Silt/Fly Ash	587.5 to 582.5	22.06	585.84	
OW-12	603.10	Silty Sand	584.2 to 579.2	17.05	586.05	
DEK Nature and Exten		J, J.				
DEK-MW-15004	611.04	Sand	576.6 to 571.6	28.22	582.82	
MW-01	597.02	Sand	573.0 to 570.0	17.08	579.94	
MW-03	597.30	Sand	569.8 to 566.8	17.37	579.93	
MW-06	589.44	Sand and Silty Sand	578.5 to 563.5	9.26	580.18	
MW-08	598.78	Sand and Silty Clay	580.9 to 570.9	17.79	580.99	
MW-10	596.97	Sand	582.5 to 572.5	16.90	580.07	
MW-12	598.60	Sand	583.9 to 573.9	18.61	579.99	
MW-14	594.37	Sand and Silty Clay	584.7 to 574.7	14.43	579.94	
MW-16	595.80	Sand and Sand/Bottom Ash	584.1 to 574.1	15.84	579.96	
MW-22	598.99	Ash/Sand	571.4 to 568.4	16.78	582.21	
MW-23	595.57	Ash/Sand	576.9 to 571.9	13.92	581.65	
DEK Static Water Leve						
MW-02	597.34	Sand and Silty Clay	572.5 to 567.5	17.38	579.96	
MW-04	598.01	NR	569.5 to 564.5	18.17	579.84	
MW-17	597.91	Sand	577.0 to 574.0	12.91	585.00	
MW-18	609.22	Silty Sand and Silty Clay	575.8 to 573.8	25.86	583.36	
MW-19	597.28	NR	572.1 to 567.1	16.90	580.38	
MW-20	632.75	Sand	582.3 to 579.3	52.70	580.05	
MW-21	632.91	Sand	587.1 to 584.1	51.20	581.71	
OW-01	631.33	NR	572.5 to 567.5	51.22	580.11	
OW-02	598.01	Fly Ash	579.4 to 576.4	15.55	582.46	
OW-03	597.94	Fly Ash and Sand	573.6 to 568.6	17.53	580.41	
OW-04	590.21	Sand and Bottom/Fly Ash	579.1 to 574.1	10.25	579.96	
OW-05	593.53	Sand	576.9 to 571.9	13.49	580.04	
OW-06	603.95	NR	580.9 to 575.9	22.00	581.95	
OW-07	596.41	Ash	583.3 to 580.3	14.84	581.57	
OW-08	593.93	NR	581.0 to 576.0	10.78	583.15	
OW-09	593.45	NR	585.5 to 580.5	10.25	583.20	
OW-13	588.52	NR	579.5 to 574.5	4.08	584.44	
OW-15	587.75	NR	572.8 to 567.8	4.40	583.35	

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.

NR: Not Recorded

Table 2

Summary of Field Parameters: May 2022 DE Karn Bottom Ash Pond – RCRA CCR Monitoring Program Essexville, Michigan

Sample Location	Sample Date	Dissolved Oxygen	Oxidation Reduction Potential	рН	Specific Conductivity	Temperature	Turbidity		
		(mg/L)	(mV)	(SU)	(umhos/cm)	(°C)	(NTU)		
Background									
MW-15002	5/2/2022	0.00	-49.7	6.5	5,911	9.2	10.0		
MW-15008	5/2/2022	0.05	-73.2	6.4	1,347	8.5	9.5		
MW-15016	5/3/2022	0.01	-84.0	6.7	1,390	8.1	10.0		
MW-15019	5/2/2022	0.01	-71.1	6.5	1,414	7.3	4.0		
Karn Bottom Ash Po	ond								
DEK-MW-15002	5/3/2022	0.01	-95.3	7.0	884	8.9	3.8		
DEK-MW-15003	5/3/2022	0.15	-198.2	7.9	379	15.6	2.2		
DEK-MW-15004	5/4/2022		-99.0	7.3	1,068	12.6	6.0		
DEK-MW-15005	5/3/2022	0.02	-101.0	7.1	1,036	9.6	4.4		
DEK-MW-15006	5/3/2022	0.12	-75.5	7.4	713	10.2	2.1		
DEK-MW-18001	5/3/2022		-76.3	7.6	983	9.6	4.9		

Notes:

mg/L - Milligrams per Liter.

mV - Millivolts.

SU - Standard units.

umhos/cm - Micromhos per centimeter.

°C - Degrees Celsius

NTU - Nephelometric Turbidity Unit.

-- = Parameter Not Measured

Table 3

Summary of Groundwater Sampling Results (Analytical): May 2022 DE Karn & JC Weadock Background – RCRA CCR Monitoring Program Essexville, Michigan

					Sample Location:	MW-15002	MW-15008	MW-15016	MW-15019
					Sample Date:	5/2/2022	5/2/2022	5/3/2022	5/2/2022
				MI Non-	Gampie Date.	3/2/2022			3/2/2022
Constituent	Unit	EPA MCL	MI Residential*	Residential*	MI GSI^		Backo	ground	
Appendix III ⁽¹⁾									
Boron	ug/L	NC	500	500	4,000	103	112	329	236
Calcium	mg/L	NC	NC	NC	500EE	238	89.5	216	139
Chloride	mg/L	250**	250 ^E	250 ^E	50	2,210	197	243	324
Fluoride	ug/L	4,000	NC	NC	NC	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	250**	250 ^E	250 ^E	500EE	6	4.99	267	62.5
Total Dissolved Solids	mg/L	500**	500 ^E	500 ^E	500	4,240	783	1,390	1,200
pH, Field	SU	6.5 - 8.5**	6.5 - 8.5 ^E	6.5 - 8.5 ^E	6.5 - 9.0	6.5	6.4	6.7	6.5
Appendix IV ⁽¹⁾									
Antimony	ug/L	6	6.0	6.0	2.0	< 1	< 1	< 1	< 1
Arsenic	ug/L	10	10	10	10	14	2	8	2
Barium	ug/L	2,000	2,000	2,000	1,200	682	52	72	308
Beryllium	ug/L	4	4.0	4.0	33	< 1	< 1	< 1	< 1
Cadmium	ug/L	5	5.0	5.0	2.5	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	100	100	11	3	1	1	1
Cobalt	ug/L	NC	40	100	100	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	NC	NC	NC	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	NC	4.0	4.0	14	< 1	< 1	< 1	< 1
Lithium	ug/L	NC	170	350	440	16	16	80	12
Mercury	ug/L	2	2.0	2.0	0.20#	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	NC	73	210	120	< 5	< 5	< 5	< 5
Radium-226	pCi/L	NC	NC	NC	NC	1.37	< 0.447	< 0.368	< 0.579
Radium-228	pCi/L	NC	NC	NC	NC	3.30	< 0.588	< 0.611	1.83
Radium-226/228	pCi/L	5	NC	NC	NC	4.68	0.826	0.624	2.11
Selenium	ug/L	50	50	50	5	54	< 1	2	2
Thallium	ug/L	2	2.0	2.0	2.0	< 2	< 2	< 2	< 2
Additional MI Part 115 ⁽²⁾									
Iron	ug/L	300**	300 ^E	300 ^E	500,000EE	16,100	15,500	8,020	21,000
Copper	ug/L	1,000**	1,000 ^E	1,000 ^E	20	3	< 1	5	< 1
Nickel	ug/L	NC	100	100	120	14	5	13	8
Silver	ug/L	100**	34	98	0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	NC	4.5	62	27	15	6	3	3
Zinc	ug/L	5,000**	2,400	5,000 ^E	260	23	< 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

- * Michigan Part 201 Generic Drinking Water Cleanup Criteria, December 21, 2020.
- ** 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 EGLE 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 Amendments Public Act No. 640 of 2018 Section 11511a(3)(c) and 11519b(2) additional detection monitoring constituents (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.

Table 4

Summary of Groundwater Sampling Results (Analytical): May 2022 DE Karn Bottom Ash Pond – RCRA CCR Monitoring Program Essexville, Michigan

					Sample Location:	DEK-MW-15002	DEK-MW-15005	DEK-MW-15006	DEK-MW-18001
					Sample Date:	5/3/2022	5/3/2022	5/3/2022	5/3/2022
				MI Non-	·		down	ıradient	
Constituent	Unit	EPA MCL	MI Residential*	Residential*	MI GSI^		downg	radieni	
Appendix III ⁽¹⁾									
Boron	ug/L	NC	500	500	4,000	1,100	787	893	869
Calcium	mg/L	NC	NC	NC	500 ^{EE}	105	127	65	63.7
Chloride	mg/L	250**	250 ^E	250 ^E	50	99.3	141	68.6	65.9
Fluoride	ug/L	4,000	NC	NC	NC	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	250**	250 ^E	250 ^E	500 ^{EE}	172	151	173	187
Total Dissolved Solids	mg/L	500**	500 ^E	500 ^E	500	779	909	597	555
pH, Field	SU	6.5 - 8.5**	6.5 - 8.5 ^E	6.5 - 8.5 ^E	6.5 - 9.0	7.0	7.1	7.4	7.6
Appendix IV ⁽¹⁾									
Antimony	ug/L	6	6.0	6.0	2.0	< 1	< 1	< 1	< 1
Arsenic	ug/L	10	10	10	10	2	54	25	113
Barium	ug/L	2,000	2,000	2,000	1,200	134	305	68	164
Beryllium	ug/L	4	4.0	4.0	33	< 1	< 1	< 1	< 1
Cadmium	ug/L	5	5.0	5.0	2.5	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	100	100	11	1	< 1	1	< 1
Cobalt	ug/L	NC	40	100	100	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	NC	NC	NC	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	NC	4.0	4.0	14	< 1	< 1	< 1	< 1
Lithium	ug/L	NC	170	350	440	28	36	16	22
Mercury	ug/L	2	2.0	2.0	0.20#	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	NC	73	210	120	< 5	12	6	< 5
Radium-226	pCi/L	NC	NC	NC	NC	< 0.423	0.620	< 0.449	0.294
Radium-228	pCi/L	NC	NC	NC	NC	< 0.530	1.08	0.870	0.592
Radium-226/228	pCi/L	5	NC	NC	NC	0.636	1.70	1.29	0.885
Selenium	ug/L	50	50	50	5.0	1	1	< 1	2
Thallium	ug/L	2	2.0	2.0	2.0	< 2	< 2	< 2	< 2
Additional MI Part 11	5 ⁽²⁾								
Iron	ug/L	300**	300 ^E	300 ^E	500,000EE	1,910	1,570	715	1,360
Copper	ug/L	1,000**	1,000 ^E	1,000 ^E	20	1	2	< 1	< 1
Nickel	ug/L	NC	100	100	120	6	7	4	3
Silver	ug/L	100**	34	98	0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	NC	4.5	62	27	< 2	< 2	< 2	< 2
Zinc	ug/L	5,000**	2,400	5,000 ^E	260	< 10	< 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 21, 2020.
- ** 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.

Table 5

Summary of Groundwater Protection Standard Exceedances – May 2022 DE Karn Bottom Ash Pond – RCRA CCR Monitoring Program Essexville, Michigan

Constituent	Units	GWPS	DEW-MW-15002		DEK-MW-15005		DEK-MW-15006		DEK-MW-18001	
			LCL	UCL	LCL	UCL	LCL	UCL	LCL	UCL
Arsenic	ug/L	21	1.7	14	26	82	21	26	67	110

Notes:

ug/L - micrograms per Liter.

GWPS - Groundwater Protection Standard as established in TRC's Technical Memorandum dated October 15, 2018.

UCL - Upper Confidence Limit ($\alpha = 0.01$) of the downgradient data set.

LCL - Lower Confidence Limit (α = 0.01) of the downgradient data set.

Indicates a statistically significant exceedance of the GWPS. An exceedance occurs when the LCL is greater than the GWPS.



Figures









Appendix A Data Quality Reviews

Laboratory Data Quality Review Groundwater Monitoring Event May 2022 DE Karn Bottom Ash Pond

Groundwater samples were collected by TRC for the May 2022 sampling event. Samples were analyzed for total metals, anions, total dissolved solids, ammonia, and alkalinity by Consumers Energy (CE) Laboratory Services in Jackson, Michigan. The sulfide analyses were subcontracted to Merit Laboratories, Inc. (Merit) in East Lansing, Michigan and the total and dissolved organic carbon analyses were subcontracted to Brighton Analytical LLC (BAL) in Brighton, Michigan. The laboratory analytical results were reported in laboratory sample delivery group (SDGs) 22-0436, S35620.01(01), and 81649.

During the May 2022 sampling event, a groundwater sample was collected from each of the following wells:

DEK-MW-15002

■ DEK-MW-15005

■ DEK-MW-15006

Each 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
Total and Dissolved Organic Carbon (TOC, DOC)	SM 5310B

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:

- 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. 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, alkalinity, TDS, ammonia, 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, IV, optional Piper diagram analyses, and additional Part 115 constituents will be utilized for the purposes of the detection monitoring program.
- Data are usable for the purposes of the assessment monitoring program.
- When the data are evaluated through an assessment monitoring statistical program, findings below may be used to support the removal of outliers.

QA/QC Sample Summary:

- TOC and DOC were not detected in the method blank.
- One field blank (FB-DEK-BAP) and one equipment blank (EB-DEK-BAP) were collected with this data set. Total metals, nitrate, nitrite, ammonia, sulfide, and TOC/DOC were not detected in the blanks with the following exception.
 - DOC was detected at 1,300 ug/L in FB-DEK-BAP. The positive results for DOC in all groundwater samples are potential false positive results as summarized in the attached table, Attachment A.

- MS and MSD analyses were performed on sample DUP-DEK-BAP-01 for TOC/DOC. All criteria were met.
- The field duplicate pair samples were DUP-DEK-BAP-01 with DEK-MW-15006; relative percent differences (RPDs) between the parent and duplicate sample were within the QC limits.
- Laboratory duplicate analyses were not performed on a sample from this data set.

Attachment A

Summary of Data Non-Conformances for Groundwater Analytical Data DE Karn Bottom Ash Pond – CCR Monitoring Program Essexville, Michigan

Samples	Collection Date	Analyte	Non-Conformance/Issue
DEK-MW-15002	5/3/2022		
DEK-MW-15005	5/3/2022	DOC	Potential false positive results due to field blank contamination.
DEK-MW-15006	5/3/2022	DOC	Fotential raise positive results due to field blank contamination.
DUP-DEK-BAP-01	5/3/2022		

Laboratory Data Quality Review Groundwater Monitoring Event May 2022 DE Karn Bottom Ash Pond

Groundwater samples were collected by TRC for the May 2022 sampling event. Samples were analyzed for radium by Eurofins-TestAmerica in St. Louis, Missouri (Eurofins TA – St. Louis). The laboratory analytical results were reported in laboratory sample delivery group (SDG) 240-166154-1.

During the May 2022 sampling event, a groundwater sample was collected from each of the following wells:

DEK-MW-15002

DEK-MW-15005

DEK-MW-15006

Each sample was analyzed for one or more of the following constituents:

Analyte Group	Method
Radium (Ra-226, Ra-228, Combined Ra-226 & Ra-228)	EPA 903.0, EPA 904.0

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 Department of Energy Evaluation of Radiochemical Data Usability (USDOE, 1997). The following items were included in the evaluation of the data:

- 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;
- Percent recoveries for carriers, where applicable, for radiochemistry only. Carriers are used to assess the chemical yield for the preparation and/or instrument efficiency;
- 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. Field duplicate samples are used to assess variability introduced by the sampling and analytical processes; and
- Overall usability of the data.

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 constituents will be utilized for the purposes of an assessment monitoring program.
- Data are usable for the purposes of the assessment monitoring program.
- When the data are evaluated through an assessment monitoring statistical program, findings below may be used to support the removal of outliers.

QA/QC Sample Summary:

- Target analytes were not detected in the method blanks.
- One equipment blank (DEK-MW-EB) was collected. Target analytes were not detected in the equipment blank sample.
- LCS/LCSD recoveries and relative percent differences or relative error ratios (RER) for all target analytes were within laboratory control limits with the following exception.
 - The RER (1.12) for radium 228 was outside of the laboratory control limit (1.0) in the LCS/LCSD associated with all samples. Positive detections of radium 228 in select samples should be considered estimated as summarized in the attached table, Attachment A.
- MS/MSD and laboratory duplicate analyses were not performed on a sample from this SDG.
- The field duplicate pair samples were DUP-DEK-BAP/DEK-MW-15006. All criteria were met.
- Carrier recoveries were within 40-110%.

Attachment A

Summary of Data Non-Conformances for Groundwater Analytical Data DE Karn Bottom Ash Pond – CCR Monitoring Program Essexville, Michigan

Samples	Collection Date	Analyte	Non-Conformance/Issue
DEK-MW-15005	5/3/2022	Radium 228	Detected results are estimated due to Relative Error Ratio (RER) for LCS/LCDS outside of criteria
DEK-MW-15006	5/3/2022	Naululli 220	Detected results are estimated due to relative Effor ratio (RER) for EC3/ECD3 outside or chiefla

Laboratory Data Quality Review Groundwater Monitoring Event May 2022 DE Karn Bottom Ash Pond and Lined Impoundment

A groundwater sample was collected by TRC for the May 2022 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 and the total and dissolved organic carbon analyses were subcontracted to Brighton Analytical LLC (BAL) in Brighton, Michigan. The laboratory analytical results were reported in laboratory sample delivery group (SDGs) 22-0437, S35622.01(01), and 81646.

During the May 2022 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)	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
Total and Dissolved Organic Carbon (TOC, DOC)	SM 5310B

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:

- 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. 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 metals, anions, TDS, and alkalinity 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, IV, optional Piper Diagram analyses, and additional Part 115 constituents will be utilized for the purposes of a detection or assessment monitoring program.
- Data are usable for the purposes of the detection or assessment monitoring program.
- 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

- TOC and DOC were not detected in the method blank.
- A field blank was not collected with this data set.
- An equipment blank was not collected with this data set.

- MS and MSD analyses were performed on sample DEK-MW-18001 for total metals, anions, ammonia, alkalinity, sulfide, TOC, and DOC. The recoveries were within the acceptance limits. Relative percent differences (RPDs) were not provided by the laboratory and therefore were not evaluated; further, MS/MSD concentrations were not provided by the laboratory with the exception of the sulfide analysis which met RPD criteria. However, since all recoveries were within the acceptance limits, there is no impact on data usability due to this issue.
- A field duplicate pair was not collected with this data set.
- Laboratory duplicate analyses were not performed on a sample from this data set.

Laboratory Data Quality Review Groundwater Monitoring Event May 2022 DE Karn Bottom Ash Pond and Lined Impoundment

A groundwater sample was collected by TRC for the May 2022 sampling event. The sample was analyzed for radium by Eurofins-TestAmerica in St. Louis, Missouri (Eurofins TA – St. Louis). The laboratory analytical results were reported in laboratory sample delivery group (SDG) 240-166148-1.

During the May 2022 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
Radium (Ra-226, Ra-228, Combined Ra-226 & Ra-228)	EPA 903.0, EPA 904.0

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 Department of Energy Evaluation of Radiochemical Data Usability (USDOE, 1997). The following items were included in the evaluation of the data:

- 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;
- Percent recoveries for carriers, where applicable, for radiochemistry only. Carriers are used to assess the chemical yield for the preparation and/or instrument efficiency;
- 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. Field duplicate samples are used to assess variability introduced by the sampling and analytical processes; and
- Overall usability of the data.

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 constituents will be utilized for the purposes of an assessment monitoring program.
- Data are usable for the purposes of the assessment monitoring program.
- When the data are evaluated through an assessment monitoring statistical program, findings below may be used to support the removal of outliers.

QA/QC Sample Summary:

- Target analytes were not detected in the method blanks.
- No equipment or field blank were collected.
- LCS/LCSD recoveries and relative percent differences or relative error ratios (RER) for all target analytes were within laboratory control limits with the following exception.
 - The RER (1.12) for radium 228 was outside of the laboratory control limit (1.0) in the LCS/LCSD associated with the sample. The positive detection of radium 228 in sample DEK-MW-18001 should be considered estimated as summarized in the attached table, Attachment A.
- MS/MSD and laboratory duplicate analyses were not performed on a sample from this SDG.
- A field duplicate pair was not collected.
- Carrier recoveries were within 40-110%.

Attachment A

Summary of Data Non-Conformances for Groundwater Analytical Data DE Karn Lined Impoundment – CCR Monitoring Program Essexville, Michigan

Samples	Collection Date	Analyte	Non-Conformance/Issue
DEK-MW-18001	5/3/2022	Radium 228	Detected result should be considered estimated due to LCS/LCSD Relative Error Ratio (RER) outside of criteria.

Laboratory Data Quality Review Groundwater Monitoring Event May 2022 JC Weadock/DE Karn Background

Groundwater samples were collected by TRC for the May 2022 sampling event. Samples were analyzed for total metals, anions, and total dissolved solids by Consumers Energy (CE) Laboratory Services in Jackson, Michigan. The laboratory analytical results were reported in laboratory sample delivery group (SDG) 22-0443.

During the May 2022 sampling event, a groundwater sample was collected from each of the following wells:

■ MW-15002

■ MW-15008

MW-15016

■ MW-15019

Each sample was analyzed for the following constituents:

Analyte Group	Method
Anions (Fluoride, Chloride, Sulfate)	EPA 300.0
Total Dissolved Solids (TDS)	SM 2540C
Total Metals	SW-846 6020B/7470A

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:

- 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. 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. 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 laboratory control samples were not provided for review by CE Laboratory Services. 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 metals, anions, and TDS 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, IV, and additional Part 115 constituents will be utilized for the purposes of an assessment monitoring program.
- Data are usable for the purposes of the assessment monitoring program.
- When the data are evaluated through an assessment monitoring statistical program, findings below may be used to support the removal of outliers.

QA/QC Sample Summary:

- One field blank (FB-Background) was collected. Total metals were not detected in this blank sample.
- MS and MSD analyses were not performed on a sample from this data set.
- The field duplicate pair samples were DUP-Background and MW-15008; all criteria were met.
- Laboratory duplicate analyses were not performed on a sample from this data set.

Laboratory Data Quality Review Groundwater Monitoring Event May 2022 JC Weadock/Karn DEK Background

Groundwater samples were collected by TRC for the May 2022 sampling event. Samples were analyzed for radium by Eurofins-TestAmerica in St. Louis, Missouri (Eurofins TA – St. Louis). The laboratory analytical results were reported in laboratory sample delivery group (SDG) 240-166150-1.

During the May 2022 sampling event, a groundwater sample was collected from each of the following wells:

■ MW-15002

MW-15008

MW-15016

MW-15019

Each sample was analyzed for the following constituents:

Analyte Group	Method					
Radium (Ra-226, Ra-228, Combined Ra-226 & Ra-228)	EPA 903.0, EPA 904.0					

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 Department of Energy Evaluation of Radiochemical Data Usability (USDOE, 1997). The following items were included in the evaluation of the data:

- 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;
- Percent recoveries for carriers, where applicable, for radiochemistry only. Carriers are used to assess the chemical yield for the preparation and/or instrument efficiency;

- 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. Field duplicate samples are used to assess variability introduced by the sampling and analytical processes; and
 - Overall usability of the data.

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 constituents will be utilized for the purposes of an assessment monitoring program.
- Data are usable for the purposes of the assessment monitoring program.
- When the data are evaluated through an assessment monitoring statistical program, findings below may be used to support the removal of outliers.

QA/QC Sample Summary:

- Target analytes were not detected in the method blanks.
- One equipment blank (EB-04) was collected. Target analytes were not detected in the equipment blank sample.
- LCS/LCSD recoveries and relative percent differences or relative error ratios (RER) for all target analytes were within laboratory control limits with the following exception.
 - The RER (1.12) for radium 228 was outside of the laboratory control limit (1.0) in the LCS/LCSD associated with all samples. Positive detections of radium 228 in select samples should be considered estimated as summarized in the attached table, Attachment A.
- MS/MSD and laboratory duplicate analyses were not performed on a sample from this SDG.
- The field duplicate pair samples were DUP-04/MW-15008. All criteria were met.
- Carrier recoveries were within 40-110%.

Attachment A

Summary of Data Non-Conformances for Groundwater Analytical Data JC Weadock and DE Karn Background Wells – CCR Monitoring Program Essexville, Michigan

Samples	Collection Date	Analyte	Non-Conformance/Issue
MW-15002	5/2/2022		
MW-15019	5/2/2022	Radium 228	Detected results should be considered estimated due to LCS/LCSD Relative Error Ratio (RER) outside of criteria.
DUP-04	5/2/2022		



Appendix B Statistical Evaluation of May 2022 Assessment Monitoring Sampling Event



Date: June 29, 2022

To: J.R. Register, Consumers Energy

From: Darby Litz, TRC

Alex Eklund, TRC

Project No.: 464095.0001.0000 Phase 002, Task 002

Subject: Statistical Evaluation of May 2022 Assessment Monitoring Sampling Event

DE Karn Bottom Ash Pond, Consumers Energy Company, Essexville, Michigan

During the statistical evaluation of the initial assessment monitoring event (May 2018), arsenic was present in one or more downgradient monitoring wells at statistically significant levels exceeding the Groundwater Protection Standards (GWPSs). Therefore, Consumers Energy Company (Consumers Energy) initiated an Assessment of Corrective Measures (ACM) within 90 days from when the Appendix IV exceedance was determined. The ACM was completed on September 11, 2019. Currently, Consumers Energy is continuing semiannual assessment monitoring in accordance with §257.95 of the CCR Rule ¹ at the DE Karn Power Plant Bottom Ash Pond (Karn Bottom Ash Pond).

An assessment monitoring event was conducted on May 2 through 4, 2022. In accordance with §257.95, the assessment monitoring data must be compared to GWPSs to determine whether or not Appendix IV constituents are detected at statistically significant levels above the GWPSs. GWPSs were established in accordance with §257.95(h), as detailed in the October 15, 2018 Groundwater Protection Standards technical memorandum, which was also included in the 2018 Annual Groundwater Monitoring Report (TRC, January 2019).

The statistical evaluation of the assessment monitoring event data indicates the following constituent is present at statistically significant levels exceeding the GWPS in downgradient monitoring wells at the Karn Bottom Ash Pond:

Constituent	GWPS	#Downgradient Wells Observed
Arsenic	21 ug/L	2 of 4

The results of the assessment monitoring statistical evaluation for the downgradient wells are consistent with the results of the previous assessment monitoring data statistical evaluations, indicating that arsenic is the only constituent present at concentrations above the GWPS. Consumers Energy will continue to evaluate corrective measures per §257.96 and §257.97. Consumers Energy will continue

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 per Phase One, Part One of the CCR Rule (83 FR 36435).

executing the self-implementing groundwater compliance schedule in conformance with §257.90 - §257.98.

Assessment Monitoring Statistical Evaluation

When the initial assessment monitoring event was completed in May 2018, the compliance well network at the Karn Bottom Ash Pond included six wells encircling the unit (DEK-MW-15002 through DEK-MW-15006 and DEK-MW-18001). Starting with the May 2021 statistical evaluation, the compliance well network includes DEK-MW-15002, DEK-MW-15005, DEK-MW-15006, and DEK-MW-18001. Due to changes in groundwater flow direction on site, monitoring wells DEK-MW-15003 and DEK-MW-15004 are no longer located downgradient of the unit and were determined to be no longer indicative of groundwater conditions influenced by the Karn Bottom Ash Pond. Therefore, monitoring wells DEK-MW-15003 and DEK-MW-15004 are no longer included for statistical analysis.

Following the assessment monitoring sampling event, compliance well data for the DEK BAP were evaluated in accordance with the Groundwater Statistical Evaluation Plan (Stats Plan) (TRC, October 2017). An assessment monitoring program was developed to evaluate concentrations of CCR constituents present in the uppermost aquifer relative to acceptable levels (i.e., GWPSs). To evaluate whether or not a GWPS exceedance is statistically significant, the difference in concentration observed at the downgradient wells during a given assessment monitoring event compared to the GWPS must be large enough, after accounting for variability in the sample data, that the result is unlikely to have occurred merely by chance. Consistent with the Unified Guidance ², the preferred method for comparisons to a fixed standard is confidence limits. Based on the number of historical observations in the representative sample population, the sample mean, the sample standard deviation, and a selected confidence level (i.e., 99 percent), an upper and lower confidence limit is calculated. The true mean concentration, with 99 percent confidence, will fall between the lower and upper confidence limits.

The concentrations observed in the downgradient wells are deemed to be a statistically significant exceedance when the 99 percent lower confidence limit of the downgradient data exceeds the GWPS. If the confidence interval straddles the GWPS (i.e., the lower confidence level is below the GWPS, but the upper confidence level is above), the statistical test result indicates that there is insufficient confidence that the measured concentrations are different from the GWPS and thus no compelling evidence that the measured concentration is a result of a release from the CCR unit versus the inherent variability of the sample data. This statistical approach is consistent with the statistical methods for assessment monitoring presented in §257.93(f) and (g). Statistical evaluation methodologies built into the CCR Rule, and numerous other federal rules, are key in determining whether or not individually measured data points represent a concentration increase over the baseline or a fixed standard (such as a GWPS in an assessment monitoring program).

For each detected Appendix IV constituent, the concentrations from each well were first compared directly to the GWPS, as shown on Table 1. Parameter-well combinations that included a direct exceedance of the GWPS within the past eight sampling events (November 2018 through May 2022) were retained for further analysis. Arsenic in each of the downgradient monitoring wells at the Karn

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² USEPA. 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance. Office of Conservation and Recovery. EPA 530/R-09-007.

Bottom Ash Pond had individual results exceeding the GWPS.

Groundwater data were then evaluated utilizing SanitasTM statistical software. SanitasTM is a software tool that is commercially available for performing statistical evaluation consistent with procedures outlined in the Unified Guidance. Within the SanitasTM statistical program, confidence limits were selected to perform the statistical comparison of compliance data to a fixed standard. Parametric and non-parametric confidence intervals were calculated for each of the CCR Appendix IV constituents using a using a per test³ 99 percent confidence level, i.e., a significance level (α) of 0.01. The following narrative describes the methods employed, the results obtained and the SanitasTM output files are included as an attachment.

The statistical data evaluation included the following steps:

- Review of data quality checklists for the data sets;
- Graphical representation of the monitoring data as time versus concentration by well/constituent pair;
- Outlier testing of individual data points that appear from the graphical representations as potential outliers;
- Evaluation of visual trends apparent in the graphical representations for statistical significance;
- Evaluation of percentage of non-detects for each well/constituent pair;
- Distribution of the data; and
- Calculation of the confidence intervals for each cumulative dataset.

The results of these evaluations are presented and discussed below.

Data from each round were evaluated for completeness, overall quality, and usability and were deemed appropriate for the purposes of the CCR assessment monitoring program. Initially, the assessment monitoring results (November 2018 through May 2022) were visually assessed for potential trends. No outliers were identified. Arsenic concentrations at DEK-MW-15002 appear to exhibit a downward trend on the time-series chart (Attachment 1). This data set was tested further in Sanitas™ utilizing Sen's Slope to estimate the average rate of change in concentration over time and utilizing the Mann-Kendall trend test to test for significance of the trend at the 98% confidence level. The trend test showed that arsenic concentration at DEK-MW-15002 is generally decreasing with time, as evidenced by the negative Sen's Slope. Additionally, the decrease in concentration at DEK-MW-15002 was shown to be statistically significant and arsenic concentration have been below the GWPS for the seven most recent sampling events (Attachment 1). The decrease in arsenic concentrations at DEK-MW-15002 is causing the confidence interval to widen. Calculating a confidence interval around a trending data set incorporates not only variability present naturally in the underlying dataset, but also incorporates variability due to the trend itself. Arsenic concentrations have already triggered assessment monitoring (e.g., not a newly identified GWPS exceedance) and an interim measure has been initiated through the removal of CCR from the bottom ash pond in 2019; therefore, traditional confidence interval calculations are presented in this statistical evaluation until more post-CCR removal data are available. If trends continued to be observed as additional post-CCR removal data are collected, confidence

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³ Confidence level is assessed for each individual comparison (i.e. per well and per constituent).

bands may be a more appropriate assessment to determine compliance with the CCR Rule. Confidence bands are selected by the UG as the appropriate method for calculating confidence intervals on trending data. A confidence band calculates upper and lower confidence limits at each point along the trend to reduce variability and create a narrower confidence interval. At least 8 to 10 measurements should be available when computing a confidence band around a linear regression, and as of the May 2022 event, six semi-annual sampling events have been completed post-CCR removal.

The SanitasTM software was used to test compliance at the downgradient monitoring wells using the confidence interval method for the most recent 8 sampling events. Eight independent sampling events provide the appropriate density of data as recommended per the UG yet are collected recently enough to provide an indication of current condition. The tests were run with a per-test significance of $\alpha = 0.01$. The software outputs are included in Attachment 1 along with data reports showing the values used for the evaluation. The percentage of non-detect observations for well/constituent pairs with a direct GWPS exceedance are also included in Attachment 1. Non-detect data was handled in accordance with the Stats Plan for the purposes of calculating the confidence intervals.

The Sanitas™ software generates an output graph for the confidence intervals of each well. The arsenic data set at DEK-MW-15006 and DEK-MW-18001 were found to be normally distributed, DEK-MW-15005 was normalized using a square root transformation, and DEK-MW-15002 was normalized using a natural log transformation, . The confidence interval test compares the lower confidence limit to the GWPS. The statistical evaluation of the Appendix IV parameters shows exceedances for arsenic at two of the four monitoring locations (DEK-MW-15005 and DEK-MW-18001). The results of the assessment monitoring statistical evaluation for the other downgradient wells are consistent with the results of the previous assessment monitoring data statistical evaluations, indicating that arsenic is the only constituent present at concentrations above the GWPS. Consumers Energy will continue to evaluate corrective measures per §257.96 and §257.97. Consumers Energy will continue executing the self-implementing groundwater compliance schedule in conformance with §257.90 - §257.98.

Attachments

Table 1 Comparison of Groundwater Sampling Results to Groundwater Protection Standards – November 2018 to May 2022

Attachment 1 Sanitas™ Output Files

Comparison of Groundwater Sampling Results to Groundwater Protection Standards – November 2018 to May 2022 DE Karn Bottom Ash Pond – RCRA CCR Monitoring Program Essexville, Michigan

				5	Sample Location:				D	EK-MW-1500)2			
					Sample Date:	11/5/2018	4/11/2019	10/15/2019	5/13/2020	10/6/2020	10/6/2020	5/3/2021	10/4/2021	5/3/2022
Constituent	Unit	EPA MCL	EPA RSL	UTL	GWPS			downgradient						
Appendix III											Field Dup			
Boron	ug/L	NC	NA	619	NA	894	860	1,600	1,390	1,580	1,600	1,420	1,530	1,100
Calcium	mg/L	NC	NA	302	NA	67.8	72	130	170	126	122	148	73.1	105
Chloride	mg/L	250*	NA	2,440	NA	83.5	80	410	130	106	102	148	102	99.3
Fluoride	ug/L	4,000	NA	1,000	NA	< 1,000	< 1,000	< 1,000	< 1,000	1,300	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	250*	NA	407	NA	77.2	45	150	367	142	139	216	58.3	172
Total Dissolved Solids	mg/L	500*	NA	4,600	NA	536	560	1,300	1,100	791	776	926	599	779
pH, Field	SU	6.5 - 8.5*	NA	6.5 - 7.3	NA	7.3	7.5	7.3	7.1	7.1		7.4	7.1	7.0
Appendix IV														
Antimony	ug/L	6	NA	1	6	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	10	NA	21	21	31.7	9.0	6.5	3	8	8	2	2	2
Barium	ug/L	2,000	NA	1,300	2,000	71.6	71	140	196	133	131	211	102	134
Beryllium	ug/L	4	NA	1	4	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5	NA	0.2	5	< 0.20	< 0.20	< 0.20	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	NA	3	100	1.4	1.3	< 1.0	< 1	1	1	< 1	1	1
Cobalt	ug/L	NC	6	15	15	< 6.0	< 6.0	< 6.0	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	NA	1,000	4,000	< 1,000	< 1,000	<1,000	< 1,000	1,300	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	NC	15	1	15	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	NC	40	180	180	32	26	35	48	35	36	36	29	28
Mercury	ug/L	2	NA	0.2	2	< 0.20	< 0.20	< 0.20	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	NC	100	6	100	< 5.0	< 5.0	< 5.0	< 5	< 5	< 5	< 5	< 5	< 5
Radium-226	pCi/L	NC	NA	NA	NA	< 0.850	< 0.376	0.334	0.673	< 0.430	< 0.577	0.582	1.47	< 0.42
Radium-228	pCi/L	5	NA	3.32	5	< 1.39	0.846	0.987	0.899	1.06	< 0.577	0.811	2.29	< 0.53
Radium-226/228	pCi/L	NC	NA	NA	NA	0.730	0.684	0.654	< 0.763	0.642	< 0.460	< 0.537	0.827	0.636
Selenium	ug/L	50	NA	2	50	< 1.0	< 1.0	< 1.0	< 1	< 1	1	< 1	3	1
Thallium	ug/L	2	NA	2	2	< 2.0	< 2.0	< 2.0	< 2	< 2	< 2	< 2	< 2	< 2

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

pCi/L - picocuries per liter.

NA - not applicable.

NC - no criteria.

-- - not analyzed.

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

RSL - Regional Screening Level from 83 FR 36435.

UTL - Upper Tolerance Limit (95%) of the background data set.

GWPS - Groundwater Protection Standard. GWPS is the higher of the MCL/RSL and UTL as established in

TRC's Technical Memorandum dated October 15, 2018.

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

Bold value indicates an exceedance of the GWPS. Data from downgradient monitoring wells are screened against the

GWPS for evaluation purposes only. Confidence intervals will be used to determine compliance per the CCR rules.

All metals were analyzed as total unless otherwise specified.

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 Page 1 of 4

Comparison of Groundwater Sampling Results to Groundwater Protection Standards – November 2018 to May 2022 DE Karn Bottom Ash Pond – RCRA CCR Monitoring Program Essexville, Michigan

				Sa	ample Location:						DEK-M	W-15005					
					Sample Date:	11/6/2018	4/11/2019	4/11/2019	10/15/2019	10/15/2019	5/13/2020	5/13/2020	10/7/2020	5/3/2021	5/3/2021	10/4/2021	5/3/2022
Constituent	Unit	EPA MCL	EPA RSL	UTL	GWPS						downg	ıradient					
Appendix III								Field Dup		Field Dup		Field Dup			Field Dup		
Boron	ug/L	NC	NA	619	NA	947	910	910	700	650	863	858	847	926	948	991	787
Calcium	mg/L	NC	NA	302	NA	32.9	31	31	60	59	71.0	72.1	155.0	95.6	97.6	102	127
Chloride	mg/L	250*	NA	2,440	NA	69.1	60	60	64	64	48.0	47.5	52.7	65.2	65.1	82.3	141
Fluoride	ug/L	4,000	NA	1,000	NA	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	250*	NA	407	NA	160	140	140	5.2	5.0	18.9	18.9	102	50.8	50.2	57.2	151
Total Dissolved Solids	mg/L	500*	NA	4,600	NA	474	470	470	390	400	419	425	687	534	561	546	909
pH, Field	SU	6.5 - 8.5*	NA	6.5 - 7.3	NA	7.9	7.7		7.6		8.1		7.7	7.6		7.1	7.1
Appendix IV																	
Antimony	ug/L	6	NA	1	6	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	10	NA	21	21	35.0	24	24	120	120	34	34	42	45	44	68	54
Barium	ug/L	2,000	NA	1,300	2,000	56.7	46	45	110	100	127	127	248	173	170	192	305
Beryllium	ug/L	4	NA	1	4	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5	NA	0.2	5	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	NA	3	100	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cobalt	ug/L	NC	6	15	15	< 6.0	< 6.0	< 6.0	< 6.0	< 6.0	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	NA	1,000	4,000	< 1,000	< 1,000	< 1,000	<1,000	<1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	NC	15	1	15	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	NC	40	180	180	17	15	14	16	15	20	20	45	38	39	41	36
Mercury	ug/L	2	NA	0.2	2	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	NC	100	6	100	45.3	39	38	< 5.0	< 5.0	< 5	< 5	< 5	8	8	7	12
Radium-226	pCi/L	NC	NA	NA	NA	< 0.865	< 0.379	< 0.406	0.165	0.185	< 0.469	< 0.335	0.621	0.291	< 0.187	1.12	0.620
Radium-228	pCi/L	5	NA	3.32	5	< 1.46	< 0.754	< 0.586	0.524	0.682	1.34	0.662	0.875	0.722	0.650	2.06	1.08
Radium-226/228	pCi/L	NC	NA	NA	NA	< 0.598	< 0.754	< 0.586	< 0.456	0.497	1.14	< 0.554	< 0.502	< 0.459	0.479	0.940	1.70
Selenium	ug/L	50	NA	2	50	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1	1	1	2	1
Thallium	ug/L	2	NA	2	2	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

pCi/L - picocuries per liter.

NA - not applicable.

NC - no criteria.

-- - not analyzed.

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

RSL - Regional Screening Level from 83 FR 36435.

UTL - Upper Tolerance Limit (95%) of the background data set.

GWPS - Groundwater Protection Standard. GWPS is the higher of the MCL/RSL and UTL as established in

TRC's Technical Memorandum dated October 15, 2018.

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

Bold value indicates an exceedance of the GWPS. Data from downgradient monitoring wells are screened against the GWPS for evaluation purposes only. Confidence intervals will be used to determine compliance per the CCR rules.

All metals were analyzed as total unless otherwise specified.

Page 2 of 4 July 2022

Comparison of Groundwater Sampling Results to Groundwater Protection Standards – November 2018 to May 2022 DE Karn Bottom Ash Pond – RCRA CCR Monitoring Program Essexville, Michigan

				S	ample Location:					D	EK-MW-1500	16				
					Sample Date:	11/5/2018	11/5/2018	4/11/2019	10/14/2019	5/13/2020	10/7/2020	5/3/2021	10/4/2021	10/4/2021	5/3/2022	5/3/2022
Constituent	Unit	EPA MCL	EPA RSL	UTL	GWPS						downgradient					
Appendix III							Field Dup							Field Dup		Field Dup
Boron	ug/L	NC	NA	619	NA	1,340	1,270	1,700	1,200	1,090	1,220	938	1,050	1,080	893	888
Calcium	mg/L	NC	NA	302	NA	29.4	29.6	35	34	70.4	106	115	117	117	65.0	65.5
Chloride	mg/L	250*	NA	2,440	NA	87.9	88.3	75	45	71.5	102	63.5	78.9	74.7	68.6	67.9
Fluoride	ug/L	4,000	NA	1,000	NA	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	1,060	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	250*	NA	407	NA	341	344	320	74	316	296	324	209	196	173	168
Total Dissolved Solids	mg/L	500*	NA	4,600	NA	792	784	780	450	833	1,010	790	712	708	597	609
pH, Field	SU	6.5 - 8.5*	NA	6.5 - 7.3	NA	7.9		7.8	7.8	8.1	7.7	7.5	7.3		7.4	
Appendix IV																
Antimony	ug/L	6	NA	1	6	< 1.0	< 1.0	< 1.0	< 1.0	3	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	10	NA	21	21	20.9	19.6	21	27	21	27	24	23	24	25	24
Barium	ug/L	2,000	NA	1,300	2,000	38.5	38.3	43	51	86	141	139	125	126	68	67
Beryllium	ug/L	4	NA	1	4	< 1.0	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5	NA	0.2	5	< 0.20	< 0.20	< 0.20	< 0.20	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	NA	3	100	< 1.0	< 1.0	< 1.0	1.1	2	6	< 1	< 1	< 1	1	< 1
Cobalt	ug/L	NC	6	15	15	< 6.0	< 6.0	< 6.0	< 6.0	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	NA	1,000	4,000	< 1,000	< 1,000	< 1,000	<1,000	< 1,000	1,060	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	NC	15	1	15	< 1.0	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	NC	40	180	180	< 10	10	< 10	11	15	22	21	19	19	16	15
Mercury	ug/L	2	NA	0.2	2	< 0.20	< 0.20	< 0.20	< 0.20	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	NC	100	6	100	50.3	48.0	59	11	18	11	9	7	7	6	6
Radium-226	pCi/L	NC	NA	NA	NA	< 0.885	< 1.06	< 0.459	< 0.159	< 0.370	0.629	0.353	0.797	0.832	< 0.449	0.395
Radium-228	pCi/L	5	NA	3.32	5	< 1.53	< 1.96	< 0.677	< 0.581	1.01	1.12	1.16	1.50	1.35	0.870	< 0.502
Radium-226/228	pCi/L	NC	NA	NA	NA	< 0.649	< 0.897	< 0.677	< 0.581	0.780	0.492	0.804	0.704	0.518	1.29	0.742
Selenium	ug/L	50	NA	2	50	< 1.0	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1	2	2	< 1	1
Thallium	ug/L	2	NA	2	2	< 2.0	< 2.0	< 2.0	< 2.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

pCi/L - picocuries per liter.

NA - not applicable.

NC - no criteria.

-- - not analyzed.

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

RSL - Regional Screening Level from 83 FR 36435.

UTL - Upper Tolerance Limit (95%) of the background data set.

 ${\sf GWPS-Groundwater\ Protection\ Standard.\ \ GWPS\ is\ the\ higher\ of\ the\ MCL/RSL\ and\ UTL\ as\ established\ in\ Protection\ Protec$

TRC's Technical Memorandum dated October 15, 2018.

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

Bold value indicates an exceedance of the GWPS. Data from downgradient monitoring wells are screened against the GWPS for evaluation purposes only. Confidence intervals will be used to determine compliance per the CCR rules.

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Page 3 of 4

Comparison of Groundwater Sampling Results to Groundwater Protection Standards – November 2018 to May 2022 DE Karn Bottom Ash Pond – RCRA CCR Monitoring Program Essexville, Michigan

				S	ample Location:				DEK-MV	V-18001			
					Sample Date:	11/6/2018	4/10/2019	10/15/2019	5/14/2020	10/6/2020	5/3/2021	10/7/2021	5/3/2022
Constituent	Unit	EPA MCL	EPA RSL	UTL	GWPS		downgradient						
Appendix III													
Boron	ug/L	NC	NA	619	NA	1,020	970	2,200	1,670	1,740	1,180	1,370	869
Calcium	mg/L	NC	NA	302	NA	51.1	48	84	72.1	71.7	65.2	71.0	63.7
Chloride	mg/L	250*	NA	2,440	NA	76.6	69	81	64.7	60.7	51.6	55.2	65.9
Fluoride	ug/L	4,000	NA	1,000	NA	1,300	1,200	1,000	1,090	1,240	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	250*	NA	407	NA	< 2.0	< 2.0	31	51.1	91.9	121	118	187
Total Dissolved Solids	mg/L	500*	NA	4,600	NA	340	360	500	484	476	486	494	555
pH, Field	SU	6.5 - 8.5*	NA	6.5 - 7.3	NA	7.5	7.2	7.3	7.7	7.6	7.3	7.4	7.6
Appendix IV													
Antimony	ug/L	6	NA	1	6	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	10	NA	21	21	116	68	63	79	85	92	85	113
Barium	ug/L	2,000	NA	1,300	2,000	79.5	75	160	130	136	135	135	164
Beryllium	ug/L	4	NA	1	4	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5	NA	0.2	5	< 0.20	< 0.20	< 0.20	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	NA	3	100	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1	< 1	< 1
Cobalt	ug/L	NC	6	15	15	< 6.0	< 6.0	< 6.0	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	NA	1,000	4,000	1,300	1,200	1,000	1,090	1,240	< 1,000	< 1,000	< 1,000
Lead	ug/L	NC	15	1	15	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	NC	40	180	180	24	24	36	27	26	25	24	22
Mercury	ug/L	2	NA	0.2	2	< 0.20	< 0.20	< 0.20	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	NC	100	6	100	< 5.0	< 5.0	< 5.0	< 5	< 5	< 5	< 5	< 5
Radium-226	pCi/L	NC	NA	NA	NA	< 0.813	0.173	0.206	< 0.608	< 0.473	0.189	0.873	0.294
Radium-228	pCi/L	5	NA	3.32	5	1.56	0.867	0.952	< 0.676	0.591	0.828	1.85	0.592
Radium-226/228	pCi/L	NC	NA	NA	NA	0.811	0.694	0.746	< 0.676	0.463	0.639	0.979	0.885
Selenium	ug/L	50	NA	2	50	< 1.0	< 1.0	< 1.0	< 1	1	< 1	2	2
Thallium	ug/L	2	NA	2	2	< 2.0	< 2.0	< 2.0	< 2	< 2	< 2	< 2	< 2

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

pCi/L - picocuries per liter.

NA - not applicable.

NC - no criteria.

-- - not analyzed.

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

RSL - Regional Screening Level from 83 FR 36435.

UTL - Upper Tolerance Limit (95%) of the background data set.

GWPS - Groundwater Protection Standard. GWPS is the higher of the MCL/RSL and UTL as established in

TRC's Technical Memorandum dated October 15, 2018.

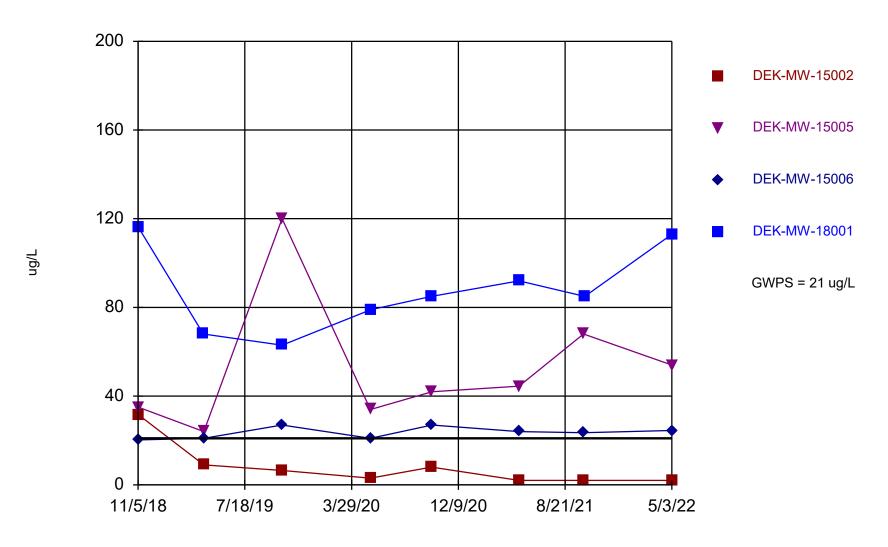
* - Secondary Maximum Contaminant Level (SMCL), EPA Secondary Drinking Water Regulations (SDWR) April 2012.

Bold value indicates an exceedance of the GWPS. Data from downgradient monitoring wells are screened against the GWPS for evaluation purposes only. Confidence intervals will be used to determine compliance per the CCR rules.

All metals were analyzed as total unless otherwise specified.

Attachment 1 Sanitas™ Output Files

Arsenic Comparison to GWPS



Time Series Analysis Run 6/9/2022 2:46 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. UG

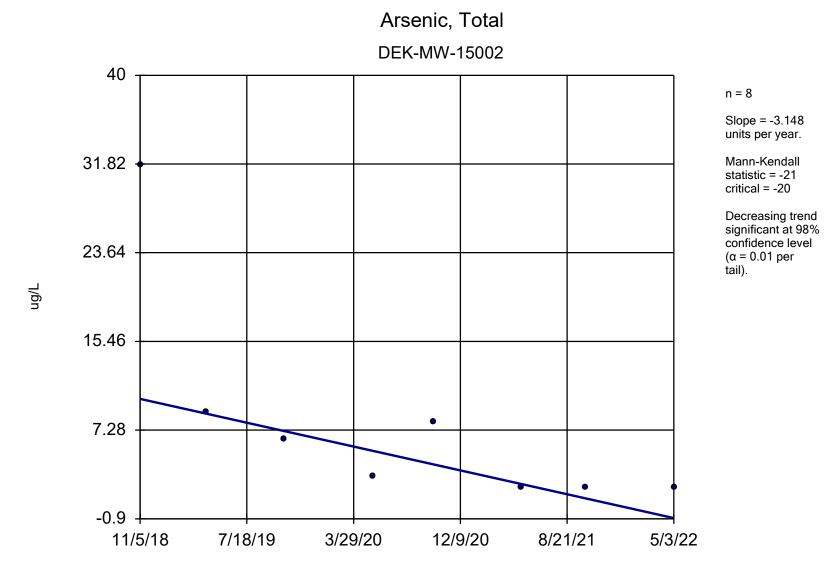
Summary Report

Constituent: Arsenic, Total Analysis Run 6/9/2022 2:45 PM
Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

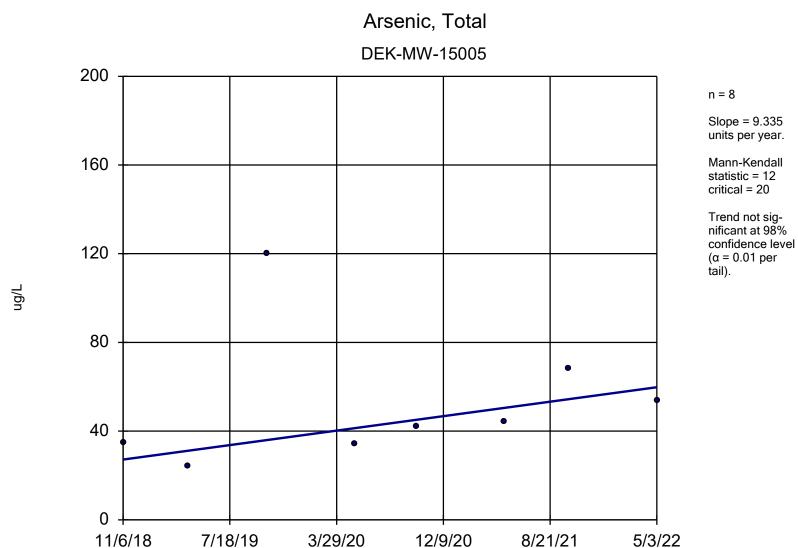
For observations made between 11/5/2018 and 5/3/2022, a summary of the selected data set:

Observations = 32 ND/Trace = 0 Wells = 4 Minimum Value = 2 Maximum Value = 120 Mean Value = 42.97 Median Value = 29.35 Standard Deviation = 35.57 Coefficient of Variation = 0.8279 Skewness = 0.7809

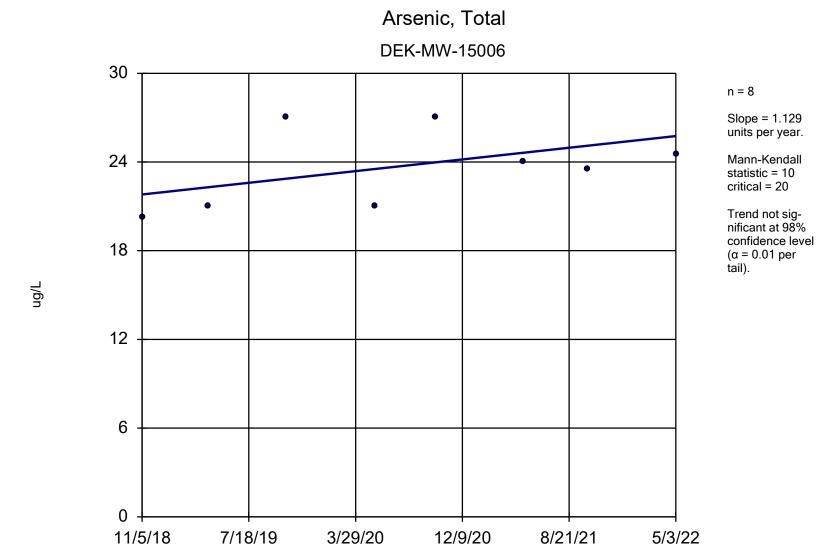
<u>Well</u>	#Obs.	ND/Trace	<u>Min</u>	<u>Max</u>	<u>Mean</u>	<u>Median</u>	Std.Dev.	CV	<u>Skewness</u>
DEK-MW-15002	8	0	2	31.7	8.025	4.75	9.985	1.244	1.915
DEK-MW-15005	8	0	24	120	52.69	43.25	30.32	0.5754	1.486
DEK-MW-15006	8	0	20.25	27	23.53	23.75	2.64	0.1122	0.1387
DEK-MW-18001	8	0	63	116	87.63	85	19.08	0.2177	0.3541



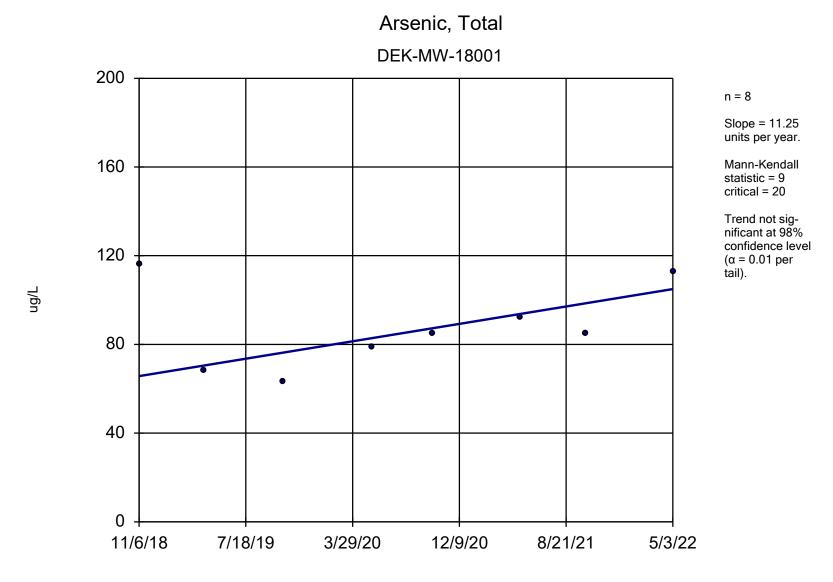
Sen's Slope Estimator Analysis Run 6/10/2022 1:26 PM
Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2



Sen's Slope Estimator Analysis Run 6/10/2022 1:26 PM
Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2



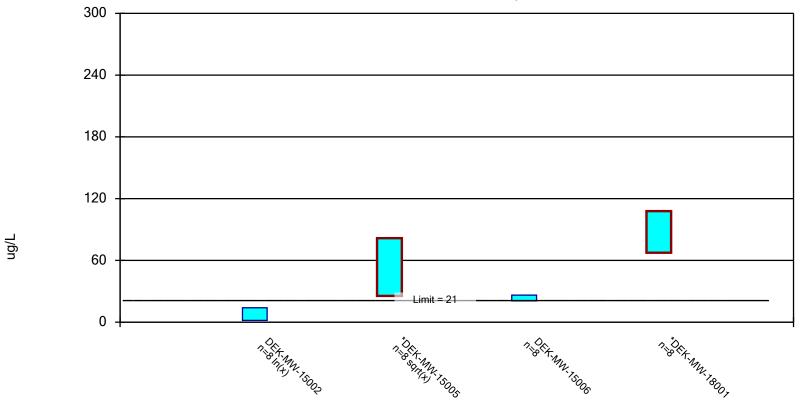
Sen's Slope Estimator Analysis Run 6/10/2022 1:26 PM
Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2



Sen's Slope Estimator Analysis Run 6/10/2022 1:26 PM
Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

Parametric Confidence Interval

Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Arsenic, Total Analysis Run 6/9/2022 3:05 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

Confidence Interval

Constituent: Arsenic, Total (ug/L) Analysis Run 6/9/2022 3:07 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q2

	DEK-MW-15002	DEK-MW-15005	DEK-MW-15006	DEK-MW-18001
11/5/2018	31.7		20.25 (D)	
11/6/2018		35		116
4/10/2019				68
4/11/2019	9	24 (D)	21	
10/15/2019	6.5	120 (D)	27	63
5/13/2020	3	34 (D)	21	
5/14/2020				79
10/6/2020	8 (D)			85
10/7/2020		42	27	
5/3/2021	2	44.5 (D)	24	92
10/4/2021	2	68	23.5 (D)	
10/7/2021				85
5/3/2022	2	54	24.5 (D)	113
Mean	8.025	52.69	23.53	87.63
Std. Dev.	9.985	30.32	2.64	19.08
Upper Lim.	14.08	81.57	26.33	107.8
Lower Lim.	1.735	25.55	20.73	67.4



Appendix C Laboratory Analytical Reports



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

To: CDBatts, Karn/Weadock

From: EBlaj, T-258

Date: May 22, 2022

Subject: RCRA GROUNDWATER MONITORING – DEK BOTTOM ASH POND WELLS – 2022 Q2

CC: HDRegister, P22-521 Darby Litz, Project Manager

BLSwanberg, P22-119 TRC Companies, Inc.

1540 Eisenhower Place Ann Arbor, MI 48108

Chemistry Project: 22-0436

TRC Environmental, Inc. conducted groundwater monitoring at the DEKarn Bottom Ash Pond Wells area on 05/03/2022 for the 2nd 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 05/04/2022.

Samples for Total Sulfide have been subcontracted to Merit Laboratories, Inc. and the results are listed under the analyst initials "Merit". Samples for Total & Dissolved Organic Carbon have been subcontracted to Brighton Analytical LLC and the results are listed under the analyst initials "BAL". The original reports from both labs are attached. 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



Testing performed in accordance with the A2LA scope of accredidation 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.

DEFINITIONS / QUALIFIERS

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

<u>Acronym</u>	<u>Description</u>
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	<u>Description</u>
*	Generic data flag, applicable description added in the corresponding notes section
В	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
Н	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
PΙ	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



Work Order Sample Summary

Customer Name: Karn/Weadock Complex

Work Order ID: Q2-2022 DEK Bottom Ash Pond Wells

Date Received: 5/4/2022 **Chemistry Project:** 22-0436

Sample #	Field Sample ID	<u>Matrix</u>	Sample Date	<u>Site</u>
22-0436-01	DEK-MW-15002	Groundwater	05/03/2022 02:21 PM	DEK Bottom Ash Pond
22-0436-02	DEK-MW-15005	Groundwater	05/03/2022 12:56 PM	DEK Bottom Ash Pond
22-0436-03	DEK-MW-15006	Groundwater	05/03/2022 10:42 AM	DEK Bottom Ash Pond
22-0436-04	DUP-DEK-BAP-01	Groundwater	05/03/2022 12:00 AM	DEK Bottom Ash Pond
22-0436-05	FB-DEK-BAP	Water	05/03/2022 10:42 AM	DEK Bottom Ash Pond
22-0436-06	EB-DEK-BAP	Water	05/03/2022 10:42 AM	DEK Bottom Ash Pond

05/22/22



Laboratory Services

Sample Site: **DEK Bottom Ash Pond** Laboratory Project: **22-0436**

 Field Sample ID:
 DEK-MW-15002
 Collect Date:
 05/03/2022

 Lab Sample ID:
 22-0436-01
 Collect Time:
 02:21 PM

Metals by EPA 6020B: CCR Rule A	opendix III-IV To	tai wetais	= xp	Aliquot #: 22-0	436-01-C01-A01	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Arsenic	2		ug/L	1.0	05/05/2022	AB22-0505-08
Barium	134		ug/L	5.0	05/05/2022	AB22-0505-08
Beryllium	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Boron	1100		ug/L	20.0	05/05/2022	AB22-0505-08
Cadmium	ND		ug/L	0.2	05/05/2022	AB22-0505-08
Calcium	105000		ug/L	1000.0	05/10/2022	AB22-0505-08
Chromium	1		ug/L	1.0	05/05/2022	AB22-0505-08
Cobalt	ND		ug/L	6.0	05/05/2022	AB22-0505-08
Copper	1		ug/L	1.0	05/05/2022	AB22-0505-08
Iron	1910		ug/L	20.0	05/05/2022	AB22-0505-08
Lead	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Lithium	28		ug/L	10.0	05/05/2022	AB22-0505-08
Magnesium	28800		ug/L	1000.0	05/10/2022	AB22-0505-08
Manganese	410		ug/L	5.0	05/05/2022	AB22-0505-08
Molybdenum	ND		ug/L	5.0	05/05/2022	AB22-0505-08
Nickel	6		ug/L	2.0	05/05/2022	AB22-0505-08
Potassium	8460		ug/L	100.0	05/10/2022	AB22-0505-08
Selenium	1		ug/L	1.0	05/05/2022	AB22-0505-08
Silver	ND		ug/L	0.2	05/05/2022	AB22-0505-08
Sodium	106000		ug/L	1000.0	05/10/2022	AB22-0505-08
Thallium	ND		ug/L	2.0	05/05/2022	AB22-0505-08
Vanadium	ND		ug/L	2.0	05/05/2022	AB22-0505-08
Zinc	ND		ug/L	10.0	05/05/2022	AB22-0505-08
Mercury by EPA 7470A, Total, Aque	eous			Aliquot #: 22-0	436-01-C01-A02	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/09/2022	AB22-0509-01
Anions by EPA 300.0 Aqueous, NO	2, NO3			Aliquot #: 22-0	436-01-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	ND		ug/L	100.0	05/04/2022	AB22-0504-08
Nitrite	ND		ug/L	100.0	05/04/2022	AB22-0504-08
Anions by EPA 300.0 CCR Rule An	alyte List, Cl, F,	SO4, Aqu	eous	Aliquot #: 22-0	436-01-C02-A02	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
· urumotor(o)						





Report Date: 05/22/22

Sample Site: Laboratory Project: **DEK Bottom Ash Pond** 22-0436

Field Sample ID: **DEK-MW-15002** Collect Date: 05/03/2022 Lab Sample ID: 22-0436-01 Collect Time: 02:21 PM

Anions by EPA 300.0 CCR Rule Analyte	List, CI, F, SO	4, Aqı	ieous	Aliquot #: 22-0	436-01-C02-A02	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	05/04/2022	AB22-0505-07
Sulfate	172000		ug/L	1000.0	05/06/2022	AB22-0505-07
Nitrogen-Ammonia by SM4500NH3(h), (Groundwater H	IL		Aliquot #: 22-0	436-01-C03-A01	Analyst: LMO
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	6170		ug/L	25.0	05/09/2022	AB22-0509-03
Total Dissolved Solids by SM 2540C				Aliquot #: 22-0	436-01-C04-A01	Analyst: CET
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	779		mg/L	10.0	05/05/2022	AB22-0505-01
Alkalinity by SM 2320B				Aliquot #: 22-0	436-01-C05-A01	Analyst: DLS
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	302000		ug/L	10000.0	05/09/2022	AB22-0509-10
Alkalinity Bicarbonate	302000		ug/L	10000.0	05/09/2022	AB22-0509-10
Alkalinity Carbonate	ND		ug/L	10000.0	05/09/2022	AB22-0509-10
Sulfide, Total by SM 4500 S2D				Aliquot #: 22-0	436-01-C07-A01	Analyst: Merit
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	20.0	05/05/2022	AB22-0509-14
Total Organic Carbon by SM 5310B, Aq	ueous			Aliquot #: 22-0	436-01-C08-A01	Analyst: BAL
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	4800		ug/L	1000.0	05/11/2022	AB22-0519-12
Dissolved Organic Carbon by SM 5310	B, Aqueous			Aliquot #: 22-0	436-01-C09-A01	Analyst: BAL
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	4800		ug/L	1000.0	05/11/2022	AB22-0519-13

05/22/22



A CENTURY OF EXCELLENCE

Sample Site: **DEK Bottom Ash Pond** Laboratory Project: **22-0436**

 Field Sample ID:
 DEK-MW-15005
 Collect Date:
 05/03/2022

 Lab Sample ID:
 22-0436-02
 Collect Time:
 12:56 PM

Parameter(s) Result Flag Units Antimony ND ug/L Arsenic 54 ug/L Barium 305 ug/L Beryllium ND ug/L Boron 787 ug/L Cadmium ND ug/L Calcium 127000 ug/L Chromium ND ug/L Cobalt ND ug/L Copper 2 ug/L Iron 1570 ug/L Lead ND ug/L Lithium 36 ug/L Magnesium 21700 ug/L Molybdenum 12 ug/L Nickel 7 ug/L Potassium 8830 ug/L Selenium 1 ug/L	1.0 1.0 5.0	Analysis Date 05/05/2022	Tracking
Arsenic 54 ug/L Barium 305 ug/L Beryllium ND ug/L Boron 787 ug/L Cadmium ND ug/L Calcium 127000 ug/L Chromium ND ug/L Cobalt ND ug/L Copper 2 ug/L Iron 1570 ug/L Lead ND ug/L Lithium 36 ug/L Magnesium 21700 ug/L Manganese 347 ug/L Molybdenum 12 ug/L Nickel 7 ug/L Potassium 8830 ug/L	1.0 5.0		A DOO 0505 00
Barium 305 ug/L Beryllium ND ug/L Boron 787 ug/L Cadmium ND ug/L Calcium 127000 ug/L Chromium ND ug/L Cobalt ND ug/L Copper 2 ug/L Iron 1570 ug/L Lead ND ug/L Lithium 36 ug/L Magnesium 21700 ug/L Manganese 347 ug/L Molybdenum 12 ug/L Nickel 7 ug/L Potassium 8830 ug/L	5.0		AB22-0505-08
Beryllium ND ug/L Boron 787 ug/L Cadmium ND ug/L Calcium 127000 ug/L Chromium ND ug/L Cobalt ND ug/L Copper 2 ug/L Iron 1570 ug/L Lead ND ug/L Lithium 36 ug/L Magnesium 21700 ug/L Manganese 347 ug/L Molybdenum 12 ug/L Nickel 7 ug/L Potassium 8830 ug/L		05/05/2022	AB22-0505-08
Boron 787 ug/L Cadmium ND ug/L Calcium 127000 ug/L Chromium ND ug/L Cobalt ND ug/L Copper 2 ug/L Iron 1570 ug/L Lead ND ug/L Lithium 36 ug/L Magnesium 21700 ug/L Manganese 347 ug/L Molybdenum 12 ug/L Nickel 7 ug/L Potassium 8830 ug/L	4.0	05/05/2022	AB22-0505-08
Cadmium ND ug/L Calcium 127000 ug/L Chromium ND ug/L Cobalt ND ug/L Copper 2 ug/L Iron 1570 ug/L Lead ND ug/L Lithium 36 ug/L Magnesium 21700 ug/L Manganese 347 ug/L Molybdenum 12 ug/L Nickel 7 ug/L Potassium 8830 ug/L	1.0	05/05/2022	AB22-0505-08
Calcium 127000 ug/L Chromium ND ug/L Cobalt ND ug/L Copper 2 ug/L Iron 1570 ug/L Lead ND ug/L Lithium 36 ug/L Magnesium 21700 ug/L Manganese 347 ug/L Molybdenum 12 ug/L Nickel 7 ug/L Potassium 8830 ug/L	20.0	05/05/2022	AB22-0505-08
Chromium ND ug/L Cobalt ND ug/L Copper 2 ug/L Iron 1570 ug/L Lead ND ug/L Lithium 36 ug/L Magnesium 21700 ug/L Manganese 347 ug/L Molybdenum 12 ug/L Nickel 7 ug/L Potassium 8830 ug/L	0.2	05/05/2022	AB22-0505-08
Cobalt ND ug/L Copper 2 ug/L Iron 1570 ug/L Lead ND ug/L Lithium 36 ug/L Magnesium 21700 ug/L Manganese 347 ug/L Molybdenum 12 ug/L Nickel 7 ug/L Potassium 8830 ug/L	1000.0	05/10/2022	AB22-0505-08
Copper 2 ug/L Iron 1570 ug/L Lead ND ug/L Lithium 36 ug/L Magnesium 21700 ug/L Manganese 347 ug/L Molybdenum 12 ug/L Nickel 7 ug/L Potassium 8830 ug/L	1.0	05/05/2022	AB22-0505-08
Iron 1570 ug/L Lead ND ug/L Lithium 36 ug/L Magnesium 21700 ug/L Manganese 347 ug/L Molybdenum 12 ug/L Nickel 7 ug/L Potassium 8830 ug/L	6.0	05/05/2022	AB22-0505-08
Lead ND ug/L Lithium 36 ug/L Magnesium 21700 ug/L Manganese 347 ug/L Molybdenum 12 ug/L Nickel 7 ug/L Potassium 8830 ug/L	1.0	05/05/2022	AB22-0505-08
Lithium 36 ug/L Magnesium 21700 ug/L Manganese 347 ug/L Molybdenum 12 ug/L Nickel 7 ug/L Potassium 8830 ug/L	20.0	05/05/2022	AB22-0505-08
Magnesium 21700 ug/L Manganese 347 ug/L Molybdenum 12 ug/L Nickel 7 ug/L Potassium 8830 ug/L	1.0	05/05/2022	AB22-0505-08
Manganese 347 ug/L Molybdenum 12 ug/L Nickel 7 ug/L Potassium 8830 ug/L	10.0	05/05/2022	AB22-0505-08
Molybdenum 12 ug/L Nickel 7 ug/L Potassium 8830 ug/L	1000.0	05/10/2022	AB22-0505-08
Nickel7ug/LPotassium8830ug/L	5.0	05/05/2022	AB22-0505-08
Potassium 8830 ug/L	5.0	05/05/2022	AB22-0505-08
-	2.0	05/05/2022	AB22-0505-08
Selenium 1 ug/L	100.0	05/10/2022	AB22-0505-08
	1.0	05/05/2022	AB22-0505-08
Silver ND ug/L	0.2	05/05/2022	AB22-0505-08
Sodium 138000 ug/L	1000.0	05/10/2022	AB22-0505-08
Thallium ND ug/L	2.0	05/05/2022	AB22-0505-08
Vanadium ND ug/L	2.0	05/05/2022	AB22-0505-08
Zinc ND ug/L	10.0	05/05/2022	AB22-0505-08
Mercury by EPA 7470A, Total, Aqueous	Aliquot #: 22-0	436-02-C01-A02	Analyst: CLH
Parameter(s) Result Flag Units	RL	Analysis Date	Tracking
Mercury ND ug/L	0.2	05/09/2022	AB22-0509-01
Anions by EPA 300.0 Aqueous, NO2, NO3	Aliquot #: 22-0	436-02-C02-A01	Analyst: DMW
Parameter(s) Result Flag Units	RL	Analysis Date	Tracking
Nitrate ND ug/L	100.0	05/04/2022	AB22-0504-08
Nitrite ND ug/L	100.0	05/04/2022	AB22-0504-08
Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous	Aliquot #: 22-0	436-02-C02-A02	Analyst: DMW
Parameter(s) Result Flag Units	RL	Analysis Date	Tracking
Chloride 141000 ug/L			



05/22/22



A CENTURY OF EXCELLENCE

Sample Site:DEK Bottom Ash PondLaboratory Project:22-0436Field Sample ID:DEK-MW-15005Collect Date:05/03/2022Lab Sample ID:22-0436-02Collect Time:12:56 PM

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous Aliquot #: 22-0436-02-C02-A02		Analyst: DMW				
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	05/04/2022	AB22-0505-07
Sulfate	151000		ug/L	1000.0	05/06/2022	AB22-0505-07
Nitrogen-Ammonia by SM4500NH3(h), Groundwate	r HL		Aliquot #: 22-0	436-02-C03-A01	Analyst: LMO
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	2100		ug/L	25.0	05/09/2022	AB22-0509-03
Total Dissolved Solids by SM 25400				Aliquot #: 22-0	436-02-C04-A01	Analyst: CET
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	909		mg/L	10.0	05/05/2022	AB22-0505-01
Alkalinity by SM 2320B				Aliquot #: 22-0	436-02-C05-A01	Analyst: DLS
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	403000		ug/L	10000.0	05/09/2022	AB22-0509-10
Alkalinity Bicarbonate	403000		ug/L	10000.0	05/09/2022	AB22-0509-10
Alkalinity Carbonate	ND		ug/L	10000.0	05/09/2022	AB22-0509-10
Sulfide, Total by SM 4500 S2D				Aliquot #: 22-0	436-02-C07-A01	Analyst: Merit
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	20.0	05/05/2022	AB22-0509-14
Total Organic Carbon by SM 5310B	, Aqueous			Aliquot #: 22-0	436-02-C08-A01	Analyst: BAL
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	5000		ug/L	1000.0	05/11/2022	AB22-0519-12
Dissolved Organic Carbon by SM 5	310B, Aqueous			Aliquot #: 22-0	436-02-C09-A01	Analyst: BAL
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	5600		ug/L	1000.0	05/11/2022	AB22-0519-13

05/22/22



Sample Site: **DEK Bottom Ash Pond** Laboratory Project: **22-0436**

 Field Sample ID:
 DEK-MW-15006
 Collect Date:
 05/03/2022

 Lab Sample ID:
 22-0436-03
 Collect Time:
 10:42 AM

Metals by EPA 6020B: CCR R	——————————————————————————————————————			Aliquot #: 22-0	436-03-C01-A01	Analyst: EE
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Arsenic	25		ug/L	1.0	05/05/2022	AB22-0505-08
Barium	68		ug/L	5.0	05/05/2022	AB22-0505-08
Beryllium	ND		ug/L	1.0	05/05/2022	AB22-0505-0
Boron	893		ug/L	20.0	05/05/2022	AB22-0505-08
Cadmium	ND		ug/L	0.2	05/05/2022	AB22-0505-0
Calcium	65000		ug/L	1000.0	05/10/2022	AB22-0505-08
Chromium	1		ug/L	1.0	05/05/2022	AB22-0505-08
Cobalt	ND		ug/L	6.0	05/05/2022	AB22-0505-08
Copper	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Iron	715		ug/L	20.0	05/05/2022	AB22-0505-08
Lead	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Lithium	16		ug/L	10.0	05/05/2022	AB22-0505-08
Magnesium	7450		ug/L	1000.0	05/10/2022	AB22-0505-08
Manganese	202		ug/L	5.0	05/05/2022	AB22-0505-0
Molybdenum	6		ug/L	5.0	05/05/2022	AB22-0505-0
Nickel	4		ug/L	2.0	05/05/2022	AB22-0505-0
Potassium	7890		ug/L	100.0	05/10/2022	AB22-0505-0
Selenium	ND		ug/L	1.0	05/05/2022	AB22-0505-0
Silver	ND		ug/L	0.2	05/05/2022	AB22-0505-0
Sodium	127000		ug/L	1000.0	05/10/2022	AB22-0505-08
Thallium	ND		ug/L	2.0	05/05/2022	AB22-0505-08
Vanadium	ND		ug/L	2.0	05/05/2022	AB22-0505-08
Zinc	ND		ug/L	10.0	05/05/2022	AB22-0505-08
Mercury by EPA 7470A, Total	, Aqueous			Aliquot #: 22-0	436-03-C01-A02	Analyst: CLI
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/09/2022	AB22-0509-01
Anions by EPA 300.0 Aqueou	s, NO2, NO3			Aliquot #: 22-0	436-03-C02-A01	Analyst: DMV
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	ND		ug/L	100.0	05/04/2022	AB22-0504-0
Nitrite	ND		ug/L	100.0	05/04/2022	AB22-0504-0
Anions by EPA 300.0 CCR Ru	ıle Analyte List, Cl, F,	SO4, Aqu	ieous	Aliquot #: 22-0	436-03-C02-A02	Analyst: DMV
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
i didilictor(3)		9	• • • • • • • • • • • • • • • • • • • •			



05/22/22



Count on Us®

Sample Site: **DEK Bottom Ash Pond** Laboratory Project: **22-0436**

 Field Sample ID:
 DEK-MW-15006
 Collect Date:
 05/03/2022

 Lab Sample ID:
 22-0436-03
 Collect Time:
 10:42 AM

Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous Aliquot #: 22-0436-03-C02-A02			Analyst: DMW			
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	05/04/2022	AB22-0505-07
Sulfate	173000		ug/L	1000.0	05/06/2022	AB22-0505-07
Nitrogen-Ammonia by SM4500NH3(h)	, Groundwate	r HL		Aliquot #: 22-0	436-03-C03-A01	Analyst: LMO
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	2920		ug/L	25.0	05/09/2022	AB22-0509-03
Total Dissolved Solids by SM 2540C				Aliquot #: 22-0	436-03-C04-A01	Analyst: CET
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	597		mg/L	10.0	05/05/2022	AB22-0505-01
Alkalinity by SM 2320B				Aliquot #: 22-0	436-03-C05-A01	Analyst: DLS
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	224000		ug/L	10000.0	05/09/2022	AB22-0509-10
Alkalinity Bicarbonate	224000		ug/L	10000.0	05/09/2022	AB22-0509-10
Alkalinity Carbonate	ND		ug/L	10000.0	05/09/2022	AB22-0509-10
Sulfide, Total by SM 4500 S2D				Aliquot #: 22-0	436-03-C07-A01	Analyst: Merit
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	20.0	05/05/2022	AB22-0509-14
Total Organic Carbon by SM 5310B,	Aqueous			Aliquot #: 22-0	436-03-C08-A01	Analyst: BAL
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	3000		ug/L	1000.0	05/11/2022	AB22-0519-12
Dissolved Organic Carbon by SM 531	0B, Aqueous			Aliquot #: 22-0	436-03-C09-A01	Analyst: BAL
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	3500		ug/L	1000.0	05/11/2022	AB22-0519-13

05/22/22



Sample Site: **DEK Bottom Ash Pond** Laboratory Project: **22-0436**

 Field Sample ID:
 DUP-DEK-BAP-01
 Collect Date:
 05/03/2022

 Lab Sample ID:
 22-0436-04
 Collect Time:
 12:00 AM

Metals by EPA 6020B: CCR R	uie Appenaix III-IV To	tai Metals	s ⊏xp	Aliquot #: 22-0	436-04-C01-A01	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Arsenic	24		ug/L	1.0	05/05/2022	AB22-0505-08
Barium	67		ug/L	5.0	05/05/2022	AB22-0505-08
Beryllium	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Boron	888		ug/L	20.0	05/05/2022	AB22-0505-08
Cadmium	ND		ug/L	0.2	05/05/2022	AB22-0505-08
Calcium	65500		ug/L	1000.0	05/10/2022	AB22-0505-08
Chromium	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Cobalt	ND		ug/L	6.0	05/05/2022	AB22-0505-08
Copper	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Iron	696		ug/L	20.0	05/05/2022	AB22-0505-08
Lead	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Lithium	15		ug/L	10.0	05/05/2022	AB22-0505-08
Magnesium	7520		ug/L	1000.0	05/10/2022	AB22-0505-08
Manganese	206		ug/L	5.0	05/05/2022	AB22-0505-08
Molybdenum	6		ug/L	5.0	05/05/2022	AB22-0505-08
Nickel	4		ug/L	2.0	05/05/2022	AB22-0505-08
Potassium	8090		ug/L	100.0	05/10/2022	AB22-0505-08
Selenium	1		ug/L	1.0	05/05/2022	AB22-0505-08
Silver	ND		ug/L	0.2	05/05/2022	AB22-0505-08
Sodium	125000		ug/L	1000.0	05/10/2022	AB22-0505-08
Thallium	ND		ug/L	2.0	05/05/2022	AB22-0505-08
Vanadium	ND		ug/L	2.0	05/05/2022	AB22-0505-08
Zinc	ND		ug/L	10.0	05/05/2022	AB22-0505-08
Mercury by EPA 7470A, Total	, Aqueous			Aliquot #: 22-0	436-04-C01-A02	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/09/2022	AB22-0509-01
Anions by EPA 300.0 Aqueou	s, NO2, NO3			Aliquot #: 22-0	436-04-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	ND		ug/L	100.0	05/04/2022	AB22-0504-08
Nitrite	ND		ug/L	100.0	05/04/2022	AB22-0504-08
Anions by EPA 300.0 CCR Ru	ıle Analyte List, Cl, F,	SO4, Aqı	ieous	Aliquot #: 22-0	436-04-C02-A02	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	67900		ug/L	1000.0	05/06/2022	AB22-0505-07
	22.4	1436 Page 1	-			





Report Date: 05/22/22

Sample Site: **DEK Bottom Ash Pond** Laboratory Project: **22-0436**

 Field Sample ID:
 DUP-DEK-BAP-01
 Collect Date:
 05/03/2022

 Lab Sample ID:
 22-0436-04
 Collect Time:
 12:00 AM

Anions by EPA 300.0 CCR Rule Analyt	ons by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous Aliquot #: 22-0436-04-C02-A02			Analyst: DMW		
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	05/04/2022	AB22-0505-07
Sulfate	168000		ug/L	1000.0	05/06/2022	AB22-0505-07
Nitrogen-Ammonia by SM4500NH3(h),	Groundwater	r HL		Aliquot #: 22-0	436-04-C03-A01	Analyst: LMO
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	2960		ug/L	25.0	05/09/2022	AB22-0509-03
Total Dissolved Solids by SM 2540C				Aliquot #: 22-0	436-04-C04-A01	Analyst: CET
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	609		mg/L	10.0	05/05/2022	AB22-0505-01
Alkalinity by SM 2320B				Aliquot #: 22-0	436-04-C05-A01	Analyst: DLS
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	225000		ug/L	10000.0	05/09/2022	AB22-0509-10
Alkalinity Bicarbonate	225000		ug/L	10000.0	05/09/2022	AB22-0509-10
Alkalinity Carbonate	ND		ug/L	10000.0	05/09/2022	AB22-0509-10
Sulfide, Total by SM 4500 S2D				Aliquot #: 22-0	436-04-C07-A01	Analyst: Merit
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	20.0	05/05/2022	AB22-0509-14
Total Organic Carbon by SM 5310B, A	queous			Aliquot #: 22-0	436-04-C08-A01	Analyst: BAL
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	3100		ug/L	1000.0	05/11/2022	AB22-0519-12
Dissolved Organic Carbon by SM 5310)B, Aqueous			Aliquot #: 22-0	436-04-C09-A01	Analyst: BAL
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	3800		ug/L	1000.0	05/11/2022	AB22-0519-13

05/22/22



Sample Site: **DEK Bottom Ash Pond** Laboratory Project: **22-0436**

Field Sample ID: FB-DEK-BAP Collect Date: 05/03/2022
Lab Sample ID: 22-0436-05 Collect Time: 10:42 AM

Matrix: Water

					436-05-C01-A01	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Arsenic	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Barium	ND		ug/L	5.0	05/05/2022	AB22-0505-08
Beryllium	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Boron	ND		ug/L	20.0	05/05/2022	AB22-0505-08
Cadmium	ND		ug/L	0.2	05/05/2022	AB22-0505-08
Calcium	ND		ug/L	1000.0	05/10/2022	AB22-0505-08
Chromium	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Cobalt	ND		ug/L	6.0	05/05/2022	AB22-0505-08
Copper	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Iron	ND		ug/L	20.0	05/05/2022	AB22-0505-08
Lead	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Lithium	ND		ug/L	10.0	05/05/2022	AB22-0505-08
Magnesium	ND		ug/L	1000.0	05/10/2022	AB22-0505-08
Manganese	ND		ug/L	5.0	05/05/2022	AB22-0505-08
Molybdenum	ND		ug/L	5.0	05/05/2022	AB22-0505-08
Nickel	ND		ug/L	2.0	05/05/2022	AB22-0505-08
Potassium	ND		ug/L	100.0	05/10/2022	AB22-0505-08
Selenium	ND		ug/L	1.0	05/05/2022	AB22-0505-08
Silver	ND		ug/L	0.2	05/05/2022	AB22-0505-08
Sodium	ND		ug/L	1000.0	05/10/2022	AB22-0505-08
Thallium	ND		ug/L	2.0	05/05/2022	AB22-0505-08
Vanadium	ND		ug/L	2.0	05/05/2022	AB22-0505-08
Zinc	ND		ug/L	10.0	05/05/2022	AB22-0505-08
Mercury by EPA 7470A, Total, Aqu	leous			Aliquot #: 22-0	436-05-C01-A02	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/09/2022	AB22-0509-01
Anions by EPA 300.0 Aqueous, No	O2, NO3			Aliquot #: 22-0	436-05-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	ND		ug/L	100.0	05/04/2022	AB22-0504-08
Nitrite	ND		ug/L	100.0	05/04/2022	AB22-0504-08
Nitrogen-Ammonia by SM4500NH	3(h), Groundwate	er HL		Aliquot #: 22-0	436-05-C03-A01	Analyst: LMC
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	ND		ug/L	25.0	05/09/2022	AB22-0509-09
	22.	0436 Page 1	-			



A CENTURY OF EXCELLENCE

Analytical Report

Report Date: 05/22/22

Sample Site: **DEK Bottom Ash Pond**

Laboratory Project: 22-0436 Collect Date: Field Sample ID: FB-DEK-BAP 05/03/2022 Lab Sample ID: 22-0436-05 Collect Time: 10:42 AM

Matrix: Water

Sulfide, Total by SM 4500 S2D				Aliquot #: 22-0	0436-05-C04-A01	Analyst: Merit
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	20.0	05/05/2022	AB22-0509-14
Total Organic Carbon by SM 5310	B, Aqueous			Aliquot #: 22-0)436-05-C05-A01	Analyst: BAL
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	ND		ug/L	1000.0	05/11/2022	AB22-0519-12
Dissolved Organic Carbon by SM	5310B, Aqueous			Aliquot #: 22-0	0436-05-C06-A01	Analyst: BAL
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	1300		ug/L	1000.0	05/11/2022	AB22-0519-13

05/22/22



A CENTURY OF EXCELLENCE

Sample Site: **DEK Bottom Ash Pond** Laboratory Project: **22-0436**

Field Sample ID: EB-DEK-BAP Collect Date: 05/03/2022 Lab Sample ID: 22-0436-06 Collect Time: 05/03/2022

Matrix: Water

	Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp Aliquot #: 22-0436-06-C01-A01						
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking	
Antimony	ND		ug/L	1.0	05/05/2022	AB22-0505-08	
Arsenic	ND		ug/L	1.0	05/05/2022	AB22-0505-08	
Barium	ND		ug/L	5.0	05/05/2022	AB22-0505-08	
Beryllium	ND		ug/L	1.0	05/05/2022	AB22-0505-08	
Boron	ND		ug/L	20.0	05/05/2022	AB22-0505-08	
Cadmium	ND		ug/L	0.2	05/05/2022	AB22-0505-08	
Calcium	ND		ug/L	1000.0	05/10/2022	AB22-0505-08	
Chromium	ND		ug/L	1.0	05/05/2022	AB22-0505-08	
Cobalt	ND		ug/L	6.0	05/05/2022	AB22-0505-08	
Copper	ND		ug/L	1.0	05/05/2022	AB22-0505-08	
Iron	ND		ug/L	20.0	05/10/2022	AB22-0505-08	
Lead	ND		ug/L	1.0	05/05/2022	AB22-0505-08	
Lithium	ND		ug/L	10.0	05/05/2022	AB22-0505-08	
Magnesium	ND		ug/L	1000.0	05/10/2022	AB22-0505-08	
Manganese	ND		ug/L	5.0	05/05/2022	AB22-0505-08	
Molybdenum	ND		ug/L	5.0	05/05/2022	AB22-0505-08	
Nickel	ND		ug/L	2.0	05/05/2022	AB22-0505-08	
Potassium	ND		ug/L	100.0	05/10/2022	AB22-0505-08	
Selenium	ND		ug/L	1.0	05/05/2022	AB22-0505-08	
Silver	ND		ug/L	0.2	05/05/2022	AB22-0505-08	
Sodium	ND		ug/L	1000.0	05/10/2022	AB22-0505-08	
Thallium	ND		ug/L	2.0	05/05/2022	AB22-0505-08	
Vanadium	ND		ug/L	2.0	05/05/2022	AB22-0505-08	
Zinc	ND		ug/L	10.0	05/05/2022	AB22-0505-08	
Mercury by EPA 7470A, Total, Aqued	ous			Aliquot #: 22-0	436-06-C01-A02	Analyst: CLH	
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking	
Mercury	ND		ug/L	0.2	05/09/2022	AB22-0509-01	
Anions by EPA 300.0 Aqueous, NO2	, NO3			Aliquot #: 22-0	436-06-C02-A01	Analyst: DMW	
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking	
Nitrate	ND		ug/L	100.0	05/04/2022	AB22-0504-08	
Nitrite	ND		ug/L	100.0	05/04/2022	AB22-0504-08	
Nitrogen-Ammonia by SM4500NH3(h	n), Groundwate	r HL		Aliquot #: 22-0	436-06-C03-A01	Analyst: LMC	
	Result	Flag	Units	RL	Analysis Date	Tracking	
Parameter(s)	Nesuit	ı ıag	Oilits		Analysis Bats	rruoning	



A CENTURY OF EXCELLENCE

Analytical Report

Report Date: 05/22/22

Sample Site: **DEK Bottom Ash Pond**

Laboratory Project: 22-0436 Collect Date: Field Sample ID: EB-DEK-BAP 05/03/2022 Lab Sample ID: 22-0436-06 Collect Time: 10:42 AM

Matrix: Water

Sulfide, Total by SM 4500 S2D	ulfide, Total by SM 4500 S2D Aliquot #: 22-0436-06-C04-A01					Analyst: Merit
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	20.0	05/05/2022	AB22-0509-14
Total Organic Carbon by SM 5310B	, Aqueous			Aliquot #: 22-0)436-06-C05-A01	Analyst: BAL
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	ND		ug/L	1000.0	05/11/2022	AB22-0519-12
Dissolved Organic Carbon by SM 5	310B, Aqueous			Aliquot #: 22-0)436-06-C06-A01	Analyst: BAL
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	ND		ug/L	1000.0	05/11/2022	AB22-0519-13





Report Date: 05/22/22

Data Qualifiers	Exception Summary
	No exceptions occurred.

CONSUMERS ENERGY

Chemistry Department

General Standard Operating Procedure

PROC CHEM-1.2.01 PAGE 1 OF 2 REVISION 2 ATTACHMENT A

TITLE: SAMPLE LOG-IN - SHIPMENT INSPECTION FORM

	rroject Log-in Number:	L 1-				
	Project Log-In Number: Inspection Date: 5-4.22			Inspection By:	amn	
	Sample Origin/Project Name	: 02.2022	DEK B			
	Shipment Delivered By: Ente	er the type of sh	ipment carri	er.		
	Pony 1	redEx_	UPS	us	PS A	irborne
	Other/Hand Carry (what Tracking Number: 2	nom) 1272410				/ No
100	Shipping Containers: Enter the					
		Cardboard Box			Envelo	
	Loose/Unpackaged Co	ontainers		Other		
10	Condition of Shipment: Enter	r the as-received	d condition	of the shipment cont	ainer.	
	Damaged Shipment O	bserved: None		Dented	Le	eaking
	Other					
-	Shipment Security: Enter if a	ny of the chinni	no containa	e ware anenad hefe	ra ranaint	
- 4					/ receipt.	
	Shipping Containers R	eceived: Open	ed	Sealed		
			4			
1	Enclosed Documents: Enter the	ne type of docur			nt.	
1	/		ments enclos	sed with the shipmer		
	CoCWon	k Request	ments enclos	sed with the shipmer	Other	
	CoC Won	k Request	ments enclos	sed with the shipmer Air Data Sheet_ several sample conta	Other	
7	CoC Won Comperature of Containers: No. Received Temperature	Measure the tem	ments encloses	Air Data Sheet_ several sample controls	Otherainers.	ō
7	CoC Won	Measure the tem	ments encloses	Air Data Sheet_ several sample controls	Otherainers.	0
7	CoC Won Comperature of Containers: No. Received Temperature	Measure the term ture 3.1 - 4.1 dote 015 ers: Enter the t	ments encloses	Air Data Sheet_ several sample controls	Otherainers.	o <u>Leaking</u>
7	CoC Won Femperature of Containers: A As-Received Temperat METE * E. EM Number and Type of Contain	Measure the term ture 3.1 - 4.6 of c 015 ers: Enter the t	nents encloses perature of 8 % 5407 otal number	Air Data Sheet_several sample container Samples Received 6 3 2 2 of sample container	Otherainers. on Ice: Yes Normalizers received.	
papa	CoC Word Comperature of Containers: MAs-Received Temperature of Containers: MAS-Received Temperature of Container Type VOA (40mL or 60mL)	Measure the term ture 3.1 - 4.6 of c 015 ers: Enter the t	nents encloses perature of 8 % 5407 otal number	Air Data Sheet_several sample container Samples Received 6 3 2 2 of sample container	Otherainers. on Ice: Yes Normalizers received.	
papa	CoC Word Comperature of Containers: MAs-Received Temperature of Containers: MAS-Received Temperature of Container Type VOA (40mL or 60mL)	Measure the term ture 3.1 - 4.6 of c 015 ers: Enter the t	nents encloses perature of 8 % 5407 otal number	Air Data Sheet_several sample container Samples Received 6 3 2 2 of sample container	Otherainers. on Ice: Yes Normalizers received.	
13-640-50	CoC Word Comperature of Containers: MAs-Received Temperature of Containers: MAS-Received Temperature of Container Type VOA (40mL or 60mL)	Measure the term ture 3.1 - 4.6 of c 015 ers: Enter the t	nents encloses perature of 8 % 5407 otal number	Air Data Sheet_several sample container Samples Received 6 3 2 2 of sample container	Otherainers. on Ice: Yes Normalizers received.	
-14:0 Baba 13-640-50	CoC Word Comperature of Containers: MAs-Received Temperature of Containers: MAs-Received Temperature of Container Type of Container Type VOA (40mL or 60mL) Quart/Liter (g/p) 9-oz (amber glass jar)	Measure the term ture 3.1 - 4.6 of c 015 ers: Enter the t	nents encloses perature of 8 % 5407 otal number	Air Data Sheet_several sample container Samples Received 6 3 2 2 of sample container	Otherainers. on Ice: Yes Normalizers received.	
-14:9 baba 1	CoC Work Containers: Marker of Containers: Marker of Containers: Marker of Containers Note: The the transfer of Container Container Type VOA (40mL or 60mL) Quart/Liter (g/p) 9-oz (amber glass jar) 2-oz (amber glass)	Measure the term ture 3.1 - 4.6 of c 015 ers: Enter the t	nents encloses perature of 8 % 5407 otal number	Air Data Sheet_several sample container Samples Received 6 3 2 2 of sample container	Otherainers. on Ice: Yes Normalizers received.	
	CoC Work Containers: Mas-Received Temperature of Containers: Mas-Received Temperature of Containers: Mas-Received Temperature of Container Type Von (40mL or 60mL) Quart/Liter (g/p) 9-oz (amber glass jar) 2-oz (amber glass) 125 mL (plastic)	Measure the term ture 3.1 - 4.6 of c 015 ers: Enter the t	nents encloses perature of 8 % 5407 otal number	Air Data Sheet_several sample container Samples Received 6 3 2 2 of sample container	Otherainers. on Ice: Yes Normalizers received.	

CHAIN OF CUSTODY



CONSUMERS ENERGY COMPANY - LABORATORY SERVICES

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

Page _ 1 _ of _ 1

SAMPLING SITE / CUSTOMER: Q2-2022 DEK Bottom Ash Pond Wells					PROJECT NUMBER:	SAP CC or W	O#:								A	NAL	YSI	S RE	QUI	ESTE	D		QA REQUIREMENT:
Q2-2	022 DEK Botto	m Ash Pond We	ells		22-0436	REQUESTER	: Haro	ld R	Regi	ste	r			(is No)	QA REQUIREMENT:
SAM	PLING TEAM:	Hickry 5	ch word	lr o	TURNAROUND TIME REQUIRED: □ 24 HR □ 48 HR □ 3 DAYS □ ST.	ANDARD ⊠ OT	ARD ⊠ OTHER					i						non		□ NPDES ☑ TNI			
	D REPORT TO:	and the same of th			email:	phone:														no	Carl		□ ISO 17025
	COPY TO:	Harold Regist	er		MATRIX CODES: GW = Groundwater OX = Other WW = Wastewater SL = Sludge					_	NER			20						Total Organic Carbon	Dissolved Organic Carbon		□ 10 CFR 50 APP. B
	LAB	TRC SAMPLE COLL	ECTION	XIX	W = Water / Aqueous Liquid A = Air S = Soil / General Solid WP = Wipe O = Oil WT = General Solid WT		AL#	PRESERVATIVE				Metals	su	Ammonia		Alkalinity	de	Organ	O paylo		□ INTERNAL INFO □ OTHER REMARKS		
S	AMPLE ID	DATE	THE RESERVE TO THE RE		CATION	TOTAL	None	None HNO ₃ H ₂ SO ₄		H ₂ SO,		Other	Total	Anions	Amm	TDS	Alka	Sulfide	Total	Disso			
	22-0436-01	5/3/22	1421	GW	DEK-MW-15002		9	4	1	1	1 2	2		x	x	x	x	x	x	x	x		
	-02		1256	GW	DEK-MW-15005		9.	4	1	1	1 2	2		x	x	x	x	x	x	x	x		
	-03		1042	GW	DEK-MW-15006		9	4	1	1	1 2	2		x	x	x	x	x	x	x	x		
	-04		-	GW	DUP-DEK-BAP-01		9	4	1	1	1 2	2		x	x	x	x	x	x	x	x		
	-05		1042	W	FB-DEK-BAP		6	2	1	1	1 2	2		x	x	x			x	x	х		
	-06	ý	1042	W	EB-DEK-BAP		6	2	1	1	1 2	2		x	x	x			x	x	x		
		voy sol	imaidit		5/3/22	ECEIVED BY:										ENTS		,					A1556a2
RELI	NQUISHED BY:	6 4		95-	04-22 10:25	ECEIVED BY: 2-0436 Page 19 of	f 46											-3.		No			E_015402



Report ID: S35620.01(01) Generated on 05/06/2022

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): S35620.01-S35620.06

Project: 22-0436 PR#22050489 Collected Date(s): 05/03/2022

Submitted Date/Time: 05/05/2022 08:15

Sampled by: Unknown P.O. #: 4400106050

Table of Contents

Cover Page (Page 1)

General Report Notes (Page 2)

Report Narrative (Page 2)

Laboratory Certifications (Page 3)

Qualifier Descriptions (Page 3)

Glossary of Abbreviations (Page 3)

Method Summary (Page 4)

Sample Summary (Page 5)

Maya Murshak Technical Director

Naya Mushah



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, acrylonitrile, and 2-chlorovinylethyl 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.

Full accreditation certificates are available upon request. Starred (*) analytes are not 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.

Report Narrative

There is no additional narrative for this analytical report



Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
В	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
Н	Sample submitted and run outside of holding time
1	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
0	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
Т	No correction for total solids
X	Elevated reporting limit due to matrix interference
Υ	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
е	Reported value estimated due to interference
j	Analyte also found in associated method blank
р	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
х	Preserved from bulk sample

Glossary of Abbreviations

Appreviation	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 4450 S2 D 2011

Report to Consumers Energy Company Project: 22-0436 PR#22050489 **P2age43**60**P3**ge 23 of 46

Generated on 05/06/2022 Report ID: S35620.01(01)



Sample Summary (6 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S35620.01	22-0436-01 (DEK-MW-15002)	Groundwater	05/03/22 14:21
S35620.02	22-0436-02 (DEK-MW-15005)	Groundwater	05/03/22 12:56
S35620.03	22-0436-03 (DEK-MW-15006)	Groundwater	05/03/22 10:42
S35620.04	22-0436-04 (DUP-DEK-BAP-01)	Groundwater	05/03/22 00:01
S35620.05	22-0436-05 (FB-DEK-BAP)	Groundwater	05/03/22 10:42
S35620.06	22-0436-06 (EB-DEK-BAP)	Groundwater	05/03/22 10:42



Lab Sample ID: S35620.01

Sample Tag: 22-0436-01 (DEK-MW-15002) Collected Date/Time: 05/03/2022 14:21

Matrix: Groundwater COC Reference:

Sample Containers

#	Туре	Preservative(s)	Refrigerated?	Arrival Temp. (C)	I hermometer #
1	125ml Plastic	NaOH	Yes	3.2	IR

Inorganics

Method: SM4500-S2 D, Run Date: 05/05/22 13:54, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	



Lab Sample ID: S35620.02

Sample Tag: 22-0436-02 (DEK-MW-15005) Collected Date/Time: 05/03/2022 12:56

Matrix: Groundwater COC Reference:

Sample Containers

#	Туре	Preservative(s)	Refrigerated?	Arrival Temp. (C)	I hermometer #
1	125ml Plastic	NaOH	Yes	3.2	IR

Inorganics

Method: SM4500-S2 D, Run Date: 05/05/22 13:56, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	



Lab Sample ID: S35620.03

Sample Tag: 22-0436-03 (DEK-MW-15006) Collected Date/Time: 05/03/2022 10:42

Matrix: Groundwater COC Reference:

Sample Containers

#	Туре	Preservative(s)	Refrigerated?	Arrival Temp. (C)	I hermometer #
1	125ml Plastic	NaOH	Yes	3.2	IR

Inorganics

Method: SM4500-S2 D, Run Date: 05/05/22 13:58, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	



Lab Sample ID: S35620.04

Sample Tag: 22-0436-04 (DUP-DEK-BAP-01) Collected Date/Time: 05/03/2022 00:01

Matrix: Groundwater COC Reference:

Sample Containers

#	Туре	Preservative(s)	Refrigerated?	Arrival Temp. (C)	I hermometer #
1	125ml Plastic	NaOH	Yes	3.2	IR

Inorganics

Method: SM4500-S2 D, Run Date: 05/05/22 14:00, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	



Lab Sample ID: S35620.05

Sample Tag: 22-0436-05 (FB-DEK-BAP) Collected Date/Time: 05/03/2022 10:42

Matrix: Groundwater COC Reference:

Sample Containers

#	Туре	Preservative(s)	Refrigerated?	Arrival Temp. (C)	I hermometer #
1	125ml Plastic	NaOH	Yes	3.2	IR

Inorganics

Method: SM4500-S2 D, Run Date: 05/05/22 14:04, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	



Lab Sample ID: S35620.06

Sample Tag: 22-0436-06 (EB-DEK-BAP) Collected Date/Time: 05/03/2022 10:42

Matrix: Groundwater COC Reference:

Sample Containers

#	Туре	Preservative(s)	Refrigerated?	Arrival Temp. (C)	I hermometer #
1	125ml Plastic	NaOH	Yes	3.2	IR

Inorganics

Method: SM4500-S2 D, Run Date: 05/05/22 14:06, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	

Merit Laboratories Login Checklist

Lab Set ID:S35620

Client: CONSUMERS (Consumers Energy)

Project: 22-0436 PR#22050489

Submitted: 05/05/2022 08:15 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

Selec	tion			Description	Note
Samı	ole Receiv	ving			
01.	X Yes	No	□ N/A	Samples are received at 4C +/- 2C Thermometer #	IR 3.2
02.	X Yes	No	□ N/A	Received on ice/ cooling process begun	
03.	Yes	X No	□ N/A	Samples shipped	
04.	X Yes	No	□ N/A	Samples left in 24 hr. drop box	
05.	X Yes	No	□ N/A	Are there custody seals/tape or is the drop box locked	
Chai	n of Custo	ody			
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:	
Pres	ervation				
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?	
Bottl	e Conditi	ons			
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 or TOX bottles contain headspace	
Corr	active activ	on for all	evcentions	is to call the client and to notify the project manager.	
Clier	t Review	Ву:		Date:	

Merit Laboratories Bottle Preservation Check

Lab Set ID: S35620 Submitted: 05/05/2022 08:15

Client: CONSUMERS (Consumers Energy)

Project: 22-0436 PR#22050489

Initial Preservation Check: 05/05/2022 08:52 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
S35620.01	125ml Plastic NaOH	>12			
S35620.02	125ml Plastic NaOH	>12			
S35620.03	125ml Plastic NaOH	>12			
S35620.04	125ml Plastic NaOH	>12			
S35620.05	125ml Plastic NaOH	>12			
S35620.06	125ml Plastic NaOH	>12			



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

			1		1
C.O.C.	PAGE	#	1	OF	1

REPOR		'	Laboratories, Inc.	CHAII	N OF	CL	JST	TOI	Y	RE	СО	RD	•					INVOI	CE TO
CONTACT NAME E	mil Blaj							CONT	ACT N	IAME							×s	AME	
	sumers E						7	COM	PANY										
ADDRESS 135 V								ADDR	ESS										
Jackson				STATE MI ZIP	CODE	1920	1	CITY STATE ZIP CODE											
PHONE NO. 517-	788-5888		FAX NO. 517-788-2533	P.O. NO. 440010	6050			PHON	E NO.					E-MAIL AD	DRESS				
E-MAIL ADDRESS	mil.blaj@	@cmsen	ergy.com	QUOTE NO.					7				ANALYS	IS (ATTACH	LIST IF N	MORE SP	ACE IS REQU	JIRED)	
PROJECT NO./NAM				SAMPLER(S) - PLEASE	PRINT/SI	3N NA	ME				N/A	7						cations	
			1 DAY 2 DAYS 3 DA	AYS XSTANDARD	ОТІ	HER					- //							VAP Dri	
DELIVERABLE	S REQUIR	ED S1	D X LEVEL II LEVEL III	LEVEL IV EDI	0 🗆 0	THE	R_					٥ ا					□D ₀ D	□NP	DES
MATRIX CODE:	GW=GROUN SL=SLUDG		WW=WASTEWATER S=SC DRINKING WATER O=OIL		D=SOLI W=WAS				ontal			Sulfide					Project Detro	Locations it Ne	w York
MERIT LAB NO. FOR LAB USE ONLY	DATE	AR		SAMPLE TAG IDENTIFICATION-DESCRIPTION				E I	HNO,	NaOH	MeOH	Total					☐Other Specia	Instruction	s
35620.01	05/03/22	1421	22-0436-01 (DEK-MW-	(5002)	GW	1	П			1		1					preserve	d with NaOI	/ZnAcetate
.02	05/03/22	1256	22-0436-02 (DEK-MW-	(5005)	GW	1				1		1					"		
.03	05/03/22	1042	22-0436-03 (DEK-MW-	15006)	GW	1				1		1					"		
.04	05/03/22	2	22-0436-04 (DUP-DEK-	BAP-01)	GW	1				1		1					"		
05	05/03/22	1042	22-0436-05 (FB-DEK-B	AP)	GW	1				1		1					"		
.06	05/03/22	1042	22-0436-06 (EB-DEK-B	AP)	GW	1	Ц			1		1					"		
					+		H			+		-							
					-				H			H							
RELINQUISHED BY SIGNATURE/ORGA RECEIVED BY: SIGNATURE/ORGA	NIZATION	y o	niners energy	Sampler DATE	2 (IME 8 20 IME		SIGN	IVED E	ORC	BY: BANIZ/			me.	rit D	rop T	Зох	5/5/22 5/5/22	08/5
RELINQUISHED BY SIGNATURE/ORGA RECEIVED BY: SIGNATURE/ORGA	NIZATION			DATE		IME IME	4	SEAL					SEAL INTAC YES D SEAL INTAC YES D	NOD	TALS	NOTES	: ТЕМР.	ON ARRIVAL	2,2



2105 Pless Drive Brighton, Michigan 48114 Phone (810)229-7575 Fax (810)229-8650 E-mail bai-brighton@sbcglobal.net

May 13, 2022

Consumers Energy Company 135 W. Trail St. Jackson, MI 49201

Subject: Q2-2022 DEK Bottom Ash Pond Wells

22-0436

Dear Mr. Blaj:

Thank you for making Brighton Analytical, L.L.C. your laboratory of choice. Attached are the results for the samples submitted on 05/06/2022 for the above mentioned project. NELAP/TNI Accredited Analysis and EGLE Drinking Water Certified Analysis will be identified in their respective reporting formats. Hard copies can be supplied at your request for a fee of \$20.00 per copy.

The invoice for this project will be emailed separately. If you have any questions concerning the data or invoice, please don't hesitate to contact our office. We welcome your comments and suggestions to improve our quality systems. Please reference Brighton Analytical, L.L.C. Project ID 81649 when calling or emailing. We thank you for this opportunity to partner with you on this project and hope to work with you again in the future.

Sincerely, Brighton Analytical, L.L.C.







2105 Pless Drive Brighton, Michigan 48114 Phone: (810)229-7575 (810)229-8650 e-mail:bai-brighton@sbcglobal.net EGLE Certified #9404 NELAC Accredited #176507

Sample Date: 05/03/2022 Submit Date: 05/06/2022

Report Date: 05/13/2022

To:

Consumers Energy Company

135 W. Trail St. Jackson, MI 49201

BA Report Number: 81649

Project Name:

Q2-2022 DEK Bottom Ash Pond Wells

BA Sample ID: **CR00156**

Project Number: 22-0436

Sample ID: 22-0436-01 DEK-MW-15002

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon Total Organic Carbon	4800 4800	ug/L ug/L	1000 1000	SM5310B SM5310B	RG RG	05/11/2022 05/11/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date



2105 Pless Drive Brighton, Michigan 48114 Phone: (810)229-7575 (810)229-8650 e-mail:bai-brighton@sbcglobal.net EGLE Certified #9404 NELAC Accredited #176507

 Sample Date:
 05/03/2022

 Submit Date:
 05/06/2022

 Report Date:
 05/13/2022

CR00157

To: Consumers Energy Company

135 W. Trail St. Jackson, MI 49201

BA Report Number: **81649**

BA Sample ID:

Project Name:

Q2-2022 DEK Bottom Ash Pond Wells

Project Number: 22-0436

Sample ID: 22-0436-02 DEK-MW-15005

22-0450-02 DER-1111-15005						
Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis Dissolved Organic Carbon	5600	ug/L	1000	SM5310B	RG	05/12/2022
Total Organic Carbon	5000	ug/L	1000	SM5310B	RG	05/12/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date



2105 Pless Drive Brighton, Michigan 48114 Phone: (810)229-7575 (810)229-8650 e-mail:bai-brighton@sbcglobal.net EGLE Certified #9404 NELAC Accredited #176507

Sample Date: 05/03/2022 Submit Date: 05/06/2022

Report Date: 05/06/2022

CR00158

To:

Consumers Energy Company

135 W. Trail St. Jackson, MI 49201

BA Report Number: 81649

BA Sample ID:

Project Name:

Q2-2022 DEK Bottom Ash Pond Wells

Project Number: 22-0436

Sample ID: 22-0436-03 DEK-MW-15006

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon Total Organic Carbon	3500 3000	ug/L ug/L	1000 1000	SM5310B SM5310B	RG RG	05/12/2022 05/12/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date



2105 Pless Drive Brighton, Michigan 48114 Phone: (810)229-7575 (810)229-8650 e-mail:bai-brighton@sbcglobal.net EGLE Certified #9404 NELAC Accredited #176507

Sample Date: 05/03/2022 Submit Date: 05/06/2022

Report Date: 05/13/2022 To:

Consumers Energy Company

135 W. Trail St. Jackson, MI 49201

BA Report Number: 81649

Project Name: Q2-2022 DEK Bottom Ash Pond Wells

BA Sample ID: CR00159

Project Number: 22-0436

Sample ID: 22-0436-04 DUP-DEK-BAP-01

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	3800	ug/L	1000	SM5310B	RG	05/12/2022
Total Organic Carbon	3100	ug/L	1000	SM5310B	RG	05/12/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date



2105 Pless Drive Brighton, Michigan 48114 Phone: (810)229-7575 (810)229-8650 e-mail:bai-brighton@sbcglobal.net EGLE Certified #9404 NELAC Accredited #176507

Sample Date: 05/03/2022 Submit Date: 05/06/2022

Report Date: 05/13/2022 To:

Consumers Energy Company

135 W. Trail St. Jackson, MI 49201

BA Report Number:

BA Sample ID:

81649

CR00160

Q2-2022 DEK Bottom Ash Pond Wells Project Name:

Project Number: 22-0436

Sample ID: 22-0436-05 FR-DEK-RAP

22-0430-03 FD-DER-DAI						
Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon	1300	ug/L	1000	SM5310B	RG	05/12/2022
Total Organic Carbon	Not detected	ug/L	1000	SM5310B	RG	05/12/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date



2105 Pless Drive Brighton, Michigan 48114 Phone: (810)229-7575 (810)229-8650 e-mail:bai-brighton@sbcglobal.net EGLE Certified #9404 NELAC Accredited #176507

Sample Date: 05/03/2022 Submit Date: 05/06/2022

Report Date: 05/13/2022 To:

Consumers Energy Company

135 W. Trail St. Jackson, MI 49201

BA Report Number: 81649

BA Sample ID:

CR00161

Project Name: Q2-2022 DEK Bottom Ash Pond Wells

Project Number: 22-0436

Sample ID: 22-0436-06 EB-DEK-BAP

Parameters	Result	Units	DL	Method Reference Analyst		Analysis Date
Organic Analysis						
Dissolved Organic Carbon Total Organic Carbon	Not detected Not detected	ug/L ug/L	1000 1000	SM5310B SM5310B	RG RG	05/12/2022 05/12/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date

5/13/2022

CHAIN OF CUSTODY

81649

CONSUMERS ENERGY COMPANY – LABORATORY SERVICES
135 WEST TRAIL ST., JACKSON, MI 49201 • (517) 788-1251

Consumers Energy

Page___of__

3 Days	Count on Us* SAMPLING SITE / CUSTOMER:				135 WEST TRAIL ST., JACKSON, MI 49201 PROJECT NUMBER: SAP CC or WO#:	or WO#:	1251 ANALYSIS REQUESTED	OA BEOTTBEMENT.
3 DAYS & STANDARD OTHER	Q2-2022 DEK Bottom Ash Pond Wells	ells				STER: Emil Blaj	(Attach List if More Space is Needed)	QA REQUIREMENT:
Strington Phone: CONTAINERS Strington Phone: CONTAINERS Strington Phone: Strington Phone PRESERVATIVE Strington PRESERVATIVE PRESERVATIVE PRESERVATIVE PRESERVATIVE PROPH PROPH PASOD PASOD	SAMPLING TEAM: TURNAR C TURNAR	TURN	TURN	TURN D 24	OUND TIME REQUIRED: □ 48 HR □ 3 DAYS ☒ STANDARD	□ OTHER	uoc	□ NPDES ⊠ TNI
Stricture A = Stricture	SEND REPORT TO: Emil Blaj email:	email:	email:	email:		·		□ ISO 17025
A	MATR	MATR	MATRI	MATR		CONTAINERS	nic Car	☐ 10 CFR 50 APP. B☐ INTERNAL INFO
TE B / TOCATION		XIS		s w 0			sgrO le	□ OTHER
	DATE TIME &		TAM		FIELD SAMPLE ID / LOCATION	HCI N ^g O. H ^z SC HNC HNC	Othe	REMARKS
	05/03/2022 1421 GW L	GW		Д	DEK-MW-15002		-	901
	05/03/2022 1256 GW DJ	GW		ĺΩ	DEK-MW-15005			151
	05/03/2022 1042 GW D	GW		Q	DEK-MW-15006			751
	05/03/2022 - GW DU	GW		DC	DUP-DEK-BAP-01			189
x x x	05/03/2022 1042 GW FB	GW		FB	FB-DEK-BAP			0
	05/03/2022 1042 GW EB	GW		EB	EB-DEK-BAP			191
	Ches 506.72	206.72	5.06.72	22.5	1555	9		
	RELINQUISHED BY: DATE/TIME:	DATE/TIME:	DATE/TIME:	TIME:	RECEIVED BY:	Y:	Received on Ice? Yes No M&TE#	# 3

Cal. Due Date:

ွ

Temperature: 3 4



BRIGHTON ANALYTICAL, LLC

QUALITY ASSURANCE/QUALITY CONTROL

REPRESENTATIVE BATCH QUALITY CONTROL Accuracy & Precision

Analyst:	RG	Parameter:	тос
Analysis Date:	5/11/2022	Method Reference:	EPA 415.1/SM5310B/9060

		SPIKE - ACC	CURACY		
Laboratory ID	Spike level PPB	Background PPB	Recoveries (%)	Acceptable Range (%)	Method Blank Concentration
CR00151	TV=10000	2500	107/109	80 - 120	ND
Laboratory ID	Observed A PPB	Observed B PPB	RPD (%)	Acceptable Range(%)	
CR00151	13200	13300	0.75	<u>< </u> 20	
		MISCELLA	NEOUS		
		Standard ID#	%Recoveries		
ndependent Secondar	y Reference Material:	#4295.1	109		
Method Standard (Lab	. Control Spike):	#3046.6	106		

COMMENTS:	

REPRESENTATIVE BATCH QUALITY CONTROL Accuracy & Precision

Analyst:	RG	Parameter:	DOC
Analysis Date:	5/11/2022	Method Reference:	EPA 415.1/SM5310B/9060

		SPIKE - ACC	URACY		
Laboratory ID	Spike level PPB	Background PPB	Recoveries (%)	Acceptable Range (%)	Method Blank Concentration
CR00151	TV=10000	3300	105/107	80 - 120	ND
Laboratory ID	Observed A PPB	Observed B PPB	RPD (%)	Acceptable Range(%)	
CR00151	13800	14000	1.40	<u>< 20</u>	
		MISCELLA	NEOUS		<u></u>
		Standard ID#	%Recoveries		
Independent Secondar	ry Reference Material:	#4295.1	109		
Method Standard (Lal	o. Control Spike):	#3046.6	106		

COMMENTS:						

REPRESENTATIVE BATCH QUALITY CONTROL Accuracy & Precision

Analyst:	RG	Parameter:	тос
Analysis Date:	5/12/2022	Method Reference:	EPA 415.1/SM5310B/9060

		SPIKE - ACC	URACY		
Laboratory ID	Spike level PPB	Background PPB	Recoveries (%)	Acceptable Range (%)	Method Blank Concentration
CR00159	TV=10000	3100	117/112	80 - 120	ND
Laboratory ID	Observed A PPB	Observed B PPB	RPD (%)	Acceptable Range(%)	
CR00159	14800	14400	2.70	<u><</u> 20	
		MISCELLA	NEOUS		
		Standard ID#	%Recoveries		
ndependent Secondai	y Reference Material:	#4295.1	106		
Method Standard (Lal	o. Control Spike):	#3046.6	104		

COMMENTS:	

REPRESENTATIVE BATCH QUALITY CONTROL Accuracy & Precision

Analyst:	RG	Parameter:	DOC
Analysis Date:	5/12/2022	Method Reference:	EPA 415.1/SM5310B/9060

		SPIKE - ACC	URACY		
Laboratory ID	Spike level PPB	Background PPB	Recoveries (%)	Acceptable Range (%)	Method Blank Concentration
CR00159	TV=10000	3800	105/106	80 - 120	ND
Laboratory ID	Observed A PPB	Observed B PPB	RPD (%)	Acceptable Range(%)	
CR00159	14300	14400	0.70	<u>< </u> 20	
1		MISCELLA	NEOUS		
		Standard ID #	%Recoveries		
Independent Secondar	ry Reference Material:	#4295.1	106		
Method Standard (Lal	b. Control Spike):	#3046.6	104		

COMMENTS:	



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

To: CDBatts, Karn/Weadock

From: EBlaj, T-258

Date: May 22, 2022

Subject: RCRA GROUNDWATER MONITORING – KARN BAP & LINED IMP. WELLS – 2022 Q2

CC: HDRegister, P22-521 Darby Litz, Project Manager

BLSwanberg, P22-119 TRC Companies, Inc.

1540 Eisenhower Place Ann Arbor, MI 48108

Chemistry Project: 22-0437

TRC Environmental, Inc. conducted groundwater monitoring at the DEKarn Bottom Ash Pond and Lined Impoundment Wells area on 05/03/2022, for the 2nd 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 05/04/2022.

Samples for Total Sulfide have been subcontracted to Merit Laboratories, Inc. and the results are listed under the analyst initials "Merit". Samples for Total & Dissolved Organic Carbon have been subcontracted to Brighton Analytical LLC and the results are listed under the analyst initials "BAL". The original reports from both labs are attached. 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



Testing performed in accordance with the A2LA scope of accredidation 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.

DEFINITIONS / QUALIFIERS

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

<u>Acronym</u>	<u>Description</u>
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	<u>Description</u>
*	Generic data flag, applicable description added in the corresponding notes section
В	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
Н	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



Work Order Sample Summary

Customer Name: Karn/Weadock Complex

Work Order ID: Q2-2022 DEK Bottom Ash Pond & Lined Impoundment

Date Received: 5/4/2022 **Chemistry Project:** 22-0437

Sample #	Field Sample ID	<u>Matrix</u>	Sample Date	<u>Site</u>
22-0437-01	DEK-MW-18001	Groundwater	05/03/2022 01:44 PM	DEK Bottom Ash Pond & Lined Impoundment
22-0437-02	DEK-MW-18001 MS	Groundwater	05/03/2022 01:44 PM	DEK Bottom Ash Pond & Lined Impoundment
22-0437-03	DEK-MW-18001 MSD	Groundwater	05/03/2022 01:44 PM	DEK Bottom Ash Pond & Lined Impoundment

Report Date:

05/22/22



Laboratory Services

A CENTURY OF EXCELLENCE

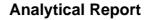
Sample Site: **DEK Bottom Ash Pond & Lined Impoundment** Laboratory Project: **22-0437**

 Field Sample ID:
 DEK-MW-18001
 Collect Date:
 05/03/2022

 Lab Sample ID:
 22-0437-01
 Collect Time:
 01:44 PM

Matrix: Groundwater

Parameter(s) Result Flag Units RL Analysis Date Tracking Antsenic 113 ug/L 1.0 05/05/2022 ABS2-050-08 Barlum 164 ug/L 1.0 05/05/2022 ABS2-050-08 Beryllium ND ug/L 1.0 05/05/2022 ABS2-050-08 Boron 869 ug/L 2.0 05/05/2022 ABS2-050-08 Cadmium ND ug/L 1.00 05/05/2022 ABS2-050-08 Calcium 63700 ug/L 1.0 05/05/2022 ABS2-050-08 Cobalt ND ug/L 1.0 05/05/2022 ABS2-050-08 Copper ND ug/L 1.0 05/05/2022 ABS2-050-08 Copper ND ug/L 1.0 05/05/2022 ABS2-050-08 Lead ND ug/L 1.0 05/05/2022 ABS2-050-08 Lead ND ug/L 1.0 05/05/2022 ABS2-050-08 Malagessium	Metals by EPA 6020B: CCR	Rule Appendix III-IV Tot	Aliquot #: 22-0	437-01-C01-A01	Analyst: EB	
Arsenic 113 ug/L 1.0 05/05/2022 AB22-0505-08 Barlium 164 ug/L 5.0 05/05/2022 AB22-0505-08 Beryllium ND ug/L 1.0 05/05/2022 AB22-0505-08 Borron 869 ug/L 20.0 05/05/2022 AB22-0505-08 Cadmium ND ug/L 1000.0 05/10/2022 AB22-0505-08 Calcium 63700 ug/L 1000.0 05/10/2022 AB22-0505-08 Chromium ND ug/L 1.0 05/05/2022 AB22-0505-08 Cobalt ND ug/L 1.0 05/05/2022 AB22-0505-08 Copper ND ug/L 1.0 05/05/2022 AB22-0505-08 Iron 1360 ug/L 1.0 05/05/2022 AB22-0505-08 Lead ND ug/L 10.0 05/05/2022 AB22-0505-08 Lead ND ug/L 10.0 05/05/2022 AB22-0505-08 Lead ND	Parameter(s)	Result	Flag Unit	s RL	Analysis Date	Tracking
Barium 164 ug/L 5.0 05/05/2022 AB22-0506-08 Beryllium ND ug/L 1.0 05/05/2022 AB22-0506-08 Boron 869 ug/L 20.0 05/05/2022 AB22-0506-08 Cadmium ND ug/L 100.0 05/05/2022 AB22-0506-08 Calcium 63700 ug/L 1000.0 05/05/2022 AB22-0506-08 Chromium ND ug/L 1.0 05/05/2022 AB22-0506-08 Cobalt ND ug/L 1.0 05/05/2022 AB22-0506-08 Copper ND ug/L 1.0 05/05/2022 AB22-0506-08 Iron 1360 ug/L 1.0 05/05/2022 AB22-0506-08 Lead ND ug/L 1.0 05/05/2022 AB22-0506-08 Lithium 2 ug/L 1.0 05/05/2022 AB22-0506-08 Magnesium 13300 ug/L 1.0 05/05/2022 AB22-0506-08 Molybdenum ND <td>Antimony</td> <td>ND</td> <td>ug/L</td> <td>1.0</td> <td>05/05/2022</td> <td>AB22-0505-08</td>	Antimony	ND	ug/L	1.0	05/05/2022	AB22-0505-08
Beryllium ND ug/L 1.0 05/05/2022 AB22-0505-08 Boron 869 ug/L 20.0 05/05/2022 AB22-0505-08 Cadmium ND ug/L 0.2 05/05/2022 AB22-0505-08 Calcium 63700 ug/L 1000.0 05/05/2022 AB22-0505-08 Chomium ND ug/L 1.0 05/05/2022 AB22-0505-08 Cobalt ND ug/L 6.0 05/05/2022 AB22-0505-08 Copper ND ug/L 1.0 05/05/2022 AB22-0505-08 Iron 1360 ug/L 1.0 05/05/2022 AB22-0505-08 Lead ND ug/L 1.0 05/05/2022 AB22-0505-08 Lithium 22 ug/L 10.0 05/05/2022 AB22-0505-08 Magnesium 13300 ug/L 5.0 05/05/2022 AB22-0505-08 Molybdenum ND ug/L 5.0 05/05/2022 AB22-0505-08 Mickel 3	Arsenic	113	ug/L	1.0	05/05/2022	AB22-0505-08
Boron 869 ug/L 20,0 05/05/2022 AB22-0505-08 Cadnium ND ug/L 0,2 05/05/2022 AB22-0505-08 Calcium 63700 ug/L 1000,0 05/05/2022 AB22-0505-08 Chromium ND ug/L 1,0 05/05/2022 AB22-0505-08 Cobalt ND ug/L 1,0 05/05/2022 AB22-0505-08 Copper ND ug/L 1,0 05/05/2022 AB22-0505-08 Iron 1360 ug/L 20,0 05/05/2022 AB22-0505-08 Lead ND ug/L 1,0 05/05/2022 AB22-0505-08 Lithium 22 ug/L 100,0 05/05/2022 AB22-0505-08 Magnesium 13300 ug/L 5,0 05/05/2022 AB22-0505-08 Manganese 200 ug/L 5,0 05/05/2022 AB22-0505-08 Molybdenum ND ug/L 5,0 05/05/2022 AB22-0505-08 Nickel 3 </td <td>Barium</td> <td>164</td> <td>ug/L</td> <td>5.0</td> <td>05/05/2022</td> <td>AB22-0505-08</td>	Barium	164	ug/L	5.0	05/05/2022	AB22-0505-08
Cadmium ND ug/L 0.2 05/05/2022 AB22-0505-08 Calcium 63700 ug/L 1000.0 05/10/2022 AB22-0505-08 Chomium ND ug/L 1.0 05/05/2022 AB22-0505-08 Cobalt ND ug/L 1.0 05/05/2022 AB22-0505-08 Copper ND ug/L 1.0 05/05/2022 AB22-0505-08 Iron 1360 ug/L 1.0 05/05/2022 AB22-0505-08 Lead ND ug/L 1.0 05/05/2022 AB22-0505-08 Lithium 22 ug/L 100.0 05/05/2022 AB22-0505-08 Magnesium 13300 ug/L 100.0 05/05/2022 AB22-0505-08 Molybdenum ND ug/L 5.0 05/05/2022 AB22-0505-08 Molybdenum ND ug/L 2.0 05/05/2022 AB22-0505-08 Molybdenum ND ug/L 2.0 05/05/2022 AB22-0505-08 Nickel	Beryllium	ND	ug/L	1.0	05/05/2022	AB22-0505-08
Calcium 63700 ug/L 1000.0 05/10/2022 AB22-0505-08 Chromium ND ug/L 1.0 05/05/2022 AB22-0505-08 Cobalt ND ug/L 6.0 05/05/2022 AB22-0505-08 Copper ND ug/L 1.0 05/05/2022 AB22-0505-08 Iron 1360 ug/L 20.0 05/05/2022 AB22-0506-08 Lead ND ug/L 1.0 05/05/2022 AB22-0506-08 Lithium 22 ug/L 10.0 05/05/2022 AB22-0506-08 Manganesium 13300 ug/L 5.0 05/05/2022 AB22-0506-08 Molybdenum ND ug/L 5.0 05/05/2022 AB22-0506-08 Molybdenum ND ug/L 5.0 05/05/2022 AB22-0506-08 Mickel 3 ug/L 2.0 05/05/2022 AB22-0506-08 Potassium 4270 ug/L 1.0 05/05/2022 AB22-0506-08 Selenium <t< td=""><td>Boron</td><td>869</td><td>ug/L</td><td>20.0</td><td>05/05/2022</td><td>AB22-0505-08</td></t<>	Boron	869	ug/L	20.0	05/05/2022	AB22-0505-08
Chromium ND ug/L 1.0 05/05/2022 AB22-0505-08 Cobalt ND ug/L 6.0 05/05/2022 AB22-0506-08 Copper ND ug/L 1.0 05/05/2022 AB22-0506-08 Load ND ug/L 2.0. 05/05/2022 AB22-0506-08 Lead ND ug/L 1.0 05/05/2022 AB22-0506-08 Lithium 22 ug/L 10.0 05/05/2022 AB22-0506-08 Magnesium 13300 ug/L 5.0 05/05/2022 AB22-0506-08 Manganese 200 ug/L 5.0 05/05/2022 AB22-0506-08 Manganese 200 ug/L 5.0 05/05/2022 AB22-0506-08 Manganese 3 ug/L 5.0 05/05/2022 AB22-0506-08 Manganese 200 ug/L 5.0 05/05/2022 AB22-0506-08 Maleyatem 3 ug/L 1.0 05/05/2022 AB22-0506-08 Nickel 3	Cadmium	ND	ug/L	0.2	05/05/2022	AB22-0505-08
Cobalt ND ug/L 6.0 05/05/2022 AB22-0505-08 Copper ND ug/L 1.0 05/05/2022 AB22-0505-08 Iron 1360 ug/L 20.0 05/05/2022 AB22-0505-08 Lead ND ug/L 1.0 05/05/2022 AB22-0505-08 Lithium 22 ug/L 1.0 05/05/2022 AB22-0505-08 Magnesium 13300 ug/L 1.00 05/05/2022 AB22-0505-08 Manganese 200 ug/L 5.0 05/05/2022 AB22-0505-08 Midybdenum ND ug/L 5.0 05/05/2022 AB22-0505-08 Midybdenum ND ug/L 5.0 05/05/2022 AB22-0505-08 Midybdenum ND ug/L 1.0 05/05/2022 AB22-0505-08 Midybdenum ND ug/L 1.0 05/05/2022 AB22-0505-08 Midssium 4270 ug/L 1.0 05/05/2022 AB22-0505-08 Silver <td< td=""><td>Calcium</td><td>63700</td><td>ug/L</td><td>1000.0</td><td>05/10/2022</td><td>AB22-0505-08</td></td<>	Calcium	63700	ug/L	1000.0	05/10/2022	AB22-0505-08
Copper ND ug/L 1.0 05/05/2022 AB22-0505-08 Iron 1360 ug/L 20.0 05/05/2022 AB22-0505-08 Lead ND ug/L 1.0 05/05/2022 AB22-0505-08 Lithium 22 ug/L 10.0 05/05/2022 AB22-0505-08 Magnesium 13300 ug/L 100.0 05/05/2022 AB22-0505-08 Manganese 200 ug/L 5.0 05/05/2022 AB22-0505-08 Molybdenum ND ug/L 5.0 05/05/2022 AB22-0505-08 Mickel 3 ug/L 2.0 05/05/2022 AB22-0505-08 Potassium 4270 ug/L 100.0 05/05/2022 AB22-0505-08 Selenium 2 ug/L 1.0 05/05/2022 AB22-0505-08 Silver ND ug/L 1.0 05/05/2022 AB22-0505-08 Sodium 97400 ug/L 1.0 05/05/2022 AB22-0505-08 Vanadium N	Chromium	ND	ug/L	1.0	05/05/2022	AB22-0505-08
Iron	Cobalt	ND	ug/L	6.0	05/05/2022	AB22-0505-08
Lead ND ug/L 1.0 05/05/2022 AB22-0505-08 Lithium 22 ug/L 10.0 05/05/2022 AB22-0505-08 Magnesium 13300 ug/L 1000.0 05/10/2022 AB22-0505-08 Manganese 200 ug/L 5.0 05/05/2022 AB22-0505-08 Molybdenum ND ug/L 5.0 05/05/2022 AB22-0505-08 Nickel 3 ug/L 100.0 05/05/2022 AB22-0505-08 Potassium 4270 ug/L 100.0 05/10/2022 AB22-0505-08 Selenium 2 ug/L 1.0 05/05/2022 AB22-0505-08 Silver ND ug/L 0.2 05/05/2022 AB22-0505-08 Sodium 97400 ug/L 1000.0 05/05/2022 AB22-0505-08 Thallium ND ug/L 2.0 05/05/2022 AB22-0505-08 Vanadium ND ug/L 2.0 05/05/2022 AB22-0505-08 Mercury by EPA 747	Copper	ND	ug/L	1.0	05/05/2022	AB22-0505-08
Lithium 22 ug/L 10.0 05/05/2022 AB22-0505-08 Magnesium 13300 ug/L 1000.0 05/10/2022 AB22-0505-08 Manganese 200 ug/L 5.0 05/05/2022 AB22-0505-08 Molybdenum ND ug/L 5.0 05/05/2022 AB22-0505-08 Nickel 3 ug/L 2.0 05/05/2022 AB22-0505-08 Potassium 4270 ug/L 100.0 05/05/2022 AB22-0505-08 Selenium 2 ug/L 1.0 05/05/2022 AB22-0505-08 Silver ND ug/L 1.0 05/05/2022 AB22-0505-08 Sodium 97400 ug/L 1000.0 05/05/2022 AB22-0505-08 Tallium ND ug/L 2.0 05/05/2022 AB22-0505-08 Vanadium ND ug/L 10.0 05/05/2022 AB22-0505-08 Zinc ND ug/L 10.0 05/05/2022 AB22-0505-08 Mercury by EPA 7470	Iron	1360	ug/L	20.0	05/05/2022	AB22-0505-08
Magnesium 13300 ug/L 1000.0 05/10/2022 AB22-0505-08 Manganese 200 ug/L 5.0 05/05/2022 AB22-0505-08 Molybdenum ND ug/L 5.0 05/05/2022 AB22-0505-08 Nickel 3 ug/L 2.0 05/05/2022 AB22-0505-08 Potassium 4270 ug/L 100.0 05/10/2022 AB22-0505-08 Selenium 2 ug/L 1.0 05/05/2022 AB22-0505-08 Selenium 9 ND ug/L 1.0 05/05/2022 AB22-0505-08 Sodium 97400 ug/L 100.0 05/10/2022 AB22-0505-08 Thallium ND ug/L 2.0 05/05/2022 AB22-0505-08 Vanadium ND ug/L 10.0 05/05/2022 AB22-0505-08 Zinc ND ug/L 10.0 05/05/2022 AB22-0505-08 Mercury by EPA 7470A, Total, Aqueous Flag Unit RL Analysis Date Tracking	Lead	ND	ug/L	1.0	05/05/2022	AB22-0505-08
Manganese 200 ug/L 5.0 05/05/2022 AB22-0505-08 Molybdenum ND ug/L 5.0 05/05/2022 AB22-0505-08 Nickel 3 ug/L 2.0 05/05/2022 AB22-0505-08 Potassium 4270 ug/L 100.0 05/10/2022 AB22-0505-08 Selenium 2 ug/L 1.0 05/05/2022 AB22-0505-08 Silver ND ug/L 0.2 05/05/2022 AB22-0505-08 Sodium 97400 ug/L 1000.0 05/10/2022 AB22-0505-08 Thallium ND ug/L 2.0 05/05/2022 AB22-0505-08 Vanadium ND ug/L 2.0 05/05/2022 AB22-0505-08 Zinc ND ug/L 10.0 05/05/2022 AB22-0505-08 Mercury by EPA 7470A, Total, Aqueous Result Flag Units RL Analysis Date Tracking Mercury by EPA 300.0 Aqueous, NO2, NO3 Aliquot #: 22-0437-01-C02-A01 Analyst: DMW	Lithium	22	ug/L	10.0	05/05/2022	AB22-0505-08
Molybdenum ND ug/L 5.0 05/05/2022 AB22-0505-08 Nickel 3 ug/L 2.0 05/05/2022 AB22-0505-08 Potassium 4270 ug/L 100.0 05/10/2022 AB22-0505-08 Selenium 2 ug/L 1.0 05/05/2022 AB22-0505-08 Silver ND ug/L 0.2 05/05/2022 AB22-0505-08 Sodium 97400 ug/L 1000.0 05/10/2022 AB22-0505-08 Thallium ND ug/L 2.0 05/05/2022 AB22-0505-08 Vanadium ND ug/L 2.0 05/05/2022 AB22-0505-08 Zinc ND ug/L 10.0 05/05/2022 AB22-0505-08 Mercury by EPA 7470A, Total, Aqueous Flag Units RL Analysis Date Tracking Mercury by EPA 7470A, Total, Aqueous Flag Units RL Analysis Date Tracking Mercury ND ug/L 0.2 05/09/2022 AB22-0509-01	Magnesium	13300	ug/L	1000.0	05/10/2022	AB22-0505-08
Nickel 3 ug/L 2.0 05/05/2022 AB22-0505-08 Potassium 4270 ug/L 100.0 05/10/2022 AB22-0505-08 Selenium 2 ug/L 1.0 05/05/2022 AB22-0505-08 Silver ND ug/L 0.2 05/05/2022 AB22-0505-08 Sodium 97400 ug/L 1000.0 05/10/2022 AB22-0505-08 Thallium ND ug/L 2.0 05/05/2022 AB22-0505-08 Vanadium ND ug/L 2.0 05/05/2022 AB22-0505-08 Zinc ND ug/L 10.0 05/05/2022 AB22-0505-08 Mercury by EPA 7470A, Total, Aqueous Value ug/L 10.0 05/05/2022 AB22-0505-08 Mercury by EPA 7470A, Total, Aqueous Result Flag Units RL Analysis Date Tracking Mercury by EPA 7470A, Total, Aqueous ND ug/L 0.2 05/09/2022 AB22-0505-08 Anions by EPA 300.0 Aqueous, NO2, NO3 Aliquot #: 22-0437-01-C02-A01 <t< td=""><td>Manganese</td><td>200</td><td>ug/L</td><td>5.0</td><td>05/05/2022</td><td>AB22-0505-08</td></t<>	Manganese	200	ug/L	5.0	05/05/2022	AB22-0505-08
Potassium 4270 ug/L 100.0 05/10/2022 AB22-0505-08 Selenium 2 ug/L 1.0 05/05/2022 AB22-0505-08 Silver ND ug/L 0.2 05/05/2022 AB22-0505-08 Sodium 97400 ug/L 1000.0 05/10/2022 AB22-0505-08 Thallium ND ug/L 2.0 05/05/2022 AB22-0505-08 Vanadium ND ug/L 2.0 05/05/2022 AB22-0505-08 Zinc ND ug/L 10.0 05/05/2022 AB22-0505-08 Mercury by EPA 7470A, Total, Aqueous Result Flag Units RL Analysis Date Tracking Mercury by EPA 7470A, Total, Aqueous Result Flag Units RL Analysis Date Tracking Mercury by EPA 7470A, Total, Aqueous ND ug/L 0.2 05/09/2022 AB22-0509-01 Anions by EPA 300.0 Aqueous, NO2, NO3 Aliquot #: 22-0437-01-C02-A01 Analysis DMW Parameter(s) Result Flag <t< td=""><td>Molybdenum</td><td>ND</td><td>ug/L</td><td>5.0</td><td>05/05/2022</td><td>AB22-0505-08</td></t<>	Molybdenum	ND	ug/L	5.0	05/05/2022	AB22-0505-08
Selenium 2 ug/L 1.0 05/05/2022 AB22-0505-08 Silver ND ug/L 0.2 05/05/2022 AB22-0505-08 Sodium 97400 ug/L 1000.0 05/10/2022 AB22-0505-08 Thallium ND ug/L 2.0 05/05/2022 AB22-0505-08 Vanadium ND ug/L 2.0 05/05/2022 AB22-0505-08 Zinc ND ug/L 10.0 05/05/2022 AB22-0505-08 Mercury by EPA 7470A, Total, Aqueous Aliquot #: 22-0437-01-C01-A02 Analyst: CLH Parameter(s) Result Flag Units RL Analysis Date Tracking Mercury ND ug/L 0.2 05/09/2022 AB22-0509-01 Anions by EPA 300.0 Aqueous, NO2, NO3 * Aliquot #: 22-0437-01-C02-A01 Analyst: DMW Parameter(s) Result Flag Units RL Analysis Date Tracking Nitrite ND ug/L 100.0 05/04/2022	Nickel	3	ug/L	2.0	05/05/2022	AB22-0505-08
Silver ND ug/L 0.2 05/05/2022 AB22-0505-08 Sodium 97400 ug/L 1000.0 05/10/2022 AB22-0505-08 Thallium ND ug/L 2.0 05/05/2022 AB22-0505-08 Vanadium ND ug/L 2.0 05/05/2022 AB22-0505-08 Zinc ND ug/L 10.0 05/05/2022 AB22-0505-08 Mercury by EPA 7470A, Total, Aqueous Aliquot #: 22-0437-01-C01-A02 Analyst: CLH Parameter(s) Result Flag Units RL Analysis Date Tracking Mercury ND ug/L 0.2 05/09/2022 AB22-0509-01 Anions by EPA 300.0 Aqueous, NO2, NO3 Aliquot #: 22-0437-01-C02-A01 Analyst: DMW Parameter(s) Result Flag Units RL Analysis Date Tracking Nitrate ND ug/L 100.0 05/04/2022 AB22-0504-08 Nitrite ND ug/L 100.0 05/04/2022 AB22-0504-08 Ani	Potassium	4270	ug/L	100.0	05/10/2022	AB22-0505-08
Sodium 97400 ug/L 1000.0 05/10/2022 AB22-0505-08 Thallium ND ug/L 2.0 05/05/2022 AB22-0505-08 Vanadium ND ug/L 2.0 05/05/2022 AB22-0505-08 Zinc ND ug/L 10.0 05/05/2022 AB22-0505-08 Mercury by EPA 7470A, Total, Aqueous Aliquot #: 22-0437-01-C01-A02 Analyst: CLH Parameter(s) Result Flag Units RL Analysis Date Tracking Nitrate ND ug/L 100.0 05/04/2022 AB22-0504-08 Nitrite ND ug/L 100.0 05/04/2022 AB22-0504-08 Anions by EPA 300.0 CCR Rule Analyte List, CI, F, SO4, Aqueous Aliquot #: 22-0437-01-C02-A02 Analyst: DMW Parameter(s) Result Flag Units RL Analysis Date Tracking	Selenium	2	ug/L	1.0	05/05/2022	AB22-0505-08
Thallium ND ug/L 2.0 05/05/2022 AB22-0505-08 Vanadium ND ug/L 2.0 05/05/2022 AB22-0505-08 Zinc ND ug/L 10.0 05/05/2022 AB22-0505-08 Mercury by EPA 7470A, Total, Aqueous Aliquot #: 22-0437-01-C01-A02 Analyst: CLH Parameter(s) Result Flag Units RL Analysis Date Tracking Mercury ND ug/L 0.2 05/09/2022 AB22-0509-01 Anions by EPA 300.0 Aqueous, NO2, NO3 Aliquot #: 22-0437-01-C02-A01 Analyst: DMW Parameter(s) Result Flag Units RL Analysis Date Tracking Nitrate ND ug/L 100.0 05/04/2022 AB22-0504-08 Nitrite ND ug/L 100.0 05/04/2022 AB22-0504-08 Anions by EPA 300.0 CCR Rule Analyte List, CI, F, SO4, Aqueous Aliquot #: 22-0437-01-C02-A02 Analyst: DMW Parameter(s) Result Flag Units RL Analysis Date Analyst: DM	Silver	ND	ug/L	0.2	05/05/2022	AB22-0505-08
Vanadium ND ug/L ug/L ug/L 2.0 05/05/2022 dB22-0505-08 AB22-0505-08 Mercury by EPA 7470A, Total, Aqueous Aliquot #: 22-0437-01-C01-A02 dParameter(s) Analyst: CLH Parameter(s) Result Flag Units Mercury ND ug/L 0.2 05/09/2022 dParameter(s) AB22-0509-01 Anions by EPA 300.0 Aqueous, NO2, NO3 Aliquot #: 22-0437-01-C02-A01 dParameter(s) Analyst: DMW Parameter(s) Result Flag Units RL Analysis Date Nitrate ND ug/L 100.0 05/04/2022 dParameter(s) AB22-0504-08 dParameter(s) dParameter(s) ND ug/L 100.0 05/04/2022 dParameter(s) dParameter(s) Aliquot #: 22-0437-01-C02-A02 dParameter(s) dParameter(s) Analyst: DMW Parameter(s) Result Flag Units RL Analysis Date dParameter(s) Aliquot #: 22-0437-01-C02-A02 dParameter(s) Analyst: DMW	Sodium	97400	ug/L	1000.0	05/10/2022	AB22-0505-08
Zinc ND ug/L 10.0 05/05/2022 AB22-0505-08 Mercury by EPA 7470A, Total, Aqueous Aliquot #: 22-0437-01-C01-A02 Analyst: CLH Parameter(s) Result Flag Units RL Analysis Date Tracking Mercury ND ug/L 0.2 05/09/2022 AB22-0509-01 Anions by EPA 300.0 Aqueous, NO2, NO3 Aliquot #: 22-0437-01-C02-A01 Analyst: DMW Parameter(s) Result Flag Units RL Analysis Date Tracking Nitrate ND ug/L 100.0 05/04/2022 AB22-0504-08 Nitrite ND ug/L 100.0 05/04/2022 AB22-0504-08 Anions by EPA 300.0 CCR Rule Analyte List, CI, F, SO4, Aqueous Aliquot #: 22-0437-01-C02-A02 Analyst: DMW Parameter(s) Result Flag Units RL Analysis Date Tracking	Thallium	ND	ug/L	2.0	05/05/2022	AB22-0505-08
Mercury by EPA 7470A, Total, Aqueous Aliquot #: 22-0437-01-C01-A02 Analyst: CLH Parameter(s) Result Flag Units RL Analysis Date Tracking Mercury ND ug/L 0.2 05/09/2022 AB22-0509-01 Anions by EPA 300.0 Aqueous, NO2, NO3 Aliquot #: 22-0437-01-C02-A01 Analyst: DMW Parameter(s) Result Flag Units RL Analysis Date Tracking Nitrate ND ug/L 100.0 05/04/2022 AB22-0504-08 Nitrite ND ug/L 100.0 05/04/2022 AB22-0504-08 Anions by EPA 300.0 CCR Rule Analyte List, CI, F, SO4, Aqueous Aliquot #: 22-0437-01-C02-A02 Analyst: DMW Parameter(s) Result Flag Units RL Analysis Date Tracking	Vanadium	ND	ug/L	2.0	05/05/2022	AB22-0505-08
Parameter(s) Result Flag Units RL Analysis Date Tracking Mercury ND ug/L 0.2 05/09/2022 AB22-0509-01 Anions by EPA 300.0 Aqueous, NO2, NO3 Aliquot #: 22-0437-01-C02-A01 Analysis DMW Parameter(s) Result Flag Units RL Analysis Date Tracking Nitrate ND ug/L 100.0 05/04/2022 AB22-0504-08 Nitrite ND ug/L 100.0 05/04/2022 AB22-0504-08 Anions by EPA 300.0 CCR Rule Analyte List, CI, F, SO4, Aqueous Aliquot #: 22-0437-01-C02-A02 Analyst: DMW Parameter(s) Result Flag Units RL Analysis Date Tracking	Zinc	ND	ug/L	10.0	05/05/2022	AB22-0505-08
Mercury ND ug/L 0.2 05/09/2022 AB22-0509-01 Anions by EPA 300.0 Aqueous, NO2, NO3 Aliquot #: 22-0437-01-C02-A01 Analyst: DMW Parameter(s) Result Flag Units RL Analysis Date Tracking Nitrate ND ug/L 100.0 05/04/2022 AB22-0504-08 Nitrite ND ug/L 100.0 05/04/2022 AB22-0504-08 Anions by EPA 300.0 CCR Rule Analyte List, CI, F, SO4, Aqueous Aliquot #: 22-0437-01-C02-A02 Analyst: DMW Parameter(s) Result Flag Units RL Analysis Date Tracking	Mercury by EPA 7470A, To	tal, Aqueous		Aliquot #: 22-0	437-01-C01-A02	Analyst: CLH
Anions by EPA 300.0 Aqueous, NO2, NO3 Aliquot #: 22-0437-01-C02-A01 Analyst: DMW Parameter(s) Result Flag Units RL Analysis Date Tracking Nitrate ND ug/L 100.0 05/04/2022 AB22-0504-08 Nitrite ND ug/L 100.0 05/04/2022 AB22-0504-08 Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous Aliquot #: 22-0437-01-C02-A02 Analyst: DMW Parameter(s) Result Flag Units RL Analysis Date Tracking	Parameter(s)	Result	Flag Unit	s RL	Analysis Date	Tracking
Parameter(s) Result Flag Units RL Analysis Date Tracking Nitrate ND ug/L 100.0 05/04/2022 AB22-0504-08 Nitrite ND ug/L 100.0 05/04/2022 AB22-0504-08 Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous Aliquot #: 22-0437-01-C02-A02 Analyst: DMW Parameter(s) Result Flag Units RL Analysis Date Tracking	Mercury	ND	ug/L	0.2	05/09/2022	AB22-0509-01
Nitrate ND ug/L 100.0 05/04/2022 AB22-0504-08 Nitrite ND ug/L 100.0 05/04/2022 AB22-0504-08 Anions by EPA 300.0 CCR Rule Analyte List, CI, F, SO4, Aqueous Aliquot #: 22-0437-01-C02-A02 Analyst: DMW Parameter(s) Result Flag Units RL Analysis Date Tracking	Anions by EPA 300.0 Aque	ous, NO2, NO3		Aliquot #: 22-0	437-01-C02-A01	Analyst: DMW
Nitrite ND ug/L 100.0 05/04/2022 AB22-0504-08 Anions by EPA 300.0 CCR Rule Analyte List, CI, F, SO4, Aqueous Aliquot #: 22-0437-01-C02-A02 Analyst: DMW Parameter(s) Result Flag Units RL Analysis Date Tracking	Parameter(s)	Result	Flag Unit	s RL	Analysis Date	Tracking
Anions by EPA 300.0 CCR Rule Analyte List, CI, F, SO4, Aqueous Aliquot #: 22-0437-01-C02-A02 Analyst: DMW Parameter(s) Result Flag Units RL Analysis Date Tracking	Nitrate	ND	ug/L	100.0	05/04/2022	AB22-0504-08
Parameter(s) Result Flag Units RL Analysis Date Tracking	Nitrite	ND	ug/L	100.0	05/04/2022	AB22-0504-08
	Anions by EPA 300.0 CCR	Rule Analyte List, Cl, F, S	O4, Aqueous	Aliquot #: 22-0	437-01-C02-A02	Analyst: DMW
Chloride 65900 ug/L 1000.0 05/06/2022 AB22-0505-07	Parameter(s)	Result	Flag Unit	s RL	Analysis Date	Tracking
	Chloride	65900	ug/L	1000.0	05/06/2022	AB22-0505-07





A CENTURY OF EXCELLENCE

05/22/22 Report Date:

Sample Site: **DEK Bottom Ash Pond & Lined Impoundment**

Laboratory Project: 22-0437 Collect Date: Field Sample ID: DEK-MW-18001 05/03/2022 Lab Sample ID: 22-0437-01 Collect Time: 01:44 PM

Matrix: Groundwater

Anions by EPA 300.0 CCR Rule Analyt	e List, CI, F, SC	04, Aqւ	ieous	Aliquot #: 22-0	437-01-C02-A02	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	05/04/2022	AB22-0505-07
Sulfate	187000		ug/L	1000.0	05/06/2022	AB22-0505-07
Nitrogen-Ammonia by SM4500NH3(h),	Groundwater I	-IL		Aliquot #: 22-0	437-01-C03-A01	Analyst: LMO
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	2040		ug/L	25.0	05/09/2022	AB22-0509-09
Total Dissolved Solids by SM 2540C				Aliquot #: 22-0	437-01-C04-A01	Analyst: CET
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	555		mg/L	10.0	05/05/2022	AB22-0505-01
Alkalinity by SM 2320B				Aliquot #: 22-0	437-01-C05-A01	Analyst: DLS
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	174000		ug/L	10000.0	05/09/2022	AB22-0509-08
Alkalinity Bicarbonate	174000		ug/L	10000.0	05/09/2022	AB22-0509-08
Alkalinity Carbonate	ND		ug/L	10000.0	05/09/2022	AB22-0509-08
Sulfide, Total by SM 4500 S2D				Aliquot #: 22-0	437-01-C07-A01	Analyst: Merit
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	20.0	05/06/2022	AB22-0509-15
Total Organic Carbon by SM 5310B, Ac	queous			Aliquot #: 22-0	437-01-C08-A01	Analyst: BAL
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	4400		ug/L	1000.0	05/10/2022	AB22-0519-08
Dissolved Organic Carbon by SM 5310	B, Aqueous			Aliquot #: 22-0	437-01-C09-A01	Analyst: BAL
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	4800		ug/L	1000.0	05/10/2022	AB22-0519-09

Report Date:

05/22/22

22-0437



Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: **DEK Bottom Ash Pond & Lined Impoundment** Laboratory Project:

 Field Sample ID:
 DEK-MW-18001 MS
 Collect Date:
 05/03/2022

 Lab Sample ID:
 22-0437-02
 Collect Time:
 01:44 PM

Matrix: Groundwater

Metals by EPA 6020B: CCR R	Exp	Aliquot #: 22-0437-02-C01-A01 Analyst: El				
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	110		%	1.0	05/05/2022	AB22-0505-08
Arsenic	94		%	1.0	05/05/2022	AB22-0505-08
Barium	104		%	5.0	05/05/2022	AB22-0505-08
Beryllium	100		%	1.0	05/05/2022	AB22-0505-08
Boron	107		%	20.0	05/05/2022	AB22-0505-08
Cadmium	104		%	0.2	05/05/2022	AB22-0505-08
Calcium	102		%	1000.0	05/10/2022	AB22-0505-08
Chromium	97		%	1.0	05/05/2022	AB22-0505-08
Cobalt	98		%	6.0	05/05/2022	AB22-0505-08
Copper	92		%	1.0	05/05/2022	AB22-0505-08
Iron	114		%	20.0	05/05/2022	AB22-0505-08
Lead	99		%	1.0	05/05/2022	AB22-0505-08
Lithium	101		%	10.0	05/05/2022	AB22-0505-08
Magnesium	111		%	1000.0	05/10/2022	AB22-0505-08
Manganese	97		%	5.0	05/05/2022	AB22-0505-08
Molybdenum	111		%	5.0	05/05/2022	AB22-0505-08
Nickel	92		%	2.0	05/05/2022	AB22-0505-08
Potassium	109		%	100.0	05/10/2022	AB22-0505-08
Selenium	97		%	1.0	05/05/2022	AB22-0505-08
Silver	115		%	0.2	05/05/2022	AB22-0505-08
Sodium	114		%	1000.0	05/10/2022	AB22-0505-08
Thallium	98		%	2.0	05/05/2022	AB22-0505-08
Vanadium	101		%	2.0	05/05/2022	AB22-0505-08
Zinc	93		%	10.0	05/05/2022	AB22-0505-08
Mercury by EPA 7470A, Total	, Aqueous			Aliquot #: 22-0	437-02-C01-A02	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	101		%	0.2	05/09/2022	AB22-0509-01
Anions by EPA 300.0 Aqueou	s, NO2, NO3			Aliquot #: 22-0	437-02-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	93		%	100.0	05/04/2022	AB22-0504-08
Nitrite	93		%	100.0	05/04/2022	AB22-0504-08
Anions by EPA 300.0 CCR Ru	le Analyte List, Cl, F,	SO4, Aqu	eous	Aliquot #: 22-0	437-02-C02-A02	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	108		%	1000.0	05/06/2022	AB22-0505-07



05/22/22

22-0437



A CENTURY OF EXCELLENCE

Report Date:

DEK Bottom Ash Pond & Lined Impoundment Sample Site:

Laboratory Project: Field Sample ID: DEK-MW-18001 MS Collect Date: 05/03/2022 Lab Sample ID: 22-0437-02 Collect Time: 01:44 PM

Matrix: Groundwater

Anions by EPA 300.0 CCR Rule A	nalyte List, CI, F,	SO4, Aqı	ieous	Aliquot #: 22-0	437-02-C02-A02	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	83		%	1000.0	05/04/2022	AB22-0505-07
Sulfate	108		%	1000.0	05/06/2022	AB22-0505-07
Nitrogen-Ammonia by SM4500NH	3(h), Groundwate	r HL		Aliquot #: 22-0	0437-02-C03-A01	Analyst: LMO
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	99		%	25.0	05/09/2022	AB22-0509-09
Alkalinity by SM 2320B				Aliquot #: 22-0)437-02-C05-A01	Analyst: DLS
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	96.2		%	10000.0	05/09/2022	AB22-0509-08
Sulfide, Total by SM 4500 S2D				Aliquot #: 22-0)437-02-C07-A01	Analyst: Merit
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	92		%	20.0	05/06/2022	AB22-0509-15
Total Organic Carbon by SM 5310	B, Aqueous			Aliquot #: 22-0)437-02-C08-A01	Analyst: BAL
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	114		%	1000.0	05/10/2022	AB22-0519-08
Dissolved Organic Carbon by SM	5310B, Aqueous			Aliquot #: 22-0)437-02-C09-A01	Analyst: BAL
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	106		%	1000.0	05/10/2022	AB22-0519-09

Report Date:

05/22/22

22-0437



Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: **DEK Bottom Ash Pond & Lined Impoundment** Laboratory Project:

 Field Sample ID:
 DEK-MW-18001 MSD
 Collect Date:
 05/03/2022

 Lab Sample ID:
 22-0437-03
 Collect Time:
 01:44 PM

Matrix: Groundwater

Parameter(s) Result Flag Units RL Analysis Date Tracking Mercury 94.0 % 0.2 05/09/2022 AB22-0509-01 Anions by EPA 300.0 Aqueous, NO2, NO3 Aliquot #: 22-0437-03-C02-A01 Analyst: DMW Parameter(s) Result Flag Units RL Analysis Date Tracking Nitrate 93 % 100.0 05/04/2022 AB22-0504-08 Nitrite 93 % 100.0 05/04/2022 AB22-0504-08	Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp Aliquot #: 22-0437-03-C01-A01					
Arsenic 91 % 1.0 05/05/2022 AB22-0505-08 Barlum 101 % 5.0 05/05/2022 AB22-0505-08 Beryllim 101 % 1.0 05/05/2022 AB22-0505-08 Boron 1111 % 20.0 05/05/2022 AB22-0505-08 Cadmium 103 % 1000.0 05/10/2022 AB22-0505-08 Calcium 102 % 1000.0 05/10/2022 AB22-0505-08 Chromium 97 % 1.0 05/05/2022 AB22-0505-08 Cobalt 96 % 1.0 05/05/2022 AB22-0505-08 Copper 91 % 1.0 05/05/2022 AB22-0505-08 Iron 113 % 20.0 05/05/2022 AB22-0505-08 Lead 99 % 1.0 05/05/2022 AB22-0505-08 Lead 99 % 1.0 05/05/2022 AB22-0505-08 Maleanester 113 % 10.0 </th <th>Parameter(s)</th> <th>Result</th> <th>Flag Uni</th> <th>ts RL</th> <th>Analysis Date</th> <th>Tracking</th>	Parameter(s)	Result	Flag Uni	ts RL	Analysis Date	Tracking
Barium 101 % 5.0 05/05/2022 AB22-0505-08 Beryllium 101 % 1.0 05/05/2022 AB22-0505-08 Boron 1111 % 20.0 05/05/2022 AB22-0505-08 Cadmium 103 % 0.2 05/05/2022 AB22-0505-08 Calcium 102 % 1000.0 05/10/2022 AB22-0505-08 Chromium 97 % 1.0 05/05/2022 AB22-0505-08 Cobalt 96 % 6.0 05/05/2022 AB22-0505-08 Copper 91 % 1.0 05/05/2022 AB22-0505-08 Iron 113 % 20.0 05/05/2022 AB22-0505-08 Lead 99 % 1.0 05/05/2022 AB22-0505-08 Lead 99 % 1.0 05/05/2022 AB22-0505-08 Magnesium 114 % 100.0 05/05/2022 AB22-0505-08 Malagnesium 110 % 5.0	Antimony	108	%	1.0	05/05/2022	AB22-0505-08
Beryllium 101 % 1.0 05/05/2022 AB22-0505-08 Boron 111 % 20.0 05/05/2022 AB22-0505-08 Cadnium 103 % 0.2 05/05/2022 AB22-0505-08 Calcium 102 % 1000.0 05/10/2022 AB22-0505-08 Chromium 97 % 1.0 05/05/2022 AB22-0505-08 Cobalt 96 % 6.0 05/05/2022 AB22-0505-08 Copper 91 % 1.0 05/05/2022 AB22-0505-08 Iron 113 % 20.0 05/05/2022 AB22-0505-08 Lead 99 % 1.0 05/05/2022 AB22-0505-08 Lithium 103 % 10.0 05/05/2022 AB22-0505-08 Lithium 103 % 10.0 05/05/2022 AB22-0505-08 Midanganese 94 % 5.0 05/05/2022 AB22-0505-08 Midanganese 94 % <td< td=""><td>Arsenic</td><td>91</td><td>%</td><td>1.0</td><td>05/05/2022</td><td>AB22-0505-08</td></td<>	Arsenic	91	%	1.0	05/05/2022	AB22-0505-08
Boron 1111 % 20,0 05/05/2022 AB22-0505-08 Cadnium 103 % 0,2 05/05/2022 AB22-0505-08 Calcium 102 % 1000,0 05/10/2022 AB22-0505-08 Chromium 97 % 1,0 05/05/2022 AB22-0505-08 Cobalt 96 % 6,0 05/05/2022 AB22-0505-08 Copper 91 % 1,0 05/05/2022 AB22-0505-08 Iron 1113 % 20,0 05/05/2022 AB22-0505-08 Lead 99 % 1,0 05/05/2022 AB22-0505-08 Lithium 103 % 10,0 05/05/2022 AB22-0505-08 Magnesium 114 % 1000,0 05/05/2022 AB22-0505-08 Manganese 94 % 5.0 05/05/2022 AB22-0505-08 Manganesium 110 % 5.0 05/05/2022 AB22-0505-08 Micylebenum 110 %	Barium	101	%	5.0	05/05/2022	AB22-0505-08
Cadmium 103 % 0.2 05/05/2022 AB22-0505-08 Calcium 102 % 1000.0 05/10/2022 AB22-0505-08 Chromium 97 % 1.0 05/05/2022 AB22-0505-08 Cobalt 96 % 6.0 05/05/2022 AB22-0505-08 Copper 91 % 1.0 05/05/2022 AB22-0505-08 Iron 113 % 20,0 05/05/2022 AB22-0505-08 Lead 99 % 1.0 05/05/2022 AB22-0505-08 Lithium 103 % 10,0 05/05/2022 AB22-0505-08 Magnesium 114 % 100,0 05/05/2022 AB22-0505-08 Molybdenum 110 % 5.0 05/05/2022 AB22-0505-08 Mickel 90 % 2.0 05/05/2022 AB22-0505-08 Nickel 90 % 100,0 05/10/2022 AB22-0505-08 Selenium 92 % 10	Beryllium	101	%	1.0	05/05/2022	AB22-0505-08
Calcium 102 % 1000.0 05/10/2022 AB22-0505-08 Chromium 97 % 1.0 05/05/2022 AB22-0505-08 Cobalt 96 % 6.0 05/05/2022 AB22-0505-08 Copper 91 % 1.0 05/05/2022 AB22-0505-08 Iron 1113 % 20.0 05/05/2022 AB22-0505-08 Lead 99 % 1.0 05/05/2022 AB22-0505-08 Lithium 103 % 10.0 05/05/2022 AB22-0505-08 Manganesium 1114 % 1000.0 05/05/2022 AB22-0505-08 Molybdenum 110 % 5.0 05/05/2022 AB22-0505-08 Mickel 90 % 2.0 05/05/2022 AB22-0505-08 Nickel 90 % 1.0 05/05/2022 AB22-0505-08 Potassium 109 % 1.0 05/05/2022 AB22-0505-08 Selenium 92 % <	Boron	111	%	20.0	05/05/2022	AB22-0505-08
Chromium 97 % 1.0 05/05/2022 AB22-0505-08 Cobalt 96 % 6.0 05/05/2022 AB22-0505-08 Copper 91 % 1.0 05/05/2022 AB22-0505-08 Iron 1113 % 20.0 05/05/2022 AB22-0505-08 Lead 99 % 1.0 05/05/2022 AB22-0505-08 Lithium 103 % 10.0 05/05/2022 AB22-0505-08 Magnesium 114 % 1000.0 05/10/2022 AB22-0505-08 Manganese 94 % 5.0 05/05/2022 AB22-0505-08 Molybdenum 110 % 5.0 05/05/2022 AB22-0505-08 Mickel 90 % 2.0 05/05/2022 AB22-0505-08 Potassium 109 % 100.0 05/05/2022 AB22-0505-08 Selenium 92 % 1.0 05/05/2022 AB22-0505-08 Silver 1113 % <t< td=""><td>Cadmium</td><td>103</td><td>%</td><td>0.2</td><td>05/05/2022</td><td>AB22-0505-08</td></t<>	Cadmium	103	%	0.2	05/05/2022	AB22-0505-08
Cobalt 96 % 6.0 05/05/2022 AB22-0505-08 Copper 91 % 1.0 05/05/2022 AB22-0506-08 Iron 1113 % 20.0 05/05/2022 AB22-0505-08 Lead 99 % 1.0 05/05/2022 AB22-0505-08 Lithium 103 % 1.0 05/05/2022 AB22-0506-08 Magnesium 114 % 1000.0 05/05/2022 AB22-0506-08 Manganese 94 % 5.0 05/05/2022 AB22-0506-08 Molybdenum 110 % 5.0 05/05/2022 AB22-0506-08 Mickel 90 % 2.0 05/05/2022 AB22-0506-08 Potassium 109 % 1.0 05/05/2022 AB22-0506-08 Selenium 92 % 1.0 05/05/2022 AB22-0506-08 Silver 113 % 0.2 05/05/2022 AB22-0506-08 Thallium 99 % 2.	Calcium	102	%	1000.0	05/10/2022	AB22-0505-08
Copper 91 % 1.0 05/05/2022 AB22-0505-08 Iron 1113 % 20.0 05/05/2022 AB22-0505-08 Lead 99 % 1.0 05/05/2022 AB22-0505-08 Lithium 103 % 10.0 05/05/2022 AB22-0505-08 Magnesium 114 % 100.0 05/05/2022 AB22-0505-08 Manganese 94 % 5.0 05/05/2022 AB22-0505-08 Molybdenum 110 % 5.0 05/05/2022 AB22-0505-08 Nickel 90 % 2.0 05/05/2022 AB22-0505-08 Potassium 109 % 10.0 05/05/2022 AB22-0505-08 Selenium 92 % 1.0 05/05/2022 AB22-0505-08 Silver 113 % 0.2 05/05/2022 AB22-0505-08 Sodium 116 % 100.0 05/05/2022 AB22-0505-08 Thallium 99 % <t< td=""><td>Chromium</td><td>97</td><td>%</td><td>1.0</td><td>05/05/2022</td><td>AB22-0505-08</td></t<>	Chromium	97	%	1.0	05/05/2022	AB22-0505-08
Iron	Cobalt	96	%	6.0	05/05/2022	AB22-0505-08
Lead 99 % 1.0 05/05/2022 AB22-0505-08 Lithium 103 % 10.0 05/05/2022 AB22-0505-08 Magnesium 114 % 1000.0 05/10/2022 AB22-0505-08 Manganese 94 % 5.0 05/05/2022 AB22-0505-08 Molybdenum 110 % 5.0 05/05/2022 AB22-0505-08 Nickel 90 % 2.0 05/05/2022 AB22-0505-08 Potassium 109 % 100.0 05/10/2022 AB22-0505-08 Selenium 92 % 1.0 05/05/2022 AB22-0505-08 Silver 113 % 0.2 05/05/2022 AB22-0505-08 Sodium 116 % 1000.0 05/10/2022 AB22-0505-08 Sodium 99 % 2.0 05/05/2022 AB22-0505-08 Tallium 99 % 2.0 05/05/2022 AB22-0505-08 Zinc 91 % <td< td=""><td>Copper</td><td>91</td><td>%</td><td>1.0</td><td>05/05/2022</td><td>AB22-0505-08</td></td<>	Copper	91	%	1.0	05/05/2022	AB22-0505-08
Lithium 103 % 10.0 05/05/2022 AB22-0505-08 Magnesium 114 % 1000.0 05/10/2022 AB22-0505-08 Manganese 94 % 5.0 05/05/2022 AB22-0505-08 Molybdenum 110 % 5.0 05/05/2022 AB22-0505-08 Nickel 90 % 2.0 05/05/2022 AB22-0505-08 Potassium 109 % 10.0 05/10/2022 AB22-0505-08 Selenium 92 % 1.0 05/05/2022 AB22-0505-08 Silver 113 % 0.2 05/05/2022 AB22-0505-08 Sodium 116 % 1000.0 05/10/2022 AB22-0505-08 Thallium 99 % 2.0 05/05/2022 AB22-0505-08 Vanadium 98 % 2.0 05/05/2022 AB22-0505-08 Mercury by EPA 7470A, Total, Aqueous Flag Units RL Analysis Date Tracking Mercury by EPA 300.0 A	Iron	113	%	20.0	05/05/2022	AB22-0505-08
Magnesium 114 % 1000.0 05/10/2022 AB22-0505-08 Manganese 94 % 5.0 05/05/2022 AB22-0505-08 Molybdenum 110 % 5.0 05/05/2022 AB22-0505-08 Nickel 90 % 2.0 05/05/2022 AB22-0505-08 Potassium 109 % 10.0 05/05/2022 AB22-0505-08 Selenium 92 % 1.0 05/05/2022 AB22-0505-08 Silver 113 % 0.2 05/05/2022 AB22-0505-08 Sodium 116 % 1000.0 05/10/2022 AB22-0505-08 Thallium 99 % 2.0 05/05/2022 AB22-0505-08 Vanadium 98 % 2.0 05/05/2022 AB22-0505-08 Zinc 91 % 10.0 05/05/2022 AB22-0505-08 Mercury by EPA 7470A, Total, Aqueous Flag Units RL Analysis Date Tracking Mercury 9	Lead	99	%	1.0	05/05/2022	AB22-0505-08
Manganese 94 % 5.0 05/05/2022 AB22-0505-08 Molybdenum 110 % 5.0 05/05/2022 AB22-0505-08 Nickel 90 % 2.0 05/05/2022 AB22-0505-08 Potassium 109 % 100.0 05/10/2022 AB22-0505-08 Selenium 92 % 1.0 05/05/2022 AB22-0505-08 Silver 113 % 0.2 05/05/2022 AB22-0505-08 Sodium 116 % 1000.0 05/10/2022 AB22-0505-08 Thallium 99 % 2.0 05/05/2022 AB22-0505-08 Vanadium 98 % 2.0 05/05/2022 AB22-0505-08 Zinc 91 % 10.0 05/05/2022 AB22-0505-08 Mercury by EPA 7470A, Total, Aqueous Flag Units RL Analysis Date Tracking Mercury 94.0 % 0.2 05/09/2022 AB22-0509-01 Anions by EPA 300.0 Aqueous,	Lithium	103	%	10.0	05/05/2022	AB22-0505-08
Molybdenum 110 % 5.0 05/05/2022 AB22-0505-08 Nickel 90 % 2.0 05/05/2022 AB22-0505-08 Potassium 109 % 100.0 05/10/2022 AB22-0505-08 Selenium 92 % 1.0 05/05/2022 AB22-0505-08 Silver 113 % 0.2 05/05/2022 AB22-0505-08 Sodium 116 % 1000.0 05/10/2022 AB22-0505-08 Tallium 99 % 2.0 05/05/2022 AB22-0505-08 Vanadium 98 % 2.0 05/05/2022 AB22-0505-08 Zinc 91 % 10.0 05/05/2022 AB22-0505-08 Mercury by EPA 7470A, Total, Aqueous Aliquot #: 22-0437-03-C01-A02 Analyst: CLH Parameter(s) Result Flag Units RL Analysis Date Tracking Nitrate 93 % 100.0 05/04/2022 AB22-0504-08 Nitrite<	Magnesium	114	%	1000.0	05/10/2022	AB22-0505-08
Nickel 90 % 2.0 05/05/2022 AB22-0505-08 Potassium 109 % 100.0 05/10/2022 AB22-0505-08 Selenium 92 % 1.0 05/05/2022 AB22-0505-08 Silver 113 % 0.2 05/05/2022 AB22-0505-08 Sodium 116 % 1000.0 05/10/2022 AB22-0505-08 Thallium 99 % 2.0 05/05/2022 AB22-0505-08 Vanadium 98 % 2.0 05/05/2022 AB22-0505-08 Zinc 91 % 10.0 05/05/2022 AB22-0505-08 Mercury by EPA 7470A, Total, Aqueous Flag Units RL Analysis Date Tracking Mercury by EPA 7470A, Total, Aqueous Result Flag Units RL Analysis Date Tracking Mercury by EPA 7470A, Total, Aqueous Paulous Result Flag Units RL Analysis Date Tracking Anions by EPA 300.0 Aqueous, NO2, NO3 Aliqu	Manganese	94	%	5.0	05/05/2022	AB22-0505-08
Potassium 109 % 100.0 05/10/2022 AB22-0505-08 Selenium 92 % 1.0 05/05/2022 AB22-0505-08 Silver 113 % 0.2 05/05/2022 AB22-0505-08 Sodium 116 % 1000.0 05/10/2022 AB22-0505-08 Thallium 99 % 2.0 05/05/2022 AB22-0505-08 Vanadium 98 % 2.0 05/05/2022 AB22-0505-08 Zinc 91 % 10.0 05/05/2022 AB22-0505-08 Mercury by EPA 7470A, Total, Aqueous Flag Units RL Analysis Date Tracking Mercury 94.0 % 0.2 05/09/2022 AB22-0509-01 Anions by EPA 300.0 Aqueous, NO2, NO3 Aliquot #: 22-0437-03-C02-A01 Analyst: DMW Parameter(s) Result Flag Units RL Analysis Date Tracking Nitrate 93 % 100.0 05/04/2022 AB22-0504-08 Nitrite <td>Molybdenum</td> <td>110</td> <td>%</td> <td>5.0</td> <td>05/05/2022</td> <td>AB22-0505-08</td>	Molybdenum	110	%	5.0	05/05/2022	AB22-0505-08
Selenium 92 % 1.0 05/05/2022 AB22-0505-08 Silver 113 % 0.2 05/05/2022 AB22-0505-08 Sodium 116 % 1000.0 05/10/2022 AB22-0505-08 Thallium 99 % 2.0 05/05/2022 AB22-0505-08 Vanadium 98 % 2.0 05/05/2022 AB22-0505-08 Zinc 91 % 10.0 05/05/2022 AB22-0505-08 Mercury by EPA 7470A, Total, Aqueous Flag Units RL Analysis Date Tracking Mercury 94.0 % 0.2 05/09/2022 AB22-0509-01 Anions by EPA 300.0 Aqueous, NO2, NO3 Aliquot #: 22-0437-03-C02-A01 Analyst: DMW Parameter(s) Result Flag Units RL Analysis Date Tracking Nitrate 93 % 100.0 05/04/2022 AB22-0504-08 Nitrite 93 % 100.0 05/04/2022 AB22-0504-08 Anions by EPA	Nickel	90	%	2.0	05/05/2022	AB22-0505-08
Silver 113 % 0.2 05/05/2022 AB22-0505-08 Sodium 116 % 1000.0 05/10/2022 AB22-0505-08 Thallium 99 % 2.0 05/05/2022 AB22-0505-08 Vanadium 98 % 2.0 05/05/2022 AB22-0505-08 Zinc 91 % 10.0 05/05/2022 AB22-0505-08 Mercury by EPA 7470A, Total, Aqueous Aliquot #: 22-0437-03-C01-A02 Analyst: CLH Parameter(s) Result Flag Units RL Analysis Date Tracking Nitrate 93 % 100.0 05/04/2022 AB22-0504-08 Nitrite 93 % 100.0 05/04/2022 AB22-0504-08 Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous Aliquot #: 22-0437-03-C02-A02 Analyst: DMW Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous Aliquot #: 22-0437-03-C02-A02 Analyst: DMW	Potassium	109	%	100.0	05/10/2022	AB22-0505-08
Sodium	Selenium	92	%	1.0	05/05/2022	AB22-0505-08
Thallium 99 % 2.0 05/05/2022 AB22-0505-08 Vanadium 98 % 2.0 05/05/2022 AB22-0505-08 Zinc 91 % 10.0 05/05/2022 AB22-0505-08 Mercury by EPA 7470A, Total, Aqueous Aliquot #: 22-0437-03-C01-A02 Analyst: CLH Parameter(s) Result Flag Units RL Analysis Date Tracking Mercury 94.0 % 0.2 05/09/2022 AB22-0509-01 Anions by EPA 300.0 Aqueous, NO2, NO3 Aliquot #: 22-0437-03-C02-A01 Analyst: DMW Parameter(s) Result Flag Units RL Analysis Date Tracking Nitrate 93 % 100.0 05/04/2022 AB22-0504-08 Nitrite 93 % 100.0 05/04/2022 AB22-0504-08 Anions by EPA 300.0 CCR Rule Analyte List, CI, F, SO4, Aqueous Aliquot #: 22-0437-03-C02-A02 Analyst: DMW Parameter(s) Result Flag Units RL Analysis Date	Silver	113	%	0.2	05/05/2022	AB22-0505-08
Vanadium 98 % 2.0 05/05/2022 AB22-0505-08 Mercury by EPA 7470A, Total, Aqueous Aliquot #: 22-0437-03-C01-A02 Analyst: CLH Parameter(s) Result Flag Units RL Analysis Date Tracking Mercury 94.0 % 0.2 05/09/2022 AB22-0509-01 Anions by EPA 300.0 Aqueous, NO2, NO3 Aliquot #: 22-0437-03-C02-A01 Analyst: DMW Parameter(s) Result Flag Units RL Analysis Date Tracking Nitrate 93 % 100.0 05/04/2022 AB22-0504-08 Nitrite 93 % 100.0 05/04/2022 AB22-0504-08 Anions by EPA 300.0 CCR Rule Analyte List, CI, F, SO4, Aqueous Aliquot #: 22-0437-03-C02-A02 Analyst: DMW Parameter(s) Result Flag Units RL Analysis Date Tracking	Sodium	116	%	1000.0	05/10/2022	AB22-0505-08
Zinc 91 % 10.0 05/05/2022 AB22-0505-08 Mercury by EPA 7470A, Total, Aqueous Aliquot #: 22-0437-03-C01-A02 Analyst: CLH Parameter(s) Result Flag Units RL Analysis Date Tracking Mercury 94.0 % 0.2 05/09/2022 AB22-0509-01 Anions by EPA 300.0 Aqueous, NO2, NO3 Aliquot #: 22-0437-03-C02-A01 Analyst: DMW Parameter(s) Result Flag Units RL Analysis Date Tracking Nitrate 93 % 100.0 05/04/2022 AB22-0504-08 Nitrite 93 % 100.0 05/04/2022 AB22-0504-08 Anions by EPA 300.0 CCR Rule Analyte List, CI, F, SO4, Aqueous Aliquot #: 22-0437-03-C02-A02 Analyst: DMW Parameter(s) Result Flag Units RL Analysis Date Tracking	Thallium	99	%	2.0	05/05/2022	AB22-0505-08
Mercury by EPA 7470A, Total, Aqueous Aliquot #: 22-0437-03-C01-A02 Analyst: CLH Parameter(s) Result Flag Units RL Analysis Date Tracking Mercury 94.0 % 0.2 05/09/2022 AB22-0509-01 Anions by EPA 300.0 Aqueous, NO2, NO3 Aliquot #: 22-0437-03-C02-A01 Analyst: DMW Parameter(s) Result Flag Units RL Analysis Date Tracking Nitrate 93 % 100.0 05/04/2022 AB22-0504-08 Nitrite 93 % 100.0 05/04/2022 AB22-0504-08 Anions by EPA 300.0 CCR Rule Analyte List, CI, F, SO4, Aqueous Aliquot #: 22-0437-03-C02-A02 Analyst: DMW Parameter(s) Result Flag Units RL Analysis Date Tracking	Vanadium	98	%	2.0	05/05/2022	AB22-0505-08
Parameter(s) Result Flag Units RL Analysis Date Tracking Mercury 94.0 % 0.2 05/09/2022 AB22-0509-01 Anions by EPA 300.0 Aqueous, NO2, NO3 Aliquot #: 22-0437-03-C02-A01 Analyst: DMW Parameter(s) Result Flag Units RL Analysis Date Tracking Nitrate 93 % 100.0 05/04/2022 AB22-0504-08 Nitrite 93 % 100.0 05/04/2022 AB22-0504-08 Anions by EPA 300.0 CCR Rule Analyte List, CI, F, SO4, Aqueous Aliquot #: 22-0437-03-C02-A02 Analyst: DMW Parameter(s) Result Flag Units RL Analysis Date Tracking	Zinc	91	%	10.0	05/05/2022	AB22-0505-08
Mercury 94.0 % 0.2 05/09/2022 AB22-0509-01 Anions by EPA 300.0 Aqueous, NO2, NO3 Aliquot #: 22-0437-03-C02-A01 Analyst: DMW Parameter(s) Result Flag Units RL Analysis Date Tracking Nitrate 93 % 100.0 05/04/2022 AB22-0504-08 Nitrite 93 % 100.0 05/04/2022 AB22-0504-08 Anions by EPA 300.0 CCR Rule Analyte List, CI, F, SO4, Aqueous Aliquot #: 22-0437-03-C02-A02 Analyst: DMW Parameter(s) Result Flag Units RL Analysis Date Tracking	Mercury by EPA 7470A, To	tal, Aqueous		Aliquot #: 22-0	437-03-C01-A02	Analyst: CLH
Anions by EPA 300.0 Aqueous, NO2, NO3 Aliquot #: 22-0437-03-C02-A01 Analyst: DMW Parameter(s) Result Flag Units RL Analysis Date Tracking Nitrate 93 % 100.0 05/04/2022 AB22-0504-08 Nitrite 93 % 100.0 05/04/2022 AB22-0504-08 Anions by EPA 300.0 CCR Rule Analyte List, CI, F, SO4, Aqueous Aliquot #: 22-0437-03-C02-A02 Analyst: DMW Parameter(s) Result Flag Units RL Analysis Date Tracking	Parameter(s)	Result	Flag Uni	ts RL	Analysis Date	Tracking
Parameter(s) Result Flag Units RL Analysis Date Tracking Nitrate 93 % 100.0 05/04/2022 AB22-0504-08 Nitrite 93 % 100.0 05/04/2022 AB22-0504-08 Anions by EPA 300.0 CCR Rule Analyte List, CI, F, SO4, Aqueous Aliquot #: 22-0437-03-C02-A02 Analyst: DMW Parameter(s) Result Flag Units RL Analysis Date Tracking	Mercury	94.0	%	0.2	05/09/2022	AB22-0509-01
Nitrate 93 % 100.0 05/04/2022 AB22-0504-08 Nitrite 93 % 100.0 05/04/2022 AB22-0504-08 Anions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous Aliquot #: 22-0437-03-C02-A02 Analyst: DMW Parameter(s) Result Flag Units RL Analysis Date Tracking	Anions by EPA 300.0 Aque	ous, NO2, NO3		Aliquot #: 22-0	437-03-C02-A01	Analyst: DMW
Nitrite 93 % 100.0 05/04/2022 AB22-0504-08 Anions by EPA 300.0 CCR Rule Analyte List, CI, F, SO4, Aqueous Aliquot #: 22-0437-03-C02-A02 Analyst: DMW Parameter(s) Result Flag Units RL Analysis Date Tracking	Parameter(s)	Result	Flag Uni	ts RL	Analysis Date	Tracking
Anions by EPA 300.0 CCR Rule Analyte List, CI, F, SO4, Aqueous Aliquot #: 22-0437-03-C02-A02 Analyst: DMW Parameter(s) Result Flag Units RL Analysis Date Tracking	Nitrate	93	%	100.0	05/04/2022	AB22-0504-08
Parameter(s) Result Flag Units RL Analysis Date Tracking	Nitrite	93	%	100.0	05/04/2022	AB22-0504-08
.,	Anions by EPA 300.0 CCR	Rule Analyte List, Cl, F, S	SO4, Aqueous	Aliquot #: 22-0	437-03-C02-A02	Analyst: DMW
Chloride 113 % 1000.0 05/06/2022 AB22-0505-07	Parameter(s)	Result	Flag Uni	ts RL	Analysis Date	Tracking
	Chloride	113	%	1000.0	05/06/2022	AB22-0505-07





A CENTURY OF EXCELLENCE

Report Date: 05/22/22

Sample Site: **DEK Bottom Ash Pond & Lined Impoundment** Laboratory Project: 22-0437

Field Sample ID: DEK-MW-18001 MSD Collect Date: 05/03/2022 Lab Sample ID: 22-0437-03 Collect Time: 01:44 PM

Matrix: Groundwater

Anions by EPA 300.0 CCR Rule Analy	te List, CI, F, S	04, Aqι	ieous	Aliquot #: 22-0	437-03-C02-A02	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	83		%	1000.0	05/04/2022	AB22-0505-07
Sulfate	114		%	1000.0	05/06/2022	AB22-0505-07
Nitrogen-Ammonia by SM4500NH3(h)	, Groundwater	HL		Aliquot #: 22-0	437-03-C03-A01	Analyst: LMO
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	103		%	25.0	05/09/2022	AB22-0509-09
Alkalinity by SM 2320B				Aliquot #: 22-0	437-03-C05-A01	Analyst: DLS
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	96.7		%	10000.0	05/09/2022	AB22-0509-08
Sulfide, Total by SM 4500 S2D				Aliquot #: 22-0	437-03-C07-A01	Analyst: Merit
Sulfide, Total by SM 4500 S2D Parameter(s)	Result	Flag	Units	Aliquot #: 22-0	437-03-C07-A01 Analysis Date	Analyst: Merit Tracking
· · · · · · · · · · · · · · · · · · ·	Result	Flag	Units %	•		
Parameter(s) Sulfide	92	Flag		RL 20.0	Analysis Date 05/06/2022	Tracking AB22-0509-15
Parameter(s)	92	Flag		RL 20.0	Analysis Date	Tracking
Parameter(s) Sulfide	92	Flag		RL 20.0	Analysis Date 05/06/2022	Tracking AB22-0509-15
Parameter(s) Sulfide Total Organic Carbon by SM 5310B, A	92 .queous		%	RL 20.0 Aliquot #: 22-0	Analysis Date 05/06/2022 0437-03-C08-A01	Tracking AB22-0509-15 Analyst: BAL
Parameter(s) Sulfide Total Organic Carbon by SM 5310B, A Parameter(s)	92 Aqueous Result 117		% Units	RL 20.0 Aliquot #: 22-0 RL 1000.0	Analysis Date 05/06/2022 0437-03-C08-A01 Analysis Date	Tracking AB22-0509-15 Analyst: BAL Tracking
Parameter(s) Sulfide Total Organic Carbon by SM 5310B, A Parameter(s) Total Organic Carbon	92 Aqueous Result 117		% Units	RL 20.0 Aliquot #: 22-0 RL 1000.0	Analysis Date 05/06/2022 0437-03-C08-A01 Analysis Date 05/10/2022	Tracking AB22-0509-15 Analyst: BAL Tracking AB22-0519-08





Report Date: 05/22/22

Data Qualifiers	Exception Summary
	No exceptions occurred.

CONSUMERS ENERGY

10+4.

Chemistry Department

General Standard Operating Procedure

PROC CHEM-1.2.01 PAGE 1 OF 2 **REVISION 2** ATTACHMENT A

TITLE:	SAMPLE LOG-IN – SHIPMENT INSPECTION FORM
	49 424

Pro		ľ		2000		
Insp	pection Date: 05 04	[22	Inspection	By: CUT		
San	iple Origin/Project Name	" DEK L	I + BAP			
Ship	oment Delivered By: Ent	er the type of ship	ment carrier.			
			UPS		_ Airb	orne
			Shipp		ed: Yes X	No
Ship	pping Containers: Enter t	he type and numb	er of shipping contain	ers received.		
	Cooler 🗸	Cardboard Box	Custom	Case	Envelope	e/Mailer
	Loose/Unpackaged C	ontainers	Other_			
Con	dition of Shipment: Ente	er the as-received	condition of the shipm	ent container.		
	Damaged Shipment C		<u>v</u> D	ented		cing
Chi						
	ment Security Enter if a	my of the chinning	containers were oner	ed before recein		
Sing	oment Security: Enter if a		Carlotte and Carlotte		r.	
Sing	oment Security: Enter if a Shipping Containers I		Carlotte and Carlotte		I.	
		Received: Opened	. Se	ealed	I.	
	Shipping Containers I	Received: Opened	Seents enclosed with the	ealed	Other	
Enc	Shipping Containers I	Received: Opened he type of docume ork Request	See	shipment.		
Enc	Shipping Containers I losed Documents: Enter to CoC Wo	Received: Opened the type of docume ork Request Measure the temp	Seents enclosed with the Air Data erature of several sam	shipment. Sheet	Other	
Enc	Shipping Containers I losed Documents: Enter t CoC Wo sperature of Containers: As-Received Tempera	Received: Opened the type of docume ork Request Measure the temporature 1.2-1.06	ents enclosed with the Air Data erature of several sam	shipment. Sheet ple containers.	OtherYes_XNo_	
Enc	Shipping Containers Indosed Documents: Enter to CoC Wo perature of Containers: As-Received Tempera # 015402 Relater and Type of Containers	Received: Opened the type of docume ork Request Measure the temperature 1.2.1.0° 2. 6.3.22 ters: Enter the total	ents enclosed with the Air Data erature of several sam C Samples R al number of sample of	shipment. Sheet ple containers. ecceived on Ice:	Other Yes_X No_ ed.	
Enc	Shipping Containers For the CoC V Work Coc V Work Containers: As-Received Tempers As-Received Tempers Asber and Type of Container Type	Received: Opened the type of docume ork Request Measure the temperature 1.2.1.10 2. 6.3.22 ners: Enter the total	ents enclosed with the Air Data erature of several sam CL Samples R al number of sample of	shipment. Sheet ple containers. ecceived on Ice: 'containers received	OtherYes_XNo_	
Enc	Shipping Containers I losed Documents: Enter to CoC Wo perature of Containers: As-Received Tempera	Received: Opened the type of docume ork Request Measure the temperature 1.2.1.10 2. 6.3.22 ners: Enter the tot Water Service of the servi	ents enclosed with the Air Data erature of several sam C Samples R al number of sample of	shipment. Sheet ple containers. ecceived on Ice: 'containers received	Other Yes_X No_ ed.	
Enc	Shipping Containers Folgoed Documents: Enter to CoC V Worker at Containers: As-Received Temperation of Container Type of Container Type VOA (40mL or 60mL) Quart/Liter (g/p)	Received: Opened the type of docume ork Request Measure the temperature 1.2-1.0° 2. 6. 3. 22 ners: Enter the tot Water 46 2 6 60 = 6	ents enclosed with the Air Data erature of several sam CL Samples R al number of sample of	shipment. Sheet ple containers. ecceived on Ice: 'containers received	Other Yes_X No_ ed.	
Enc Tem Nun	Shipping Containers Indeed Documents: Enter to CoC Wo sperature of Containers: As-Received Tempers 015402 016	Received: Opened the type of docume ork Request Measure the temperature 1.2-1.0° 2. 6. 3. 22 ners: Enter the tot Water 46 2 6 60 = 6	ents enclosed with the Air Data erature of several sam CL Samples R al number of sample of	shipment. Sheet ple containers. ecceived on Ice: 'containers received'	Other Yes_X No_ ed.	
Enc Tem Nun	Shipping Containers Folgoed Documents: Enter to CoC V Work Perature of Containers: As-Received Tempera A 0.5402 Referend Type of Container Type VOA (40mL or 60mL) Quart/Liter (g/p) 9-oz (amber glass jar) 2-oz (amber glass)	Received: Opened the type of docume ork Request Measure the temperature 1.2-1.0° 2. 6. 3. 22 ners: Enter the tot Water Series (00-6)	ents enclosed with the Air Data erature of several sam CL Samples R al number of sample of	shipment. Sheet ple containers. ecceived on Ice: 'containers received'	Other Yes_X No_ ed.	
Enc Tem Nun † Papel 0-14	Shipping Containers Indeed Documents: Enter to CoC Wo sperature of Containers: As-Received Temperative As-Received Temperative and Type of Container Type VOA (40mL or 60mL) Quart/Liter (g/p) 9-oz (amber glass jar) 2-oz (amber glass) 125 mL (plastic)	Received: Opened the type of docume ork Request Measure the temperature 1.2-1.0° 2. 6. 3. 22 ners: Enter the tot Water 46 2 6 60 = 6	ents enclosed with the Air Data erature of several sam CL Samples R al number of sample of	shipment. Sheet ple containers. ecceived on Ice: 'containers received'	Other Yes_X No_ ed.	
Enc Tem Nun + Papel 0-14	Shipping Containers Interest CoC Wo perature of Containers: As-Received Temperature of Containers: As-Received Temperature of Container Type Work (40mL or 60mL) Quart/Liter (g/p) 9-oz (amber glass jar) 2-oz (amber glass) 125 mL (plastic) 24 mL vial (glass)	Received: Opened the type of docume ork Request Measure the temperature 1.2-1.0° 2. 6. 3. 22 ners: Enter the tot Water Series (00-6)	ents enclosed with the Air Data erature of several sam CL Samples R al number of sample of	shipment. Sheet ple containers. ecceived on Ice: 'containers received'	Other Yes_X No_ ed.	
Enc Tem Nun 1 Papel 0 - 14	Shipping Containers Indeed Documents: Enter to CoC Wo sperature of Containers: As-Received Temperative As-Received Temperative and Type of Container Type VOA (40mL or 60mL) Quart/Liter (g/p) 9-oz (amber glass jar) 2-oz (amber glass) 125 mL (plastic)	Received: Opened the type of docume ork Request Measure the temperature 1.2-1.0° 2. 6. 3. 22 ners: Enter the tot Water Series (00-6)	ents enclosed with the Air Data erature of several sam CL Samples R al number of sample of	shipment. Sheet ple containers. ecceived on Ice: 'containers received'	Other Yes_X No_ ed.	

CHAIN OF CUSTODY



CONSUMERS ENERGY COMPANY - LABORATORY SERVICES

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

Page 6 of

	NG SITE / CU		Date Con Wor.							ANA	LYS	IS R	EQL	JEST	ED	0 -	QA REQUIREMENT:					
		m Ash Pond &	Lined Imp	ound.	22-0437 REQUESTER: Harold Register						(At	tach L	ist if	More	Space	e is	Need	led)	Q. F. TOQ C. IT C. IT.			
SAMPLII	NG TEAM:				TURNAROUND TIME REQUIRED: □ 24 HR □ 48 HR □ 3 DAYS □ S	TANDARD ⊠ OT	HER_															□ NPDES ☑ TNI
SEND R	EPORT TO:	Caleb Batts			email:	phone:															ırbon	☐ ISO 17025
со	PY TO:	Harold Regis	ster		MATRIX CODES: GW = Groundwater OX = Other			C	ONT	AI	NER	s							4	110011	ic Ca	☐ 10 CFR 50 APP. B
		TRC			WW = Wastewater SL = Slud W = Water / Aqueous Liquid A = Air			I	PRE	SER	VA	TIVE	٦,	als						2)rgan	☐ INTERNAL INFO ☐ OTHER
- 1	LAB	SAMPLE COL	LECTION	XIX	S = Soil / General Solid WP = Wi	pe neral Waste	TOTAL#			-7 ,	_	ш		II Metals	Ammonia		Alkalinity) e		i otal Organic Caroni	Dissolved Organic Carbon	
SAM	PLE ID	DATE	TIME	MATRIX	FIELD SAMPLE ID / LO	FIELD SAMPLE ID / LOCATION		None	HNO	H ₂ SO	NaOF	МеОН	Other	Iotal	Ammoni	TDS	Alka	Sulfide	Total L	LOIA	Disse	REMARKS
22-	0437-01	4/3/52	1344	GW	DEK-MW-18001		9	4	1	1	1 2			x >	x	x	x	x	×	ζ .	x	
	-02	10 11	1344	GW	DEK-MW-18001 MS		8	3	1	1	1 2			x >	x		x	x	>	ζ .	x	
1	-03	1111	1344	GW	DEK-MW-18001 MSD		8	3	1	1	1 2			x >	x		x	x	>	ζ .	x	
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										1	+	+	+			4	+					
								H		-	+	H	+		-						-	
									H	-	+	H	+									
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DEL SIG	norms ar-														7.5							
RELINQU	JISHED BY:			DATE/		RECEIVED BY:							12	COM	MENT	S:						
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RELINO	USHED BY:			DATE/	TIME:	RECEIVED BY:								Receiv								E#: 015402
	Fed	Ex		5.0	4-22 10:25	V							3	Гетр	rature	1.2	-1-	6 .	C		Cal. D	Due Date: 6-3-22
						22-0437 Page 13	of 32															



Report ID: S35622.01(01) Generated on 05/06/2022

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): S35622.01-S35622.03

Project: 22-0437 PR#22050489 Collected Date(s): 05/03/2022

Submitted Date/Time: 05/05/2022 08:15

Sampled by: Unknown P.O. #: 4400106050

Table of Contents

Cover Page (Page 1)

General Report Notes (Page 2)

Report Narrative (Page 2)

Laboratory Certifications (Page 3)

Qualifier Descriptions (Page 3)

Glossary of Abbreviations (Page 3)

Method Summary (Page 4)

Sample Summary (Page 5)

Maya Murshak Technical Director

Naya Mushah



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, acrylonitrile, and 2-chlorovinylethyl 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.

Full accreditation certificates are available upon request. Starred (*) analytes are not 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.

Report Narrative

There is no additional narrative for this analytical report



Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
В	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
Н	Sample submitted and run outside of holding time
1	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
0	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
Т	No correction for total solids
X	Elevated reporting limit due to matrix interference
Υ	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
е	Reported value estimated due to interference
j	Analyte also found in associated method blank
р	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
х	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 4450 S2 D 2011

Report to Consumers Energy Company Project: 22-0437 PR#22050489 **P2**4004370Page 17 of 32



Sample Summary (3 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S35622.01	22-0437-01 (DEK-MW-18001)	Groundwater	05/03/22 07:18
S35622.02	22-0437-01 (DEK-MW-18001 Field MS)	Groundwater	05/03/22 08:05
S35622.03	22-0437-01 (DEK-MW-18001 Field MSD)	Groundwater	05/03/22 09:20



Lab Sample ID: S35622.01

Sample Tag: 22-0437-01 (DEK-MW-18001) Collected Date/Time: 05/03/2022 07:18

Matrix: Groundwater COC Reference:

Sample Containers

#	Туре	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.2	IR

Inorganics

Method: SM4500-S2 D, Run Date: 05/06/22 08:06, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	ma/L	1	18496-25-8	



Lab Sample ID: S35622.02

Sample Tag: 22-0437-01 (DEK-MW-18001 Field MS)

Collected Date/Time: 05/03/2022 08:05

Matrix: Groundwater COC Reference:

Sample Containers

#	Туре	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.2	IR

Inorganics

Method: SM4500-S2 D, Run Date: 05/06/22 08:10, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	0.183	0.02	0.005	ma/L	1	18496-25-8	1

1-* Sample spiked @ 0.200 mg/L



Lab Sample ID: S35622.03

Sample Tag: 22-0437-01 (DEK-MW-18001 Field MSD)

Collected Date/Time: 05/03/2022 09:20

Matrix: Groundwater COC Reference:

Sample Containers

#	Туре	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.2	IR

Inorganics

Method: SM4500-S2 D, Run Date: 05/06/22 08:12, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	0.183	0.02	0.005	ma/L	1	18496-25-8	1

1-* Sample spiked @ 0.200 mg/L

Merit Laboratories Login Checklist

Lab Set ID:S35622

Client: CONSUMERS (Consumers Energy)

Project: 22-0437 PR#22050489

Submitted: 05/05/2022 08:15 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

Selec	tion			Description	Note
Samp	ole Receiv	ving			
01.	X Yes	No	□ N/A	Samples are received at 4C +/- 2C Thermometer #	IR 3.2
02.	X Yes	No	□ N/A	Received on ice/ cooling process begun	
03.	Yes	X No	□ N/A	Samples shipped	
04.	X Yes	No	□ N/A	Samples left in 24 hr. drop box	
05.	X Yes	No	□ N/A	Are there custody seals/tape or is the drop box locked	
Chaiı	of Custo	ody			
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:	
Prese	ervation				
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	e Conditio	ons			
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 or TOX bottles contain headspace	
_					
Corre	ective action	on for all	exceptions	is to call the client and to notify the project manager.	
Clien	t Review I	Ву:		Date:	

Merit Laboratories Bottle Preservation Check

Lab Set ID: S35622 Submitted: 05/05/2022 08:15

Client: CONSUMERS (Consumers Energy)

Project: 22-0437 PR#22050489

Initial Preservation Check: 05/05/2022 08:56 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
S35622.01	125ml Plastic NaOH	>12			
S35622.02	125ml Plastic NaOH	>12			
S35622.03	125ml Plastic NaOH	>12			



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	
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REPOR	т то] `	Laboratories, Inc.	CHAIN	OF	CU	ST	OD	Y	RE	CO	RD							11	VOI	CE TO
CONTACT NAME	Emil Blaj						7	CONT	ACT N	AME									X SAME		
COMPANY Con	sumers I	Energy						СОМР	ANY												
ADDRESS 135 V	W. Trail S	Street					11	ADDR	ESS												
Jackson				STATE MI ZIP (CODE	1920	1 0	ЭПҮ											STATE	ZIP CODE	
PHONE NO. 517-	788-5888	3	FAX NO. 517-788-2533	P.O. NO. 4400106	050			HON	E NO.					E-1	MAIL ADDI	RESS				7	
E-MAIL ADDRESS	emil.blaj	@cmsen	ergy.com	QUOTE NO.			٦Ì						ANALY:	SIS (AT	TACH	JST IF	MORE S	SPACE	IS REQUIRE	0)	- 12-31
PROJECT NO./NAM	^{ME} 22-043	FR#22	20 50489	SAMPLER(S) - PLEASE P	RINT/SI	3N NAM	NE L				N/A	7	TT	T				T	Certification		
TURNAROUNI	D TIME RE	QUIRED	□1 DAY □2 DAYS □3 DA	AYS STANDARD [ОТІ	HER .													OHIO VAF	Drin	king Water
DELIVERABLE	S REQUIR	ED S	TD X LEVEL II LEVEL III	LEVEL IV EDD		THEF	· _						4 1						□D ₀ D	NPD	ES
MATRIX CODE:	GW=GROUN SL=SLUDG		WW=WASTEWATER S=SO DRINKING WATER O=OIL V		=SOLI V=WAS				ntair		22	Sulfide							Project Loc Detroit	ations New	York
MERIT LAB NO.	YE	AR	SAMPLE 1		XIII	J.ES	¥.	5 6	00	Ŧ	FE	Total							Other _		7720
FOR LAB USE ONLY	DATE	TIME	IDENTIFICATION-DE	SCRIPTION	MATRIX	# OF BOTTLES	NONE	E E	H,SO,	NaOH	MeOH	Ĕ							Special Ins	tructions	
35622.01	05/03/22		22-0437-01 (DEK-MW-1	8001)	GW	1		1	\sqcup	1		√							preserved wi	th NaOH/	ZnAcetate
.02	05/03/22		22-0437-02 (DEK-MW-1	8001 Field MS)	GW	1				1		1							"		
.03	05/03/22	0920	22-0437-03 (DEK-MW-1)	8001 Field MSD)	GW	1			Ц	1		1							"		
									П										Please spike	MS/MSD a	and report
							4	-		1		_							spike conce	ntration a	nd/or rec.
					\vdash			+	H	+	+	H	++	+	-			-			
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RELINQUISHED BY SIGNATURE/ORGA RECEIVED BY:		Yis	NUMBERS ENERGY	Sampler DATE OS-O4-22	18	IME 20	8	IGNA	DUISH TURE/	ORG		TION		h	neri	+ Dr	90	Box	5/	DATE 5/22	0815
SIGNATURE/ORGA		U		DATE	T	IME			VED BY		ANIZA	TION			m	Oh	Cca	L	5/	DATE 5/22	08/5
RELINQUISHED BY SIGNATURE/ORGA				DATE	TI	ME	S	EALN	10.			1	SEAL INTAC	NOD	INITIA	LS	NOTE	ES:	TEMP. ON AR		
RECEIVED BY: SIGNATURE/ORGA	INIZATION			DATE	TI	ME .	s	EALN	Ю.				SEAL INTAC		INITIA	LS				3. :	2



2105 Pless Drive Brighton, Michigan 48114 Phone (810)229-7575 Fax (810)229-8650 E-mail bai-brighton@sbcglobal.net

May 11, 2022

Consumers Energy Company 135 W. Trail St. Jackson, MI 49201

Subject: Q2-2022 DEK Bottom Ash Pond&Lined Impound

22-0437

Dear Mr. Blaj:

Thank you for making Brighton Analytical, L.L.C. your laboratory of choice. Attached are the results for the samples submitted on 05/06/2022 for the above mentioned project. NELAP/TNI Accredited Analysis and EGLE Drinking Water Certified Analysis will be identified in their respective reporting formats. Hard copies can be supplied at your request for a fee of \$20.00 per copy.

The invoice for this project will be emailed separately. If you have any questions concerning the data or invoice, please don't hesitate to contact our office. We welcome your comments and suggestions to improve our quality systems. Please reference Brighton Analytical, L.L.C. Project ID 81646 when calling or emailing. We thank you for this opportunity to partner with you on this project and hope to work with you again in the future.

Sincerely, Brighton Analytical, L.L.C.







2105 Pless Drive Brighton, Michigan 48114 Phone: (810)229-7575 (810)229-8650 e-mail:bai-brighton@sbcglobal.net EGLE Certified #9404 NELAC Accredited #176507

Sample Date: 05/03/2022 Submit Date: 05/06/2022 Report Date:

05/11/2022

To:

Consumers Energy Company

135 W. Trail St. Jackson, MI 49201

BA Report Number:

BA Sample ID:

81646

CR00137

Project Name:

Q2-2022 DEK Bottom Ash Pond&Lined Impound

Project Number: 22-0437

Sample ID: 22-0437-01 DEK-MW-18001

		io / or DEIX M	** 10001			
Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon Total Organic Carbon	4800 4400	ug/L ug/L	5000 1000	SM5310B SM5310B	RG RG	05/10/2022 05/10/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Elevated DOC dl due to sample matrix.

Released by

Date

5/11/2022



2105 Pless Drive Brighton, Michigan 48114 Phone: (810)229-7575 (810)229-8650 e-mail:bai-brighton@sbcglobal.net EGLE Certified #9404 NELAC Accredited #176507

Sample Date: 05/03/2022 Submit Date: 05/06/2022

Report Date: 05/11/2022

To:

Consumers Energy Company

135 W. Trail St. Jackson, MI 49201

BA Report Number: 81

BA Sample ID:

81646

CR00138

Project Name:

Q2-2022 DEK Bottom Ash Pond&Lined Impound

Project Number: 22-0437

Sample ID: 22-0437-02 DEK-MW-18001 MS

		IO / OZ DEIL MI	11 10001 1	10		
Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon Total Organic Carbon	106% 114%	ug/L ug/L		SM5310B SM5310B	RG RG	05/10/2022 05/10/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date

5/11/2022



2105 Pless Drive Brighton, Michigan 48114 Phone: (810)229-7575 (810)229-8650 e-mail:bai-brighton@sbcglobal.net EGLE Certified #9404 NELAC Accredited #176507

Sample Date: 05/03/2022 Submit Date: 05/06/2022

Report Date: 05/11/2022

CR00139

To:

Consumers Energy Company

135 W. Trail St. Jackson, MI 49201

BA Report Number: 81646

BA Sample ID:

31646

Project Name: Q2-2022 DEK Bottom Ash Pond&Lined Impound

Project Number: 22-0437

Sample ID: 22-0437-03 DEK-MW-18001 MSD

		10 / UU DEIX IVI	. ** 10001	TOD .		
Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon Total Organic Carbon	87% 117%	ug/L ug/L		SM5310B SM5310B	RG RG	05/10/2022 05/10/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date

5/11/2022

CHAIN OF CUSTODY

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CONSUMERS ENERGY COMPANY – LABORATORY SERVICES 135 WEST TRAIL ST., JACKSON, MI 49201 • (517) 788-1251

Consumers Energy

Page of

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SAMPLING SITE / CUSTOMER:	JSTOMER:			PROJECT NUMBER:	SAP CC or WO#:			_	ANALYSIS REOUESTED	THE STATE OF THE PARTY OF THE P
Q2-2022 DEK Bottom Ash Pond & Lined Impound.	ım Ash Pond & I	Lined Imp	ound.	22-0437	REQUESTER: Emil Blaj	nil Blaj			(Attach List if More Space is Needed)	VA KEŲUIKEMENI:
SAMPLING TEAM:				TURNAROUND TIME REQUIRED:						□ NPDES
				□ 24 HR □ 48 HR □ 3 DAYS □ STA	STANDARD SOTHER				u	INI 🛭
SEND REPORT TO:	Emil Blaj			email:Emil.Blaj@cmsenergy.com	phone:			u	stpoi	□ ISO 17025
COPY TO:				MATRIX CODES: GW = Groundwater OX = Other		CONTA	CONTAINERS	Carbor	O oiru	☐ 10 CFR 50 APP. B
				s Liquid			PRESERVATIVE	O oineg	egrO t	☐ INTERNAL INFO
LAB	SAMPLE COLLECTION	ECTION	RIX	S = Soil / General Solid WP = Wipe O = Oil WT = General Waste		٤(H		solvec	□ OTHER
SAMPLE ID	DATE	TIME	TAM	FIELD SAMPLE ID / LOG	ID / LOCATION	O.L.	MeC MeC	Othe	9	N REMARKS
22-0437-01	05/03/2022	1344	GW	DEK-MW-18001		2	2	×	×	137
-0437	05/03/2022	1344	GW	DEK-MW-18001 MS	. 1	2	2	×	×	138
Page	05/03/2022	1344	GW	DEK-MW-18001 MSD		2	2	×	×	134
9 of 3										
32										
RELINQUISHED BY:	3		DATE/TIME:		RECEIVED BY:			00	COMMENTS: PR 220500	
Lessa	Sep-		5.C	5.00.12 1555	1			-1		
RELINQUISHED BY:			DATE/TIME:		RECEIVED BY:			Rec	ZVes No	Ξ#:
								Ten	Temperature: 2.4 °C Cal. D	Cal. Due Date:



BRIGHTON ANALYTICAL, LLC

QUALITY ASSURANCE/QUALITY CONTROL

REPRESENTATIVE BATCH QUALITY CONTROL Accuracy & Precision

Analyst:	RG	Parameter:	тос
Analysis Date:	5/10/2022	Method Reference:	EPA 415.1/SM5310B/9060

SPIKE - ACCURACY								
Laboratory ID	Spike level PPB	Background PPB	Recoveries (%)	Acceptable Range (%)	Method Blank Concentration			
CR00137 TV=10000		4400 114/117		80 - 120	ND			
Laboratory ID	Observed A PPB	Observed B PPB	RPD (%)	Acceptable Range(%)				
CR00137	15800	16100	1.90	<u>< 20</u>				
		MISCELLA	NEOUS					
		Standard ID#	%Recoveries					
Independent Secondar	ry Reference Material:	#4295.1	93					
Method Standard (La	b. Control Spike):	#3046.6	108					

COMMENTS:	

REPRESENTATIVE BATCH QUALITY CONTROL Accuracy & Precision

Analyst:	RG	Parameter:	DOC		
Analysis Date:	5/10/2022	Method Reference:	EPA 415.1/SM5310B/9060		

SPIKE - ACCURACY								
Laboratory ID	Spike level PPB	Background PPB	Recoveries (%)	Acceptable Range (%)	Method Blank Concentration			
CR00137	TV=10000	4800	106/87	80 - 120	ND			
Laboratory ID Observed A PPB		Observed B PPB	RPD (%)	Acceptable Range(%)				
CR00137	CR00137 15400 13500		13.10					
		MISCELLA	NEOUS					
		Standard ID#	%Recoveries					
Independent Secondar	y Reference Material:	#4295.1	93					
Method Standard (Lab	o. Control Spike):	#3046.6	108					

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

To: CDBatts, Karn/Weadock

From: EBlaj, T-258

Date: May 25, 2022

Subject: RCRA GROUNDWATER MONITORING – DEK-JCW BACKGROUND WELLS – 2022 Q2

CC: HDRegister, P22-521 Darby Litz, Project Manager

BLSwanberg, P22-119 TRC Companies, Inc.

1540 Eisenhower Place Ann Arbor, MI 48108

Chemistry Project: 22-0443

TRC Environmental, Inc. conducted groundwater monitoring at the Karn/Weadock Background Wells area on 05/02/2022 and 05/03/2022, for the 2nd Quarter monitoring 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 05/04/2022.

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



Testing performed in accordance with the A2LA scope of accredidation specified in the listed certificate. The information contained in this report is the sole property of Consumers Energy. It cannot be reproduced except in full, and with consent from Consumers Energy, or the customer for which this report was issued.

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, when applicable; 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:

<u>Acronym</u>	<u>Description</u>
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

<u>Qualifier</u>	<u>Description</u>
*	Generic data flag, applicable description added in the corresponding notes section
В	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
Н	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



Work Order Sample Summary

Customer Name: Karn/Weadock Complex

Work Order ID: Q2-2022 JCW-DEK Background Wells

Date Received: 5/04/2022 **Chemistry Project:** 22-0443

Sample #	Field Sample ID	<u>Matrix</u>	Sample Date	<u>Site</u>
22-0443-01	MW-15002	Groundwater	05/02/2022 05:24 PM	DEK JCW Background
22-0443-02	MW-15008	Groundwater	05/02/2022 01:45 PM	DEK JCW Background
22-0443-03	MW-15016	Groundwater	05/03/2022 08:37 AM	DEK JCW Background
22-0443-04	MW-15019	Groundwater	05/02/2022 03:20 PM	DEK JCW Background
22-0443-05	DUP-Background	Groundwater	05/02/2022 12:00 AM	DEK JCW Background
22-0443-06	FB- Background	Water	05/02/2022 01:45 PM	DEK JCW Background

Report Date:

05/25/22



Laboratory Services
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Sample Site: **DEK JCW Background** Laboratory Project: **22-0443**

 Field Sample ID:
 MW-15002
 Collect Date:
 05/02/2022

 Lab Sample ID:
 22-0443-01
 Collect Time:
 05:24 PM

Matrix: Groundwater

Mercury by EPA 7470A, Total, Aqueou	s			Aliquot #: 22-0	0443-01-C01-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/10/2022	AB22-0510-04
Metals by EPA 6020B: CCR Rule Appe	ndix III-IV To	tal Metals	s Exp	Aliquot #: 22-0)443-01-C01-A02	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Arsenic	14		ug/L	1.0	05/11/2022	AB22-0511-14
Barium	682		ug/L	5.0	05/11/2022	AB22-0511-14
Beryllium	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Boron	103		ug/L	20.0	05/11/2022	AB22-0511-14
Cadmium	ND		ug/L	0.2	05/11/2022	AB22-0511-14
Calcium	238000		ug/L	1000.0	05/12/2022	AB22-0511-14
Chromium	3		ug/L	1.0	05/11/2022	AB22-0511-14
Cobalt	ND		ug/L	6.0	05/11/2022	AB22-0511-14
Copper	3		ug/L	1.0	05/11/2022	AB22-0511-14
Iron	16100		ug/L	20.0	05/11/2022	AB22-0511-14
Lead	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Lithium	16		ug/L	10.0	05/11/2022	AB22-0511-14
Molybdenum	ND		ug/L	5.0	05/11/2022	AB22-0511-14
Nickel	14		ug/L	2.0	05/11/2022	AB22-0511-14
Selenium	54		ug/L	1.0	05/11/2022	AB22-0511-14
Silver	ND		ug/L	0.2	05/11/2022	AB22-0511-14
Thallium	ND		ug/L	2.0	05/11/2022	AB22-0511-14
Vanadium	15		ug/L	2.0	05/11/2022	AB22-0511-14
Zinc	23		ug/L	10.0	05/11/2022	AB22-0511-14
Anions by EPA 300.0 CCR Rule Analyt	te List, Cl, F,	SO4, Aqı	ueous	Aliquot #: 22-0)443-01-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	2210000		ug/L	1000.0	05/17/2022	AB22-0509-05
Fluoride	ND		ug/L	1000.0	05/16/2022	AB22-0509-05
Sulfate	6000		ug/L	1000.0	05/16/2022	AB22-0509-05
Total Dissolved Solids by SM 2540C				Aliquot #: 22-0)443-01-C03-A01	Analyst: CET
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids		9			_	_
Total Dissolved Solids	4240		mg/L	10.0	05/05/2022	AB22-0505-01

Report Date:

05/25/22



Laboratory Services

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Sample Site: **DEK JCW Background** Laboratory Project: **22-0443**

 Field Sample ID:
 MW-15008
 Collect Date:
 05/02/2022

 Lab Sample ID:
 22-0443-02
 Collect Time:
 01:45 PM

Matrix: Groundwater

Mercury by EPA 7470A, Total, Aqueous	s			Aliquot #: 22-0	0443-02-C01-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/10/2022	AB22-0510-04
Metals by EPA 6020B: CCR Rule Appe	ndix III-IV To	otal Metal	s Exp	Aliquot #: 22-0)443-02-C01-A02	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Arsenic	2		ug/L	1.0	05/11/2022	AB22-0511-14
Barium	52		ug/L	5.0	05/11/2022	AB22-0511-14
Beryllium	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Boron	112		ug/L	20.0	05/11/2022	AB22-0511-14
Cadmium	ND		ug/L	0.2	05/11/2022	AB22-0511-14
Calcium	89500		ug/L	1000.0	05/12/2022	AB22-0511-14
Chromium	1		ug/L	1.0	05/11/2022	AB22-0511-14
Cobalt	ND		ug/L	6.0	05/11/2022	AB22-0511-14
Copper	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Iron	15500		ug/L	20.0	05/11/2022	AB22-0511-14
Lead	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Lithium	16		ug/L	10.0	05/11/2022	AB22-0511-14
Molybdenum	ND		ug/L	5.0	05/11/2022	AB22-0511-14
Nickel	5		ug/L	2.0	05/11/2022	AB22-0511-14
Selenium	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Silver	ND		ug/L	0.2	05/11/2022	AB22-0511-14
Thallium	ND		ug/L	2.0	05/11/2022	AB22-0511-14
Vanadium	6		ug/L	2.0	05/11/2022	AB22-0511-14
Zinc	ND		ug/L	10.0	05/11/2022	AB22-0511-14
Anions by EPA 300.0 CCR Rule Analyt	e List, CI, F,	SO4, Aqı	ueous	Aliquot #: 22-0)443-02-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	197000		ug/L	1000.0	05/17/2022	AB22-0509-05
Fluoride	ND		ug/L	1000.0	05/16/2022	AB22-0509-05
Sulfate	4990		ug/L	1000.0	05/16/2022	AB22-0509-05
Total Dissolved Solids by SM 2540C				Aliguot #: 22-0)443-02-C03-A01	Analyst: CET
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	783	9	mg/L	10.0	05/05/2022	AB22-0505-02

Report Date:

05/25/22



Laboratory Services A CENTURY OF EXCELLENCE

Sample Site:

DEK JCW Background Laboratory Project: 22-0443 Field Sample ID: MW-15016 Collect Date: 05/03/2022 Lab Sample ID: 22-0443-03 Collect Time: 08:37 AM

Matrix: Groundwater

Mercury by EPA 7470A, Total, Aqueou	S			Aliquot #: 22-0	0443-03-C01-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/10/2022	AB22-0510-04
Metals by EPA 6020B: CCR Rule Appe	ndix III-IV To	tal Metal	s Exp	Aliquot #: 22-0)443-03-C01-A02	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Arsenic	8		ug/L	1.0	05/11/2022	AB22-0511-14
Barium	72		ug/L	5.0	05/11/2022	AB22-0511-14
Beryllium	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Boron	329		ug/L	20.0	05/11/2022	AB22-0511-14
Cadmium	ND		ug/L	0.2	05/11/2022	AB22-0511-14
Calcium	216000		ug/L	1000.0	05/12/2022	AB22-0511-14
Chromium	1		ug/L	1.0	05/11/2022	AB22-0511-14
Cobalt	ND		ug/L	6.0	05/11/2022	AB22-0511-14
Copper	5		ug/L	1.0	05/11/2022	AB22-0511-14
Iron	8020		ug/L	20.0	05/11/2022	AB22-0511-14
Lead	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Lithium	80		ug/L	10.0	05/11/2022	AB22-0511-14
Molybdenum	ND		ug/L	5.0	05/11/2022	AB22-0511-14
Nickel	13		ug/L	2.0	05/11/2022	AB22-0511-14
Selenium	2		ug/L	1.0	05/11/2022	AB22-0511-14
Silver	ND		ug/L	0.2	05/11/2022	AB22-0511-14
Thallium	ND		ug/L	2.0	05/11/2022	AB22-0511-14
Vanadium	3		ug/L	2.0	05/11/2022	AB22-0511-14
Zinc	ND		ug/L	10.0	05/11/2022	AB22-0511-14
Anions by EPA 300.0 CCR Rule Analyt	e List, CI, F,	SO4, Aqı	ueous	Aliquot #: 22-0)443-03-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	243000		ug/L	1000.0	05/17/2022	AB22-0509-05
Fluoride	ND		ug/L	1000.0	05/16/2022	AB22-0509-05
Sulfate	267000		ug/L	1000.0	05/17/2022	AB22-0509-05
Total Dissolved Solids by SM 2540C				Aliguot #: 22-0)443-03-C03-A01	Analyst: CET
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	1390	9	mg/L	10.0	05/05/2022	AB22-0505-02

Report Date:

05/25/22



Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: **DEK JCW Background** Laboratory Project: **22-0443**

 Field Sample ID:
 MW-15019
 Collect Date:
 05/02/2022

 Lab Sample ID:
 22-0443-04
 Collect Time:
 03:20 PM

Matrix: Groundwater

Mercury by EPA 7470A, Total, Aqueous	s		Aliquot #: 22-0	0443-04-C01-A01	Analyst: CLH	
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/10/2022	AB22-0510-04
Metals by EPA 6020B: CCR Rule Appe	ndix III-IV To	tal Metal	s Exp	Aliquot #: 22-0)443-04-C01-A02	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Arsenic	2		ug/L	1.0	05/11/2022	AB22-0511-14
Barium	308		ug/L	5.0	05/11/2022	AB22-0511-14
Beryllium	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Boron	236		ug/L	20.0	05/11/2022	AB22-0511-14
Cadmium	ND		ug/L	0.2	05/11/2022	AB22-0511-14
Calcium	139000		ug/L	1000.0	05/12/2022	AB22-0511-14
Chromium	1		ug/L	1.0	05/11/2022	AB22-0511-14
Cobalt	ND		ug/L	6.0	05/11/2022	AB22-0511-14
Copper	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Iron	21000		ug/L	20.0	05/11/2022	AB22-0511-14
Lead	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Lithium	12		ug/L	10.0	05/11/2022	AB22-0511-14
Molybdenum	ND		ug/L	5.0	05/11/2022	AB22-0511-14
Nickel	8		ug/L	2.0	05/11/2022	AB22-0511-14
Selenium	2		ug/L	1.0	05/11/2022	AB22-0511-14
Silver	ND		ug/L	0.2	05/11/2022	AB22-0511-14
Thallium	ND		ug/L	2.0	05/11/2022	AB22-0511-14
Vanadium	3		ug/L	2.0	05/11/2022	AB22-0511-14
Zinc	ND		ug/L	10.0	05/11/2022	AB22-0511-14
Anions by EPA 300.0 CCR Rule Analyt	e List, CI, F,	SO4, Aqı	ueous	Aliquot #: 22-0)443-04-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	324000		ug/L	1000.0	05/17/2022	AB22-0509-05
Fluoride	ND		ug/L	1000.0	05/16/2022	AB22-0509-05
Sulfate	62500		ug/L	1000.0	05/16/2022	AB22-0509-05
Total Dissolved Solids by SM 2540C				Aliguot #: 22-0)443-04-C03-A01	Analyst: CET
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	1200	9	mg/L	10.0	05/05/2022	AB22-0505-02



A CENTURY OF EXCELLENCE

Sample Site: **DEK JCW Background** Laboratory Project: **22-0443**

Field Sample ID: **DUP-Background**

Lab Sample ID: 22-0443-05 Matrix: Groundwater Collect Date: 05/02/2022

Collect Time: 12:00 AM

Report Date:

05/25/22

Mercury by EPA 7470A, Total, Aqueous	443-05-C01-A01	Analyst: CLH				
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/10/2022	AB22-0510-04
Metals by EPA 6020B: CCR Rule Apper	ndix III-IV To	tal Metals	s Ехр	Aliquot #: 22-0	443-05-C01-A02	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Arsenic	2		ug/L	1.0	05/11/2022	AB22-0511-14
Barium	58		ug/L	5.0	05/11/2022	AB22-0511-14
Beryllium	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Boron	125		ug/L	20.0	05/11/2022	AB22-0511-14
Cadmium	ND		ug/L	0.2	05/11/2022	AB22-0511-14
Calcium	103000		ug/L	1000.0	05/12/2022	AB22-0511-14
Chromium	2		ug/L	1.0	05/11/2022	AB22-0511-14
Cobalt	ND		ug/L	6.0	05/11/2022	AB22-0511-14
Copper	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Iron	16600		ug/L	20.0	05/11/2022	AB22-0511-14
Lead	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Lithium	17		ug/L	10.0	05/11/2022	AB22-0511-14
Molybdenum	ND		ug/L	5.0	05/11/2022	AB22-0511-14
Nickel	5		ug/L	2.0	05/11/2022	AB22-0511-14
Selenium	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Silver	ND		ug/L	0.2	05/11/2022	AB22-0511-14
Thallium	ND		ug/L	2.0	05/11/2022	AB22-0511-14
Vanadium	6		ug/L	2.0	05/11/2022	AB22-0511-14
Zinc	ND		ug/L	10.0	05/11/2022	AB22-0511-14
Anions by EPA 300.0 CCR Rule Analyte	e List, CI, F,	SO4, Aqı	ieous	Aliquot #: 22-0	443-05-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	198000		ug/L	1000.0	05/17/2022	AB22-0509-05
Fluoride	ND		ug/L	1000.0	05/16/2022	AB22-0509-05
Sulfate	4950		ug/L	1000.0	05/16/2022	AB22-0509-05
Total Dissolved Solids by SM 2540C				Aliguot #: 22-0	443-05-C03-A01	Analyst: CET
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	786	J	mg/L	10.0	05/05/2022	AB22-0505-02



Report Date:

05/25/22



A CENTURY OF EXCELLENCE

Sample Site: **DEK JCW Background** Laboratory Project: **22-0443**

Field Sample ID: FB- Background Collect Date: 05/02/2022 Lab Sample ID: 22-0443-06 Collect Time: 01:45 PM

Matrix: Water

Mercury by EPA 7470A, Total, Aque	Aliquot #: 22-0	443-06-C01-A01	1 Analyst: CLH			
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	05/10/2022	AB22-0510-04
Metals by EPA 6020B: CCR Rule Ap	Aliquot #: 22-0	443-06-C01-A02	Analyst: EB			
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Arsenic	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Barium	ND		ug/L	5.0	05/11/2022	AB22-0511-14
Beryllium	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Boron	ND		ug/L	20.0	05/11/2022	AB22-0511-14
Cadmium	ND		ug/L	0.2	05/11/2022	AB22-0511-14
Calcium	ND		ug/L	1000.0	05/12/2022	AB22-0511-14
Chromium	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Cobalt	ND		ug/L	6.0	05/11/2022	AB22-0511-14
Copper	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Iron	ND		ug/L	20.0	05/11/2022	AB22-0511-14
Lead	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Lithium	ND		ug/L	10.0	05/11/2022	AB22-0511-14
Molybdenum	ND		ug/L	5.0	05/11/2022	AB22-0511-14
Nickel	ND		ug/L	2.0	05/11/2022	AB22-0511-14
Selenium	ND		ug/L	1.0	05/11/2022	AB22-0511-14
Silver	ND		ug/L	0.2	05/11/2022	AB22-0511-14
Thallium	ND		ug/L	2.0	05/11/2022	AB22-0511-14
Vanadium	ND		ug/L	2.0	05/11/2022	AB22-0511-14
Zinc	ND		ug/L	10.0	05/11/2022	AB22-0511-14





Report Date: 05/25/22

Data Qualifiers	Exception Summary
	No exceptions occured.

CONSUMERS ENERGY

Chemistry Department

General Standard Operating Procedure

PROC CHEM-1,2.01 PAGE 1 OF 2 REVISION 2 ATTACHMENT A

TITLE:	SAMPL	E LOG-I	IN - SHIPM	TENT INSPE	CTION FORM
~ ~ ~ ~ ~ ~ ~ ~ ~	MANAGE SM		AA I MAAAA AI		

Inst	pection Date:5.	4.22	Inspe	ction By:d	MW	
	iple Origin/Project Na				4.44	
	oment Delivered By: I					
	Pony	FedEx		USPS	Airl	oorne
	Other/Hand Carry		010			, oi ii o
			18810	Shipping Form Attac	ched: Yes	No
Ship	pping Containers: Ent	er the type and num	ber of shipping co	ntainers received.		
	Cooler V	Cardboard Box	Cu	stom Case	Envelope	e/Mailer
		Containers		her	Market of State of St	
Con	dition of Shipment: E	nter the as-received	condition of the sl	hipment container.		
	Damaged Shipmen	t Observed: None	1	Dented	Leal	cing
	Other	N-3-2-0 1-30, F-200-2-	Y			
		s Received: Opene		Sealed		
Encl	osed Documents: Ente				Diff.	
	CoC_	Work Request	Air	Data Sheet	Other	
Tem	1	Work Request s: Measure the temperature 2.9 - 4	Air	Data Sheetsample containers.	Yes V No	
Tem	CoC	Work Request s: Measure the temperature 2.9 - 4 X(. Dote: US ainers: Enter the te	Air	Data Sheetsample containers.	Yes V No	Leaking
Num	Derature of Container As-Received Temp METELE E ther and Type of Container Type VOA (40mL or 60m)	Work Request s: Measure the temperature 2.9 - 4 M. Dote: 015 ainers: Enter the temperature Water	Air perature of several .7°C Samp. 6402 6.3 otal number of sam	pata Sheetsample containers. les Received on Ice: 2.2 ple containers received	Yes No_	Leaking
PH papa	Derature of Container As-Received Temp METEME E Container Type VOA (40mL or 60m) Quart/Liter (g/p)	Work Request s: Measure the temperature 2.9 - 4 X(. Dote: 015 ainers: Enter the to Water 5	Air perature of several .7°C Samp. 6402 6.3 otal number of sam	pata Sheetsample containers. les Received on Ice: 2.2 ple containers received	Yes No_	<u>L</u> eaking
PH papa	Perature of Container As-Received Temp M.E.T. E.	Work Request s: Measure the temperature 2.9 - 4 X(. Dote: 015 ainers: Enter the to Water 5	Air perature of several .7°C Samp. 6402 6.3 otal number of sam	pata Sheetsample containers. les Received on Ice: 2.2 ple containers received	Yes No_	<u>Leaking</u>
PH PGP-0 COH NO: 13-640-508	perature of Container As-Received Temp METELE E ber and Type of Cont Container Type VOA (40mL or 60m Quart/Liter (g/p) 9-oz (amber glass)	Work Request s: Measure the temperature 2.9 - 4 XI. DOTE: UNE ainers: Enter the to Water L) ar)	Air perature of several .7°C Samp. 6402 6.3 otal number of sam	pata Sheetsample containers. les Received on Ice: 2.2 ple containers received	Yes No_	Leaking
PH Paper COH NO: 13-640-508 0.0-14.0	perature of Container As-Received Temp METERE and Type of Container Type VOA (40mL or 60m) Quart/Liter (g/p) 9-oz (amber glass ja 2-oz (amber glass) 125 mL (plastic)	Work Request s: Measure the temperature 2.9 - 4 X(. Dote: 015 ainers: Enter the to Water 5	Air perature of several .7°C Samp. 6402 6.3 otal number of sam	pata Sheetsample containers. les Received on Ice: 2.2 ple containers received	Yes No_	Leaking
PH PGP-0 COH NO: 13-640-508	perature of Container As-Received Temp METELE E ber and Type of Cont Container Type VOA (40mL or 60m Quart/Liter (g/p) 9-oz (amber glass)	Work Request s: Measure the temperature 2.9 - 4 XI. DOTE: UNE ainers: Enter the to Water L) ar)	Air perature of several .7°C Samp. 6402 6.3 otal number of sam	pata Sheetsample containers. les Received on Ice: 2.2 ple containers received	Yes No_	Leaking

CHAIN OF CUSTODY



CONSUMERS ENERGY COMPANY - LABORATORY SERVICES

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

Page of

				PROJECT NUMBER: SAP CC or WO#;			ANALYSIS REQUESTED					QA REQUIREMENT:											
022 JCW-DEK	Background W	ells		22-0443 REQUESTER: Harold Register					(Atta	ch Li	st if N	fore Sp	pace is	Needed)	QA REQUIREMENT:								
PLING TEAM:				TURNAROUND TIME REQUIRED: □ 24 HR □ 48 HR □ 3 DAYS □ STANDARD ⋈ OTHER									□ NPDES ☑ TNI										
D REPORT TO:	Caleb Batts		-							=	-							☐ ISO 17025					
	727000000	ter		MATRIX CODES:		110	CC	ONT	AIN	ERS									□ 10 CFR 50 APP. B				
		***		WW = Wastewater SL = Sludg		PRESERVATIVE										- Ils							☐ INTERNAL INFO
LAB	1000	LECTION	XIX	S = Soil / General Solid WP = Wipe		AL#						Il Meta	suc						□ OTHER				
AMPLE ID	DATE	TIME	MATI	FIELD SAMPLE ID / LO	CATION	TOT	None	HINO	H ₂ SO	HCI	MeOl Other	Tota	Anic	TDS					REMARKS				
22-0443-01	5/2/22	1724	GW	MW-15002		4	3	1				x	x	x									
-02	5/2/22	1345	GW	MW-15008		4	3	1				x	x	x									
-03	5/3/202	837	GW	MW-15016		4	3	1				x	x	x									
-04	5/422	1520	GW	MW-15019		4	3	1				x	x	x									
-05	3/2/22	_	GW	DUP-Background		4	3	1				x	x	x									
→ -06	5/2/2.2	1345	w	FB- Background		1						x											
Ye																							
NQUISHED BY:	Solava	rest	DATE/	TIME: $5/3/22$	Part of the second	6						CC	MMI	ENTS	3:								
NQUISHED BY:		12	DATE/	TIME:	RECEIVED BY:							100											
72 E	<	•	5-0									Te	mpera	ature:	2.4	-4.6	°C	Cal. I	Due Date: 6-3-22				
	D REPORT TO: COPY TO: LAB AMPLE ID 22-0443-01 -02 -03 -04 -05 -06 NQUISHED BY: NQUISHED BY:	D REPORT TO: Caleb Batts COPY TO: Harold Regis TRC SAMPLE COLI DATE 22-0443-01	022 JCW-DEK Background Wells PLING TEAM: D REPORT TO: Caleb Batts COPY TO: Harold Register TRC SAMPLE COLLECTION DATE TIME 22-0443-01	DREPORT TO: Caleb Batts COPY TO: Harold Register TRC LAB AMPLE ID DATE TIME W 22-0443-01	DREPORT TO: Caleb Batts Caleb Batts	DREPORT TO: Caleb Batts COPY TO: Harold Register TIRC William Water / Agueous Liquid Saleb Water / Agueous / Agu	DEFORT TO: Caleb Batts COPY To: Copy To: Caleb Batts Copy To: Copy To: Caleb Batts Copy To: Copy T	Description Description	DREPORT TO: Caleb Batts COPY TO: Harold Register TRC MARRIX CODES: WY - Winge WP - Winge W	22-0443 REQUESTER: Harold Register	C22 JCW-DEK Background Wells C2-0443 REQUESTER: Harold Register	22-0443 REQUESTER: Harold Register	22-0443 REQUESTER: Harold Register	22-0443 REQUESTER: Harold Register Automatical Pling Team: TURNAROUND TIME REQUIRED: DATE/TIME: DATE/TIME: DATE/TIME: DATE/TIME: DATE/TIME: RECEIVED BY: COMMITTER RECEIVED RECEIVED RECEIVED RECEIVED	22-0443 REQUESTER: Harold Register ANAL	22-0443 REQUESTER: Harold Register CAttach List if N	22-0443 REQUESTER: Harold Register	1022 ICW-DEK Background Wells	ANALYSIS REQUESTER ANALYS				



Environment Testing America

ANALYTICAL REPORT

Eurofins Canton 180 S. Van Buren Avenue Barberton, OH 44203 Tel: (330)497-9396

Laboratory Job ID: 240-166154-1

Client Project/Site: CCR DEK Bottom Ash Pond

For:

TRC Environmental Corporation. 1540 Eisenhower Place Ann Arbor, Michigan 48108-7080

Attn: Darby Litz

Authorized for release by: 6/12/2022 7:41:03 PM

Kris Brooks, Project Manager II

(330)966-9790

Kris.Brooks@et.eurofinsus.com

LINKS

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Table of Contents

Cover Page	1
Table of Contents	2
Definitions/Glossary	3
Case Narrative	4
Method Summary	5
Sample Summary	6
Client Sample Results	7
Tracer Carrier Summary	12
QC Sample Results	13
QC Association Summary	15
Lab Chronicle	16
Certification Summary	18
Chain of Custody	19
Receipt Checklists	24

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Definitions/Glossary

Client: TRC Environmental Corporation.

Job ID: 240-166154-1

Project/Site: CCR DEK Bottom Ash Pond

Qualifiers

	ı
Nac	ı

Qualifier	Qualifier	Description

* RPD of the LCS and LCSD exceeds the control limits
U Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly	used abbreviations may	or may not be	present in this report.

Example 2 Listed under the "D" column to designate that the result is reported on a dry weight basis

%R Percent Recovery
CFL Contains Free Liquid
CFU Colony Forming Unit
CNF Contains No Free Liquid

DER Duplicate Error Ratio (normalized absolute difference)

Dil Fac Dilution Factor

DL Detection Limit (DoD/DOE)

DL, RA, RE, IN Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample

DLC Decision Level Concentration (Radiochemistry)

EDL Estimated Detection Limit (Dioxin)

LOD Limit of Detection (DoD/DOE)

LOQ Limit of Quantitation (DoD/DOE)

MCL EPA recommended "Maximum Contaminant Level"

MDA Minimum Detectable Activity (Radiochemistry)

MDC Minimum Detectable Concentration (Radiochemistry)

MDL Method Detection Limit
ML Minimum Level (Dioxin)
MPN Most Probable Number
MQL Method Quantitation Limit

NC Not Calculated

ND Not Detected at the reporting limit (or MDL or EDL if shown)

NEG Negative / Absent POS Positive / Present

PQL Practical Quantitation Limit

PRES Presumptive
QC Quality Control

RER Relative Error Ratio (Radiochemistry)

RL Reporting Limit or Requested Limit (Radiochemistry)

RPD Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin)
TEQ Toxicity Equivalent Quotient (Dioxin)

TNTC Too Numerous To Count

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Case Narrative

Client: TRC Environmental Corporation. Project/Site: CCR DEK Bottom Ash Pond

Job ID: 240-166154-1

Job ID: 240-166154-1

Laboratory: Eurofins Canton

Narrative

Job Narrative 240-166154-1

Comments

The EPA Method 904.0 Radium-228, EPA Method 903.0 Radium-226, and Ra226_Ra228 Combined Radium 226 and Radium 228 analyses were performed at the Eurofins St. Louis laboratory.

Receipt

The samples were received on 5/6/2022 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were 0.9° C, 1.3° C and 1.4° C.

RAD

Method 903.0: Radium-226 batch 564568

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. DEK-MW-15002 (240-166154-1), DEK-MW-EB (240-166154-2), DEK-MW-15005 (240-166154-3), DEK-MW-15006 (240-166154-4), DUP-DEK-BAP (240-166154-5), (LCS 160-564568/1-A), (LCSD 160-564568/2-A) and (MB 160-564568/23-A)

Method 904.0: Radium-228 batch 564569

The RER/DER of the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) was outside control limits. However the recovery for the LCS/LCSD passed and the RPD was <40% demonstrating acceptable method performance. Original results will be reported. (LCSD 160-564569/2-A)

Method 904.0: Radium-228 batch 564569

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. DEK-MW-15002 (240-166154-1), DEK-MW-EB (240-166154-2), DEK-MW-15005 (240-166154-3), DEK-MW-15006 (240-166154-4), DUP-DEK-BAP (240-166154-5), (LCS 160-564569/1-A), (LCSD 160-564569/2-A) and (MB 160-564569/23-A)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

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Method Summary

Client: TRC Environmental Corporation. Project/Site: CCR DEK Bottom Ash Pond

Job ID: 240-166154-1

Method	Method Description	Protocol	Laboratory
903.0	Radium-226 (GFPC)	EPA	TAL SL
904.0	Radium-228 (GFPC)	EPA	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
PrecSep STD	Preparation, Precipitate Separation (Standard In-Growth)	None	TAL SL
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL

Protocol References:

EPA = US Environmental Protection Agency

None = None

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

TAL SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Eurofins Canton

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Sample Summary

Client: TRC Environmental Corporation. Project/Site: CCR DEK Bottom Ash Pond

Job ID: 240-166154-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-166154-1	DEK-MW-15002	Water	05/03/22 14:21	05/06/22 08:00
240-166154-2	DEK-MW-EB	Water	05/03/22 10:42	05/06/22 08:00
240-166154-3	DEK-MW-15005	Water	05/03/22 12:56	05/06/22 08:00
240-166154-4	DEK-MW-15006	Water	05/03/22 10:42	05/06/22 08:00
240-166154-5	DUP-DEK-BAP	Water	05/03/22 00:00	05/06/22 08:00

Client: TRC Environmental Corporation. Project/Site: CCR DEK Bottom Ash Pond

Lab Sample ID: 240-166154-1

Matrix: Water

Job ID: 240-166154-1

Client Sample ID: DEK-MW-15002

Date Collected: 05/03/22 14:21 Date Received: 05/06/22 08:00

Method: 903.0 -	Radium-226	(GFPC)								
		` /	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.353	U	0.282	0.283	1.00	0.423	pCi/L	05/10/22 09:51	06/07/22 18:09	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.5		40 - 110					05/10/22 09:51	06/07/22 18:09	1

Method: 904.0 -	Radium-228	(GFPC)								
		` ,	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.283	U *	0.323	0.324	1.00	0.530	pCi/L	05/10/22 10:04	06/07/22 15:36	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.5		40 - 110					05/10/22 10:04	06/07/22 15:36	1
Y Carrier	88.2		40 - 110					05/10/22 10:04	06/07/22 15:36	1

Method: Ra226_Ra	228 - Con	nbined Rad	dium-226 a	nd Radium	-228					
_			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.636		0.429	0.430	5.00	0.530	pCi/L		06/08/22 13:03	1

Client: TRC Environmental Corporation. Project/Site: CCR DEK Bottom Ash Pond

Lab Sample ID: 240-166154-2

Job ID: 240-166154-1

Matrix: Water

Cli	ient	Samp	le ID:	DEK-N	IW-EB

Date Collected: 05/03/22 10:42 Date Received: 05/06/22 08:00

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0206	U	0.279	0.279	1.00	0.571	pCi/L	05/10/22 09:51	06/07/22 18:09	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	57.9		40 - 110					05/10/22 09:51	06/07/22 18:09	1

Method: 904.0 -	Radium-228	(GFPC)								
		. ,	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.185	U *	0.434	0.435	1.00	0.763	pCi/L	05/10/22 10:04	06/07/22 15:36	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	57.9		40 - 110					05/10/22 10:04	06/07/22 15:36	1
Y Carrier	87.1		40 - 110					05/10/22 10:04	06/07/22 15:36	1

Method: Ra226 Ra2	228 - Con	nbined Ra	dium-226 a	nd Radium	1-228					
_			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.165	U	0.516	0.517	5.00	0.763	pCi/L		06/08/22 13:03	1

Client: TRC Environmental Corporation. Project/Site: CCR DEK Bottom Ash Pond

Lab Sample ID: 240-166154-3

Matrix: Water

Job ID: 240-166154-1

Client Sample ID: DEK-MW-15005

Date Collected: 05/03/22 12:56 Date Received: 05/06/22 08:00

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.620		0.301	0.306	1.00	0.356	pCi/L	05/10/22 09:51	06/07/22 18:09	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.8		40 - 110					05/10/22 09:51	06/07/22 18:09	1

Method: 904.0 - I	Radium-228	(GFPC)								
		. ,	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.08	*	0.399	0.412	1.00	0.498	pCi/L	05/10/22 10:04	06/07/22 15:36	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.8		40 - 110					05/10/22 10:04	06/07/22 15:36	1
Y Carrier	87.1		40 - 110					05/10/22 10:04	06/07/22 15:36	1

	228 - Con	bined Rad	dium-226 a	nd Radium	1-228					
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.70		0.500	0.513	5.00	0.498	pCi/L		06/08/22 13:03	1

Client: TRC Environmental Corporation.

Date Received: 05/06/22 08:00

Project/Site: CCR DEK Bottom Ash Pond

Lab Sample ID: 240-166154-4

Client Sample ID: DEK-MW-15006 Date Collected: 05/03/22 10:42

Matrix: Water

Job ID: 240-166154-1

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analvzed	Dil Fac
Radium-226	0.417		0.305	0.308	1.00	0.449		05/10/22 09:51	06/07/22 18:09	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	86.3		40 - 110					05/10/22 09:51	06/07/22 18:09	1

Method: 904.0 - R	adium-228	(GFPC)								
			Count	Total						
Analyte	Pocult	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Allalyte	- Nesuit	Qualifier	(20+7-)	(20+/-)	NL	IVIDC	OIIIL	Frepareu	Allalyzeu	Dil Fac
Radium-228	0.870	*	0.402	0.410	1.00	0.554	pCi/L	05/10/22 10:04	06/07/22 15:36	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	86.3		40 - 110					05/10/22 10:04	06/07/22 15:36	1
Y Carrier	87.9		40 - 110					05/10/22 10:04	06/07/22 15:36	1

Method: Ra226_Ra	228 - Con	nbined Rad	dium-226 a	nd Radiun	1-228					
			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.29		0.505	0.513	5.00	0.554	pCi/L		06/08/22 13:03	1

Client: TRC Environmental Corporation. Project/Site: CCR DEK Bottom Ash Pond

Job ID: 240-166154-1

Client Sample ID: DUP-DEK-BAP

Lab Sample ID: 240-166154-5

Matrix: Water

Date Collected: 05/03/22 00:00 Date Received: 05/06/22 08:00

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.395		0.273	0.275	1.00	0.386	pCi/L	05/10/22 09:51	06/07/22 18:09	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.0		40 - 110					05/10/22 09:51	06/07/22 18:09	1

Method: 904.0 -	Radium-228	(GFPC)								
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.347	U *	0.316	0.318	1.00	0.502	pCi/L	05/10/22 10:04	06/07/22 15:36	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.0		40 - 110					05/10/22 10:04	06/07/22 15:36	1
Y Carrier	88.6		40 - 110					05/10/22 10:04	06/07/22 15:36	1

Method: Ra226_Ra	228 - Con	nbined Rad	dium-226 a	nd Radium	-228					
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.742		0.418	0.420	5.00	0.502	pCi/L		06/08/22 13:03	1

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Tracer/Carrier Summary

Client: TRC Environmental Corporation.

Project/Site: CCR DEK Bottom Ash Pond

Job ID: 240-166154-1

Method: 903.0 - Radium-226 (GFPC)

Matrix: Water Prep Type: Total/NA

			Percent Yield (Acceptance Limits)
		Ва	
Lab Sample ID	Client Sample ID	(40-110)	
240-166154-1	DEK-MW-15002	88.5	
240-166154-2	DEK-MW-EB	57.9	
240-166154-3	DEK-MW-15005	88.8	
240-166154-4	DEK-MW-15006	86.3	
240-166154-5	DUP-DEK-BAP	90.0	
LCS 160-564568/1-A	Lab Control Sample	94.3	
LCSD 160-564568/2-A	Lab Control Sample Dup	82.3	
MB 160-564568/23-A	Method Blank	99.3	
Tracer/Carrier Legend			

Method: 904.0 - Radium-228 (GFPC)

Matrix: Water Prep Type: Total/NA

				Percent Yield (Acceptance Limits)
		Ва	Y	
Lab Sample ID	Client Sample ID	(40-110)	(40-110)	
240-166154-1	DEK-MW-15002	88.5	88.2	
240-166154-2	DEK-MW-EB	57.9	87.1	
240-166154-3	DEK-MW-15005	88.8	87.1	
240-166154-4	DEK-MW-15006	86.3	87.9	
240-166154-5	DUP-DEK-BAP	90.0	88.6	
LCS 160-564569/1-A	Lab Control Sample	94.3	84.9	
LCSD 160-564569/2-A	Lab Control Sample Dup	82.3	84.5	
MB 160-564569/23-A	Method Blank	99.3	91.2	

Tracer/Carrier Legend

Ba = Ba Carrier

Y = Y Carrier

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Client: TRC Environmental Corporation. Job ID: 240-166154-1 Project/Site: CCR DEK Bottom Ash Pond

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-564568/23-A Client Sample ID: Method Blank

Matrix: Water

Matrix: Water

Radium-226

Analysis Batch: 569008 Count Total

Prep Type: Total/NA Prep Batch: 564568

MB MB Uncert. Uncert. Analyte Result Qualifier $(2\sigma + / -)$ $(2\sigma + / -)$ RL **MDC** Unit Prepared Analyzed Dil Fac Radium-226 0.002143 U 0.135 0.135 1.00 0.285 pCi/L 05/10/22 09:51 06/07/22 20:02

MB

11.3

9.625

Carrier %Yield Qualifier Limits Prepared Analyzed Dil Fac Ba Carrier 99.3 40 - 110 05/10/22 09:51 06/07/22 20:02

Client Sample ID: Lab Control Sample

75 - 125

Lab Sample ID: LCS 160-564568/1-A Prep Type: Total/NA

0.274 pCi/L

1.00

Prep Batch: 564568

Analysis Batch: 568823 Total LCS LCS %Rec **Spike** Uncert. Analyte Added Result Qual $(2\sigma + / -)$ RL **MDC** Unit %Rec Limits

LCS LCS Carrier %Yield Qualifier Limits Ba Carrier 94.3 40 - 110

Lab Sample ID: LCSD 160-564568/2-A **Client Sample ID: Lab Control Sample Dup**

1.28

Matrix: Water

Analysis Batch: 568823

Prep Type: Total/NA

85

Prep Batch: 564568

Prep Batch: 564569

Total LCSD LCSD %Rec **RER** Spike Uncert. Added Result Qual $(2\sigma + / -)$ RL **MDC** Unit %Rec Limits Analyte RER Limit Radium-226 11.3 9.709 1.34 1.00 0.405 pCi/L 86 75 - 125 0.03

LCSD LCSD Carrier %Yield Qualifier Limits Ba Carrier 82.3 40 - 110

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-564569/23-A Client Sample ID: Method Blank **Matrix: Water** Prep Type: Total/NA

Analysis Batch: 568850

Count Total MB MB Uncert. Uncert. Analyte Result Qualifier $(2\sigma + / -)$ $(2\sigma + / -)$ RL **MDC** Unit Prepared Dil Fac Analyzed pCi/L Radium-228 0.03881 Ū 0.215 0.215 1.00 05/10/22 10:04 06/07/22 15:38 0.396

MB MB Carrier %Yield Qualifier Limits Prepared Dil Fac Analyzed Ba Carrier 99.3 40 - 110 05/10/22 10:04 06/07/22 15:38 40 - 110 Y Carrier 91.2 05/10/22 10:04 06/07/22 15:38

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QC Sample Results

Client: TRC Environmental Corporation. Job ID: 240-166154-1 Project/Site: CCR DEK Bottom Ash Pond

Method: 904.0 - Radium-228 (GFPC) (Continued)

Lab Sample ID: LCS 160-564569/1-A **Client Sample ID: Lab Control Sample**

Matrix: Water

Prep Type: Total/NA Analysis Batch: 569007 **Prep Batch: 564569**

				iotai					
	Spike	LCS	LCS	Uncert.				%Rec	
Analyte	Added	Result	Qual	(2σ+/-)	RL	MDC Unit	%Rec	Limits	
Radium-228	8.55	6.624		1.00	1.00	0.571 pCi/L	77	75 - 125	

LCS LCS Carrier %Yield Qualifier Limits Ba Carrier 94.3 40 - 110 Y Carrier 84.9 40 - 110

Lab Sample ID: LCSD 160-564569/2-A **Client Sample ID: Lab Control Sample Dup** Prep Type: Total/NA

Matrix: Water

Analysis Batch: 569007

				Total						
	Spike	LCSD	LCSD	Uncert.				%Rec		RER
Analyte	Added	Result	Qual	(2σ+/-)	RL	MDC Unit	%Rec	Limits	RER	Limit
Radium-228	8.55	9.176	*	1.28	1.00	0.579 pCi/L	107	75 - 125	1.12	1

LCSD LCSD Carrier %Yield Qualifier Limits Ba Carrier 40 - 110 82.3 84.5 40 - 110 Y Carrier

Prep Batch: 564569

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6/12/2022

QC Association Summary

Client: TRC Environmental Corporation.

Project/Site: CCR DEK Bottom Ash Pond

Job ID: 240-166154-1

Rad

Prep Batch: 564568

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-166154-1	DEK-MW-15002	Total/NA	Water	PrecSep STD	
240-166154-2	DEK-MW-EB	Total/NA	Water	PrecSep STD	
240-166154-3	DEK-MW-15005	Total/NA	Water	PrecSep STD	
240-166154-4	DEK-MW-15006	Total/NA	Water	PrecSep STD	
240-166154-5	DUP-DEK-BAP	Total/NA	Water	PrecSep STD	
MB 160-564568/23-A	Method Blank	Total/NA	Water	PrecSep STD	
LCS 160-564568/1-A	Lab Control Sample	Total/NA	Water	PrecSep STD	
LCSD 160-564568/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep STD	

Prep Batch: 564569

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-166154-1	DEK-MW-15002	Total/NA	Water	PrecSep_0	
240-166154-2	DEK-MW-EB	Total/NA	Water	PrecSep_0	
240-166154-3	DEK-MW-15005	Total/NA	Water	PrecSep_0	
240-166154-4	DEK-MW-15006	Total/NA	Water	PrecSep_0	
240-166154-5	DUP-DEK-BAP	Total/NA	Water	PrecSep_0	
MB 160-564569/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-564569/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-564569/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

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Lab Chronicle

Client: TRC Environmental Corporation. Project/Site: CCR DEK Bottom Ash Pond

Client Sample ID: DEK-MW-15002

Analysis

Date Received: 05/06/22 08:00

Ra226_Ra228

Lab Sample ID: 240-166154-1

Matrix: Water

Job ID: 240-166154-1

Date Collected: 05/03/22 14:21 Date Received: 05/06/22 08:00

Total/NA

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			564568	05/10/22 09:51	LPS	TAL SL
Total/NA	Analysis	903.0		1	568835	06/07/22 18:09	FLC	TAL SL
Total/NA	Prep	PrecSep_0			564569	05/10/22 10:04	LPS	TAL SL
Total/NA	Analysis	904.0		1	568835	06/07/22 15:36	FLC	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	569042	06/08/22 13:03	SCB	TAL SL

Lab Sample ID: 240-166154-2 Client Sample ID: DEK-MW-EB

Date Collected: 05/03/22 10:42 **Matrix: Water** Date Received: 05/06/22 08:00

Batch **Batch** Dilution Batch Prepared Method Number **Prep Type** Type Run **Factor** or Analyzed Analyst Lab Total/NA PrecSep STD TAL SL Prep 564568 05/10/22 09:51 LPS Total/NA Analysis 903.0 1 568835 06/07/22 18:09 FLC TAL SL Total/NA TAL SL Prep PrecSep 0 564569 05/10/22 10:04 LPS Total/NA Analysis 904.0 568835 06/07/22 15:36 FLC TAL SL 1 569042 06/08/22 13:03 SCB TAL SL

Client Sample ID: DEK-MW-15005 Lab Sample ID: 240-166154-3

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Date Collected: 05/03/22 12:56 **Matrix: Water**

Batch Dilution Batch Batch Prepared Method **Prep Type** Type Run **Factor** Number or Analyzed Analyst Lab Prep Total/NA PrecSep STD 564568 05/10/22 09:51 LPS TAL SL Total/NA Analysis 903.0 568835 06/07/22 18:09 FLC TAL SL 1 TAL SL Total/NA Prep PrecSep 0 564569 05/10/22 10:04 LPS

Total/NA 904.0 568835 06/07/22 15:36 FLC TAL SL Analysis 1 Total/NA Analysis Ra226 Ra228 1 569042 06/08/22 13:03 SCB TAL SL

Client Sample ID: DEK-MW-15006 Lab Sample ID: 240-166154-4

Date Collected: 05/03/22 10:42 **Matrix: Water** Date Received: 05/06/22 08:00

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			564568	05/10/22 09:51	LPS	TAL SL
Total/NA	Analysis	903.0		1	568835	06/07/22 18:09	FLC	TAL SL
Total/NA	Prep	PrecSep_0			564569	05/10/22 10:04	LPS	TAL SL
Total/NA	Analysis	904.0		1	568835	06/07/22 15:36	FLC	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	569042	06/08/22 13:03	SCB	TAL SL

Eurofins Canton

Lab Chronicle

Client: TRC Environmental Corporation.

Job ID: 240-166154-1

Project/Site: CCR DEK Bottom Ash Pond

Client Sample ID: DUP-DEK-BAP

Lab Sample ID: 240-166154-5

Matrix: Water

Date Collected: 05/03/22 00:00 Date Received: 05/06/22 08:00

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			564568	05/10/22 09:51	LPS	TAL SL
Total/NA	Analysis	903.0		1	568835	06/07/22 18:09	FLC	TAL SL
Total/NA	Prep	PrecSep_0			564569	05/10/22 10:04	LPS	TAL SL
Total/NA	Analysis	904.0		1	568835	06/07/22 15:36	FLC	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	569042	06/08/22 13:03	SCB	TAL SL

Laboratory References:

TAL SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

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Accreditation/Certification Summary

Client: TRC Environmental Corporation. Project/Site: CCR DEK Bottom Ash Pond

Job ID: 240-166154-1

Laboratory: Eurofins St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority Program		Identification Number	Expiration Date
Alaska (UST)	State	20-001	05-06-25
ANAB	Dept. of Defense ELAP	L2305	04-06-25
ANAB	Dept. of Energy	L2305.01	04-06-25
ANAB	ISO/IEC 17025	L2305	04-06-25
Arizona	State	AZ0813	12-08-22
California	Los Angeles County Sanitation Districts	10259	06-30-22
California	State	2886	07-01-22
Connecticut	State	PH-0241	03-31-23
Florida	NELAP	E87689	06-30-22
HI - RadChem Recognition	State	n/a	06-30-22
Illinois	NELAP	200023	11-30-22
Iowa	State	373	12-01-22
Kansas	NELAP	E-10236	10-31-22
Kentucky (DW)	State	KY90125	12-31-22
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-22
Louisiana	NELAP	04080	06-30-22
Louisiana (DW)	State	LA011	12-31-22
Maryland	State	310	09-30-22
MI - RadChem Recognition	State	9005	06-30-22
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-22
New Jersey	NELAP	MO002	06-30-22
New York	NELAP	11616	04-01-23
North Dakota	State	R-207	06-30-22
NRC	NRC	24-24817-01	12-31-22
Oklahoma	NELAP	9997	08-31-22
Oregon	NELAP	4157	09-01-22
Pennsylvania	NELAP	68-00540	02-28-23
South Carolina	State	85002001	06-30-22
Texas	NELAP	T104704193	07-31-22
US Fish & Wildlife	US Federal Programs	058448	07-31-22
USDA	US Federal Programs	P330-17-00028	03-11-23
Utah	NELAP	MO000542021-14	08-01-22
Virginia	NELAP	10310	06-14-22
Washington	State	C592	08-30-22
West Virginia DEP	State	381	10-31-22

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Ver. 06/08/2021

Euronins Canton				HIGAIN	se eurofins
180 S. Van Buren Avenue	Chain of	hain of Custody Record	Secord	190	Environment Testing
Paribertor, OH 44203 Phone: 330-497-9396 Fax: 330-497-0772				170	
Client Information	Sampler HRWY Sch	Schwagt M Bro	Lab PM. Brooks, Kris M	Carrier Tracking No(s).	COC No. 240-94789-29052.1
Client Contact Jacob Krenz			E-Mail Kris. Brooks@et.eurofinsus.com	State of Origin:	Page Page 1 of 1
Company TRC Environmental Corporation	Ad	PWSID	Analysis Requested	quested	Job #
Address 1540 Eisenhower Place	Due Date Requested:				ĕ
City Ann Arbor	TAT Requested (days):				B - NaOH N - None C - Zn Acetate O - AsNaO2
State, Zip. MI, 48108-7080	Compliance Project: A Yes A No	9			
Phone (734-971-7080(Tel) 734-971-9022(Fax)	PO#: TBD		(c		-
Email: JKrenz@trccompanies.com	#OM				I - Ice J - DI Water
Project Name: Karn/Weadock CCR DEK Bottom Ash Pond	Project # 24024154		EbC		K EDTA L - EDA
Site	\$SOW#		228_GI		of con
Sample Identification	Sample Date Time 6	Sample (wwweter. Type (wwweter. Besoild. (C=comp, co-wasteled.	Field Filtered W/SM MS/M MS/SM Filtered Personal Poston Personal P		Action Mumber
	X	0			
DEK-MW-15002	5/3/22 1421	Water	V		
DEK-MW-16004-E-B	1 (0413	Water	X		
DEK-MW-15005	1256	Water	NWXX		
DEK-MW-15006	23,01	Water	XX		
DUP-DEK-BAP	(Water	N X X		
			240-	240-166154 Chain of Custody	
Identification			Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)	assessed if samples are re	tained longer than 1 month)
Non-Hazard Flammable Skin Irritant Po Deliverable Requested: 1, II, III, IV, Other (specify)	Poison B Unknown Rac	Radiological	Special Instructions/QC Requirements:	Disposal By Lab	Archive For Months
Empty Kit Relinquished by:	Date:		Time	Method of Shipment	
Reinquished by Athur School of	Date/Time / S/3/2,7 1600	Company	30	Me The Date Time S	R
1	1-4-5	(770 Company	٧	5/5/22	1330 Company
Custody Seals Intact: Custody Seal No.	5/5/20 155S	CC TA	Goler Temperature(s) °C and Other Remarks	2 -6 -6	22 OSOO BETWC
			5		Ver: 06/08/2021

structing Environment Testing America

Eurofins Canton

Eurofins TestAmerica Canton Sample Receipt Form/Narrative Canton Facility	Login # : 100154
Client Site Name	Cooler unpacked by:
	Other
FedEx: 1st Grd Exp UPS FAS Clippet Client Drop Off TestAmerica Co Receipt After-hours: Drop-off Date/Time Storage Loc	
	her
COOLANT: Wet Ice Blue Ice Dry Ice Water None	
1. Cooler temperature upon receipt See Multiple (Cooler Form
IR GUN# IR-13 (CF 0.0 °C) Observed Cooler Temp. °C Corrected C	Cooler Temp. °C
IR GUN #IR-15 (CF -0.7°C) Observed Cooler Temp°C Corrected C	
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity/ec	
-Were the seals on the outside of the cooler(s): If Tes Quantity [8]	Vac No NA Tests that are not
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Checked for pri by
-Were tamper/custody seals intact and uncompromised?	Yes No NA Receiving:
· · · · · · · · · · · · · · · · · · ·	Yes No VOAs
3. Shippers' packing slip attached to the cooler(s)?4. Did custody papers accompany the sample(s)?	Yes No Oil and Grease
5. Were the custody papers relinquished & signed in the appropriate place?	Yes No TOC
6. Was/were the person(s) who collected the samples clearly identified on the COC?	
7. Did all bottles arrive in good condition (Unbroken)?	(Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes No
9. For each sample, does the COC specify preservatives (YN), # of containers (YN)	
10. Were correct bottle(s) used for the test(s) indicated?	Yes No
11. Sufficient quantity received to perform indicated analyses?	Yes No
12. Are these work share samples and all listed on the COC?	Yes (No)
If yes, Questions 13-17 have been checked at the originating laboratory.	163 (16)
13. Were all preserved sample(s) at the correct pH upon receipt?	No NA pH Strip Lot# HC157842
14. Were VOAs on the COC?	Yes No
15. Were air bubbles >6 mm in any VOA vials? Larger than this.	Yes No (NA)
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #	
17. Was a LL Hg or Me Hg trip blank present?	
Contacted PM Date by via Vo	erbal Voice Mail Other
Concerning	
18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES additional next	page Samples processed by:
16. CHAIN OF COSTOD & SAMI DE DISCREI ANCIES — BORRONAI REX	page Samples processed by.
19. SAMPLE CONDITION	
Sample(s) were received after the recommended	ed holding time had expired.
Sample(s) were r	eceived in a broken container.
Sample(s) were received with bubble >	6 mm in diameter. (Notify PM)
20. SAMPLE PRESERVATION	

were further preserved in the laboratory.

Sample(s)

Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

Login#: 166154

Coller Description Circle Temp °C		Eurofins - Canto	n Sample Receipt Mul	Itiple Cooler Form	
Clear Sox Other Clea		IR Gun #	Observed		Coolant
TA Clevel Box Other 18-13 18-15	(Circle)	(Gircle)	Temp °C		
More	Client Box Other	IR-13 IR-15	1.3	1.3	
March Mone	TA Client Box Other	IR-3 IR-15	1.4	1.4	
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				☐ See Tempe	

WI-NC-099 Cooler Receipt Form l'age 2 - Multiple Coolers

DUP-DEK-BAP

Login Container Summary Report

240-166154

Temperature readings: Container Preservative Client Sample ID Lab ID **Container Type** Temp Added (mls) Lot # pН DEK-MW-15002 240-166154-A-1 Plastic 1 liter - Nitric Acid <2 DEK-MW-15002 240-166154-B-1 Plastic 1 liter - Nitric Acid <2 **DEK-MW-EB** 240-166154-A-2 Plastic 1 liter - Nitric Acid <2 **DEK-MW-EB** 240-166154-B-2 Plastic 1 liter - Nitric Acid <2 DEK-MW-15005 240-166154-A-3 Plastic 1 liter - Nitric Acid <2 DEK-MW-15005 240-166154-B-3 Plastic 1 liter - Nitric Acid <2 DEK-MW-15006 240-166154-A-4 Plastic 1 liter - Nitric Acid <2 DEK-MW-15006 240-166154-B-4 Plastic 1 liter - Nitric Acid <2 **DUP-DEK-BAP** 240-166154-A-5 Plastic 1 liter - Nitric Acid <2

Plastic 1 liter - Nitric Acid

<2

240-166154-B-5

Chain of Custody Record

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Eurofins Canton 180 S. Van Buren Avenue Barberton, OH 44203 Phone: 330-497-0772		Chain o	hain of Custody Record	ody Re	cor	70							💸 eurofins		Environment Testing America
Client Information (Sub Contract Lab)	Sampler			Lab PM: Brooks	Lab PM: Brooks, Kris M	_				Carrier Tra	Camer Tracking No(s):		COC No. 240-151693.1	93.1	
Client Contact: Shipping/Receiving	Phone:			E-Mail: Kris.Br	ooks@	et.euro	finsus	E 03		State of Origin: Michigan	igin:		Page: Page 1 of 1	-	
Company: TestAmerica Laboratories, Inc.				A	Accreditations Required (See note)	ns Requ	ired (Se	e note):					Job #: 240-166154-1	54-1	
Address: 13715 Rider Trail North,	Due Date Requested: 6/7/2022	:pa						Anal	sis Re	Analysis Requested			Preservati		
Gity. Farth City	TAT Requested (days):	3ys):			484	L		}	E	L		F	A - HCL B - NaOH		- Hexane - None
Slate, Zip MO, 63045													C - Zn Acetate D - Nitric Acid E - NaHSO4		- AsNaO2 - Na2O4S - Na2SO3
Phone. (314-298-8566(Tel) 314-298-8757(Fax)	# 0d				JAT.				_				F - MeOH G - Amchlor		- Na2S2O3 - H2SO4
Email:	"MO #			ON JO	(0										- TSP Dodecahydrate - Acetone - MCAA
Project Name CCR DEK Bottom Ash Pond	Project #: 24024154				N 10 s								A EDTA L-EDA		W - pH 4-5 Z - other (specify)
olle	*MOSS			names	SD (N		Dd.						Other:		
Orange of an elifondistic principle of the lower of		_		Matrix (wwwter, Saoild, Orwaste/oil,	M/SM myone erform MS/M	04.0/PrecSep_0	\$226Ra228_GF						o redmuM lese		
			Preservation Code:	3	4X	-	8							cial Instru	Special instructions/Note:
DEK-MW-15002 (240-166154-1)	5/3/22	14:21 Factern		Water		×	×						2 TVA protoc	ol - Ra-226	TVA protocol - Ra-226+228 action limit at
DEK-MW-EB (240-166154-2)	5/3/22	10:42 Fastern		Water	×	×	×						2 TVA protoc	ol - Ra-226	TVA protocol - Ra-226+228 action limit at
DEK-MW-15005 (240-166154-3)	5/3/22	12:56 Fastern		Water	×	×	×						2 TVA protoc	ol - Ra-226	TVA protocol - Ra-226+228 action limit at 5.0 p.C.i/l
DEK-MW-15006 (240-166154-4)	5/3/22	10:42 Eastern		Water	×	×	×						2 TVA protoc	ol - Ra-226	TVA protocol - Ra-226+228 action limit at 5.0 nCi/l.
DUP-DEK-BAP (240-166154-5)	5/3/22	Eastern		Water	×	×	×						2 TVA protoc	ol - Ra-226	TVA protocol - Ra-226+228 action limit at 5.0 pCi/L.
								\dashv	=						
				1					$\frac{1}{2}$						
Note: Since laboratory accreditations are subject to change. Eurofins Environment Testing North Central, LLC places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/lessized, the samples must be shipped back to the Eurofine Environment Testing North Central I.I.C places the provided. Any changes to accreditation status should be brounded to the contraction of the provided. Any changes to	nment Testing North Centrated above for analysis/tests.	al, LLC places the	e ownership of rallyzed, the samp	nethod, analyte	& accred	itation of	ompliant Eurofins	e upon c	ut subcon	ract laborato	ries. This sa	mple shipm ratory or of	ent is forwarded u	under chain-cill be provide	of-custody. If the
Possible Hazard Identification					Samp	le Dist) osal (A fee	nav be	bessesses	if sample	s are ref	on to date, tetom the signed chain of custody attesting to said complicated to Euromis Environment resting norm Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)	than 1 mo	North Central, LLC.
Unconfirmed						Return	Return To Client	ent		Disposal By Lab	y Lab		Archive For		Months
Deliverable Requested: I, II, III, IV, Other (specify)	Primary Deliverab	able Rank: 2			Specia	ıl Instru	nctions	/QC Re	Special Instructions/QC Requirements	nts:					
Empty Kit Relinquished by:		Date:		٦	Time:	l				Meth	Method of Shipment	t			
Religious shoot by	5-6-22	1	37HI	Company	8	Received by	÷		FED EX	×	Date/Time	ime		ပိ	Company
	Date/Time:		Ö	Company	æ	Received by:	3	3	th	Werthington	,	AY 0	9 2022	88	Company
	Date/Time:		Cor	Company	Re	Received by:				0		ime:		<u>S</u>	Sompany
Custody Seals Intact: Custody Seal No.:					8	oler Tem	perature	(s) °C ar	Cooler Temperature(s) °C and Other Remarks	marks:					
						11	13	12	11	10	9	Q	6	5	Ver: 06/08/2021

Login Sample Receipt Checklist

Client: TRC Environmental Corporation.

Job Number: 240-166154-1

SDG Number:

Login Number: 166154
List Source: Eurofins St. Louis
List Number: 2
List Creation: 05/09/22 02:40 PM

Creator: Worthington, Sierra M

Creator: Worthington, Sierra M		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

6/12/2022

Eurofins Canton



Environment Testing America

ANALYTICAL REPORT

Eurofins Canton 180 S. Van Buren Avenue Barberton, OH 44203 Tel: (330)497-9396

Laboratory Job ID: 240-166148-1

Client Project/Site: CCR DEK Bottom Ash Pond

For:

TRC Environmental Corporation. 1540 Eisenhower Place Ann Arbor, Michigan 48108-7080

Attn: Darby Litz

Authorized for release by: 6/10/2022 8:42:08 PM

Kris Brooks, Project Manager II (330)966-9790

Kris.Brooks@et.eurofinsus.com

LINKS

Review your project results through

Have a Question?



Visit us at:

www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Table of Contents

Cover Page	1
Table of Contents	2
Definitions/Glossary	3
Case Narrative	4
Method Summary	5
Sample Summary	6
Client Sample Results	7
Tracer Carrier Summary	8
QC Sample Results	9
QC Association Summary	11
Lab Chronicle	12
Certification Summary	13
Chain of Custody	14
Receipt Checklists	19

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Definitions/Glossary

Client: TRC Environmental Corporation.

Job ID: 240-166148-1

Project/Site: CCR DEK Bottom Ash Pond

Qualifiers

D	-	М
т	d	u

Qualifier	Qualifier Description	

* RPD of the LCS and LCSD exceeds the control limits
U Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
Appleviation	These commonly used abbreviations may of may not be present in this report.

Example 2 Listed under the "D" column to designate that the result is reported on a dry weight basis

%R Percent Recovery
CFL Contains Free Liquid
CFU Colony Forming Unit
CNF Contains No Free Liquid

DER Duplicate Error Ratio (normalized absolute difference)

Dil Fac Dilution Factor

DL Detection Limit (DoD/DOE)

DL, RA, RE, IN Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample

DLC Decision Level Concentration (Radiochemistry)

EDL Estimated Detection Limit (Dioxin)

LOD Limit of Detection (DoD/DOE)

LOQ Limit of Quantitation (DoD/DOE)

MCL EPA recommended "Maximum Contaminant Level"

MDA Minimum Detectable Activity (Radiochemistry)

MDC Minimum Detectable Concentration (Radiochemistry)

MDL Method Detection Limit
ML Minimum Level (Dioxin)
MPN Most Probable Number
MQL Method Quantitation Limit

NC Not Calculated

ND Not Detected at the reporting limit (or MDL or EDL if shown)

NEG Negative / Absent POS Positive / Present

PQL Practical Quantitation Limit

PRES Presumptive
QC Quality Control

RER Relative Error Ratio (Radiochemistry)

RL Reporting Limit or Requested Limit (Radiochemistry)

RPD Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin)
TEQ Toxicity Equivalent Quotient (Dioxin)

TNTC Too Numerous To Count

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Case Narrative

Client: TRC Environmental Corporation. Project/Site: CCR DEK Bottom Ash Pond

Job ID: 240-166148-1

Job ID: 240-166148-1

Laboratory: Eurofins Canton

Narrative

Job Narrative 240-166148-1

Comments

The EPA Method 904.0 Radium-228, EPA Method 903.0 Radium-226, and Ra226_Ra228 Combined Radium 226 and Radium 228 analyses were performed at the Eurofins St. Louis laboratory.

Receipt

The samples were received on 5/6/2022 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were 0.9° C, 1.3° C and 1.4° C.

RAD

Method 903.0: Radium-226 batch 564568

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

DEK-MW-18001 (240-166148-1), (LCS 160-564568/1-A), (LCSD 160-564568/2-A) and (MB 160-564568/23-A)

Method 904.0: Radium-228 batch 564569

The RER/DER of the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) was outside control limits. However the recovery for the LCS/LCSD passed and the RPD was <40% demonstrating acceptable method performance. Original results will be reported. (LCSD 160-564569/2-A)

Method 904.0: Radium-228 batch 564569

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

DEK-MW-18001 (240-166148-1), (LCS 160-564569/1-A), (LCSD 160-564569/2-A) and (MB 160-564569/23-A)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

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Method Summary

Client: TRC Environmental Corporation. Project/Site: CCR DEK Bottom Ash Pond

Job ID: 240-166148-1

Method	Method Description	Protocol	Laboratory
903.0	Radium-226 (GFPC)	EPA	TAL SL
904.0	Radium-228 (GFPC)	EPA	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
PrecSep STD	Preparation, Precipitate Separation (Standard In-Growth)	None	TAL SL
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL

Protocol References:

EPA = US Environmental Protection Agency

None = None

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

TAL SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

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Sample Summary

Client: TRC Environmental Corporation. Project/Site: CCR DEK Bottom Ash Pond

Job ID: 240-166148-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-166148-1	DEK-MW-18001	Water	05/04/22 13:44	05/06/22 08:00

Client: TRC Environmental Corporation.

Project/Site: CCR DEK Bottom Ash Pond

Lab Sample ID: 240-166148-1

Matrix: Water

Job ID: 240-166148-1

Client Sample ID: DEK-M	IW-18001
Date Collected: 05/04/22 13:4	1

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.294		0.214	0.216	1.00	0.292	pCi/L	05/09/22 14:15	06/07/22 18:10	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.8		40 - 110					05/09/22 14:15	06/07/22 18:10	1

Method: 904.0 -	Radium-228	(GFPC)								
		. ,	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.592	*	0.317	0.321	1.00	0.438	pCi/L	05/09/22 14:18	06/07/22 15:33	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.8		40 - 110					05/09/22 14:18	06/07/22 15:33	1
Y Carrier	87.5		40 - 110					05/09/22 14:18	06/07/22 15:33	1

Method: Ra226_Ra	228 - Con	nbined Rad	dium-226 a	nd Radium	1-228					
_			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.885		0.382	0.387	5.00	0.438	pCi/L		06/08/22 13:03	1

Tracer/Carrier Summary

Client: TRC Environmental Corporation. Project/Site: CCR DEK Bottom Ash Pond Job ID: 240-166148-1

Method: 903.0 - Radium-226 (GFPC)

Matrix: Water Prep Type: Total/NA

			Percent Yield (Acceptance Limits)
		Ва	
Lab Sample ID	Client Sample ID	(40-110)	
240-166148-1	DEK-MW-18001	90.8	
LCS 160-564568/1-A	Lab Control Sample	94.3	
LCSD 160-564568/2-A	Lab Control Sample Dup	82.3	
MB 160-564568/23-A	Method Blank	99.3	
Tracer/Carrier Legend	I		
Ba = Ba Carrier			

Method: 904.0 - Radium-228 (GFPC)

Prep Type: Total/NA **Matrix: Water**

				Percent Yield (Acceptance Limits)
		Ва	Y	
Lab Sample ID	Client Sample ID	(40-110)	(40-110)	
240-166148-1	DEK-MW-18001	90.8	87.5	
LCS 160-564569/1-A	Lab Control Sample	94.3	84.9	
LCSD 160-564569/2-A	Lab Control Sample Dup	82.3	84.5	
MB 160-564569/23-A	Method Blank	99.3	91.2	

Ba = Ba Carrier

Y = Y Carrier

Client: TRC Environmental Corporation. Job ID: 240-166148-1

Project/Site: CCR DEK Bottom Ash Pond

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-564568/23-A

Matrix: Water

Matrix: Water

Analysis Batch: 568823

Analysis Batch: 569008

Client Sample ID: Method Blank

Prep Type: Total/NA Prep Batch: 564568

MB MB Uncert. Uncert. Analyte Result Qualifier $(2\sigma + / -)$ $(2\sigma + / -)$ RL **MDC** Unit Prepared Analyzed Dil Fac Radium-226 0.002143 U 0.135 0.135 1.00 0.285 pCi/L 05/10/22 09:51 06/07/22 20:02

Total

Count

MB

Carrier %Yield Qualifier Limits Prepared Analyzed Dil Fac Ba Carrier 99.3 40 - 110 05/10/22 09:51 06/07/22 20:02

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 564568

Total LCS LCS %Rec **Spike** Uncert. Analyte Added Result Qual $(2\sigma + / -)$ RL **MDC** Unit %Rec Limits Radium-226 11.3 9.625 1.28 1.00 0.274 pCi/L 85 75 - 125

LCS LCS Carrier %Yield Qualifier Limits Ba Carrier 94.3 40 - 110

Lab Sample ID: LCS 160-564568/1-A

Lab Sample ID: LCSD 160-564568/2-A **Client Sample ID: Lab Control Sample Dup**

Matrix: Water

Analysis Batch: 568823

Prep Type: Total/NA

Prep Batch: 564568

Total LCSD LCSD %Rec **RER** Spike Uncert. %Rec Added Result Qual $(2\sigma + / -)$ RL **MDC** Unit Limits Analyte RER Limit Radium-226 11.3 9.709 1.34 1.00 0.405 pCi/L 86 75 - 125 0.03

LCSD LCSD Carrier %Yield Qualifier Limits Ba Carrier 82.3 40 - 110

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-564569/23-A Client Sample ID: Method Blank **Matrix: Water** Prep Type: Total/NA

Analysis Batch: 568850 **Prep Batch: 564569**

Count Total MB MB Uncert. Uncert. Analyte Result Qualifier $(2\sigma + / -)$ $(2\sigma + / -)$ RL **MDC** Unit Prepared Dil Fac Analyzed pCi/L Radium-228 0.03881 Ū 0.215 0.215 1.00 05/10/22 10:04 06/07/22 15:38 0.396

MB MB Carrier %Yield Qualifier Limits Prepared Dil Fac Analyzed Ba Carrier 99.3 40 - 110 05/10/22 10:04 06/07/22 15:38 40 - 110 Y Carrier 91.2 05/10/22 10:04 06/07/22 15:38

Eurofins Canton

QC Sample Results

Client: TRC Environmental Corporation. Job ID: 240-166148-1 Project/Site: CCR DEK Bottom Ash Pond

Method: 904.0 - Radium-228 (GFPC) (Continued)

Lab Sample ID: LCS 160-564569/1-A **Client Sample ID: Lab Control Sample**

Matrix: Water

Prep Type: Total/NA Analysis Batch: 569007 **Prep Batch: 564569**

				iotai				
	Spike	LCS	LCS	Uncert.				%Rec
Analyte	Added	Result	Qual	(2σ+/-)	RL	MDC Unit	%Rec	Limits
Radium-228	8.55	6.624		1.00	1.00	0.571 pCi/L	77	75 - 125

LCS LCS Carrier %Yield Qualifier Limits Ba Carrier 94.3 40 - 110 Y Carrier 84.9 40 - 110

Lab Sample ID: LCSD 160-564569/2-A **Client Sample ID: Lab Control Sample Dup Prep Type: Total/NA**

Matrix: Water

Analysis Batch: 569007

				Total						
	Spike	LCSD	LCSD	Uncert.				%Rec		RER
Analyte	Added	Result	Qual	(2σ+/-)	RL	MDC Unit	%Rec	Limits	RER	Limit
Radium-228	8.55	9.176	*	1.28	1.00	0.579 pCi/L	107	75 - 125	1.12	1

LCSD LCSD Carrier %Yield Qualifier Limits Ba Carrier 40 - 110 82.3 84.5 40 - 110 Y Carrier

Prep Batch: 564569

QC Association Summary

Client: TRC Environmental Corporation.

Project/Site: CCR DEK Bottom Ash Pond

Job ID: 240-166148-1

Rad

Prep Batch: 564568

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-166148-1	DEK-MW-18001	Total/NA	Water	PrecSep STD	
MB 160-564568/23-A	Method Blank	Total/NA	Water	PrecSep STD	
LCS 160-564568/1-A	Lab Control Sample	Total/NA	Water	PrecSep STD	
LCSD 160-564568/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep STD	

Prep Batch: 564569

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-166148-1	DEK-MW-18001	Total/NA	Water	PrecSep_0	
MB 160-564569/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-564569/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-564569/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep 0	

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Lab Chronicle

Client: TRC Environmental Corporation. Job ID: 240-166148-1

Project/Site: CCR DEK Bottom Ash Pond

Client Sample ID: DEK-MW-18001 Lab Sample ID: 240-166148-1

Matrix: Water

Date Collected: 05/04/22 13:44 Date Received: 05/06/22 08:00

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			564568	05/09/22 14:15	LPS	TAL SL
Total/NA	Analysis	903.0		1	568823	06/07/22 18:10	FLC	TAL SL
Total/NA	Prep	PrecSep_0			564569	05/09/22 14:18	LPS	TAL SL
Total/NA	Analysis	904.0		1	568823	06/07/22 15:33	FLC	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	569042	06/08/22 13:03	SCB	TAL SL

Laboratory References:

TAL SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Accreditation/Certification Summary

Client: TRC Environmental Corporation. Project/Site: CCR DEK Bottom Ash Pond

Job ID: 240-166148-1

Laboratory: Eurofins St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	20-001	05-06-25
ANAB	Dept. of Defense ELAP	L2305	04-06-25
ANAB	Dept. of Energy	L2305.01	04-06-25
ANAB	ISO/IEC 17025	L2305	04-06-25
Arizona	State	AZ0813	12-08-22
California	Los Angeles County Sanitation Districts	10259	06-30-22
California	State	2886	07-01-22
Connecticut	State	PH-0241	03-31-23
Florida	NELAP	E87689	06-30-22
HI - RadChem Recognition	State	n/a	06-30-22
Illinois	NELAP	200023	11-30-22
lowa	State	373	12-01-22
Kansas	NELAP	E-10236	10-31-22
Kentucky (DW)	State	KY90125	12-31-22
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-22
Louisiana	NELAP	04080	06-30-22
Louisiana (DW)	State	LA011	12-31-22
Maryland	State	310	09-30-22
MI - RadChem Recognition	State	9005	06-30-22
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-22
New Jersey	NELAP	MO002	06-30-22
New York	NELAP	11616	04-01-23
North Dakota	State	R-207	06-30-22
NRC	NRC	24-24817-01	12-31-22
Oklahoma	NELAP	9997	08-31-22
Oregon	NELAP	4157	09-01-22
Pennsylvania	NELAP	68-00540	02-28-23
South Carolina	State	85002001	06-30-22
Texas	NELAP	T104704193	07-31-22
US Fish & Wildlife	US Federal Programs	058448	07-31-22
USDA	US Federal Programs	P330-17-00028	03-11-23
Utah	NELAP	MO000542021-14	08-01-22
Virginia	NELAP	10310	06-14-22
Washington	State	C592	08-30-22
West Virginia DEP	State	381	10-31-22

Eurofins Canton

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Eurofins Canton

	Euronns Canton				<u> </u>	るの目の目			
	180 S. Van Buren Avenue Barbedon OH 44203	Cha	hain of Custody Record	stody R	ecord	190	,	Env Env	Environment Testing
	barberton, UH 44203 Phone: 330-497-9396 Fax: 330-497-0772			•				Am	America
	Client Information		Kenz	Lab PM Brooks	Lab PM. Brooks, Kris M	Carrier Tracking No(s)		COC No. 240-94787-29053.1	
	Client Contact Jacob Krenz	0-	4-9804	E-Mai Kris.	E-Mail: Kris. Brooks@et.eurofinsus.com	State of Origin:	Page	Page Page 1 of 1	
	Сомралу. TRC Environmental Corporation.		PWSID		Ana	Analysis Requested	# qof	32	
	Address. 1540 Eisenhower Place	Due Date Requested:					Pres		
	City. Ann Arbor	TAT Requested (days):					O B A - H	A - HCL M - H B - NaOH N - N C - Zn Acetate O - A	M - Hexane N - None O - AsNaO2
	State, Zip MI, 48108-7080	Compliance Project: A	A Yes A No				0 W		a204S a2S03
	Phone 734-971-7080(Tel) 734-971-9022(Fax)	PO# TBD			(c		2 4 4		a2S203 2SO4 2D Dodecabudrate
	Email JKrenz@trccompanies.com	#OM							cetone
	Project Name Karn/Weadock CCR DEK Bottom Ash Pond & I	Project #: 24024154			EbC 68 OL		_		W - pH 4-5 Z - other (specify)
	Site	SSOW#			228_G SD (Y		oo to		
			4		eid Filtered : erform MS/M 33.0, Ra226Ra 34.0 - Standard		otal Number		
Pa	Sample identification	Sample Date	Ilme G=grab)	Preservation Code:	6 O)1 ×	Special Instructions/Note:	lions/Note:
ge '	DEK MW 16003			Mater					
14 o	DEK-MW-18001	5-4-27 13	344 6	Water	XXX				
of 19				Water					
						Chain of Custody	1		
					240-16614	240-166148 Chair			
		1			Sample Disposal (A fe	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)	oles are retained lo	onger than 1 mon	(th)
	Non-Hazard Hammable Skin Irritant Poison B Deliverable Requested: I, III, IV, Other (specify)	son B Unknown	Radiological		Special Instructions/QC Requirements	Disposal By Lab Requirements:	Archive For		Months
	Empty Kit Relinquished by:	Date			Time	Method of Shipment	pment		
	Relinquished.6/	Date/Time	1330	Company	Received	Da	Date/Time	Company 13 36	pany 1
6/1	Retinquished by	7 13		Company FR 74	Received by	60	22	2	ETNC
0/2	1	Odie, inc		Company	received by		Date/Time	Сотрапу	any
022	Custody Seals Infact: Custody Seal No.: △ Yes △ No				Cooler Temperature(s) °C and Other Remarks	; and Other Remarks			

Eurofins TestAmerica Canton Sample Receipt Form/Narrative	Login # : 166148
Canton Facility	
Client TRC Site Name	Cooler unpacked by:
Cooler Received on 56-72 Opened on 5-6-72	(Inc)
FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier	Other
Receipt After-hours: Drop-off Date/Time Storage Location	
Packing material used: Bubble Wrap Foam Plastic Bag None Other COOLANT: Wet Ice Blue Ice Dry Ice Water None	
1. Cooler temperature upon receipt See Multiple Cooler For	m
IR GUN# IR-13 (CF 0.0 °C) Observed Cooler Temp. °C Corrected Cooler To	
IR GUN #IR-15 (CF -0.7°C) Observed Cooler Temp. °C Corrected Cooler T	
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity/ec. Yes) No
	No NA Tests that are not checked for pH by
	Receiving:
	ONO NA
	VOAs Oil and Grease
	No Oil and Grease TOC
	No No
) No
	No
9. For each sample, does the COC specify preservatives (YN), # of containers (YN) and sa	
10. Were correct bottle(s) used for the test(s) indicated?	
	No
· · · · · · · · · · · · · · · · · · ·	66
If yes, Questions 13-17 have been checked at the originating laboratory.	N. N
13. Were all preserved sample(s) at the correct pH upon receipt? 14. Were VOAs on the COC? Yes	No NA pH Strip Lot# HC157842
	No (NA)
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # Yes	
17. Was a LL Hg or Me Hg trip blank present? Yes	
Contacted PM Date by via Verbal Ve	pice Mail Other
Concerning	
18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES	Samples processed by:
19. SAMPLE CONDITION	
Sample(s) were received after the recommended holding	
	in a broken container.
Sample(s) were received with bubble >6 mm in	diameter. (Notify PM)
20. SAMPLE PRESERVATION	
Sample(s) were furt	her preserved in the laboratory.
Sample(s) were further the preserved: Preservative(s) added/Lot number(s):	
VOA Sample Preservation - Date/Time VOAs Frozen:	

Login #: 166148

	Eurofins - Canto	n Sample Receipt Mu	Itiple Cooler Form	
Cooler Description	IR Gun #	Observed	Corrected	Coolant
(Circle)	(Gircle)	Temp °C	Temp °C	(Circle)
A Client Box Other	IR-15 IR-15	1,2	1.3 (Wet ice Blue ice Dry ice
TA Client Box Other	IR-13 IR-15	111		Wet ic Blue ice Dry ice
*	IR-13 IR-15	0.0	00	Water None Wet Ice Blue Ice Dry Ice
TA Client Box Other	Hr-13 IR-15	0.9	0.9	Water None Wet Ice Blue Ice Dry Ice
TA Client Box Other	IR-13 IR-15			Water None Wet Ice Blue Ice Dry Ice
TA Client Box Other	IR-13 IR-15			Water None Wet Ice Blue Ice Dry Ice
TA Client Box Other				Water None
TA Client Box Other	IR-13 IR-15			Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet ice Blue ice Dry ice Water None
TA Client Box Other	IR-13 IR-15			Wet ice Sive ice Dry ice Water None
TA Client Box Other	IR-13 IR-15			Wet ice Blue ice Dry ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet ice Blue ice Dry ice Water None
TA Client Box Other	IR-13 IR-15		· · · · · · · · · · · · · · · · · · ·	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet ice Blue ice Dry ice
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice
TA Client Box Other	IR-13 IR-15			Water None Wet Ice Blue Ice Dry Ice
TA Client Box Other	IR-13 IR-15			Water None Wet ice Blue ice Dry ice
TA Client Box Other	IR-13 IR-15			Water None Wet Ice Blue Ice Dry Ice
TA Client Box Other	IR-13 IR-15			Water None Wet Ice Blue Ice Dry Ice
TA Client Box Other	IR-13 IR-15			Water None Wet Ice Blue Ice Dry Ice
TA Client Box Other	IR-13 IR-15			Water None Wet Ice Blue Ice Dry Ice
	IR-13 IR-15			Water None Wet ice Blue ice Dry ice
TA Client Box Other	IR-13 IR-15			Water None Wet Ice Blue Ice Dry Ice
TA Client Box Other	IR-13 IR-15	The same and the s		Water None Wet Ice Slue Ice Dry Ice
TA Client Box Other	IR-13 IR-15			Water None Wet Ice Sive Ice Dry Ice
TA Client Box Other	IR-13 IR-15			Water None Wet Ice Slue Ice Dry Ice
TA Client Box Other				Water None Wet ice Blue ice Dry ice
TA Client Box Other	IR-13 IR-15		· · · · · · · · · · · · · · · · · · ·	Water None
TA Client Box Other	IR-13 IR-15			Wet ice Blue ice Dry ice Water None
TA Client Box Other	IR-13 R-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet ice Blue ice Dry ice Water None
TA Client Box Other	IR-13 IR-15			Wet ice Stue ice Dry ice Water None
V - 200 W - 200			☐ See Tem	perature Excursion Form

WI-NC-099 Cooler Receipt Form Page 2 - Multiple Coolers

5/6/2022

Login Container Summary Report

240-166148

Temperature readings:				
Client Sample ID	<u>Lab ID</u>	Container Type	<u>Container</u> pH Temp	Preservative Added (mls) Lot #
DEK-MW-18001	240-166148-A-1	Plastic 1 liter - Nitric Acid	<2	
DEK-MW-18001	240-166148-B-1	Plastic 1 liter - Nitric Acid	<2	

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Environment Testing

Chain of Custody Record

Phone: 330-497-9396 Fax: 330-497-0772

180 S. Van Buren Avenue **Eurofins Canton**

Barberton, OH 44203

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Carrier Tracking No(s)

N - Node O - AsNaO2 P - Na2O4S O - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate TVA protocol - Ra-226+228 action limit at Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing North Central, LLC places the ownership of method, analyte & accreditation compliance upon out subcontract laboratory or other instructions will be provided. Any changes to abovatory or other instructions will be provided. Any changes to abovation or the State of Origin listed above for analysis/lests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing North Central, LLC attention immediately. If all requested accreditations status should be brought to Eurofins Environment Testing North Central, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins Environment Testing North Central, LLC. Special Instructions/Note: Z - other (specify) Ver: 06/08/2021 ०६३४ हमान्य U - Acetone V - MCAA M - Hexane W - pH 4-5 Months Company Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

Return To Client Disposal By Lab Archive For Mon Preservation Codes: G - Amchlor H - Ascorbic Acid 240-151693.1 240-166148-1 A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH J - Di Water Page 1 of 1 K - EDTA L - EDA 5.0 pCi/L 2022 Total Number of containers 2 S MAY 0 Date/Time Method of Shipment State of Origin: Michigan Wethington **Analysis Requested** Cooler Temperature(s) °C and Other Remarks: Special Instructions/QC Requirements: FEDEX Accreditations Required (See note) Kris.Brooks@et.eurofinsus.com 13 Surve × Ra226Ra228_GFPC Received by: eceived by: Received by 04.0/PrecSep_0 Standard Target List × × Lab PM: Brooks, Kris M 03.0/PrecSep_STD Standard Target List Perform MS/MSD (Yes or No) E. Field Filtered Sample (Yes or No) E-Mail ETA Preservation Code: Matrix Water Company 424 Sample (C=comp, G=grab) Type Primary Deliverable Rank: 2 Eastern Sample Time Date: (AT Requested (days) Due Date Requested: 6/7/2022 Sate/Time: 5-6-22 Sample Date Project # 24024154 5/4/22 Date/Time: hone # O.W FED EX Client Information (Sub Contract Lab) Deliverable Requested: I, II, III, IV, Other (specify) Custody Seal No.: Sample Identification - Client ID (Lab ID) 314-298-8566(Tel) 314-298-8757(Fax) DEK-MW-18001 (240-166148-1) Possible Hazard Identification festAmerica Laboratories, Inc. CCR DEK Bottom Ash Pond Empty Kit Relinquished by: 13715 Rider Trail North, Custody Seals Intact: ∆ Yes ∆ No Shipping/Receiving inquished by: **Jnconfirmed** State Zip MO 63045 Earth City

Login Sample Receipt Checklist

Client: TRC Environmental Corporation.

Job Number: 240-166148-1

SDG Number:

Login Number: 166148
List Source: Eurofins St. Louis
List Number: 2
List Creation: 05/09/22 02:25 PM

Creator: Worthington, Sierra M

Creator. Worthington, Sierra W		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or ampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
s the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is 6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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13



Environment Testing America

ANALYTICAL REPORT

Eurofins Canton 180 S. Van Buren Avenue Barberton, OH 44203 Tel: (330)497-9396

Laboratory Job ID: 240-166150-1

Client Project/Site: CCR Background Well

For:

TRC Environmental Corporation. 1540 Eisenhower Place Ann Arbor, Michigan 48108-7080

Attn: Darby Litz

Authorized for release by: 6/12/2022 7:33:54 PM

Kris Brooks, Project Manager II (330)966-9790

Kris.Brooks@et.eurofinsus.com

LINKS

Review your project results through

Have a Question?



Visit us at:

www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Table of Contents

Cover Page	1
Table of Contents	2
Definitions/Glossary	3
Case Narrative	4
Method Summary	5
Sample Summary	6
Client Sample Results	7
Tracer Carrier Summary	13
QC Sample Results	14
QC Association Summary	16
Lab Chronicle	17
Certification Summary	19
Chain of Custody	20
Receipt Checklists	25

4

5

7

8

10

10

13

Definitions/Glossary

Client: TRC Environmental Corporation.

Job ID: 240-166150-1

Project/Site: CCR Background Well

Qualifiers

R	a	d

* RPD of the LCS and LCSD exceeds the control limits
U Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.

Listed under the "D" column to designate that the result is reported on a dry weight basis

%R Percent Recovery
CFL Contains Free Liquid
CFU Colony Forming Unit
CNF Contains No Free Liquid

DER Duplicate Error Ratio (normalized absolute difference)

Dil Fac Dilution Factor

DL Detection Limit (DoD/DOE)

DL, RA, RE, IN Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample

DLC Decision Level Concentration (Radiochemistry)

EDL Estimated Detection Limit (Dioxin)

LOD Limit of Detection (DoD/DOE)

LOQ Limit of Quantitation (DoD/DOE)

MCL EPA recommended "Maximum Contaminant Level"

MDA Minimum Detectable Activity (Radiochemistry)

MDC Minimum Detectable Concentration (Radiochemistry)

MDL Method Detection Limit
ML Minimum Level (Dioxin)
MPN Most Probable Number
MQL Method Quantitation Limit

NC Not Calculated

ND Not Detected at the reporting limit (or MDL or EDL if shown)

NEG Negative / Absent POS Positive / Present

PQL Practical Quantitation Limit

PRES Presumptive
QC Quality Control

RER Relative Error Ratio (Radiochemistry)

RL Reporting Limit or Requested Limit (Radiochemistry)

RPD Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin)
TEQ Toxicity Equivalent Quotient (Dioxin)

TNTC Too Numerous To Count

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11

13

Case Narrative

Client: TRC Environmental Corporation. Project/Site: CCR Background Well

Job ID: 240-166150-1

Job ID: 240-166150-1

Laboratory: Eurofins Canton

Narrative

Job Narrative 240-166150-1

Comments

The EPA Method 904.0 Radium-228, EPA Method 903.0 Radium-226, and Ra226_Ra228 Combined Radium 226 and Radium 228 analyses were performed at the Eurofins St. Louis laboratory.

Receipt

The samples were received on 5/6/2022 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were 0.9° C, 1.3° C and 1.4° C.

RAD

Method 903.0: Radium-226 batch 564568

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. MW-15002 (240-166150-1), MW-15008 (240-166150-2), MW-15016 (240-166150-3), MW-15019 (240-166150-4), DUP-04 (240-166150-5), EB-04 (240-166150-6), (LCS 160-564568/1-A), (LCSD 160-564568/2-A) and (MB 160-564568/23-A)

Method 904.0: Radium-228 batch 564569

The RER/DER of the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) was outside control limits. However the recovery for the LCS/LCSD passed and the RPD was <40% demonstrating acceptable method performance. Original results will be reported. (LCSD 160-564569/2-A)

Method 904.0: Radium-228 batch 564569

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. MW-15002 (240-166150-1), MW-15008 (240-166150-2), MW-15016 (240-166150-3), MW-15019 (240-166150-4), DUP-04 (240-166150-5), EB-04 (240-166150-6), (LCS 160-564569/1-A), (LCSD 160-564569/2-A) and (MB 160-564569/23-A)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

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Method Summary

Client: TRC Environmental Corporation. Project/Site: CCR Background Well

Job ID: 240-166150-1

Method 903.0	Method Description Radium-226 (GFPC)	Protocol EPA	TAL SL
904.0	Radium-228 (GFPC) Combined Radium-226 and Radium-228	EPA	TAL SL
Ra226_Ra228		TAL-STL	TAL SL
PrecSep STD	Preparation, Precipitate Separation (Standard In-Growth) Preparation, Precipitate Separation	None	TAL SL
PrecSep_0		None	TAL SL

Protocol References:

EPA = US Environmental Protection Agency

None = None

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

TAL SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Sample Summary

Client: TRC Environmental Corporation. Project/Site: CCR Background Well

Job ID: 240-166150-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-166150-1	MW-15002	Water	05/02/22 17:24	05/06/22 08:00
240-166150-2	MW-15008	Water	05/02/22 13:45	05/06/22 08:00
240-166150-3	MW-15016	Water	05/03/22 08:37	05/06/22 08:00
240-166150-4	MW-15019	Water	05/02/22 15:20	05/06/22 08:00
240-166150-5	DUP-04	Water	05/02/22 00:00	05/06/22 08:00
240-166150-6	EB-04	Water	05/02/22 13:45	05/06/22 08:00

Client: TRC Environmental Corporation. Project/Site: CCR Background Well

Lab Sample ID: 240-166150-1

Matrice Water

Job ID: 240-166150-1

Matrix: Water

Client Sample ID:	MW-15002
Date Collected: 05/02/	/22 17:24

Date Received: 05/06/22 08:00

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	1.37		0.522	0.536	1.00	0.574	pCi/L	05/10/22 09:51	06/07/22 18:11	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	82.3		40 - 110					05/10/22 09:51	06/07/22 18:11	1

Method: 904.0 - I	Radium-228	(GFPC)	Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	3.30	*	0.757	0.816	1.00	0.785	pCi/L	05/10/22 10:04	06/07/22 15:33	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	82.3		40 - 110					05/10/22 10:04	06/07/22 15:33	1
Y Carrier	86.7		40 - 110					05/10/22 10:04	06/07/22 15:33	1

Method: Ra226_Ra	228 - Con	nbined Rad	dium-226 a	nd Radium	-228					
_			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	4.68		0.920	0.976	5.00	0.785	pCi/L		06/08/22 13:03	1

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Client: TRC Environmental Corporation. Project/Site: CCR Background Well

Lab Sample ID: 240-166150-2

Matrix: Water

Job ID: 240-166150-1

Client Sampl	e ID: MW-15008
Date Collected:	05/02/22 13:45

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.317	U	0.294	0.295	1.00	0.447	pCi/L	05/10/22 09:51	06/07/22 18:35	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.8		40 - 110					05/10/22 09:51	06/07/22 18:35	1

Method: 904.0 -	Radium-228	(GFPC)								
		. ,	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.509	U *	0.388	0.391	1.00	0.588	pCi/L	05/10/22 10:04	06/07/22 15:33	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.8		40 - 110					05/10/22 10:04	06/07/22 15:33	1
Y Carrier	86.4		40 - 110					05/10/22 10:04	06/07/22 15:33	1

Method: Ra226_Ra	228 - Con	ibined Rad	dium-226 a	nd Radium	1-228					
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.826		0.487	0.490	5.00	0.588	pCi/L		06/08/22 13:03	1

Client: TRC Environmental Corporation. Project/Site: CCR Background Well

Lab Sample ID: 240-166150-3

Matrix: Water

Job ID: 240-166150-1

Client Sample ID: MW-15016	j
Date Collected: 05/03/22 08:37	

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0815	U	0.195	0.195	1.00	0.368	pCi/L	05/10/22 09:51	06/07/22 18:11	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.0		40 - 110					05/10/22 09:51	06/07/22 18:11	1

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.542	U *	0.403	0.406	1.00	0.611	pCi/L	05/10/22 10:04	06/07/22 15:33	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.0		40 - 110					05/10/22 10:04	06/07/22 15:33	1
Y Carrier	84.5		40 - 110					05/10/22 10:04	06/07/22 15:33	1

Method: Ra226_Ra	228 - Con	nbined Rad	dium-226 a	nd Radium	-228					
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.624		0.448	0.450	5.00	0.611	pCi/L		06/08/22 13:03	1

Client: TRC Environmental Corporation. Project/Site: CCR Background Well

Lab Sample ID: 240-166150-4

Matrix: Water

Job ID: 240-166150-1

Client Sample ID: MW-15019 Date Collected: 05/02/22 15:20

Method: 903.0 -	· Radium-226	(GFPC)	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.278	U	0.349	0.350	1.00	0.579	pCi/L	05/10/22 09:51	06/07/22 18:05	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.8		40 - 110					05/10/22 09:51	06/07/22 18:05	1

Method: 904.0 -	Raululli-220	(GI FC)	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.83	*	0.601	0.625	1.00	0.742	pCi/L	05/10/22 10:04	06/07/22 15:33	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.8		40 - 110					05/10/22 10:04	06/07/22 15:33	1
Y Carrier	86.7		40 - 110					05/10/22 10:04	06/07/22 15:33	1

 Method: Ra226_Ra	228 - Con	nbined Rad	dium-226 a	nd Radium	-228					
			Count	Total						
Analyte	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	2.11		0.695	0.716	5.00	0.742	pCi/L		06/08/22 13:03	1

Client: TRC Environmental Corporation. Project/Site: CCR Background Well

Lab Sample ID: 240-166150-5

Matrix: Water

Job ID: 240-166150-1

Date Collected: 05/02/22 00:00 Date Received: 05/06/22 08:00

Client Sample ID: DUP-04

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.650		0.422	0.426	1.00	0.599	pCi/L	05/10/22 09:51	06/07/22 18:05	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.3		40 - 110					05/10/22 09:51	06/07/22 18:05	1

Method: 904.0 - I	Radium-228	(GFPC)								
		, ,	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.938	*	0.482	0.490	1.00	0.675	pCi/L	05/10/22 10:04	06/07/22 15:34	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.3		40 - 110					05/10/22 10:04	06/07/22 15:34	1
Y Carrier	89.0		40 - 110					05/10/22 10:04	06/07/22 15:34	1

Method: Ra226_Ra	228 - Con	nbined Rad	dium-226 a	nd Radium	-228					
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.59		0.641	0.649	5.00	0.675	pCi/L		06/08/22 13:03	1

6/12/2022

Client: TRC Environmental Corporation. Project/Site: CCR Background Well

Lab Sample ID: 240-166150-6

Matrix: Water

Job ID: 240-166150-1

Client	t Sam	ple	ID:	FB-	04
D-4- 0	- 11 4 -	l. A	-	100 4	0 - 4

Date Collected: 05/02/22 13:45 Date Received: 05/06/22 08:00

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0315	U	0.209	0.209	1.00	0.466	pCi/L	05/10/22 09:51	06/07/22 18:05	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	57.6		40 - 110					05/10/22 09:51	06/07/22 18:05	1

Method: 904.0 -	Radium-228	(GFPC)								
		. ,	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.292	U *	0.488	0.488	1.00	0.832	pCi/L	05/10/22 10:04	06/07/22 15:35	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	57.6		40 - 110					05/10/22 10:04	06/07/22 15:35	1
Y Carrier	87.9		40 - 110					05/10/22 10:04	06/07/22 15:35	1

Method: Ra226_Ra2	228 - Con	nbined Rad	dium-226 a	nd Radium	1-228					
_			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.260	U	0.531	0.531	5.00	0.832	pCi/L		06/08/22 13:03	1

Tracer/Carrier Summary

Client: TRC Environmental Corporation.

Project/Site: CCR Background Well

Job ID: 240-166150-1

Method: 903.0 - Radium-226 (GFPC)

Matrix: Water Prep Type: Total/NA

			Percent Yield (Acceptance Limits)
		Ва	
Lab Sample ID	Client Sample ID	(40-110)	
240-166150-1	MW-15002	82.3	
240-166150-2	MW-15008	89.8	
240-166150-3	MW-15016	93.0	
240-166150-4	MW-15019	89.8	
240-166150-5	DUP-04	88.3	
240-166150-6	EB-04	57.6	
LCS 160-564568/1-A	Lab Control Sample	94.3	
LCSD 160-564568/2-A	Lab Control Sample Dup	82.3	
MB 160-564568/23-A	Method Blank	99.3	
Tracer/Carrier Legend	i		
Ba = Ba Carrier			

Method: 904.0 - Radium-228 (GFPC)

Matrix: Water Prep Type: Total/NA

				Percent Yield (Acceptance Limits)
		Ва	Υ	
Lab Sample ID	Client Sample ID	(40-110)	(40-110)	
240-166150-1	MW-15002	82.3	86.7	
240-166150-2	MW-15008	89.8	86.4	
240-166150-3	MW-15016	93.0	84.5	
240-166150-4	MW-15019	89.8	86.7	
240-166150-5	DUP-04	88.3	89.0	
240-166150-6	EB-04	57.6	87.9	
LCS 160-564569/1-A	Lab Control Sample	94.3	84.9	
LCSD 160-564569/2-A	Lab Control Sample Dup	82.3	84.5	
MB 160-564569/23-A	Method Blank	99.3	91.2	

Ba = Ba Carrier

Y = Y Carrier

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Client: TRC Environmental Corporation. Job ID: 240-166150-1

Project/Site: CCR Background Well

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-564568/23-A Client Sample ID: Method Blank

Matrix: Water

Analysis Batch: 569008

Prep Type: Total/NA Prep Batch: 564568

MB MB Uncert. Uncert. Analyte Result Qualifier $(2\sigma + / -)$ $(2\sigma + / -)$ RL **MDC** Unit Prepared Analyzed Dil Fac Radium-226 0.002143 U 0.135 0.135 1.00 0.285 pCi/L 05/10/22 09:51 06/07/22 20:02

Total

Count

MB

Carrier **%Yield Qualifier** Limits Prepared Analyzed Dil Fac Ba Carrier 99.3 40 - 110 05/10/22 09:51 06/07/22 20:02

Total

Client Sample ID: Lab Control Sample

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 564569

Prep Type: Total/NA

Prep Batch: 564568

Lab Sample ID: LCS 160-564568/1-A **Matrix: Water**

Analysis Batch: 568823

				iotai					
	Spike	LCS	LCS	Uncert.				%Rec	
Analyte	Added	Result	Qual	(2σ+/-)	RL	MDC Unit	%Rec	Limits	
Radium-226	11.3	9.625		1.28	1.00	0.274 pCi/L	85	75 - 125	

LCS LCS

Carrier %Yield Qualifier Limits Ba Carrier 94.3 40 - 110

Lab Sample ID: LCSD 160-564568/2-A **Client Sample ID: Lab Control Sample Dup** Prep Type: Total/NA

Matrix: Water

Analysis Batch: 568823

Prep Batch: 564568 Total LCSD LCSD %Rec **RER** Spike Uncert.

Analyte Added Result Qual $(2\sigma + / -)$ RL **MDC** Unit %Rec Limits RER Limit Radium-226 11.3 1.34 1.00 0.405 pCi/L 86 75 - 125 0.03 9.709

LCSD LCSD

Carrier %Yield Qualifier Limits Ba Carrier 82.3 40 - 110

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-564569/23-A **Matrix: Water**

Analysis Batch: 568850

Count Total MB MB Uncert. Uncert. Analyte Result Qualifier $(2\sigma + / -)$ $(2\sigma + / -)$ RL **MDC** Unit Prepared Dil Fac Analyzed Radium-228 0.03881 Ū 0.215 0.215 1.00 pCi/L 05/10/22 10:04 06/07/22 15:38 0.396

> MB MB

Carrier %Yield Qualifier Limits Prepared Dil Fac Analyzed Ba Carrier 99.3 40 - 110 05/10/22 10:04 06/07/22 15:38 40 - 110 Y Carrier 91.2 05/10/22 10:04 06/07/22 15:38

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6/12/2022

QC Sample Results

Client: TRC Environmental Corporation. Job ID: 240-166150-1 Project/Site: CCR Background Well

Method: 904.0 - Radium-228 (GFPC) (Continued)

Lab Sample ID: LCS 160-564569/1-A **Client Sample ID: Lab Control Sample** Prep Type: Total/NA

Matrix: Water

Analysis Batch: 569007

Total LCS LCS %Rec Spike Uncert. Analyte Added Result Qual $(2\sigma + / -)$ RL**MDC** Unit %Rec Limits Radium-228 8.55 6.624 1.00 1.00 0.571 pCi/L 75 - 125

LCS LCS %Yield Qualifier Carrier Limits Ba Carrier 94.3 40 - 110 Y Carrier 84.9 40 - 110

Lab Sample ID: LCSD 160-564569/2-A **Client Sample ID: Lab Control Sample Dup** Prep Type: Total/NA

Matrix: Water

Analysis Batch: 569007

Total **Spike** LCSD LCSD Uncert. %Rec %Rec Limits Analyte Added Result Qual $(2\sigma + / -)$ RL **MDC** Unit RER Limit Radium-228 9.176 1.00 0.579 pCi/L 8.55 1.28 107 75 - 125 1.12

LCSD LCSD Carrier %Yield Qualifier Limits Ba Carrier 40 - 110 82.3 40 - 110 Y Carrier 84.5

Prep Batch: 564569

Prep Batch: 564569

QC Association Summary

Client: TRC Environmental Corporation. Project/Site: CCR Background Well Job ID: 240-166150-1

Rad

Prep Batch: 564568

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-166150-1	MW-15002	Total/NA	Water	PrecSep STD	
240-166150-2	MW-15008	Total/NA	Water	PrecSep STD	
240-166150-3	MW-15016	Total/NA	Water	PrecSep STD	
240-166150-4	MW-15019	Total/NA	Water	PrecSep STD	
240-166150-5	DUP-04	Total/NA	Water	PrecSep STD	
240-166150-6	EB-04	Total/NA	Water	PrecSep STD	
MB 160-564568/23-A	Method Blank	Total/NA	Water	PrecSep STD	
LCS 160-564568/1-A	Lab Control Sample	Total/NA	Water	PrecSep STD	
LCSD 160-564568/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep STD	

Prep Batch: 564569

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-166150-1	MW-15002	Total/NA	Water	PrecSep_0	
240-166150-2	MW-15008	Total/NA	Water	PrecSep_0	
240-166150-3	MW-15016	Total/NA	Water	PrecSep_0	
240-166150-4	MW-15019	Total/NA	Water	PrecSep_0	
240-166150-5	DUP-04	Total/NA	Water	PrecSep_0	
240-166150-6	EB-04	Total/NA	Water	PrecSep_0	
MB 160-564569/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-564569/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-564569/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

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Lab Chronicle

Client: TRC Environmental Corporation. Project/Site: CCR Background Well

Lab Sample ID: 240-166150-1

Matrix: Water

Job ID: 240-166150-1

Date Collected: 05/02/22 17:24 Date Received: 05/06/22 08:00

Client Sample ID: MW-15002

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			564568	05/10/22 09:51	LPS	TAL SL
Total/NA	Analysis	903.0		1	568823	06/07/22 18:11	FLC	TAL SL
Total/NA	Prep	PrecSep_0			564569	05/10/22 10:04	LPS	TAL SL
Total/NA	Analysis	904.0		1	568823	06/07/22 15:33	FLC	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	569042	06/08/22 13:03	SCB	TAL SL

Lab Sample ID: 240-166150-2

Matrix: Water

Date Collected: 05/02/22 13:45 Date Received: 05/06/22 08:00

Client Sample ID: MW-15008

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			564568	05/10/22 09:51	LPS	TAL SL
Total/NA	Analysis	903.0		1	568823	06/07/22 18:35	FLC	TAL SL
Total/NA	Prep	PrecSep_0			564569	05/10/22 10:04	LPS	TAL SL
Total/NA	Analysis	904.0		1	568823	06/07/22 15:33	FLC	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	569042	06/08/22 13:03	SCB	TAL SL

Lab Sample ID: 240-166150-3 **Client Sample ID: MW-15016**

Matrix: Water

Date Collected: 05/03/22 08:37 Date Received: 05/06/22 08:00

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			564568	05/10/22 09:51	LPS	TAL SL
Total/NA	Analysis	903.0		1	568823	06/07/22 18:11	FLC	TAL SL
Total/NA	Prep	PrecSep_0			564569	05/10/22 10:04	LPS	TAL SL
Total/NA	Analysis	904.0		1	568823	06/07/22 15:33	FLC	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	569042	06/08/22 13:03	SCB	TAL SL

Lab Sample ID: 240-166150-4 Client Sample ID: MW-15019

Date Collected: 05/02/22 15:20 **Matrix: Water** Date Received: 05/06/22 08:00

_	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			564568	05/10/22 09:51	LPS	TAL SL
Total/NA	Analysis	903.0		1	569008	06/07/22 18:05	FLC	TAL SL
Total/NA	Prep	PrecSep_0			564569	05/10/22 10:04	LPS	TAL SL
Total/NA	Analysis	904.0		1	568823	06/07/22 15:33	FLC	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	569042	06/08/22 13:03	SCB	TAL SL

Lab Chronicle

Client: TRC Environmental Corporation.

Job ID: 240-166150-1 Project/Site: CCR Background Well

Client Sample ID: DUP-04 Lab Sample ID: 240-166150-5

Date Collected: 05/02/22 00:00 **Matrix: Water** Date Received: 05/06/22 08:00

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			564568	05/10/22 09:51	LPS	TAL SL
Total/NA	Analysis	903.0		1	569008	06/07/22 18:05	FLC	TAL SL
Total/NA	Prep	PrecSep_0			564569	05/10/22 10:04	LPS	TAL SL
Total/NA	Analysis	904.0		1	568823	06/07/22 15:34	FLC	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	569042	06/08/22 13:03	SCB	TAL SL

Lab Sample ID: 240-166150-6 Client Sample ID: EB-04

Date Collected: 05/02/22 13:45 **Matrix: Water**

Date Received: 05/06/22 08:00

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep STD			564568	05/10/22 09:51	LPS	TAL SL
Total/NA	Analysis	903.0		1	569008	06/07/22 18:05	FLC	TAL SL
Total/NA	Prep	PrecSep_0			564569	05/10/22 10:04	LPS	TAL SL
Total/NA	Analysis	904.0		1	568835	06/07/22 15:35	FLC	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	569042	06/08/22 13:03	SCB	TAL SL

Laboratory References:

TAL SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Accreditation/Certification Summary

Client: TRC Environmental Corporation. Project/Site: CCR Background Well

Job ID: 240-166150-1

Laboratory: Eurofins St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	20-001	05-06-25
ANAB	Dept. of Defense ELAP	L2305	04-06-25
ANAB	Dept. of Energy	L2305.01	04-06-25
ANAB	ISO/IEC 17025	L2305	04-06-25
Arizona	State	AZ0813	12-08-22
California	Los Angeles County Sanitation Districts	10259	06-30-22
California	State	2886	07-01-22
Connecticut	State	PH-0241	03-31-23
Florida	NELAP	E87689	06-30-22
HI - RadChem Recognition	State	n/a	06-30-22
Illinois	NELAP	200023	11-30-22
Iowa	State	373	12-01-22
Kansas	NELAP	E-10236	10-31-22
Kentucky (DW)	State	KY90125	12-31-22
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-22
Louisiana	NELAP	04080	06-30-22
Louisiana (DW)	State	LA011	12-31-22
Maryland	State	310	09-30-22
MI - RadChem Recognition	State	9005	06-30-22
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-22
New Jersey	NELAP	MO002	06-30-22
New York	NELAP	11616	04-01-23
North Dakota	State	R-207	06-30-22
NRC	NRC	24-24817-01	12-31-22
Oklahoma	NELAP	9997	08-31-22
Oregon	NELAP	4157	09-01-22
Pennsylvania	NELAP	68-00540	02-28-23
South Carolina	State	85002001	06-30-22
Texas	NELAP	T104704193	07-31-22
US Fish & Wildlife	US Federal Programs	058448	07-31-22
USDA	US Federal Programs	P330-17-00028	03-11-23
Utah	NELAP	MO000542021-14	08-01-22
Virginia	NELAP	10310	06-14-22
Washington	State	C592	08-30-22
West Virginia DEP	State	381	10-31-22

	Eurofins Canton 180 S. Van Buren Avenue Barberton, OH 44203 Phone: 330-497-9396 Fax: 330-497-0772	:	Chain of Custody Record	tody Re	scord	MICHIGAN 190	IGAN 0	💸 eurofins	Environment Testing America
	Client Information	Sampler. Heling.	Johnand .	1	Brooks, Kris M	Can	Camer Tracking No(s):	240-94785-33282	2.1
	Client Contact Jacob Krenz	Phone: /		_	E-Mail: Kris. Brooks@et eurofinsus.com		State of Origin:	Page 1 of 1	
	Company TRC Environmental Corporation.		PWSID.			Analysis Requested	ted	# qof	
	Address 1540 Eisenhower Place	Due Date Requested:							
	City Ann Arbor	TAT Requested (days):						A - HCL B - NaOH C - Zn Acetate	M - Hexane N - None O - AsNaO2
	State, Zip M1, 48108-7080	Compliance Project: A Yes	S A No						P - Na204S Q - Na2SO3
	Phone 734-971-7080(Tel) 734-971-9022(Fax)	PO# TBD			(0				S - NaZSZO3 S - H2SO4 T - TSP Dodecahydrate
	Email JKrenz@trccompanies.com	*OM					-	I - Ice J - Di Water	U - Acetone V - MCAA
	Project Name. Karn/Weadock CCR Background Well	Project #. 24024154			be or			K - EDTA L - EDA	W - pH 4-5 Z - other (specify)
	Site	SSOW#			45_85 45_85 45_85			Other:	
	Sample Identification	Sample Date Time	Sample Type (C=comp,	1	ield Filtered S Perform MS/MS 03.0, Razzekaz 04.0 - Standard			otal Number o	The state of the s
		(Preserval		6 O				Special Instructions/Note:
	MW-15002	5/2/27 1724	_						
20 (MW-15008	1 - 7		Water	X				
	MW-15016	5/3/12 837		Water	X				
	MW-15019	1,7,7	-	Water	ススラミ				
	DUP-04	14/12	ی	Water	XXX				
	EB-04	5/2/22 134	17	Water					
				Water					
						240-16615	240-166150 Chain of Custody		
	ant \Box	Poison B Unknown	Radiological		Sample Disp	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) Return To Client	assessed if samples are rett	etained longer than 1	month)
	I, III, IV, Other (specify)				Special Instru	Requiren			
	Empty Kit Relinquished by	Date			je:		Method of Shipment		
	Reinquished by Hewy Je W. 2. M. Reinquished by	Date/Time	2/1600	Company	Received by	1. C. 18.	S-3 -3 Date/Time		Company Company
6/12/	Reinquished by	N. C.	2	The same	Received by	Ser de la	Date/Time	3000	Company
2022	Custody Seals Intact: Custody Seal No.: Δ Yes Δ No				200ler Ten	Cobier Temperature(s) °C and Other Remarks			
)									Ver. 06/08/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative	Login # : 166150
Canton Facility	
Client Site Name	Cooler unpacked by:
Cooler Received on 56.22 Opened on 5-6-22	(Inc)
FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier	Other
Receipt After-hours: Drop-off Date/Time Storage Location	
TestAmerica Cooler # Foam Box Client Cooler Box Other	
Packing material used: Bubble Wrap Foam Plastic Bag None Other COOLANT: Wet Ice Blue Ice Dry Ice Water None	
1. Cooler temperature upon receipt See Multiple Cooler Form	
IR GUN# IR-13 (CF 0.0 °C) Observed Cooler Temp. °C Corrected Cooler Te	mp. °C
IR GUN #IR-15 (CF -0.7°C) Observed Cooler Temp°C Corrected Cooler Temp	
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity/ec.	No
	No NA lests that are not
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes	checked for pH by Receiving:
	No NA
	VOAs
4. Did custody papers accompany the sample(s)?	
5. Were the custody papers relinquished & signed in the appropriate place?)No
 6. Was/were the person(s) who collected the samples clearly identified on the COC? 7. Did all bottles arrive in good condition (Unbroken)? 	No
7. Did all bottles arrive in good condition (Unbroken)? 8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	No
9. For each sample, does the COC specify preservatives (YN), # of containers (YN) and sample.	
10. Were correct bottle(s) used for the test(s) indicated?	
11. Sufficient quantity received to perform indicated analyses?	
12. Are these work share samples and all listed on the COC? Yes	
If yes, Questions 13-17 have been checked at the originating laboratory.	
	No NA pH Strip Lot# HC157842
	No (NA)
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # Yes 17. Was a LL Hg or Me Hg trip blank present? Yes	
Contacted PM Date by via Verbal Vo	ice Mail Other
Concerning	
18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES additional next page	Samples processed by:
C (- F - DUD - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	
Containers for Dup-04 and EB-04 are labeled	
Dup-Backgound and EB-Background. De	tes and times
match COC. Samples are logged per the COC	Jul 5-6-22
, 33 /	
19. SAMPLE CONDITION	
Sample(s) were received after the recommended holding	g time had expired.
	n a broken container.
Sample(s) were received with bubble >6 mm in	diameter. (Notify PM)
20. SAMPLE PRESERVATION	
Sample(s) were furth Time preserved: Preservative(s) added/Lot number(s):	er preserved in the laboratory.
I ime preserved:Preservative(s) added/Lot number(s):	
VOA Sample Preservation - Date/Time VOAs Frozen:	

Login #: 166150

	Eurofina Conta	n Comple Dessint Mu	Minla Caalas Farm	
Cooler Description		on Sample Receipt Mu		Coolont
Cooler Description (Circle)	IR Gun #	Observed Temp °C	Corrected Temp °C	Coolant (Circle)
Client Box Other	IR-13 IR-15	1,3	1.3	Wet Ice Blue Ice Dry Ice
TA Client Box Other	IR-\3 IR-15	111	111	Water None Wet ic Blue ice Dry ice
	(R-13) IR-15	20	1.9	Wet ice Blue ice Dry ice
TA Client Box Other	HC13 IR-15	0.9	0.9	Water None Wet Ice Blue Ice Dry Ice
TA Client Box Other				Water None
TA Client Box Other	(R-13 R-15			Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet ice Blue ice Dry ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet ice Sive ice Dry ice Water None
TA Client Box Other	IR-13 IR-15			Wet ice Blue ice Dry ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice
TA Client Box Other	IR-13 IR-15			Water None Wet Ice Blue Ice Dry Ice
TA Client Box Other	IR-13 IR-15			Water None Wet Ice Blue Ice Dry Ice
TA Client Box Other	IR-13 IR-15		** ***	Water None Wet Ice Blue Ice Dry Ice
TA Client Box Other	IR-13 IR-15			Water None Wet Ice Blue Ice Dry Ice
1	IR-13 IR-15			Water None Wet Ice Blue Ice Dry Ice
	IR-13 IR-15			Water None Wet Ice Blue Ice Dry Ice
TA Client Box Other	IR-13 IR-15			Water None Wet ice Blue ice Dry ice
TA Client Box Other	IR-13 IR-15			Water None Wet Ice Blue Ice Dry Ice
TA Client Box Other				Water None
TA Client Box Other	IR-13 IR-15			Wet ice Sive ice Dry ice Water None
TA Client Box Other	iR-13 iR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet ice Blue ice Dry ice Water None
TA Client Box Other	IR-13 IR-15			Wet ice Sive ice Dry ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	JR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-13 IR-15			Wet ice Blue ice Dry ice
TA Client Box Other	IR-13 IR-15			Water None Wet Ice Blue Ice Dry Ice
TA Client Box Other	IR-13 IR-15			Water None Wet Ice Blue Ice Dry Ice
TA Client Box Other	IR-13 IR-15			Water None Wet Ice Blue Ice Dry Ice
TA Client Box Other	IR-13 IR-15			Water None Wet Ice Blue Ice Dry Ice
CHEIN BOX OTHER			☐ See Tem	Water None perature Excursion Form

WI-NC-099 Cooler Receipt Form Page 2 - Multiple Coolers

3

6

8

9

10 4 a

12

1 1

EB-04

Login Container Summary Report

240-166150

Temperature readings: _ Container Preservative Container Type Client Sample ID Lab ID Temp Added (mls) Lot # <u>pH</u> Plastic 1 liter - Nitric Acid MW-15002 240-166150-A-1 <2 Plastic 1 liter - Nitric Acid MW-15002 240-166150-B-1 <2 MW-15008 240-166150-A-2 Plastic 1 liter - Nitric Acid <2 MW-15008 240-166150-B-2 Plastic 1 liter - Nitric Acid <2 MW-15016 240-166150-A-3 Plastic 1 liter - Nitric Acid <2 MW-15016 240-166150-B-3 Plastic 1 liter - Nitric Acid <2 Plastic 1 liter - Nitric Acid MW-15019 240-166150-A-4 <2 MW-15019 240-166150-B-4 Plastic 1 liter - Nitric Acid <2 DUP-04 240-166150-A-5 Plastic 1 liter - Nitric Acid <2 DUP-04 240-166150-B-5 Plastic 1 liter - Nitric Acid <2 EB-04 240-166150-A-6 Plastic 1 liter - Nitric Acid <2

Plastic 1 liter - Nitric Acid

<2

240-166150-B-6

13

Environment Testing America

Chain of Custody Record

Eurofins Canton
180 S. Van Buren Avenue
Barberton. OH 44203
Phone: 330-497-9396 Fax: 330-497-0772

💸 eurofins

	Sampler			Lab PM					Carrier	Carrier Tracking No(s)		COC No.		r
Client Information (Sub Contract Lab)				Brooks, Kris M	Kris N	_				6		240-151693.1		_
Cuent Contact: Shipping/Receiving	Phone			E-Mail: Kris.Brooks@et.eurofinsus.com	ooks@	et.eur	nsuijo.	S.COM	State of Origin: Michigan	Origin: an		Page: Page 1 of 1		_
Company: TestAmerica Laboratories, Inc.				A	creditati	ons Re	dnired (Accreditations Required (See note):	!			Job #:		
Address: 13715 Birler Trail North	Due Date Requested	ij						Signal A				Preservation Codes	odes:	Т
City	TAT Requested (days):	YS):	;	Ť	ì	ŀ	F	Alidiysis	Arialysis Requested	- -	F	A - HCL		
Earth City				ENEST.								B - NaOH C - Zn Acetate		
State, Zip: ,MO, 63045												D - Nitric Acid E - NaHSO4		
Phone. 314-298-8566(Tel) 314-298-8757(Fax)	PO #:											F - MeOH G - Amchlor	R - Na2S203 S - H2SO4	
Émail	,#OM			ON 30	(0)									
Project Name: CCR Background Well	Project #: 24024154				A 10 80							K - EDTA L - EDA	W - pH 4-5 Z - other (specify)	
Site	SSOW#:			Names	SD (Ye							Other:		-
Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp,	Matrix (Wewater Sagold, Orweste/oll, Helenaue, ArAlr)	M\&M mohe9	903.0/PrecSep_9 904.0/PrecSep_0	Fa226Ra228_GF					Notal Number of	Special Instructions/Note:	
	X	X	4 66	on Code:		-	-							
MW-15002 (240-166150-1)	5/2/22	17:24 Eastern		Water		×	×					2 TVA protocol - R	TVA protocol - Ra-226+228 action limit at 5.0 nCi/l	1
MW-15008 (240-166150-2)	5/2/22	13:45 Eastern		Water		×	×					2 TVA protocol - R	TVA protocol - Ra-226+228 action limit at 5.0 p.Ci/l	T
MW-15016 (240-166150-3)	5/3/22	08:37 Eastern		Water		×	×					2 TVA protocol - R 5.0 oCi/L	TVA protocol - Ra-226+228 action limit at 5.0 oCi/L.	
MW-15019 (240-166150-4)	5/2/22	15:20 Eastern		Water	_	×	×					2 TVA protocol - R 5.0 pCi/L	TVA protocol - Ra-226+228 action limit at 5.0 pci/L.	
DUP-04 (240-166150-5)	5/2/22	Eastern		Water		×	×					2 TVA protocol - R 5.0 pCi/L	TVA protocol - Ra-226+228 action limit at 5.0 pCi/L.	
EB-04 (240-166150-6)	5/2/22	13:45 Eastern		Water		×	×					2 TVA protocol - R	TVA protocol - Ra-226+228 action limit at 5.0 p.Ci/L.	
						_								
Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing North Central. LLC places the ownership of method, analyte & accreditation compliance upon out subcontract laboratory or other instructions will be provided. Any changes to laboratory or other instructions will be provided. Any changes to accreditation in the State of Origin listed above for analysis/lests/matrix being analyzed. The samples must be shipped back to the Eurofins Environment Testing North Central. LLC attention immediately, if all requested accreditations are current to date, return the signed Chain of Custody attesting to Said complicance to Eurofins Environment Testing North Central. LLC.	Int Testing North Centra bove for analysis/tests/ intral, LLC attention imr	I, LLC places the matrix being an nediately. If all	le ownership of alyzed, the sam requested accre	method, analyte ples must be sh editations are cu	& accrec	ditation ck to the	complia e Eurofii um the	nce upon out su se Environment signed Chain of	bcontract labora Festing North C Custody attestir	itories. This san entral, LLC labor ig to said compli	tple shipmer atory or othe cance to Eur	It is forwarded under or instructions will be profins Environment Te	chain-of-custody. If the provided: Any changes to risting North Central, LLC.	1
Possible Hazard Identification					Samp	le Di	sposa	(A fee may	be assesse	d if samples	are retai	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)	1 month)	\neg
Unconfirmed						Retui	Return To Client	Slient	☐ Disposal By Lab	By Lab		Archive For	Months	_
Deliverable Requested: I, II, III, IV. Other (specify)	Primary Deliverable Rank: 2	ble Rank: 2			Speci	al Inst	ruction	Special Instructions/QC Requirements:	ements:					
Empty Kit Relinquished by:		Date:		į.	Time:	ı			W	Method of Shipment:	١			_
Replication of the second	Date/Time: 5-6-22		14280	Company Company	<u>«</u>	Received by	by:	FEC	FED EX	Date/Time	me:		Company	T
Relinquished by FED EX	Date/Time:		Š	Company	a.	Received by:	by:	111001	1) with : . Its	Oak Vime O	6 0,	2022 0835	S Company	
ı	Date/Time:		<u>S</u>	Сотралу	a.	Received by:	6 /2				ne:			T
Custody Seals Intact: Custody Seal No.: Δ Yes Δ No					ပိ	oler Te	mperat	Cooler Temperature(s) °C and Other Remarks:	er Remarks:					
						1/	13	12	10	9	7	5 6	Ver: 06/08/2021	1
						1	3	2)					

Login Sample Receipt Checklist

Client: TRC Environmental Corporation.

Job Number: 240-166150-1

SDG Number:

Login Number: 166150
List Source: Eurofins St. Louis
List Number: 2
List Creation: 05/09/22 02:40 PM

Creator: Worthington, Sierra M

Creator: worthington, Sierra W		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	False	

Eurofins Canton
Page 25 of 25



October 2022 Assessment Monitoring Data Summary and Statistical Evaluation

DE Karn, Bottom Ash Pond CCR Unit

Essexville, Michigan

January 2023

Darby Litz
Hydrogeologist/Project Manager

Prepared For:

Consumers Energy Company

Prepared By:

TRC 1540 Eisenhower Place Ann Arbor, Michigan 48108

Kristin Lowery, E.I.T. Project Engineer



TABLE OF CONTENTS

1.0	Intro	duction	1
	1.1	Program Summary	1
	1.2	Site Overview	3
	1.3	Geology/Hydrogeology	1
2.0	Grou	ndwater Monitoring	5
	2.1	Monitoring Well Network	5
	2.2	October 2022 Assessment Monitoring	5
		2.2.1 Groundwater Flow Rate and Direction	6
		2.2.2 Data Quality	7
3.0	Asse	ssment Monitoring Statistical Evaluation	3
	3.1	Establishing Groundwater Protection Standards	3
	3.2	Data Comparison to Groundwater Protection Standards	3
4.0	Conc	lusions and Recommendations10)
5.0	Refe	rences1	1
TAB	LES		
Table		Summary of Groundwater Elevation Data	
Table		Summary of Field Parameters	
Table		Summary of Background Wells Groundwater Sampling Results (Analytical)	
Table Table		Summary of Groundwater Sampling Results (Analytical) Summary of Assessment Monitoring Statistical Evaluation – October 2022	
FIGU	JRES		
Figur		Site Location Map	
Figur		Karn and Weadock Complex Map	
Figur	e 3	Shallow Groundwater Contour Map – October 2022	
APP	ENDI	CES	
	ndix A		
	ndix E ndix C		



1.0 Introduction

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), as amended. Standards for groundwater monitoring and corrective action codified in the CCR Rule (40 CFR 257.90 – 257.98) apply to the DE Karn Bottom Ash Pond CCR Unit (Karn Bottom Ash Pond).

Consumers Energy is continuing semiannual assessment monitoring in accordance with §257.95 of the CCR Rule for the Karn Bottom Ash Pond located in Essexville, Michigan. This report has been prepared to provide the summary of the October 2022 assessment groundwater monitoring results, data quality review, and statistical data evaluation for the Karn Bottom Ash Pond groundwater monitoring system.

1.1 Program Summary

Groundwater monitoring for the Karn Bottom Ash Pond commenced after the installation of the monitoring well network in December 2015 to establish background conditions. Detection monitoring was initiated on October 17, 2017 in conformance with the self-implementing schedule in the CCR Rule.

Consumers Energy first reported the potential for statistically significant increases (SSIs) for Appendix III constituents in the *Annual Groundwater Monitoring Report DE Karn Power Plant Bottom Ash Pond CCR Unit* (TRC, January 2018). The statistical evaluation of the Appendix III indicator parameters confirming statistically significant increases (SSIs) over background were as follows:

- Boron at DEK-MW-15001, DEK-MW-15002, DEK-MW-15003, DEK-MW-15004, DEK-MW-15005, DEK-MW-15006;
- Fluoride at DEK-MW-15001;
- Field pH at DEK-MW-15001, DEK-MW-15002, DEK-MW-15003, DEK-MW-15005, DEK-MW-15006; and
- Sulfate at DEK-MW-15006.

On April 25, 2018, Consumers Energy entered assessment monitoring upon determining that an Alternate Source Demonstration for the Appendix III constituents was not successful. After subsequent sampling for Appendix IV constituents, Consumers Energy provided notification that arsenic was present at statistically significant levels above the Ground Water Protection Standards (GWPS) established at 21 ug/L (Consumers Energy, January 2019) in five of the six downgradient monitoring wells at the Karn Bottom Ash Pond as follows:

Arsenic at DEK-MW-15001, DEK-MW-15002, DEK-MW-15003, DEK-MW-15004, and DEK-MW-15005.

The notification of the GWPS exceedance on January 14, 2019 was followed up with a Response Action Plan submitted to the Michigan Department of Environment, Great Lakes, and Energy (EGLE) on March 15, 2019 laying out the preliminary understanding of water quality and



actions that were underway to mitigate or eliminate unacceptable risk associated with the identified release from the CCR unit. The *Assessment of Corrective Measures* (ACM) (TRC, September 2019) was initiated on April 14, 2019 and submitted on September 11, 2019 in accordance with the schedule in §257.96 and the requirements of the Response Action Plan.

The ACM documents that the groundwater nature and extent has been defined, as required in §257.95(g)(1). Although arsenic concentrations exceed the GWPS in on-site groundwater monitoring locations, arsenic is delineated within the limits of the property owned by Consumers Energy and there are **currently no adverse effects on human health or the environment** from either surface water or groundwater due to CCR management at the Karn Bottom Ash Pond. Per §257.96(b), Consumers Energy is continuing to monitor groundwater in accordance with the assessment monitoring program as specified in §257.95.

Evaluation of groundwater under the CCR Rule focused on the following constituents that were collected *unfiltered* in the field:

CCR Rule Moni	toring Constituent	ts
Appendix III	Apper	ndix IV
Boron	Antimony	Mercury
Calcium	Arsenic	Molybdenum
Chloride	Barium	Radium 226/228
Fluoride	Beryllium	Selenium
рН	Cadmium	Thallium
Sulfate	Chromium	
Total Dissolved Solids (TDS)	Cobalt	
	Fluoride	
	Lead	
	Lithium	



Prior to remedy selection, Consumers Energy will also collect a sufficient number of samples to evaluate Michigan state-specific constituents as follows:

Additional Monitoring Constituents	(Michigan Part 115/PA 640¹)
Detection Monitoring	Assessment Monitoring
Iron	Copper
	Nickel
	Silver
	Vanadium
	Zinc

Consumers Energy will continue to evaluate corrective measures for the Karn Bottom Ash Pond per §257.96 and §257.97 and is continuing semiannual assessment monitoring in accordance with §257.95.

1.2 Site Overview

The Karn Bottom Ash Pond is located within the DE Karn Power Plant site, which is located north of the 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. Karn Units 3 & 4, co-located with the coal-fired generating units, are oil- and natural gas-fueled. Two other areas of coal ash management within the Karn site are the Karn Landfill and the Karn Lined Impoundment. The Karn Landfill has been certified closed and is now in post-closure care and is being monitored in accordance with the EGLE-approved Hydrogeological Monitoring Plan, Rev. 3, DE Karn Solid Waste Disposal Area (December 19, 2017). The Karn Lined Impoundment has been licensed to operate by the EGLE under Part 115 (License Number 9629) and is being monitored in accordance with the EGLE-approved Karn Lined Impoundment Hydrogeological Monitoring Plan (November 13, 2020). The locations of the Karn Landfill, the Karn Lined Impoundment, and the Karn Bottom Ash Pond are shown on Figure 2.

Previously, the Karn Bottom Ash Pond was used for wet ash dewatering and was the primary settling/detention structure for the National Pollutant Discharge Elimination System (NPDES) treatment system prior to discharge. Consumers Energy provided notification of initiation of closure on October 12, 2018 to implement the certified closure plan by removal of CCR under the self-implementing requirements and schedule of the CCR Rule. In preparation for removal of the Karn Bottom Ash Pond, a new lined impoundment (Karn Lined Impoundment) was constructed meeting the requirements of the CCR Rule and the operational needs at the Karn Power Plant. The Karn Lined Impoundment began receipt of CCR and non-CCR on June 7.

¹ On December 28, 2018, the State of Michigan enacted Public Act No. 640 of 2018 (PA 640) 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.



2018 when it replaced the Karn Bottom Ash Pond operations.

Consumers Energy has completed the removal of CCR consistent with the timeline for closure of the Karn Bottom Ash Pond under the DE Karn Bottom Ash Pond Closure Plan (Golder, January 2018; Revised April 2018) and the CCR Rule's closure by removal provisions in §257.102(c). Consumers Energy ceased hydraulic loading to the Karn Bottom Ash Pond in June 2018 and allowed the area to dewater by gravity. Consumers Energy then operated a construction dewatering system to allow for excavation of the vertical and lateral extent of CCR that commenced on March 20, 2019 and has operated through the construction and restoration period. The excavation extended to six inches below known CCR elevations established from previous investigations. Excavated CCR has been placed in the neighboring Weadock Landfill that is constructed with of a fully encapsulation soil-bentonite slurry wall keyed into a competently confining clay unit. The Karn Bottom Ash Pond has been restored by backfilling and grading the surface with clean fill in accordance with the plan to promote stormwater drainage, minimize ponding of surface water, and to reduce the potential of infiltration and migration of residual arsenic and any future constituents of concern (COCs). With the CCR removal complete, Consumers Energy submitted the DE Karn Generating Facility Bottom Ash Pond CCR Removal Documentation Report (Golder, October 2019) on October 30, 2019. EGLE approved the documentation removal report on December 1, 2020. Groundwater conditions post-CCR removal continue to be monitored.

1.3 Geology/Hydrogeology

The majority of the Karn Bottom Ash Pond area is comprised of surficial CCR and sand fill. 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, was generally encountered at 80 to 90 ft bgs.

The DE Karn Power Plant site is bounded by several surface water features (Figure 1): 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 Bottom Ash Pond, the shallow groundwater flow is generally to the west, toward the intake channel.



2.0 Groundwater Monitoring

2.1 Monitoring Well Network

In accordance with 40 CFR 257.91, Consumers Energy established a groundwater monitoring system for the Karn Bottom Ash Pond, which consists of 10 monitoring wells (four background monitoring wells and six downgradient monitoring wells) that are screened in the uppermost aquifer. The monitoring well locations are shown on Figure 2.

Groundwater around the Karn Bottom Ash Pond was initially characterized as radial based on the eight initial background sampling events prior to commencing detection monitoring; therefore, the six downgradient wells (DEK-MW-15001 through DEK-MW-15006) that were installed and spaced along the circumference of the Karn Bottom Ash Pond continued to accurately represent the quality of groundwater passing the waste boundary that ensures detection of groundwater contamination such that all potential contaminant pathways are monitored. Monitoring well DEK-MW-15001 was decommissioned on April 18, 2018 due to the installation of the new Karn Lined Impoundment, which is a new double composite lined CCR unit constructed as a replacement to the Karn Bottom Ash Pond. Monitoring well DEK-MW-18001 was installed on May 21, 2018 approximately 80 feet southeast of DEK-MW-15001 to maintain the perimeter downgradient monitoring well network.

Groundwater flow direction near the former pond has changed as a result of the pond decommissioning and monitoring wells DEK-MW-15003 and DEK-MW-15004 are no longer located downgradient of the unit (Figure 3). These two wells were removed from the certified downgradient monitoring well network. The recertification was included in Appendix D of the October 2021 Assessment Monitoring Data Summary and Statistical Evaluation (TRC, January 2022).

Four monitoring wells located south of the Karn Bottom Ash Pond on the JC Weadock Power Plant site provide data on background groundwater quality that has not been affected by the CCR unit (MW-15002, MW-15008, MW-15016, and MW-15019). Analysis for the establishment of these wells as background is detailed in the *Groundwater Statistical Evaluation Plan* for the Karn Bottom Ash Pond, dated October 17, 2017.

2.2 October 2022 Assessment Monitoring

Per §257.95, all wells in the CCR unit groundwater monitoring program must be sampled semiannually. TRC conducted the second semiannual assessment monitoring event of 2022 for Appendix III and IV constituents at the Karn Bottom Ash Pond CCR Unit in accordance with the DE Karn Monitoring Program Sample Analysis Plan (ARCADIS, May 2016) (SAP). The semiannual assessment monitoring event was performed on October 3 through 5, 2022.

The October 2022 sampling event included collection of static water level measurements from the Karn Bottom Ash Pond groundwater monitoring system and other site wells to support preparation of a groundwater contour map. Static water elevation data are summarized in Table 1 and groundwater elevation data are shown on Figure 3. The Karn Bottom Ash Pond monitoring wells (DEK-MW-15002, DEK-MW-15005, DEK-MW-15006 and DEK-MW-18001) and



background monitoring wells (MW-15002, MW-15008, MW-15016, and MW-15019) 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.

The groundwater samples were analyzed by the Consumers Energy Trail Street Laboratory for Appendix III and IV constituents in accordance with the SAP. Radium analyses were completed by Eurofins Environment Testing. The analytical results for the background wells are summarized in Table 3, and the analytical results for the downgradient monitoring wells are summarized in Table 4. Analytical results from the October 2022 monitoring event are included in the attached laboratory reports (Appendix C).

2.2.1 Groundwater Flow Rate and Direction

Groundwater elevation data collected during the October 2022 assessment monitoring event are provided in Table 1. These data were used to construct the groundwater contour map (Figure 3). Groundwater elevations measured at the site in October 2022 are generally within the range of 579 to 586 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 or within approximately 6 feet higher, flowing toward the bounding surface water features.

Although historically the point source discharge of sluiced bottom ash into the Karn Bottom Ash Pond created localized mounding of the potentiometric surface, the new Karn Lined Impoundment went into service on June 7, 2018 and has been continuously collecting 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 from the groundwater monitoring system of the former Karn Bottom Ash Pond in October 2022 demonstrate a reduction in groundwater elevation measurements by several feet when compared to groundwater elevations measured prior to June 2018. Due to the operational changes of the bottom ash pond and the completion of the landfill capping activities, the gradient between the bottom ash pond area and the surrounding surface water bodies is flattening out as compared to previous quarters as the groundwater elevations are reaching a new equilibrium, as expected. 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 Karn Lined Impoundment. Monitoring Wells OW-11, OW-12, and DEK-MW-15003 delineate the newly established groundwater elevation high point with porewater flow generally flowing radially towards the adjacent surface water features from this newly established potentiometric "high", as illustrated in Figure 3. As such, the groundwater flow across the footprint of the former bottom ash pond is generally to the west.



The average hydraulic gradient observed on October 3, 2022 in the Karn Bottom Ash Pond area during these events is estimated at 0.0048 ft/ft. The gradient was calculated using the monitoring well pairs DEK-MW-15004/DEK-MW-15005 and DEK-MW-15003/DEK-MW-15006. 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 0.24 ft/day or 88 ft/year.

2.2.2 Data Quality

Analytical data were found to be usable for assessment monitoring and were generally consistent with previous sampling events. The Data Quality Reviews are included as Appendix A.



3.0 Assessment Monitoring Statistical Evaluation

Assessment monitoring is continuing at the Karn Bottom Ash Pond while Consumers Energy further evaluates corrective measures in accordance with §257.96 and §257.97 as outlined in the ACM. The following section summarizes the statistical approach applied to assess the October 2022 groundwater data in accordance with the assessment monitoring program.

3.1 Establishing Groundwater Protection Standards

The GWPSs are used to assess whether Appendix IV constituent concentrations are present in groundwater at unacceptable levels as a result of CCR Unit operations by statistically comparing concentrations in the downgradient wells to the GWPSs for each Appendix IV constituent. In accordance with §257.95(h) and the Stats Plan, GWPSs were established for the Appendix IV constituents following the preliminary assessment monitoring event as documented in the Groundwater Protection Standards technical memorandum (Appendix C of the 2018 Annual Groundwater Monitoring Report, TRC, January 2019). The GWPS is established as the higher of the EPA Maximum Contaminant Level (MCL) or statistically derived background level for constituents with MCLs and the higher of the EPA Regional Screening Levels (RSLs) or background level for constituents without an established MCL.

3.2 Data Comparison to Groundwater Protection Standards

The compliance well groundwater concentrations for Appendix IV constituents were compared to the GWPSs to determine if a statistically significant exceedance had occurred in accordance with §257.95. Consistent with the *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance* (Unified Guidance) (USEPA, 2009), the preferred method for comparisons to a fixed standard are confidence limits. An exceedance of the standard occurs when the 99 percent lower confidence level of the downgradient monitoring well data exceeds the GWPS of any Appendix IV constituent. As documented in the January 14, 2019 *Notification of Appendix IV Constituent Exceeding Groundwater Protection Standard per §257.95(g)*, arsenic was present at statistically significant levels above the federal GWPS in five of the six downgradient wells at the Karn Bottom Ash Pond.

Confidence intervals were established per the statistical methods detailed in the *Statistical Evaluation of October 2022 Assessment Monitoring Sampling Event* technical memorandum provided in Appendix B. For each Appendix IV constituent, the concentrations were first compared directly to their respective GWPS. Constituent-well combinations that included a direct exceedance of the GWPSs were retained for further statistical analysis using confidence limits.

Due to changes in groundwater flow direction on site, monitoring wells DEK-MW-15003 and DEK-MW-15004 are no longer located downgradient of the unit and were determined to be no longer indicative of groundwater conditions influenced by the Karn Bottom Ash Pond. Therefore, monitoring wells DEK-MW-15003 and DEK-MW-15004 are no longer included for assessment monitoring statistical analysis. The monitoring well network for statistical evaluation consists of the four monitoring wells located downgradient of the bottom ash pond (DEK-MW-15002, DEK-MW-15005, DEK-MW-15006, and DEK-MW-18001). Overall, the assessment



monitoring statistical evaluations have confirmed that arsenic is the only Appendix IV constituent present at statistically significant levels above the GWPS. The statistical evaluation of the October 2022 semiannual assessment monitoring event data indicate that arsenic is present at statistically significant levels exceeding the GWPS in downgradient monitoring wells at the Karn Bottom Ash Pond:

Constituent	GWPS	#Downgradient Wells Observed
Arsenic	21 ug/L	3 of 4

Previously, arsenic was present in downgradient well DEK-MW-15002 at a statistically significant level; however, arsenic concentrations have declined since sluicing to the Karn Bottom Ash Pond ceased in June 2018 and the bottom ash and transport water was diverted to the Karn Lined Impoundment (Appendix B: Attachment 1). The statistical evaluation of the April 2019 through October 2022 data show that the lower confidence limit for arsenic is below the GWPS at DEK-MW-15002.

Concentrations of arsenic at DEK-MW-18001 have decreased since loading to the Karn Bottom Ash Pond ceased; however, arsenic remains above the GWPS at a statistically significant level. Arsenic at DEK-MW-15005 and DEK-MW-15006 also remain above the GWPS at a statistically significant level. A summary of the confidence intervals for October 2022 is provided in Table 5. Although arsenic is present above the GWPS, the drinking water pathway is not complete as there are no drinking water wells on-site. Redox conditions, which affect contaminant transport, are still stabilizing in the Bottom Ash Pond Area following removal activities and will continue to be evaluated further.



4.0 Conclusions and Recommendations

Corrective action has been triggered and assessment monitoring is ongoing at the Karn Bottom Ash Pond CCR unit. A summary of the October 2022 assessment monitoring event is presented in this report.

Overall, the statistical assessments have confirmed that arsenic is the only Appendix IV constituent present at statistically significant levels above the GWPS. Consumers Energy has completed the removal of CCR consistent with the timeline for closure of the Karn Bottom Ash Pond under the *DE Karn Bottom Ash Pond Closure Plan* (Golder, January 2018; Revised April 2018) and the CCR Rule's closure by removal provisions in §257.102(c).

The ACM Report provided a high-level assessment of groundwater remediation technologies that could potentially address site-specific COCs (i.e., arsenic) under known groundwater conditions. Groundwater chemistry appears to be improving in some areas as a result of discontinuing the hydraulic loading to the Karn Bottom Ash Pond and the completed source removal of CCR, as shown by the decreasing concentration of arsenic at DEK-MW-15002; however, attainment of the GWPS at all of the Bottom Ash Pond compliance wells may not be feasible due to influences other than the former pond, such as the presence and former operation of the nearby Karn Landfill. Redox conditions, which affect contaminant transport, are still stabilizing following pond removal and will continue to be evaluated further.

Consumers Energy will continue assessment monitoring and evaluate corrective measures in accordance with §257.96 and §257.97 as outlined in the Karn Bottom Ash Pond ACM. The groundwater management remedy for the Karn Bottom Ash Pond will be selected as soon as feasible to meet the federal standards of §257.96(b) of the CCR Rule. Consumers Energy will continue executing the self-implementing groundwater compliance schedule in conformance with §257.90 - §257.98. The next semiannual monitoring event is tentatively scheduled for the second calendar quarter of 2023.



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Tables

Table 1

Summary of Groundwater Elevation Data DE Karn – RCRA CCR Monitoring Program Essexville, Michigan

	TOC		Screen Interval	Octobe	er 3, 2022
Well Location	Elevation (ft)	Geologic Unit of Screen Interval	Elevation (ft)	Depth to Water	Groundwater Elevation
				(ft BTOC)	(ft)
DEK Bottom Ash Pon	d				
DEK-MW-15002	590.87	Sand	578.3 to 575.3	7.00	583.87
DEK-MW-15005	589.72	Sand	572.3 to 567.3	9.68	580.04
DEK-MW-15006	589.24	Sand	573.0 to 568.0	9.30	579.94
DEK Bottom Ash Pon			1		
DEK-MW-18001	593.47	Sand	579.2 to 574.2	8.98	584.49
Karn Lined Impoundr	_	T	T		
DEK-MW-15003	602.74	Sand	578.8 to 574.8	17.00	585.74
OW-10	591.58	Silty Sand and Silty Clay	576.0 to 571.0	7.18	584.40
OW-11	607.90	Silt/Fly Ash	587.5 to 582.5	22.28	585.62
OW-12	603.10	Silty Sand	584.2 to 579.2	17.35	585.75
DEK Nature and Exter	1		T		
DEK-MW-15004	611.04	Sand	576.6 to 571.6	28.45	582.59
MW-01	597.02	Sand	573.0 to 570.0	17.05	579.97
MW-03	597.30	Sand	569.8 to 566.8	17.35	579.95
MW-06	589.44	Sand and Silty Sand	578.5 to 563.5	9.34	580.10
MW-08	598.78	Sand and Silty Clay	580.9 to 570.9	17.91	580.87
MW-10	596.97	Sand	582.5 to 572.5	15.98	580.99
MW-12	598.60	Sand	583.9 to 573.9	18.33	580.27
MW-14	594.37	Sand and Silty Clay	584.7 to 574.7	14.25	580.12
MW-16	595.80	Sand and Sand/Bottom Ash	584.1 to 574.1	15.75	580.05
MW-22	598.99	Ash/Sand	571.4 to 568.4	17.05	581.94
MW-23	595.57	Ash/Sand	576.9 to 571.9	14.05	581.52
DEK Static Water Lev			,		1
MW-02	597.34	Sand and Silty Clay	572.5 to 567.5	17.34	580.00
MW-04	598.01	NR	569.5 to 564.5	18.04	579.97
MW-17	597.91	Sand	577.0 to 574.0	13.48	584.43
MW-18	609.22	Silty Sand and Silty Clay	575.8 to 573.8	26.10	583.12
MW-19	597.28	NR	572.1 to 567.1	16.94	580.34
MW-20	632.75	Sand	582.3 to 579.3	52.66	580.09
MW-21	632.91	Sand	587.1 to 584.1	51.35	581.56
OW-01	631.33	NR	572.5 to 567.5	51.30	580.03
OW-02	598.01	Fly Ash	579.4 to 576.4	15.93	582.08
OW-03	597.94	Fly Ash and Sand	573.6 to 568.6	17.15	580.79
OW-04	590.21	Sand and Bottom/Fly Ash	579.1 to 574.1	10.05	580.16
OW-05	593.53	Sand	576.9 to 571.9	13.08	580.45
OW-06	603.95	NR	580.9 to 575.9	22.06	581.89
OW-07	596.41	Ash	583.3 to 580.3	15.03	581.38
OW-08	593.93	NR	581.0 to 576.0	11.55	582.38
OW-09	593.45	NR	585.5 to 580.5	10.68	582.77
OW-13	588.52	NR	579.5 to 574.5	4.65	583.87
OW-15	587.75	NR	572.8 to 567.8	4.69	583.06

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.

NR: Not Recorded

Table 2

Summary of Field Parameters DE Karn Bottom Ash Pond – RCRA CCR Monitoring Program Essexville, Michigan

Sample Location	Sample Date	Dissolved Oxygen	Oxidation Reduction Potential	рН	Specific Conductivity	Temperature	Turbidity
		(mg/L)	(mV)	(SU)	(umhos/cm)	(°C)	(NTU)
Background							
MW-15002	10/5/2022	0.90	-66.7	6.7	4,577	14.9	2.0
MW-15008	10/4/2022	0.80	-93.0	6.7	1,474	15.6	1.6
MW-15016	10/5/2022	0.90	12.1	6.9	1,817	15.7	1.7
MW-15019	10/4/2022	0.80	-88.2	6.8	1,961	15.8	0.9
Karn Bottom Ash Po	ond						
DEK-MW-15002	10/4/2022	0.80	-177.2	7.4	917	14.6	0.3
DEK-MW-15005	10/4/2022	0.90	-143.8	7.5	1,330	14.4	0.9
DEK-MW-15006	10/4/2022	0.90	-169.9	7.8	966	13.9	1.9
DEK-MW-18001	10/4/2022	1.00	-133.4	7.6	811	15.1	1.2

Notes:

mg/L - Milligrams per Liter.

mV - Millivolts.

SU - Standard units.

umhos/cm - Micromhos per centimeter.

°C - Degrees Celsius

NTU - Nephelometric Turbidity Unit.

-- = Parameter Not Measured

Table 3

Summary of Groundwater Sampling Results (Analytical) DE Karn & JC Weadock Background – RCRA CCR Monitoring Program Essexville, Michigan

					Sample Location:	MW-15002	MW-15008	MW-15016	MW-15019
					Sample Date:	10/5/2022	10/4/2022	10/5/2022	10/4/2022
				MI Non-	·		Deale		
Constituent	Unit	EPA MCL	MI Residential*	Residential*	MI GSI^		васко	ground	
Appendix III ⁽¹⁾									
Boron	ug/L	NC	500	500	4,000	147	175	690	297
Calcium	mg/L	NC	NC	NC	500 ^{EE}	214	113	289	139
Chloride	mg/L	250**	250 ^E	250 ^E	50	1,820	261	236	355
Fluoride	ug/L	4,000	NC	NC	NC	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	250**	250 ^E	250 ^E	500 ^{EE}	2.66	19.3	639	59.7
Total Dissolved Solids	mg/L	500**	500 ^E	500 ^E	500	4,210	901	1,760	1,190
pH, Field	SU	6.5 - 8.5**	6.5 - 8.5 ^E	6.5 - 8.5 ^E	6.5 - 9.0	6.7	6.7	6.9	6.8
Appendix IV ⁽¹⁾									
Antimony	ug/L	6	6.0	6.0	2.0	< 1	< 1	< 1	< 1
Arsenic	ug/L	10	10	10	10	9	2	3	2
Barium	ug/L	2,000	2,000	2,000	1,200	600	70	115	308
Beryllium	ug/L	4	4.0	4.0	33	< 1	< 1	< 1	< 1
Cadmium	ug/L	5	5.0	5.0	2.5	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	100	100	11	2	1	< 1	< 1
Cobalt	ug/L	NC	40	100	100	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	NC	NC	NC	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	NC	4.0	4.0	14	< 1	< 1	< 1	< 1
Lithium	ug/L	NC	170	350	440	16	21	91	12
Mercury	ug/L	2	2.0	2.0	0.20#	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	NC	73	210	120	< 5	< 5	6	< 5
Radium-226	pCi/L	NC	NC	NC	NC	0.850	0.265	< 0.158	0.478
Radium-228	pCi/L	NC	NC	NC	NC	2.69	1.62	1.56	2.11
Radium-226/228	pCi/L	5	NC	NC	NC	3.54	1.88	1.71	2.59
Selenium	ug/L	50	50	50	5.0	36	< 1	2	1
Thallium	ug/L	2	2.0	2.0	2.0	< 2	< 2	< 2	< 2
Additional MI Part 11	1 5 ⁽²⁾								
Iron	ug/L	300**	300€	300E	500,000EE	15,300	17,500	427	20,700
Copper	ug/L	1,000**	1,000 ^E	1,000 ^E	20	2	1	3	1
Nickel	ug/L	NC	100	100	120	7	4	12	5
Silver	ug/L	100**	34	98	0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	NC	4.5	62	27	11	6	2	3
Zinc	ug/L	5,000**	2,400	5,000E	260	< 10	< 10	11	< 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 21, 2020.
- ** 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.

 $\ensuremath{\mathbf{BOLD}}$ 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.

Table 4

Summary of Groundwater Sampling Results (Analytical) DE Karn Bottom Ash Pond – RCRA CCR Monitoring Program Essexville, Michigan

					Sample Location:	DEK-MW-15002	DEK-MW-15005	DEK-MW-15006	DEK-MW-18001
					Sample Date:	10/4/2022	10/4/2022	10/4/2022	10/4/2022
				MI Non-					
Constituent	Unit	EPA MCL	MI Residential*	Residential*	MI GSI^				
Appendix III ⁽¹⁾									
Boron	ug/L	NC	500	500	4,000	1,340	911	871	1,060
Calcium	mg/L	NC	NC	NC	500EE	70.2	130	83.8	58.3
Chloride	mg/L	250**	250 ^E	250 ^E	50	105	138	70.6	62.5
Fluoride	ug/L	4,000	NC	NC	NC	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	250**	250 ^E	250 ^E	500EE	33.7	130	254	140
Total Dissolved Solids	mg/L	500**	500 ^E	500 ^E	500	584	894	720	551
pH, Field	SU	6.5 - 8.5**	6.5 - 8.5 ^E	6.5 - 8.5 ^E	6.5 - 9.0	7.4	7.5	7.8	7.6
Appendix IV ⁽¹⁾									
Antimony	ug/L	6	6.0	6.0	2.0	< 1	< 1	< 1	< 1
Arsenic	ug/L	10	10	10	10	3	54	26	109
Barium	ug/L	2,000	2,000	2,000	1,200	92	312	94	135
Beryllium	ug/L	4	4.0	4.0	33	< 1	< 1	< 1	< 1
Cadmium	ug/L	5	5.0	5.0	2.5	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	100	100	11	1	2	< 1	< 1
Cobalt	ug/L	NC	40	100	100	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	NC	NC	NC	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	NC	4.0	4.0	14	< 1	< 1	< 1	< 1
Lithium	ug/L	NC	170	350	440	25	36	18	23
Mercury	ug/L	2	2.0	2.0	0.20#	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	NC	73	210	120	< 5	8	7	< 5
Radium-226	pCi/L	NC	NC	NC	NC	0.219	0.544	0.242	0.264
Radium-228	pCi/L	NC	NC	NC	NC	1.81	3.11	1.43	1.67
Radium-226/228	pCi/L	5	NC	NC	NC	2.03	3.66	1.67	1.93
Selenium	ug/L	50	50	50	5.0	< 1	1	1	< 1
Thallium	ug/L	2	2.0	2.0	2.0	< 2	< 2	< 2	< 2
Additional MI Part 11	5 ⁽²⁾								
Iron	ug/L	300**	300E	300 ^E	500,000EE	72	1,400	1,370	894
Copper	ug/L	1,000**	1,000E	1,000E	20	< 1	< 1	< 1	< 1
Nickel	ug/L	NC	100	100	120	3	5	3	2
Silver	ug/L	100**	34	98	0.2	< 0.2	< 0.2	< 0.2	< 0.2
Vanadium	ug/L	NC	4.5	62	27	< 2	< 2	< 2	< 2
Zinc	ug/L	5,000**	2,400	5,000E	260	< 10	56	< 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 21, 2020.
- ** 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.

Table 5

Summary of Assessment Monitoring Statistical Evaluation – October 2022 DE Karn Bottom Ash Pond – RCRA CCR Monitoring Program Essexville, Michigan

Constituent	Units	GWPS	DEK-MW-15005		DEK-MW-15006		DEK-MW-18001	
			LCL	UCL	LCL	UCL	LCL	UCL
Arsenic	ug/L	21	28	84	22	27	68	106

Notes:

Only compliance well/constituent pairs with one or more concentrations exceeding the GWPS within

the 8 most recent semiannual sampling events are included on this table.

ug/L - micrograms per Liter.

GWPS - Groundwater Protection Standard as established in TRC's Technical Memorandum dated October 15, 2018.

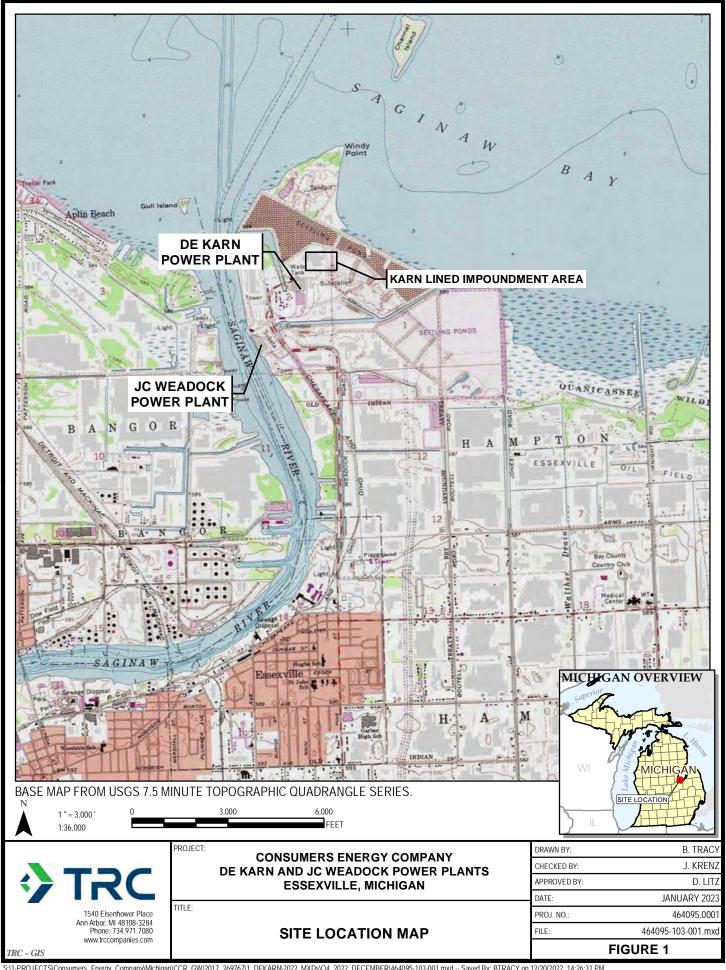
UCL - Upper Confidence Limit ($\alpha = 0.01$) of the downgradient data set.

LCL - Lower Confidence Limit ($\alpha = 0.01$) of the downgradient data set.

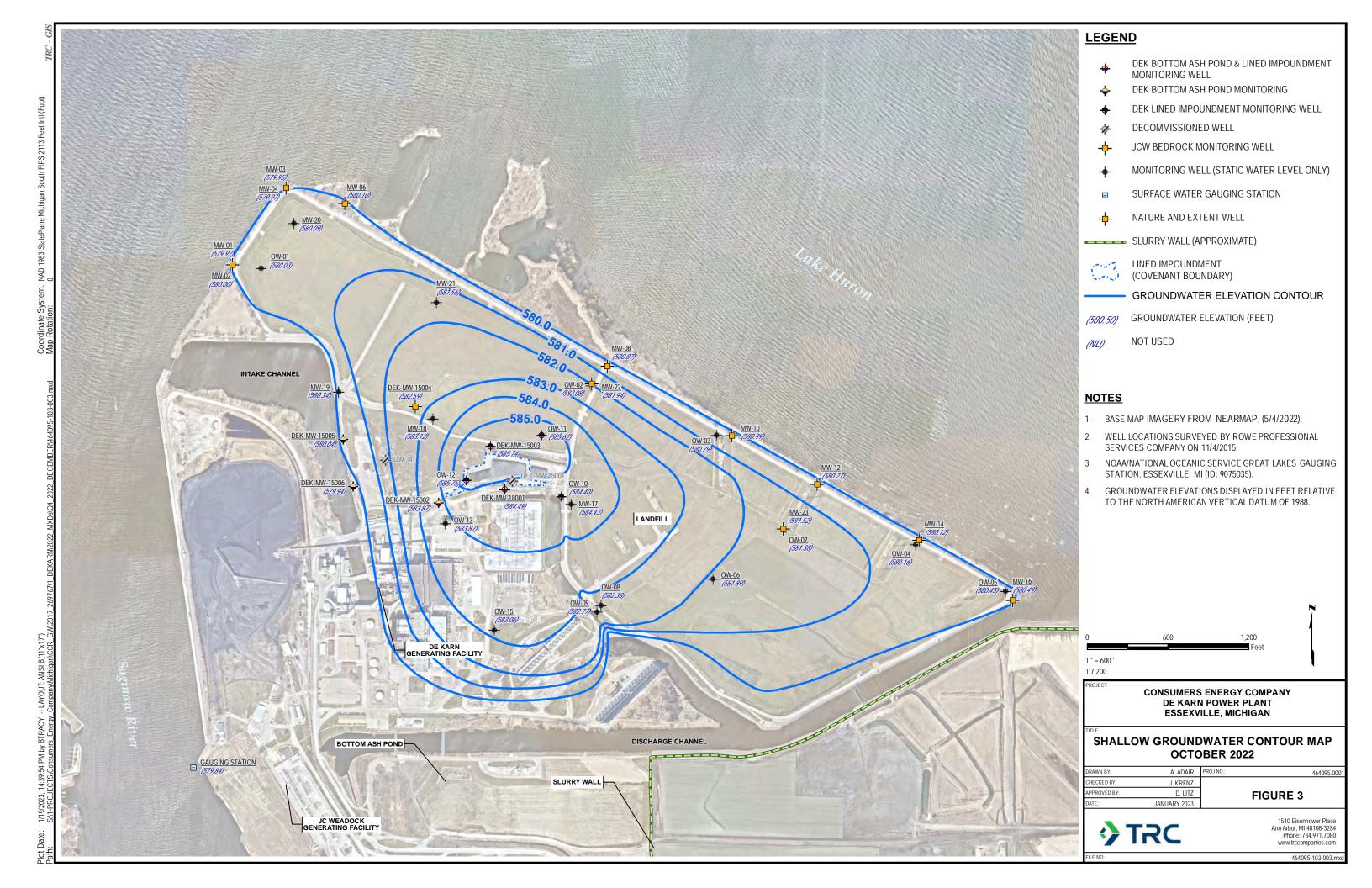
Indicates a statistically significant exceedance of the GWPS. An exceedance occurs when the LCL is greater than the GWPS.



Figures









Appendix A Data Quality Reviews

Laboratory Data Quality Review Groundwater Monitoring Event October 2022 DE Karn Bottom Ash Pond and Lined Impoundment

A groundwater sample was collected by TRC for the October 2022 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 and the total and dissolved organic carbon analyses were subcontracted to Brighton Analytical LLC (BAL) in Brighton, Michigan. The laboratory analytical results were reported in laboratory sample delivery groups (SDGs) 22-1017, S41139.01, and 85178.

During the October 2022 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
Total and Dissolved Organic Carbon (TOC, DOC)	SM 5310B

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:

- 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, IV, optional Piper Diagram analyses, additional Part 115 constituents, and additional geochemistry parameters will be utilized for the purposes of a detection or assessment monitoring program.
- Data are usable for the purposes of the detection or assessment monitoring program.
- 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

- TOC and DOC were not detected in the method blank.
- A field blank was not collected with this data set.
- An equipment blank was not collected with this data set.
- MS and MSD analyses were performed on sample DEK-MW-18001 for total metals, anions, ammonia, alkalinity, sulfide, TOC, and DOC. The recoveries were within the acceptance limits. Relative percent differences (RPDs) were within the acceptance limits for TOC and DOC but were not provided by the laboratory for the remaining parameters and therefore

were not evaluated; further, with the exception of sulfide, MS/MSD concentrations were not provided by the laboratory. However, since all recoveries were within the acceptance limits, there is no impact on data usability due to this issue.

- A field duplicate pair was not collected with this data set.
- Laboratory duplicate analyses were not performed on a sample from this data set.

Laboratory Data Quality Review Groundwater Monitoring Event October 2022 DE Karn Bottom Ash Pond and Lined Impoundment

A groundwater sample was collected by TRC for the October 2022 sampling event. The sample was analyzed for radium by Eurofins in St. Louis, Missouri (Eurofins – St. Louis). The laboratory analytical results were reported in laboratory sample delivery group (SDG) 240-174334-1.

During the October 2022 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					
Radium (Ra-226, Ra-228, Combined Ra-226 & Ra-228)	EPA 903.0, EPA 904.0					

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 Department of Energy Evaluation of Radiochemical Data Usability (USDOE, 1997). The following items were included in the evaluation of the data:

- 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;
- Percent recoveries for carriers, where applicable, for radiochemistry only. Carriers are used to assess the chemical yield for the preparation and/or instrument efficiency;
- 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. Field duplicate samples are used to assess variability introduced by the sampling and analytical processes; and
- Overall usability of the data.

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 constituents will be utilized for the purposes of an assessment monitoring program.
- Data are usable for the purposes of the assessment monitoring program.
- When the data are evaluated through an assessment monitoring statistical program, findings below may be used to support the removal of outliers.

QA/QC Sample Summary

- Target analytes were not detected in the method blanks.
- No equipment or field blanks were collected.
- LCS recoveries for all target analytes were within laboratory control limits.
- MS/MSD and laboratory duplicate analyses were not performed on a sample from this SDG.
- A field duplicate pair was not collected.
- Carrier recoveries were within 40-110%.

Laboratory Data Quality Review Groundwater Monitoring Event October 2022 DE Karn Bottom Ash Pond

Groundwater samples were collected by TRC for the October 2022 sampling event. Samples were analyzed for total metals, anions, total dissolved solids, ammonia, and alkalinity by Consumers Energy (CE) Laboratory Services in Jackson, Michigan. The sulfide analyses were subcontracted to Merit Laboratories, Inc. (Merit) in East Lansing, Michigan and the total and dissolved organic carbon analyses were subcontracted to Brighton Analytical LLC (BAL) in Brighton, Michigan. The laboratory analytical results were reported in laboratory sample delivery groups (SDGs) 22-1016, S41138.01(01), and 85181.

During the October 2022 sampling event, a groundwater sample was collected from each of the following wells:

DEK-MW-15002

DEK-MW-15005

DEK-MW-15006

Each 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
Total and Dissolved Organic Carbon (TOC, DOC)	SM 5310B

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:

- 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. 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, alkalinity, TDS, ammonia, 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, IV, optional Piper diagram analyses, additional Part 115 constituents, and additional geochemistry parameters will be utilized for the purposes of the detection monitoring program.
- Data are usable for the purposes of the assessment monitoring program.
- When the data are evaluated through an assessment monitoring statistical program, findings below may be used to support the removal of outliers.

QA/QC Sample Summary

- TOC and DOC were not detected in the method blank.
- One field blank (FB-DEK-BAP) and one equipment blank (EB-DEK-BAP) were collected with this data set. Total metals, nitrate, nitrite, ammonia, and sulfide were not detected in these blanks. The following analytes were detected in these blanks:
 - TOC was detected at 1,700 ug/L in EB-DEK BAP and FB-DEK-BAP. The positive results for TOC in all groundwater samples are potential false positive results or biased high as summarized in the attached table, Attachment A.

- DOC was detected at 1,500 ug/L in FB-DEK-BAP and 1,100 ug/L in EB-DEK-BAP. The
 positive results for DOC in all groundwater samples are potential false positive results
 or biased high as summarized in the attached table, Attachment A.
- The field duplicate pair samples were DUP-DEK-BAP-01 with DEK-MW-15002; relative percent differences (RPDs) between the parent and duplicate sample were within the QC limits.
- Laboratory duplicate analyses were not performed on a sample from this data set.
- The DOC results were greater than the TOC results by more than 20% for samples DEK-MW-15005 and DEK-MW-15006 where the total or dissolved results were >5x the RL. The positive results for DOC and TOC in these samples are potentially uncertain as summarized in the attached table, Attachment A. TOC/DOC are indicator parameters and are not used to determine compliance with the detection monitoring program.

Attachment A

Summary of Data Non-Conformances for Impoundment Groundwater Analytical Data

DE Karn Bottom Ash Pond

Essexville, Michigan

Samples	Collection Date	Analyte	Non-Conformance/Issue				
DEK-MW-15002							
DEK-MW-15005			Potential false positive results and biased high due to field and equipment blank contamination. TOC/DOC are				
DEK-MW-15006			indicator parameters and are not used to determine compliance with the detection monitoring program.				
DUP-DEK-BAP-01	10/4/2022	TOC/DOC					
DEK-MW-15005			The discolved concentration was higher than the total concentration by 200/ and total and/or discolved results - Ev				
DEK-MW-15006			The dissolved concentration was higher than the total concentration by >20% and total and/or dissolved results > 5x the RL. The positive results for DOC and TOC in these samples are potentially uncertain. TOC/DOC are indicator parameters and are not used to determine compliance with the detection monitoring program.				

Laboratory Data Quality Review Groundwater Monitoring Event October 2022 DE Karn Bottom Ash Pond

Groundwater samples were collected by TRC for the October 2022 sampling event. Samples were analyzed for radium by Eurofins in St. Louis, Missouri (Eurofins – St. Louis). The laboratory analytical results were reported in laboratory sample delivery group (SDG) 240-174326-1.

During the October 2022 sampling event, a groundwater sample was collected from each of the following wells:

DEK-MW-15002

DEK-MW-15005

DEK-MW-15006

Each sample was analyzed for one or more of the following constituents:

Analyte Group	Method
Radium (Ra-226, Ra-228, Combined Ra-226 & Ra-228)	EPA 903.0, EPA 904.0

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 Department of Energy Evaluation of Radiochemical Data Usability (USDOE, 1997). The following items were included in the evaluation of the data:

- 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;
- Percent recoveries for carriers, where applicable, for radiochemistry only. Carriers are used to assess the chemical yield for the preparation and/or instrument efficiency;
- 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. Field duplicate samples are used to assess variability introduced by the sampling and analytical processes; and
- Overall usability of the data.

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 constituents will be utilized for the purposes of an assessment monitoring program.
- Data are usable for the purposes of the assessment monitoring program.
- When the data are evaluated through an assessment monitoring statistical program, findings below may be used to support the removal of outliers.

QA/QC Sample Summary

- Target analytes were not detected in the method blanks with the following exception.
 - Radium-228 was detected in MB 160-586571/1-A at 1.001 +/- 0.433 pCi/L. Potential false positive exists for radium-228 results with normalized absolute differences (NADs)
 <1.96 and potential high bias exists for radium-228 results with NADs >1.96 but <2.48, as summarized in attachment A.
- One equipment blank (EB-DEK-BAP) was collected. Target analytes were not detected in the equipment blank sample with the following exceptions.
 - Radium-228 was detected in EB-DEK-BAP at 1.21 +/- 0.511 pCi/L. Associated samples are already qualified as potential false positive detections and potential high bias, as summarized in attachment A.
 - Combined radium 226+228 was detected in EB-DEK-BAP at 1.24 +/- 0.517 pCi/L.
 Potential false positive exists for combined radium 226+228 results with NADs <1.96, as summarized in attachment A.
- LCS recoveries for all target analytes were within laboratory control limits.
- MS/MSD and laboratory duplicate analyses were not performed on a sample from this SDG.
- The field duplicate pair samples were DUP-DEK-BAP-01/DEK-MW-15006. All criteria were met.
- Carrier recoveries were within 40-110%.

Attachment A

Summary of Data Non-Conformances for Groundwater Analytical Data DE Karn Bottom Ash Pond– CCR Monitoring Program Essexville, Michigan

Samples	Collection Date	Analyte	Non-Conformance/Issue
DEK-MW-15002	10/4/2022	Combined	
DEK-MW-15006	10/4/2022	Radium 226+228	Detected result is potentially a false positive due to equipment blank contamination.
DUP-DEK-BAP-01	10/4/2022		
DEK-MW-15002	10/4/2022		
DEK-MW-15006	10/4/2022	Radium 228	Detected result is potentially a false positive due to method blank contamination.
DUP-DEK-BAP-01	10/4/2022	Raululli 220	Detected result is potentially a false positive due to method blank containination.
EB-DEK-BAP	10/4/2022		
DEK-MW-15005	10/4/2022	Radium 228	Detected result is potentially biased high due to method blank contamination.

Laboratory Data Quality Review Groundwater Monitoring Event October 2022 JC Weadock/DE Karn Background

Groundwater samples were collected by TRC for the October 2022 sampling event. Samples were analyzed for total metals, anions, and total dissolved solids by Consumers Energy (CE) Laboratory Services in Jackson, Michigan. The laboratory analytical results were reported in laboratory sample delivery group (SDG) 22-1023.

During the October 2022 sampling event, a groundwater sample was collected from each of the following wells:

■ MW-15002

■ MW-15008

MW-15016

■ MW-15019

Each sample was analyzed for the following constituents:

Analyte Group	Method
Anions (Fluoride, Chloride, Sulfate)	EPA 300.0
Total Dissolved Solids (TDS)	SM 2540C
Total Metals	SW-846 6020B/7470A

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:

- 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. 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. 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 laboratory control samples were not provided for review by CE Laboratory Services. 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 metals, anions, and TDS 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, IV, and additional Part 115 constituents will be utilized for the purposes of an assessment monitoring program.
- Data are usable for the purposes of the assessment monitoring program.
- When the data are evaluated through an assessment monitoring statistical program, findings below may be used to support the removal of outliers.

QA/QC Sample Summary

- One field blank (FB-Background) was collected. Total metals were not detected in this blank sample.
- MS and MSD analyses were not performed on a sample from this data set.
- The field duplicate pair samples were DUP-Background and MW-15008; all criteria were met.
- Laboratory duplicate analyses were not performed on a sample from this data set.

Laboratory Data Quality Review Groundwater Monitoring Event October 2022 JC Weadock/Karn DEK Background

Groundwater samples were collected by TRC for the October 2022 sampling event. Samples were analyzed for radium by Eurofins in St. Louis, Missouri (Eurofins – St. Louis). The laboratory analytical results were reported in laboratory sample delivery group (SDG) 240-174329-1.

During the October 2022 sampling event, a groundwater sample was collected from each of the following wells:

■ MW-15002

■ MW-15008

MW-15016

■ MW-15019

Each sample was analyzed for the following constituents:

Analyte Group	Method					
Radium (Ra-226, Ra-228, Combined Ra-226 & Ra-228)	EPA 903.0, EPA 904.0					

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 Department of Energy Evaluation of Radiochemical Data Usability (USDOE, 1997). The following items were included in the evaluation of the data:

- 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;
- Percent recoveries for carriers, where applicable, for radiochemistry only. Carriers are used to assess the chemical yield for the preparation and/or instrument efficiency;

- 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. Field duplicate samples are used to assess variability introduced by the sampling and analytical processes; and
- Overall usability of the data.

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 constituents will be utilized for the purposes of an assessment monitoring program.
- Data are usable for the purposes of the assessment monitoring program.
- When the data are evaluated through an assessment monitoring statistical program, findings below may be used to support the removal of outliers.

QA/QC Sample Summary

- Target analytes were not detected in the method blanks with the following exception.
 - Radium-228 was detected in MB 160-586571/1-A at 1.001 +/- 0.433 pCi/L. Potential false positive exists for radium-228 results with normalized absolute differences (NADs) <1.96 and potential high bias exists for radium-228 results with NADs >1.96 but <2.48, as summarized in attachment A.
- One field blank (FB-Background) was collected. Target analytes were not detected in the field blank sample with the following exceptions.
 - Radium-228 was detected in FB-Background at 1.51 +/- 0.478 pCi/L. Associated samples are already qualified as potential false positive detections and potential high bias, as summarized in attachment A.
 - Combined radium 226+228 was detected in FB-Background at 1.55 +/- 0.483 pCi/L. Potential false positive exists for combined radium 226+228 results with NADs <1.96 and potential high bias exists for combined radium 226+228 results with NADs >1.96 but <2.48, as summarized in attachment A.</p>
- LCS recoveries for all target analytes were within laboratory control limits.
- MS/MSD and laboratory duplicate analyses were not performed on a sample from this SDG.
- The field duplicate pair samples were DUP-Background/MW-15019. All criteria were met.
- Carrier recoveries were within 40-110%.

Attachment A

Summary of Data Non-Conformances for Groundwater Analytical Data JC Weadock and DE Karn Background Wells– CCR Monitoring Program Essexville, Michigan

Samples	Collection Date	Analyte	Non-Conformance/Issue
MW-15008	10/4/2022		
MW-15016	10/5/2022		
MW-15019	10/4/2022	Radium 228	Detected result is potentially a false positive due to method blank contamination.
DUP-Background	10/4/2022		
FB-Background	10/5/2022		
MW-15002	10/5/2022	Radium 228	Detected result is potentially biased high due to method blank contamination.
MW-15008	10/4/2022		
MW-15016	10/5/2022	Combined	Detected result is potentially a false positive due to field blank contamination.
MW-15019	10/4/2022	Radium 226+228	Detected result is potentially a raise positive due to field plank containination.
DUP-Background	10/4/2022		
MW-15002	10/5/2022	Combined Radium 226+228	Detected result is potentially biased high due to field blank contamination.



Appendix B Statistical Evaluation of October 2022 Assessment Monitoring Sampling Event



Date: December 23, 2022

To: J.R. Register, Consumers Energy

From: Darby Litz, TRC

Alex Eklund, TRC

Project No.: 464095.0001.0000 Phase 002, Task 002

Subject: Statistical Evaluation of October 2022 Assessment Monitoring Sampling Event

DE Karn Bottom Ash Pond, Consumers Energy Company, Essexville, Michigan

During the statistical evaluation of the initial assessment monitoring event (May 2018), arsenic was present in one or more downgradient monitoring wells at statistically significant levels exceeding the Groundwater Protection Standard (GWPS). Therefore, Consumers Energy Company (Consumers Energy) initiated an Assessment of Corrective Measures (ACM) within 90 days from when the Appendix IV exceedance was determined. The ACM was completed on September 11, 2019. Currently, Consumers Energy is continuing semiannual assessment monitoring in accordance with §257.95 of the CCR Rule ¹ at the DE Karn Power Plant Bottom Ash Pond (Karn Bottom Ash Pond).

An assessment monitoring event was conducted on October 4, 2022. In accordance with §257.95, the assessment monitoring data must be compared to GWPSs to determine whether or not Appendix IV constituents are detected at statistically significant levels above the GWPSs. GWPSs were established in accordance with §257.95(h), as detailed in the October 15, 2018 Groundwater Protection Standards technical memorandum, which was also included in the 2018 Annual Groundwater Monitoring Report (TRC, January 2019).

The statistical evaluation of the assessment monitoring event data indicates the following constituent is present at statistically significant levels exceeding the GWPS in downgradient monitoring wells at the Karn Bottom Ash Pond:

Constituent	GWPS	#Downgradient Wells Observed
Arsenic	21 ug/L	3 of 4

The results of the assessment monitoring statistical evaluation for the downgradient wells are consistent with the results of the previous assessment monitoring data statistical evaluations, indicating that arsenic is the only constituent present at concentrations above the GWPS. Consumers Energy will continue to evaluate corrective measures per §257.96 and §257.97. Consumers Energy will continue

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 per Phase One, Part One of the CCR Rule (83 FR 36435).

executing the self-implementing groundwater compliance schedule in conformance with §257.90 - §257.98.

Assessment Monitoring Statistical Evaluation

When the initial assessment monitoring event was completed in May 2018, the compliance well network at the Karn Bottom Ash Pond included six wells encircling the unit (DEK-MW-15002 through DEK-MW-15006 and DEK-MW-18001). Due to changes in groundwater flow direction on site, monitoring wells DEK-MW-15003 and DEK-MW-15004 are no longer located downgradient of the unit and were determined to be no longer indicative of groundwater conditions influenced by the Karn Bottom Ash Pond. Therefore, monitoring wells DEK-MW-15003 and DEK-MW-15004 are no longer included for statistical analysis. Starting with the May 2021 statistical evaluation, the compliance well network includes DEK-MW-15002, DEK-MW-15005, DEK-MW-15006, and DEK-MW-18001.

Following the assessment monitoring sampling event, compliance well data for the Karn Bottom Ash Pond were evaluated in accordance with the Groundwater Statistical Evaluation Plan (Stats Plan) (TRC, October 2017). An assessment monitoring program was developed to evaluate concentrations of CCR constituents present in the uppermost aquifer relative to acceptable levels (i.e., GWPSs). To evaluate whether or not a GWPS exceedance is statistically significant, the difference in concentration observed at the downgradient wells during a given assessment monitoring event compared to the GWPS must be large enough, after accounting for variability in the sample data, that the result is unlikely to have occurred merely by chance. Consistent with the Unified Guidance ², the preferred method for comparisons to a fixed standard is confidence limits. Based on the number of historical observations in the representative sample population, the sample mean, the sample standard deviation, and a selected confidence level (i.e., 99 percent), an upper and lower confidence limit is calculated. The true mean concentration, with 99 percent confidence, will fall between the lower and upper confidence limits.

The concentrations observed in the downgradient wells are deemed to be a statistically significant exceedance when the 99 percent lower confidence limit of the downgradient data exceeds the GWPS. If the confidence interval straddles the GWPS (i.e., the lower confidence level is below the GWPS, but the upper confidence level is above), the statistical test result indicates that there is insufficient confidence that the measured concentrations are different from the GWPS and thus no compelling evidence that the measured concentration is a result of a release from the CCR unit versus the inherent variability of the sample data. This statistical approach is consistent with the statistical methods for assessment monitoring presented in §257.93(f) and (g). Statistical evaluation methodologies built into the CCR Rule, and numerous other federal rules, are key in determining whether or not individually measured data points represent a concentration increase over the baseline or a fixed standard (such as a GWPS in an assessment monitoring program).

For each detected Appendix IV constituent, the concentrations from each well were first compared directly to the GWPS, as shown on Table 1. Parameter-well combinations that included a direct exceedance of the GWPS within the past eight sampling events (April 2019 through October 2022)

² USEPA. 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance. Office of Conservation and Recovery. EPA 530/R-09-007.

were retained for further analysis. Arsenic in DEK-MW-15005, DEK-MW-15006, and DEK-MW-18001 at the Karn Bottom Ash Pond had individual results exceeding the GWPS.

Groundwater data were then evaluated utilizing SanitasTM statistical software. SanitasTM is a software tool that is commercially available for performing statistical evaluation consistent with procedures outlined in the Unified Guidance. Within the SanitasTM statistical program, confidence limits were selected to perform the statistical comparison of compliance data to a fixed standard. Parametric and non-parametric confidence intervals were calculated for each of the CCR Appendix IV constituents using a using a per test³ 99 percent confidence level, i.e., a significance level (α) of 0.01. The following narrative describes the methods employed, the results obtained and the SanitasTM output files are included as an attachment.

The statistical data evaluation included the following steps:

- Review of data quality checklists for the data sets;
- Graphical representation of the monitoring data as time versus concentration by well/constituent pair;
- Outlier testing of individual data points that appear from the graphical representations as potential outliers;
- Evaluation of visual trends apparent in the graphical representations for statistical significance;
- Evaluation of percentage of non-detects for each well/constituent pair;
- Distribution of the data; and
- Calculation of the confidence intervals for each cumulative dataset.

The results of these evaluations are presented and discussed below.

Data from each round were evaluated for completeness, overall quality, and usability and were deemed appropriate for the purposes of the CCR assessment monitoring program. Initially, the assessment monitoring results were visually assessed for potential outliers or trends. No outliers were identified. Arsenic concentrations at DEK-MW-18001 appear to exhibit an upward trend on the time-series chart over the eight most recent sampling events (Attachment 1). This data set was tested further in Sanitas™ utilizing Sen's Slope to estimate the average rate of change in concentration over time and utilizing the Mann-Kendall trend test to test for significance of the trend at the 98% confidence level. The trend test showed that arsenic concentration at DEK-MW-18001 is generally increasing with time, as evidenced by the positive Sen's Slope. Additionally, the increase in concentration at DEK-MW-18001 was shown to be statistically significant (Attachment 1). The recent increase in arsenic concentrations at DEK-MW-18001 is causing the confidence interval to widen. Calculating a confidence interval around a trending data set incorporates not only variability present naturally in the underlying dataset, but also incorporates variability due to the trend itself. Arsenic concentrations have already triggered assessment monitoring (e.g., not a newly identified GWPS exceedance) and an interim measure has been initiated through the removal of CCR from the bottom ash pond in 2019; therefore, traditional confidence interval calculations are presented in this statistical evaluation until more post-CCR removal data are available. If trends continued to be observed as additional post-CCR

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³ Confidence level is assessed for each individual comparison (i.e. per well and per constituent).

removal data are collected, confidence bands may be a more appropriate assessment to determine compliance with the CCR Rule. Confidence bands are identified by the UG as the appropriate method for calculating confidence intervals on trending data. A confidence band calculates upper and lower confidence limits at each point along the trend to reduce variability and create a narrower confidence interval. At least 8 to 10 measurements should be available when computing a confidence band around a linear regression, and as of the October 2022 event, seven semiannual sampling events have been completed post-CCR removal.

The SanitasTM software was used to test compliance at the downgradient monitoring wells using the confidence interval method for the most recent 8 sampling events. Eight independent sampling events provide the appropriate density of data as recommended per the UG yet are collected recently enough to provide an indication of current condition. The tests were run with a per-test significance of $\alpha = 0.01$. The software outputs are included in Attachment 1 along with data reports showing the values used for the evaluation. The percentage of non-detect observations for well/constituent pairs with a direct GWPS exceedance are also included in Attachment 1. Non-detect data was handled in accordance with the Stats Plan for the purposes of calculating the confidence intervals.

The Sanitas™ software generates an output graph for the confidence intervals of each well. The arsenic data sets at DEK-MW-15006 and DEK-MW-18001 were found to be normally distributed and DEK-MW-15005 was normalized using a square root transformation. The confidence interval test compares the lower confidence limit to the GWPS. The statistical evaluation of the Appendix IV parameters shows exceedances for arsenic at three of the four monitoring locations (DEK-MW-15005, DEK-MW-15006, and DEK-MW-18001). The results of the assessment monitoring statistical evaluation for the other downgradient wells are consistent with the results of the previous assessment monitoring data statistical evaluations, indicating that arsenic is the only constituent present at concentrations above the GWPS. Consumers Energy will continue to evaluate corrective measures per §257.96 and §257.97. Consumers Energy will continue executing the self-implementing groundwater compliance schedule in conformance with §257.90 - §257.98.

Attachments

Table 1 Comparison of Groundwater Sampling Results to Groundwater Protection Standards

Attachment 1 Sanitas™ Output Files

Comparison of Groundwater Sampling Results to Groundwater Protection Standards – April 2019 to October 2022 DE Karn Bottom Ash Pond – RCRA CCR Monitoring Program Essexville, Michigan

				S	ample Location:	DEK-MW-15002										
					Sample Date:	4/11/2019	10/15/2019	5/13/2020	10/6/2020	10/6/2020	5/3/2021	10/4/2021	5/3/2022	10/4/2022	10/4/2022	
Constituent	Unit	EPA MCL	EPA RSL	UTL	GWPS	downgradient										
Appendix III										Field Dup					Field Dup	
Boron	ug/L	NC	NA	619	NA	860	1,600	1,390	1,580	1,600	1,420	1,530	1,100	1,340	1,370	
Calcium	mg/L	NC	NA	302	NA	72	130	170	126	122	148	73.1	105	70.2	68	
Chloride	mg/L	250*	NA	2,440	NA	80	410	130	106	102	148	102	99.3	105	103	
Fluoride	ug/L	4,000	NA	1,000	NA	< 1,000	< 1,000	< 1,000	1,300	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	
Sulfate	mg/L	250*	NA	407	NA	45	150	367	142	139	216	58.3	172	33.7	33.2	
Total Dissolved Solids	mg/L	500*	NA	4,600	NA	560	1,300	1,100	791	776	926	599	779	584	631	
pH, Field	SU	6.5 - 8.5*	NA	6.5 - 7.3	NA	7.5	7.3	7.1	7.1		7.4	7.1	7.0	7.4		
Appendix IV																
Antimony	ug/L	6	NA	1	6	< 1.0	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
Arsenic	ug/L	10	NA	21	21	9.0	6.5	3	8	8	2	2	2	3	4	
Barium	ug/L	2,000	NA	1,300	2,000	71	140	196	133	131	211	102	134	92	95	
Beryllium	ug/L	4	NA	1	4	< 1.0	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
Cadmium	ug/L	5	NA	0.2	5	< 0.20	< 0.20	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	
Chromium	ug/L	100	NA	3	100	1.3	< 1.0	< 1	1	1	< 1	1	1	1	1	
Cobalt	ug/L	NC	6	15	15	< 6.0	< 6.0	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	
Fluoride	ug/L	4,000	NA	1,000	4,000	< 1,000	<1,000	< 1,000	1,300	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	
Lead	ug/L	NC	15	1	15	< 1.0	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
Lithium	ug/L	NC	40	180	180	26	35	48	35	36	36	29	28	25	27	
Mercury	ug/L	2	NA	0.2	2	< 0.20	< 0.20	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	
Molybdenum	ug/L	NC	100	6	100	< 5.0	< 5.0	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	
Radium-226	pCi/L	NC	NA	NA	NA	< 0.376	0.334	0.673	< 0.430	< 0.577	0.582	1.47	< 0.423	0.219	0.287	
Radium-228	pCi/L	5	NA	3.32	5	0.846	0.987	0.899	1.06	< 0.577	0.811	2.29	< 0.530	1.81	2.70	
Radium-226/228	pCi/L	NC	NA	NA	NA	0.684	0.654	< 0.763	0.642	< 0.460	< 0.537	0.827	0.636	2.03	2.99	
Selenium	ug/L	50	NA	2	50	< 1.0	< 1.0	< 1	< 1	1	< 1	3	1	< 1	1	
Thallium	ug/L	2	NA	2	2	< 2.0	< 2.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

pCi/L - picocuries per liter.

NA - not applicable.

NC - no criteria.

-- - not analyzed.

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

RSL - Regional Screening Level from 83 FR 36435.

UTL - Upper Tolerance Limit (95%) of the background data set.

GWPS - Groundwater Protection Standard. GWPS is the higher of the MCL/RSL and UTL as established in TRC's Technical Memorandum dated October 15, 2018.

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

Bold value indicates an exceedance of the GWPS. Data from downgradient monitoring wells are screened against the GWPS for evaluation purposes only. Confidence intervals will be used to determine compliance per the CCR rules.

All metals were analyzed as total unless otherwise specified.

January 2023

Comparison of Groundwater Sampling Results to Groundwater Protection Standards – April 2019 to October 2022 DE Karn Bottom Ash Pond – RCRA CCR Monitoring Program Essexville, Michigan

				Si	ample Location:	DEK-MW-15005											
				Sample Date:	4/11/2019	4/11/2019	10/15/2019	10/15/2019	5/13/2020	5/13/2020	10/7/2020	5/3/2021	5/3/2021	10/4/2021	5/3/2022	10/4/2022	
Constituent	Unit	EPA MCL	EPA RSL	UTL	GWPS	downgradient											
Appendix III							Field Dup		Field Dup		Field Dup			Field Dup			
Boron	ug/L	NC	NA	619	NA	910	910	700	650	863	858	847	926	948	991	787	911
Calcium	mg/L	NC	NA	302	NA	31	31	60	59	71.0	72.1	155	95.6	97.6	102	127	130
Chloride	mg/L	250*	NA	2,440	NA	60	60	64	64	48.0	47.5	52.7	65.2	65.1	82.3	141	138
Fluoride	ug/L	4,000	NA	1,000	NA	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	250*	NA	407	NA	140	140	5.2	5.0	18.9	18.9	102	50.8	50.2	57.2	151	130
Total Dissolved Solids	mg/L	500*	NA	4,600	NA	470	470	390	400	419	425	687	534	561	546	909	894
pH, Field	SU	6.5 - 8.5*	NA	6.5 - 7.3	NA	7.7		7.6		8.1		7.7	7.6		7.1	7.1	7.5
Appendix IV																	
Antimony	ug/L	6	NA	1	6	< 1.0	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	10	NA	21	21	24	24	120	120	34	34	42	45	44	68	54	54
Barium	ug/L	2,000	NA	1,300	2,000	46	45	110	100	127	127	248	173	170	192	305	312
Beryllium	ug/L	4	NA	1	4	< 1.0	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5	NA	0.2	5	< 0.20	< 0.20	< 0.20	< 0.20	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	NA	3	100	< 1.0	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	2
Cobalt	ug/L	NC	6	15	15	< 6.0	< 6.0	< 6.0	< 6.0	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	NA	1,000	4,000	< 1,000	< 1,000	<1,000	<1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	NC	15	1	15	< 1.0	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	NC	40	180	180	15	14	16	15	20	20	45	38	39	41	36	36
Mercury	ug/L	2	NA	0.2	2	< 0.20	< 0.20	< 0.20	< 0.20	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	NC	100	6	100	39	38	< 5.0	< 5.0	< 5	< 5	< 5	8	8	7	12	8
Radium-226	pCi/L	NC	NA	NA	NA	< 0.379	< 0.406	0.165	0.185	< 0.469	< 0.335	0.621	0.291	< 0.187	1.12	0.620	0.544
Radium-228	pCi/L	5	NA	3.32	5	< 0.754	< 0.586	0.524	0.682	1.34	0.662	0.875	0.722	0.650	2.06	1.08	3.11
Radium-226/228	pCi/L	NC	NA	NA	NA	< 0.754	< 0.586	< 0.456	0.497	1.14	< 0.554	< 0.502	< 0.459	0.479	0.940	1.70	3.66
Selenium	ug/L	50	NA	2	50	< 1.0	< 1.0	< 1.0	< 1.0	< 1	< 1	< 1	1	1	2	1	1
Thallium	ug/L	2	NA	2	2	< 2.0	< 2.0	< 2.0	< 2.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

pCi/L - picocuries per liter.

NA - not applicable.

NC - no criteria.

-- - not analyzed.

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

RSL - Regional Screening Level from 83 FR 36435.

UTL - Upper Tolerance Limit (95%) of the background data set.

GWPS - Groundwater Protection Standard. GWPS is the higher of the MCL/RSL and UTL as established in

TRC's Technical Memorandum dated October 15, 2018.

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

Bold value indicates an exceedance of the GWPS. Data from downgradient monitoring wells are screened against the GWPS for evaluation purposes only. Confidence intervals will be used to determine compliance per the CCR rules.

All metals were analyzed as total unless otherwise specified.

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 Page 2 of 4

Comparison of Groundwater Sampling Results to Groundwater Protection Standards – April 2019 to October 2022 DE Karn Bottom Ash Pond – RCRA CCR Monitoring Program Essexville, Michigan

Sample Location:					DEK-MW-15006										
					Sample Date:	4/11/2019	10/14/2019	5/13/2020	10/7/2020	5/3/2021	10/4/2021	10/4/2021	5/3/2022	5/3/2022	10/4/2022
Constituent	Unit	EPA MCL	EPA RSL	UTL	GWPS	downgradient									
Appendix III												Field Dup		Field Dup	
Boron	ug/L	NC	NA	619	NA	1,700	1,200	1,090	1,220	938	1,050	1,080	893	888	871
Calcium	mg/L	NC	NA	302	NA	35	34	70.4	106	115	117	117	65.0	65.5	83.8
Chloride	mg/L	250*	NA	2,440	NA	75	45	71.5	102	63.5	78.9	74.7	68.6	67.9	70.6
Fluoride	ug/L	4,000	NA	1,000	NA	< 1,000	< 1,000	< 1,000	1,060	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Sulfate	mg/L	250*	NA	407	NA	320	74	316	296	324	209	196	173	168	254
Total Dissolved Solids	mg/L	500*	NA	4,600	NA	780	450	833	1,010	790	712	708	597	609	720
pH, Field	SU	6.5 - 8.5*	NA	6.5 - 7.3	NA	7.8	7.8	8.1	7.7	7.5	7.3		7.4		7.8
Appendix IV															
Antimony	ug/L	6	NA	1	6	< 1.0	< 1.0	3	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Arsenic	ug/L	10	NA	21	21	21	27	21	27	24	23	24	25	24	26
Barium	ug/L	2,000	NA	1,300	2,000	43	51	86	141	139	125	126	68	67	94
Beryllium	ug/L	4	NA	1	4	< 1.0	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Cadmium	ug/L	5	NA	0.2	5	< 0.20	< 0.20	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium	ug/L	100	NA	3	100	< 1.0	1.1	2	6	< 1	< 1	< 1	1	< 1	< 1
Cobalt	ug/L	NC	6	15	15	< 6.0	< 6.0	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Fluoride	ug/L	4,000	NA	1,000	4,000	< 1,000	<1,000	< 1,000	1,060	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Lead	ug/L	NC	15	1	15	< 1.0	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Lithium	ug/L	NC	40	180	180	< 10	11	15	22	21	19	19	16	15	18
Mercury	ug/L	2	NA	0.2	2	< 0.20	< 0.20	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Molybdenum	ug/L	NC	100	6	100	59	11	18	11	9	7	7	6	6	7
Radium-226	pCi/L	NC	NA	NA	NA	< 0.459	< 0.159	< 0.370	0.629	0.353	0.797	0.832	< 0.449	0.395	0.242
Radium-228	pCi/L	5	NA	3.32	5	< 0.677	< 0.581	1.01	1.12	1.16	1.50	1.35	0.870	< 0.502	1.43
Radium-226/228	pCi/L	NC	NA	NA	NA	< 0.677	< 0.581	0.780	0.492	0.804	0.704	0.518	1.29	0.742	1.67
Selenium	ug/L	50	NA	2	50	< 1.0	< 1.0	< 1	< 1	< 1	2	2	< 1	1	1
Thallium	ug/L	2	NA	2	2	< 2.0	< 2.0	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

pCi/L - picocuries per liter.

NA - not applicable.

NC - no criteria.

-- - not analyzed.

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

RSL - Regional Screening Level from 83 FR 36435.

UTL - Upper Tolerance Limit (95%) of the background data set.

GWPS - Groundwater Protection Standard. GWPS is the higher of the MCL/RSL and UTL as established in TRC's Technical Memorandum dated October 15, 2018.

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

Bold value indicates an exceedance of the GWPS. Data from downgradient monitoring wells are screened against the GWPS for evaluation purposes only. Confidence intervals will be used to determine compliance per the CCR rules.

All metals were analyzed as total unless otherwise specified.

January 2023

Comparison of Groundwater Sampling Results to Groundwater Protection Standards – April 2019 to October 2022 DE Karn Bottom Ash Pond – RCRA CCR Monitoring Program Essexville, Michigan

Sample Location:						DEK-MW-18001								
					Sample Date:	4/10/2019	10/15/2019	5/14/2020	10/6/2020	5/3/2021	10/7/2021	5/3/2022	10/4/2022	
Constituent	Unit	EPA MCL	EPA RSL	UTL	GWPS	downgradient								
Appendix III														
Boron	ug/L	NC	NA	619	NA	970	2,200	1,670	1,740	1,180	1,370	869	1,060	
Calcium	mg/L	NC	NA	302	NA	48	84	72.1	71.7	65.2	71.0	63.7	58.3	
Chloride	mg/L	250*	NA	2,440	NA	69	81	64.7	60.7	51.6	55.2	65.9	62.5	
Fluoride	ug/L	4,000	NA	1,000	NA	1,200	1,000	1,090	1,240	< 1,000	< 1,000	< 1,000	< 1,000	
Sulfate	mg/L	250*	NA	407	NA	< 2.0	31	51.1	91.9	121	118	187	140	
Total Dissolved Solids	mg/L	500*	NA	4,600	NA	360	500	484	476	486	494	555	551	
pH, Field	SU	6.5 - 8.5*	NA	6.5 - 7.3	NA	7.2	7.3	7.7	7.6	7.3	7.4	7.6	7.6	
Appendix IV														
Antimony	ug/L	6	NA	1	6	< 1.0	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	
Arsenic	ug/L	10	NA	21	21	68	63	79	85	92	85	113	109	
Barium	ug/L	2,000	NA	1,300	2,000	75	160	130	136	135	135	164	135	
Beryllium	ug/L	4	NA	1	4	< 1.0	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	
Cadmium	ug/L	5	NA	0.2	5	< 0.20	< 0.20	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	
Chromium	ug/L	100	NA	3	100	< 1.0	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	
Cobalt	ug/L	NC	6	15	15	< 6.0	< 6.0	< 6	< 6	< 6	< 6	< 6	< 6	
Fluoride	ug/L	4,000	NA	1,000	4,000	1,200	1,000	1,090	1,240	< 1,000	< 1,000	< 1,000	< 1,000	
Lead	ug/L	NC	15	1	15	< 1.0	< 1.0	< 1	< 1	< 1	< 1	< 1	< 1	
Lithium	ug/L	NC	40	180	180	24	36	27	26	25	24	22	23	
Mercury	ug/L	2	NA	0.2	2	< 0.20	< 0.20	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	
Molybdenum	ug/L	NC	100	6	100	< 5.0	< 5.0	< 5	< 5	< 5	< 5	< 5	< 5	
Radium-226	pCi/L	NC	NA	NA	NA	0.173	0.206	< 0.608	< 0.473	0.189	0.873	0.294	0.264	
Radium-228	pCi/L	5	NA	3.32	5	0.867	0.952	< 0.676	0.591	0.828	1.85	0.592	1.67	
Radium-226/228	pCi/L	NC	NA	NA	NA	0.694	0.746	< 0.676	0.463	0.639	0.979	0.885	1.93	
Selenium	ug/L	50	NA	2	50	< 1.0	< 1.0	< 1	1	< 1	2	2	< 1	
Thallium	ug/L	2	NA	2	2	< 2.0	< 2.0	< 2	< 2	< 2	< 2	< 2	< 2	

Notes:

ug/L - micrograms per liter.

mg/L - milligrams per liter.

SU - standard units; pH is a field parameter.

pCi/L - picocuries per liter.

NA - not applicable.

NC - no criteria.

-- - not analyzed.

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

RSL - Regional Screening Level from 83 FR 36435.

UTL - Upper Tolerance Limit (95%) of the background data set.

GWPS - Groundwater Protection Standard. GWPS is the higher of the MCL/RSL and UTL as established in

TRC's Technical Memorandum dated October 15, 2018.

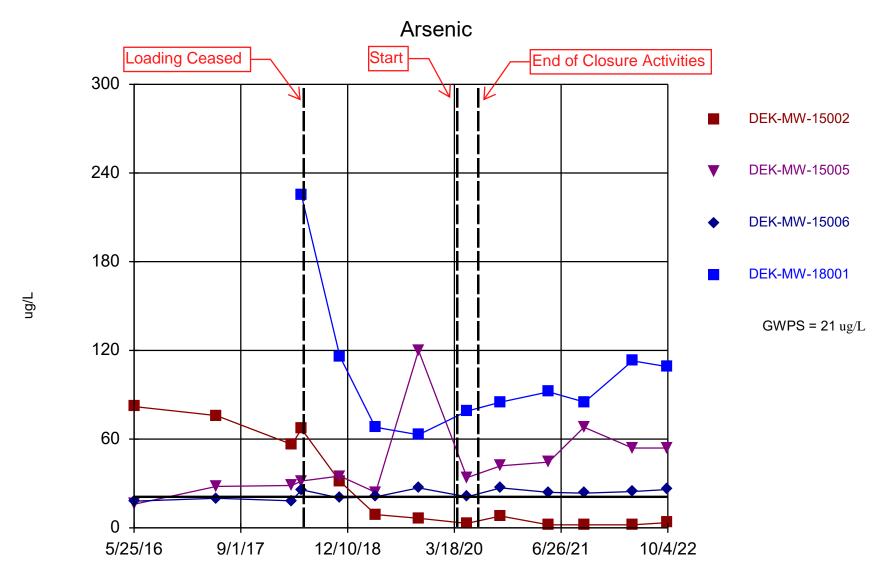
* - Secondary Maximum Contaminant Level (SMCL), EPA Secondary Drinking Water Regulations (SDWR) April 2012.

Bold value indicates an exceedance of the GWPS. Data from downgradient monitoring wells are screened against the GWPS for evaluation purposes only. Confidence intervals will be used to determine compliance per the CCR rules.

All metals were analyzed as total unless otherwise specified.

Page 4 of 4 January 2023

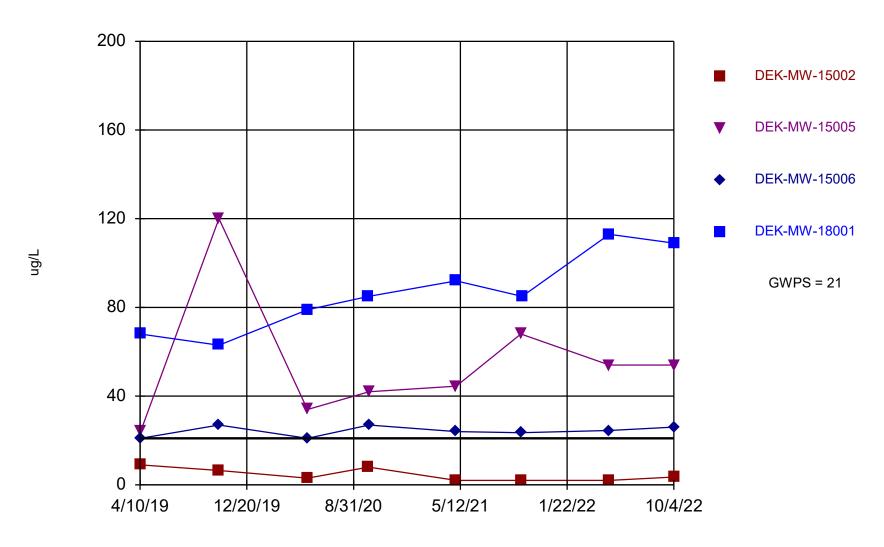
Attachment 1 Sanitas™ Output Files



Time Series Analysis Run 12/21/2022 10:59 AM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

Arsenic Comparison to GWPS



Time Series Analysis Run 11/7/2022 9:35 AM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

Sanitas™ v.9.6.32 Sanitas software licensed to Consumers Energy. UG

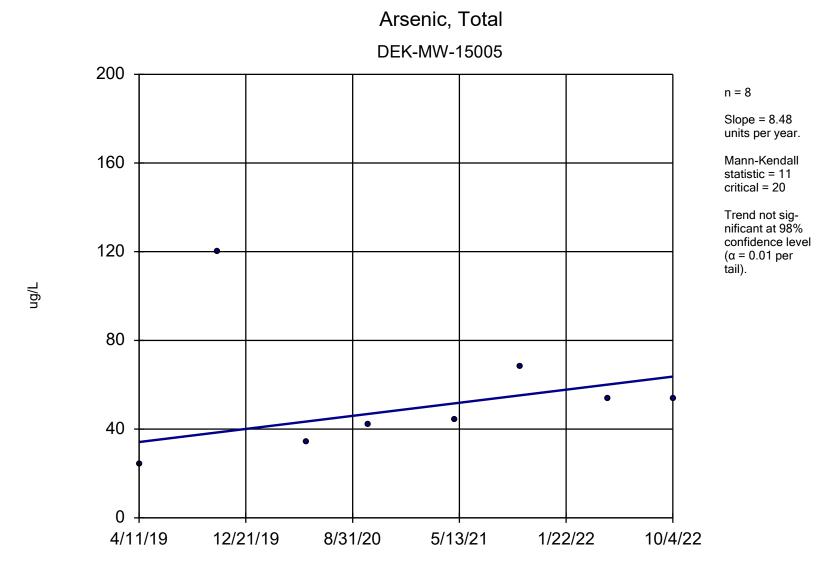
Summary Report

Constituent: Arsenic, Total Analysis Run 11/7/2022 9:37 AM
Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

For observations made between 4/10/2019 and 10/4/2022, a summary of the selected data set:

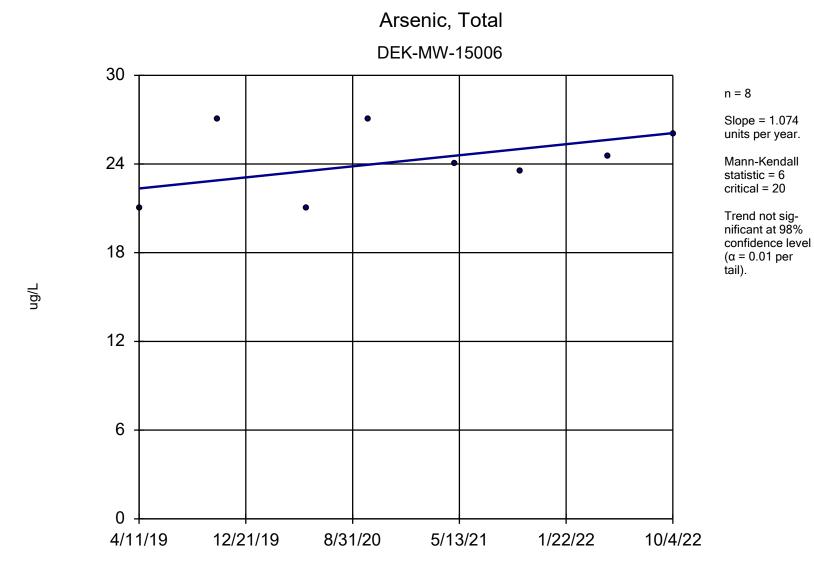
Observations = 32 ND/Trace = 0 Wells = 4 Minimum Value = 2 Maximum Value = 120 Mean Value = 42.64 Median Value = 27 Standard Deviation = 35.7 Coefficient of Variation = 0.8373 Skewness = 0.6902

<u>Well</u>	#Obs.	ND/Trace	<u>Min</u>	<u>Max</u>	<u>Mean</u>	<u>Median</u>	Std.Dev.	CV	<u>Skewness</u>
DEK-MW-15002	8	0	2	9	4.5	3.25	2.891	0.6424	0.5737
DEK-MW-15005	8	0	24	120	55.06	49.25	29.46	0.5351	1.393
DEK-MW-15006	8	0	21	27	24.25	24.25	2.39	0.09858	-0.2474
DEK-MW-18001	8	0	63	113	86.75	85	17.7	0.2041	0.2418



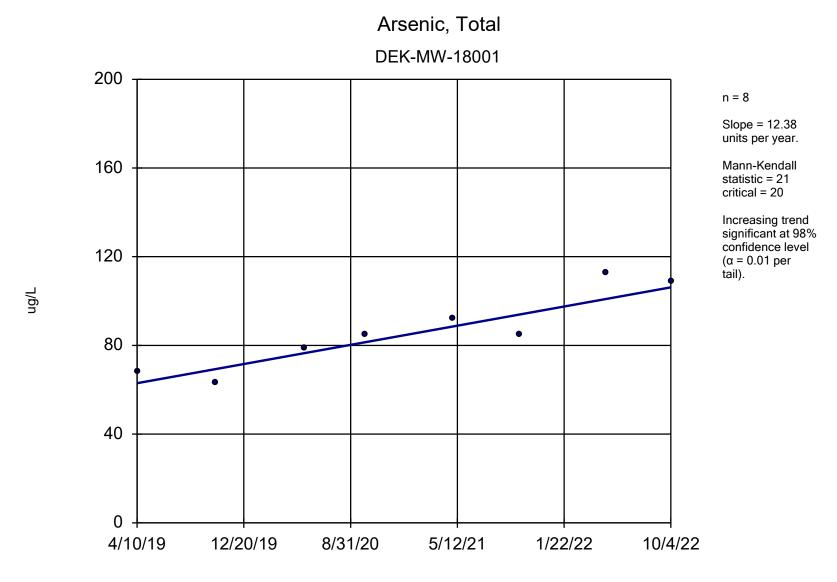
Sen's Slope Estimator Analysis Run 11/7/2022 9:39 AM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4



Sen's Slope Estimator Analysis Run 11/7/2022 9:39 AM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

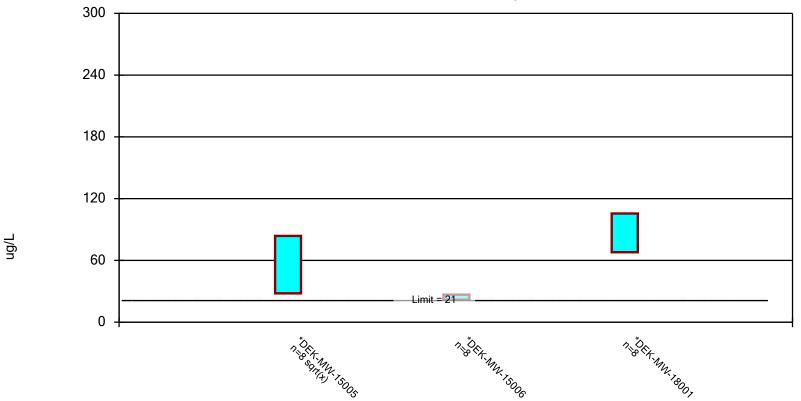


Sen's Slope Estimator Analysis Run 12/21/2022 2:09 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

Parametric Confidence Interval

Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Arsenic, Total Analysis Run 11/7/2022 4:53 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

Confidence Interval

Constituent: Arsenic, Total (ug/L) Analysis Run 11/7/2022 4:55 PM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4

	DEK-MW-15005	DEK-MW-15006	DEK-MW-18001
4/10/2019			68
4/11/2019	24 (D)	21	
10/15/2019	120 (D)	27	63
5/13/2020	34 (D)	21	
5/14/2020			79
10/6/2020			85
10/7/2020	42	27	
5/3/2021	44.5 (D)	24	92
10/4/2021	68	23.5 (D)	
10/7/2021			85
5/3/2022	54	24.5 (D)	113
10/4/2022	54	26	109
Mean	55.06	24.25	86.75
Std. Dev.	29.46	2.39	17.7
Upper Lim.	83.76	26.78	105.5
Lower Lim.	28.01	21.72	67.99



Appendix C Laboratory Analytical Reports



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

To: CDBatts, Karn/Weadock

From: EBlaj, T-258

Date: October 24, 2022

Subject: RCRA GROUNDWATER MONITORING – DEK BOTTOM ASH POND WELLS – 2022 Q4

CC: HDRegister, P22-521 Darby Litz, Project Manager

BLSwanberg, P22-119 TRC Companies, Inc.

1540 Eisenhower Place Ann Arbor, MI 48108

Chemistry Project: 22-1016

TRC Environmental, Inc. conducted groundwater monitoring at the DEKarn Bottom Ash Pond Wells area on 10/04/2022 for the 4th 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 10/05/2022.

Samples for Total Sulfide have been subcontracted to Merit Laboratories, Inc. and the results are listed under the analyst initials "Merit". Samples for Total & Dissolved Organic Carbon have been subcontracted to Brighton Analytical LLC and the results are listed under the analyst initials "BAL". The original reports from both labs are attached. 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



Testing performed in accordance with the A2LA scope of accredidation specified in the listed certificate.

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CASE NARRATIVE

I. <u>Sample Receipt</u>

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.

DEFINITIONS / QUALIFIERS

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

<u>Acronym</u>	<u>Description</u>
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	<u>Description</u>
*	Generic data flag, applicable description added in the corresponding notes section
В	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
Н	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
PΙ	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



Work Order Sample Summary

Customer Name: Karn/Weadock Complex

Work Order ID: Q4-2022 DEK Bottom Ash Pond Wells

Date Received: 10/5/2022 **Chemistry Project:** 22-1016

Sample #	Field Sample ID	<u>Matrix</u>	Sample Date	<u>Site</u>
22-1016-01	DEK-MW-15002	Groundwater	10/04/2022 08:45 AM	DEK Bottom Ash Pond
22-1016-02	DEK-MW-15005	Groundwater	10/04/2022 10:55 AM	DEK Bottom Ash Pond
22-1016-03	DEK-MW-15006	Groundwater	10/04/2022 09:47 AM	DEK Bottom Ash Pond
22-1016-04	DUP-DEK-BAP-01	Groundwater	10/04/2022 12:00 AM	DEK Bottom Ash Pond
22-1016-05	FB-DEK-BAP	Water	10/04/2022 10:55 AM	DEK Bottom Ash Pond
22-1016-06	EB-DEK-BAP	Water	10/04/2022 12:00 PM	DEK Bottom Ash Pond

Report Date:

10/24/22



Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: **DEK Bottom Ash Pond** Laboratory Project: **22-1016**

 Field Sample ID:
 DEK-MW-15002
 Collect Date:
 10/04/2022

 Lab Sample ID:
 22-1016-01
 Collect Time:
 08:45 AM

Mercury by EPA 7470A, Total, Aqueous			Aliquot #: 22-1016-01-C01-A01		Analyst: CLH
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Mercury	ND	ug/L	0.2	10/06/2022	AB22-1006-03
Metals by EPA 6020B: CCR	tal Metals Exp	Aliquot #: 22-1	1016-01-C01-A02	Analyst: EB	
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Antimony	ND	ug/L	1.0	10/12/2022	AB22-1013-04
Arsenic	3	ug/L	1.0	10/12/2022	AB22-1013-04
Barium	92	ug/L	5.0	10/12/2022	AB22-1013-04
Beryllium	ND	ug/L	1.0	10/12/2022	AB22-1013-04
Boron	1340	ug/L	20.0	10/12/2022	AB22-1013-04
Cadmium	ND	ug/L	0.2	10/12/2022	AB22-1013-04
Calcium	70200	ug/L	1000.0	10/16/2022	AB22-1013-04
Chromium	1	ug/L	1.0	10/12/2022	AB22-1013-04
Cobalt	ND	ug/L	6.0	10/12/2022	AB22-1013-04
Copper	ND	ug/L	1.0	10/12/2022	AB22-1013-04
Iron	72	ug/L	20.0	10/12/2022	AB22-1013-04
Lead	ND	ug/L	1.0	10/12/2022	AB22-1013-04
Lithium	25	ug/L	10.0	10/12/2022	AB22-1013-04
Magnesium	16000	ug/L	1000.0	10/16/2022	AB22-1013-04
Manganese	212	ug/L	5.0	10/12/2022	AB22-1013-04
Molybdenum	ND	ug/L	5.0	10/12/2022	AB22-1013-04
Nickel	3	ug/L	2.0	10/12/2022	AB22-1013-04
Potassium	7700	ug/L	100.0	10/16/2022	AB22-1013-04
Selenium	ND	ug/L	1.0	10/12/2022	AB22-1013-04
Silver	ND	ug/L	0.2	10/12/2022	AB22-1013-04
Sodium	107000	ug/L	1000.0	10/16/2022	AB22-1013-04
Thallium	ND	ug/L	2.0	10/12/2022	AB22-1013-04
Vanadium	ND	ug/L	2.0	10/12/2022	AB22-1013-04
Zinc	ND	ug/L	10.0	10/12/2022	AB22-1013-04
Anions by EPA 300.0 Aque	ous. NO2. NO3		Aliquot #: 22-1	1016-01-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Nitrate	ND	ug/L	100.0	10/05/2022	AB22-1005-05
Nitrite	ND	ug/L	100.0	10/05/2022	AB22-1005-05
Anions by EPA 300.0 CCR	Rule Analyte List. Cl. F.	SO4, Agueous	Aliauot #: 22-1	1016-01-C02-A02	Analyst: DMW
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Chloride	105000	ug/L	1000.0	10/10/2022	AB22-1010-05
		1016 Page 5 of 40			





Report Date: 10/24/22

Sample Site: **DEK Bottom Ash Pond** Laboratory Project: **22-1016**

 Field Sample ID:
 DEK-MW-15002
 Collect Date:
 10/04/2022

 Lab Sample ID:
 22-1016-01
 Collect Time:
 08:45 AM

Anions by EPA 300.0 CCR Rule Analyt	e List, CI, F, S	ieous	Aliquot #: 22-1	016-01-C02-A02	Analyst: DMW	
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	10/05/2022	AB22-1010-05
Sulfate	33700		ug/L	1000.0	10/05/2022	AB22-1010-05
Nitrogen-Ammonia by SM4500NH3(h),	Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL					Analyst: CLE
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	6260		ug/L	25.0	10/13/2022	AB22-1013-09
Total Dissolved Solids by SM 2540C	Total Dissolved Solids by SM 2540C					
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	584		mg/L	10.0	10/06/2022	AB22-1006-01
Alkalinity by SM 2320B				Aliquot #: 22-1	016-01-C05-A01	Analyst: DLS
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	314000		ug/L	10000.0	10/13/2022	AB22-1013-03
Alkalinity Bicarbonate	314000		ug/L	10000.0	10/13/2022	AB22-1013-03
Alkalinity Carbonate	ND		ug/L	10000.0	10/13/2022	AB22-1013-03
Sulfide, Total by SM 4500 S2D				Aliquot #: 22-1	016-01-C07-A01	Analyst: Merit
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	1410		ug/L	40.0	10/07/2022	AB22-1016-02
Total Organic Carbon by SM 5310B, Ad	queous			Aliquot #: 22-1	016-01-C08-A01	Analyst: BAL
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	6000		ug/L	1000.0	10/11/2022	AB22-1016-07
Dissolved Organic Carbon by SM 5310	B, Aqueous			Aliquot #: 22-1	016-01-C09-A01	Analyst: BAL
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	6600		ug/L	1000.0	10/11/2022	AB22-1016-08



Report Date:

10/24/22



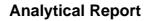
A CENTURY OF EXCELLENCE

Sample Site: **DEK Bottom Ash Pond** Laboratory Project: **22-1016**

 Field Sample ID:
 DEK-MW-15005
 Collect Date:
 10/04/2022

 Lab Sample ID:
 22-1016-02
 Collect Time:
 10:55 AM

Mercury by EPA 7470A, Total,	Aqueeus			Allquot #. ZZ	016-02-C01-A01	Analyst: CLI
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/06/2022	AB22-1006-03
Metals by EPA 6020B: CCR Ru	le Appendix III-IV To	tal Metals	з Ехр	Aliquot #: 22-1	016-02-C01-A02	Analyst: EE
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Arsenic	54		ug/L	1.0	10/12/2022	AB22-1013-04
Barium	312		ug/L	5.0	10/12/2022	AB22-1013-04
Beryllium	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Boron	911		ug/L	20.0	10/12/2022	AB22-1013-04
Cadmium	ND		ug/L	0.2	10/12/2022	AB22-1013-04
Calcium	130000		ug/L	1000.0	10/16/2022	AB22-1013-04
Chromium	2		ug/L	1.0	10/12/2022	AB22-1013-04
Cobalt	ND		ug/L	6.0	10/12/2022	AB22-1013-04
Copper	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Iron	1400		ug/L	20.0	10/12/2022	AB22-1013-04
Lead	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Lithium	36		ug/L	10.0	10/12/2022	AB22-1013-04
Magnesium	19300		ug/L	1000.0	10/16/2022	AB22-1013-04
Manganese	308		ug/L	5.0	10/12/2022	AB22-1013-04
Molybdenum	8		ug/L	5.0	10/12/2022	AB22-1013-04
Nickel	5		ug/L	2.0	10/12/2022	AB22-1013-04
Potassium	8600		ug/L	100.0	10/16/2022	AB22-1013-04
Selenium	1		ug/L	1.0	10/12/2022	AB22-1013-04
Silver	ND		ug/L	0.2	10/12/2022	AB22-1013-04
Sodium	149000		ug/L	1000.0	10/16/2022	AB22-1013-04
Thallium	ND		ug/L	2.0	10/12/2022	AB22-1013-04
Vanadium	ND		ug/L	2.0	10/12/2022	AB22-1013-04
Zinc	56		ug/L	10.0	10/12/2022	AB22-1013-04
Anions by EPA 300.0 Aqueous	s, NO2, NO3			Aliquot #: 22-1	016-02-C02-A01	Analyst: DMV
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	ND		ug/L	100.0	10/05/2022	AB22-1005-05
Nitrite	ND		ug/L	100.0	10/05/2022	AB22-1005-05
Anions by EPA 300.0 CCR Rule	e Analyte List, CI, F,	SO4, Aqu	ieous	Aliquot #: 22-1	016-02-C02-A02	Analyst: DMV
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	138000			1000.0	10/10/2022	AB22-1010-05





Report Date: 10/24/22

Sample Site: **DEK Bottom Ash Pond** Laboratory Project: **22-1016**

 Field Sample ID:
 DEK-MW-15005
 Collect Date:
 10/04/2022

 Lab Sample ID:
 22-1016-02
 Collect Time:
 10:55 AM

Anions by EPA 300.0 CCR Rule Analyte List, CI, F, SO4, Aqueous		Aliquot #: 22-1	Aliquot #: 22-1016-02-C02-A02			
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	10/05/2022	AB22-1010-05
Sulfate	130000		ug/L	1000.0	10/10/2022	AB22-1010-05
Nitrogen-Ammonia by SM4500NH3(h), Groundwate	r HL		Aliquot #: 22-1	016-02-C03-A01	Analyst: CLE
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	960		ug/L	25.0	10/13/2022	AB22-1013-09
Total Dissolved Solids by SM 25400				Aliquot #: 22-1	016-02-C04-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	894		mg/L	10.0	10/06/2022	AB22-1006-01
Alkalinity by SM 2320B				Aliquot #: 22-1	016-02-C05-A01	Analyst: DLS
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	406000		ug/L	10000.0	10/13/2022	AB22-1013-03
Alkalinity Bicarbonate	406000		ug/L	10000.0	10/13/2022	AB22-1013-03
Alkalinity Carbonate	ND		ug/L	10000.0	10/13/2022	AB22-1013-03
Sulfide, Total by SM 4500 S2D				Aliquot #: 22-1	016-02-C07-A01	Analyst: Merit
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	80		ug/L	40.0	10/07/2022	AB22-1016-02
Total Organic Carbon by SM 5310B	, Aqueous			Aliquot #: 22-1	016-02-C08-A01	Analyst: BAL
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	5900		ug/L	1000.0	10/11/2022	AB22-1016-07
Dissolved Organic Carbon by SM 5	310B, Aqueous			Aliquot #: 22-1	016-02-C09-A01	Analyst: BAL
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	7500		ug/L	1000.0	10/11/2022	AB22-1016-08



Report Date:

10/24/22



A CENTURY OF EXCELLENCE

Sample Site: **DEK Bottom Ash Pond** Laboratory Project: **22-1016**

 Field Sample ID:
 DEK-MW-15006
 Collect Date:
 10/04/2022

 Lab Sample ID:
 22-1016-03
 Collect Time:
 09:47 AM

Mercury by EPA 7470A, To	Describ	F1 = ::	Harte.	D.	Analysis Det	T111
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/06/2022	AB22-1006-0
Metals by EPA 6020B: CCR	Rule Appendix III-IV To	tal Metals	s Ехр	Aliquot #: 22-1	016-03-C01-A02	Analyst: El
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/12/2022	AB22-1013-0
Arsenic	26		ug/L	1.0	10/12/2022	AB22-1013-0
Barium	94		ug/L	5.0	10/12/2022	AB22-1013-0
Beryllium	ND		ug/L	1.0	10/12/2022	AB22-1013-0
Boron	871		ug/L	20.0	10/12/2022	AB22-1013-0
Cadmium	ND		ug/L	0.2	10/12/2022	AB22-1013-0
Calcium	83800		ug/L	1000.0	10/16/2022	AB22-1013-0
Chromium	ND		ug/L	1.0	10/12/2022	AB22-1013-0
Cobalt	ND		ug/L	6.0	10/12/2022	AB22-1013-0
Copper	ND		ug/L	1.0	10/12/2022	AB22-1013-0
Iron	1370		ug/L	20.0	10/12/2022	AB22-1013-0
Lead	ND		ug/L	1.0	10/12/2022	AB22-1013-0
Lithium	18		ug/L	10.0	10/12/2022	AB22-1013-0
Magnesium	9960		ug/L	1000.0	10/16/2022	AB22-1013-0
Manganese	312		ug/L	5.0	10/12/2022	AB22-1013-0
Molybdenum	7		ug/L	5.0	10/12/2022	AB22-1013-0
Nickel	3		ug/L	2.0	10/12/2022	AB22-1013-0
Potassium	7200		ug/L	100.0	10/16/2022	AB22-1013-0
Selenium	1		ug/L	1.0	10/12/2022	AB22-1013-0
Silver	ND		ug/L	0.2	10/12/2022	AB22-1013-0
Sodium	126000		ug/L	1000.0	10/16/2022	AB22-1013-0
Thallium	ND		ug/L	2.0	10/12/2022	AB22-1013-0
Vanadium	ND		ug/L	2.0	10/12/2022	AB22-1013-0
Zinc	ND		ug/L	10.0	10/12/2022	AB22-1013-0
Anions by EPA 300.0 Aque	ous, NO2, NO3			Aliquot #: 22-1	016-03-C02-A01	Analyst: DMV
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Trackin
Nitrate	ND		ug/L	100.0	10/05/2022	AB22-1005-0
Nitrite	ND		ug/L	100.0	10/05/2022	AB22-1005-0
Anions by EPA 300.0 CCR	Rule Analyte List, Cl, F,	SO4, Aqu	ieous	Aliquot #: 22-1	016-03-C02-A02	Analyst: DM\
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Trackin
Chloride	70600		ug/L	1000.0	10/10/2022	AB22-1010-0





Report Date: 10/24/22

Sample Site: **DEK Bottom Ash Pond**

Laboratory Project: 22-1016 Collect Date: Field Sample ID: DEK-MW-15006 10/04/2022 Lab Sample ID: 22-1016-03 Collect Time: 09:47 AM

Anions by EPA 300.0 CCR Rule A	nalyte List, CI, F, S	04, Aqι	ieous	Aliquot #: 22-1	Aliquot #: 22-1016-03-C02-A02	
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	10/05/2022	AB22-1010-05
Sulfate	254000		ug/L	1000.0	10/10/2022	AB22-1010-05
Nitrogen-Ammonia by SM4500NF	l3(h), Groundwater	HL		Aliquot #: 22-1	016-03-C03-A01	Analyst: CLE
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	7870		ug/L	25.0	10/13/2022	AB22-1013-09
Total Dissolved Solids by SM 254	10C			Aliquot #: 22-1	016-03-C04-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	720		mg/L	10.0	10/06/2022	AB22-1006-01
Alkalinity by SM 2320B				Aliquot #: 22-1	016-03-C05-A01	Analyst: DLS
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	212000		ug/L	10000.0	10/13/2022	AB22-1013-03
Alkalinity Bicarbonate	212000		ug/L	10000.0	10/13/2022	AB22-1013-03
Alkalinity Carbonate	ND		ug/L	10000.0	10/13/2022	AB22-1013-03
Sulfide, Total by SM 4500 S2D				Aliquot #: 22-1	016-03-C07-A01	Analyst: Merit
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	80		ug/L	40.0	10/07/2022	AB22-1016-02
Total Organic Carbon by SM 5310	OB, Aqueous			Aliquot #: 22-1	016-03-C08-A01	Analyst: BAL
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	3500		ug/L	1000.0	10/11/2022	AB22-1016-07
Dissolved Organic Carbon by SM	l 5310B, Aqueous			Aliquot #: 22-1	016-03-C09-A01	Analyst: BAL
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	5200		ug/L	1000.0	10/11/2022	AB22-1016-08



Report Date:

10/24/22



Countries

Sample Site: **DEK Bottom Ash Pond** Laboratory Project: **22-1016**

 Field Sample ID:
 DUP-DEK-BAP-01
 Collect Date:
 10/04/2022

 Lab Sample ID:
 22-1016-04
 Collect Time:
 12:00 AM

Mercury by EPA 7470A, Tota	I, Aqueous			Aliquot #: 22-1016-04-C01-A01		Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/06/2022	AB22-1006-03
Metals by EPA 6020B: CCR R	Rule Appendix III-IV To	tal Metals	s Exp	Aliquot #: 22-1	016-04-C01-A02	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Arsenic	4		ug/L	1.0	10/12/2022	AB22-1013-04
Barium	95		ug/L	5.0	10/12/2022	AB22-1013-04
Beryllium	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Boron	1370		ug/L	20.0	10/12/2022	AB22-1013-04
Cadmium	ND		ug/L	0.2	10/12/2022	AB22-1013-04
Calcium	68000		ug/L	1000.0	10/16/2022	AB22-1013-04
Chromium	1		ug/L	1.0	10/12/2022	AB22-1013-04
Cobalt	ND		ug/L	6.0	10/12/2022	AB22-1013-04
Copper	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Iron	63		ug/L	20.0	10/12/2022	AB22-1013-04
Lead	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Lithium	27		ug/L	10.0	10/12/2022	AB22-1013-04
Magnesium	15500		ug/L	1000.0	10/16/2022	AB22-1013-04
Manganese	212		ug/L	5.0	10/12/2022	AB22-1013-04
Molybdenum	ND		ug/L	5.0	10/12/2022	AB22-1013-04
Nickel	3		ug/L	2.0	10/12/2022	AB22-1013-04
Potassium	7630		ug/L	100.0	10/16/2022	AB22-1013-04
Selenium	1		ug/L	1.0	10/12/2022	AB22-1013-04
Silver	ND		ug/L	0.2	10/12/2022	AB22-1013-04
Sodium	101000		ug/L	1000.0	10/16/2022	AB22-1013-04
Thallium	ND		ug/L	2.0	10/12/2022	AB22-1013-04
Vanadium	ND		ug/L	2.0	10/12/2022	AB22-1013-04
Zinc	ND		ug/L	10.0	10/12/2022	AB22-1013-04
Anions by EPA 300.0 Aqueou	ıs, NO2, NO3			Aliquot #: 22-1	016-04-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	ND	J	ug/L	100.0	10/05/2022	AB22-1005-05
Nitrite	ND		ug/L	100.0	10/05/2022	AB22-1005-05
Anions by EPA 300.0 CCR Ru	ule Analyte List, Cl, F,	SO4, Aqı	ueous	Aliquot #: 22-1	016-04-C02-A02	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	103000		ug/L	1000.0	10/10/2022	AB22-1010-05





Report Date: 10/24/22

Sample Site: **DEK Bottom Ash Pond** Laboratory Project: **22-1016**

 Field Sample ID:
 DUP-DEK-BAP-01
 Collect Date:
 10/04/2022

 Lab Sample ID:
 22-1016-04
 Collect Time:
 12:00 AM

nions by EPA 300.0 CCR Rule Analyte List, Cl, F, SO4, Aqueous		ieous	Aliquot #: 22-1	016-04-C02-A02	Analyst: DMW	
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	10/05/2022	AB22-1010-05
Sulfate	33200		ug/L	1000.0	10/05/2022	AB22-1010-05
Nitrogen-Ammonia by SM4500NH3(h),	, Groundwate	er HL		Aliquot #: 22-1	016-04-C03-A01	Analyst: CLE
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	6160		ug/L	25.0	10/13/2022	AB22-1013-09
Total Dissolved Solids by SM 2540C				Aliquot #: 22-1	016-04-C04-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	631		mg/L	10.0	10/06/2022	AB22-1006-01
Alkalinity by SM 2320B				Aliquot #: 22-1	016-04-C05-A01	Analyst: DLS
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	324000		ug/L	10000.0	10/13/2022	AB22-1013-03
Alkalinity Bicarbonate	324000		ug/L	10000.0	10/13/2022	AB22-1013-03
Alkalinity Carbonate	ND		ug/L	10000.0	10/13/2022	AB22-1013-03
Sulfide, Total by SM 4500 S2D				Aliquot #: 22-1	016-04-C07-A01	Analyst: Merit
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	1360		ug/L	40.0	10/07/2022	AB22-1016-02
Total Organic Carbon by SM 5310B, A	queous			Aliquot #: 22-1	016-04-C08-A01	Analyst: BAL
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	6400		ug/L	1000.0	10/11/2022	AB22-1016-07
Dissolved Organic Carbon by SM 5310	0B, Aqueous			Aliquot #: 22-1	016-04-C09-A01	Analyst: BAL
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	6300		ug/L	1000.0	10/11/2022	AB22-1016-08



Report Date:

10/24/22



A CENTURY OF EXCELLENCE

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Sample Site: **DEK Bottom Ash Pond** Laboratory Project: **22-1016**

Field Sample ID: FB-DEK-BAP Collect Date: 10/04/2022 Lab Sample ID: 22-1016-05 Collect Time: 10:55 AM

Matrix: Water

Mercury by EPA 7470A, Total, A	queous		Aliquot #: 22-1	Analyst: CLH		
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking	
Mercury	ND		0.2	10/06/2022	AB22-1006-03	
Metals by EPA 6020B: CCR Rule	Appendix III-IV To	tal Metals Exp	Aliquot #: 22-1016-05-C01-A02		Analyst: EB	
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking	
Antimony	ND	ug/L	1.0	10/12/2022	AB22-1013-04	
Arsenic	ND	ug/L	1.0	10/12/2022	AB22-1013-04	
Barium	ND	ug/L	5.0	10/12/2022	AB22-1013-04	
Beryllium	ND	ug/L	1.0	10/12/2022	AB22-1013-04	
Boron	ND	ug/L	20.0	10/12/2022	AB22-1013-04	
Cadmium	ND	ug/L	0.2	10/12/2022	AB22-1013-04	
Calcium	ND	ug/L	1000.0	10/16/2022	AB22-1013-04	
Chromium	ND	ug/L	1.0	10/12/2022	AB22-1013-04	
Cobalt	ND	ug/L	6.0	10/12/2022	AB22-1013-04	
Copper	ND	ug/L	1.0	10/12/2022	AB22-1013-04	
Iron	ND	ug/L	20.0	10/12/2022	AB22-1013-04	
Lead	ND	ug/L	1.0	10/12/2022	AB22-1013-04	
Lithium	ND	ug/L	10.0	10/12/2022	AB22-1013-04	
Magnesium	ND	ug/L	1000.0	10/16/2022	AB22-1013-04	
Manganese	ND	ug/L	5.0	10/12/2022	AB22-1013-04	
Molybdenum	ND	ug/L	5.0	10/12/2022	AB22-1013-04	
Nickel	ND	ug/L	2.0	10/12/2022	AB22-1013-04	
Potassium	ND	ug/L	100.0	10/16/2022	AB22-1013-04	
Selenium	ND	ug/L	1.0	10/12/2022	AB22-1013-04	
Silver	ND	ug/L	0.2	10/12/2022	AB22-1013-04	
Sodium	ND	ug/L	1000.0	10/16/2022	AB22-1013-04	
Thallium	ND	ug/L	2.0	10/12/2022	AB22-1013-04	
Vanadium	ND	ug/L	2.0	10/12/2022	AB22-1013-04	
Zinc	ND	ug/L	10.0	10/12/2022	AB22-1013-04	
Anions by EPA 300.0 Aqueous, I	NO2, NO3		Aliquot #: 22-1	Aliquot #: 22-1016-05-C02-A01		
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking	
Nitrate	ND	ug/L	100.0	10/05/2022	AB22-1005-05	
Nitrite	ND	ug/L	100.0	10/05/2022	AB22-1005-05	
Nitrogen-Ammonia by SM4500N	H3(h), Groundwate	er HL	Aliquot #: 22-1	016-05-C03-A01	Analyst: CLE	
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking	
Ammonia	ND	ug/L	25.0	10/13/2022	AB22-1013-09	



A CENTURY OF EXCELLENCE

Analytical Report

Report Date: 10/24/22

Sample Site: **DEK Bottom Ash Pond**

Laboratory Project: 22-1016 Field Sample ID: FB-DEK-BAP Collect Date: 10/04/2022 Lab Sample ID: 22-1016-05 Collect Time: 10:55 AM

Matrix: Water

Sulfide, Total by SM 4500 S2D				Aliquot #: 22-1	016-05-C04-A01	Analyst: Merit
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	40.0	10/07/2022	AB22-1016-02
Total Organic Carbon by SM 5310B,	016-05-C05-A01	Analyst: BAL				
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	1700		ug/L	1000.0	10/11/2022	AB22-1016-07
Dissolved Organic Carbon by SM 53	10B, Aqueous			Aliquot #: 22-1	016-05-C06-A01	Analyst: BAL
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	1500		ug/L	1000.0	10/11/2022	AB22-1016-08



Report Date:

10/24/22



A CENTURY OF EXCELLENCE

Sample Site: **DEK Bottom Ash Pond** Laboratory Project: **22-1016**

Field Sample ID: EB-DEK-BAP Collect Date: 10/04/2022 Lab Sample ID: 22-1016-06 Collect Time: 12:00 PM

Matrix: Water

Mercury ND ug/L 0.2 10/06/2022 AB22-1006- Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp Aliquot #: 22-1016-06-C01-A02 Analysis Parameter(s) Result Flag Units RL Analysis Date Tracki Antimony ND ug/L 1.0 10/12/2022 AB22-1013- Arsenic ND ug/L 5.0 10/12/2022 AB22-1013- Berillium ND ug/L 5.0 10/12/2022 AB22-1013- Beron ND ug/L 2.0 10/12/2022 AB22-1013- Boron ND ug/L 0.2 10/12/2022 AB22-1013- Cadrium ND ug/L 0.2 10/12/2022 AB22-1013- Chromium ND ug/L 1.0 10/12/2022 AB22-1013- Cobalt ND ug/L 1.0 10/12/2022 AB22-1013- Cobalt ND ug/L 1.0 10/12/2022 AB22-1013- Iron ND	Mercury by EPA 7470A, To		Aliquot #: 22-1	1016-06-C01-A01	Analyst: CLH	
Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp Aliquot #: 22-1016-06-C01-A02 Analysis: Date Analysis: Date Trackid Parameter(s) Result Flag Units RL Analysis: Date Trackid Antimony ND ug/L 1.0 10/12/2022 AB22-1013- Arsenic ND ug/L 5.0 10/12/2022 AB22-1013- Barlium ND ug/L 5.0 10/12/2022 AB22-1013- Beryllium ND ug/L 20.0 10/12/2022 AB22-1013- Boron ND ug/L 20.0 10/12/2022 AB22-1013- Cadmium ND ug/L 10000-0 10/16/2022 AB22-1013- Calcium ND ug/L 100 10/12/2022 AB22-1013- Chromium ND ug/L 100 10/12/2022 AB22-1013- Choalt ND ug/L 6.0 10/12/2022 AB22-1013- Cobalt ND ug/L 1.0 10/12/2022	Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Parameter(s) Result Flag Units RL Analysis Date Trackit Antimony ND ug/L 1.0 10/12/2022 AB22-1013- Arsenic ND ug/L 1.0 10/12/2022 AB22-1013- Barium ND ug/L 1.0 10/12/2022 AB22-1013- Beryllium ND ug/L 1.0 10/12/2022 AB22-1013- Beryllium ND ug/L 1.0 10/12/2022 AB22-1013- Boron ND ug/L 0.0 10/12/2022 AB22-1013- Boron ND ug/L 0.0 10/12/2022 AB22-1013- Cadmium ND ug/L 0.0 10/12/2022 AB22-1013- Calcium ND ug/L 1.00 10/12/2022 AB22-1013- Chomium ND ug/L 1.0 10/12/2022 AB22-1013- Chomium ND ug/L 1.0 10/12/2022 AB22-1013- Chomium ND ug/L 1.0 10/12/2022 AB22-1013- Copper ND ug/L 1.0 10/12/2022 AB22-1013- Copper ND ug/L 1.0 10/12/2022 AB22-1013- Lead ND ug/L 1.0 10/12/2022 AB22-1013- Lead ND ug/L 1.0 10/12/2022 AB22-1013- Lithium ND ug/L 1.0 10/12/2022 AB22-1013- Manganese ND ug/L 1.00 10/12/2022 AB22-1013- Manganese ND ug/L 5.0 10/12/2022 AB22-1013- Molybdenum ND ug/L 5.0 10/12/2022 AB22-1013- Molybdenum ND ug/L 5.0 10/12/2022 AB22-1013- Nickel ND ug/L 5.0 10/12/2022 AB22-1013- Selenium ND ug/L 1.0 10/12/2022 AB22-1013- Silver ND ug/L 1.0 10/12/2022 AB22-1013- Sodium ND ug/L 1.0 10/12/2022 AB22-1013- Sodium ND ug/L 1.0 10/12/2022 AB22-1013- Sodium ND ug/L 2.0 10/12/2022 AB22-1013- Sodium ND ug/L 2.0 10/12/2022 AB22-1013- Thallium ND ug/L 2.0 10/12/2022 AB22-1013- Anions by EPA 300.0 Aqueous, NO2, NO3 Aliquot #: 22-1016-06-C02-A01 Analyst: DA Parameter(s) Result Flag Units RL Analysis Date Trackit Nitrate ND ug/L 100.0 10/05/2022 AB22-1005- Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL Aliquot #: 22-1016-06-C03-A01 Analyst: DA Darameter(s) Result Flag Units RL Analysis Date Trackit No Ug/L 10.0 10/15/2022	Mercury	ND	ug/L	0.2	10/06/2022	AB22-1006-03
Parameter(s) Result Flag Units RL Analysis Date Tracki Antimony ND ug/L 1.0 10/12/2022 AB22-1013 Arsenic ND ug/L 1.0 10/12/2022 AB22-1013 Barium ND ug/L 5.0 10/12/2022 AB22-1013 Beryllium ND ug/L 5.0 10/12/2022 AB22-1013 Boron ND ug/L 20.0 10/12/2022 AB22-1013 Cadmium ND ug/L 1.0 10/12/2022 AB22-1013 Chromium ND ug/L 1.0 10/12/2022 AB22-1013 Chromium ND ug/L 1.0 10/12/2022 AB22-1013 Chromium ND ug/L 1.0 10/12/2022 AB22-1013 Chobalt ND ug/L 1.0 10/12/2022 AB22-1013 Copper ND ug/L 1.0 10/12/2022 AB22-1013 Lead ND ug/L <t< th=""><th>Metals by EPA 6020B: CCF</th><th>R Rule Appendix III-IV To</th><th>tal Metals Exp</th><th>Aliguot #: 22-1</th><th>1016-06-C01-A02</th><th>Analyst: EB</th></t<>	Metals by EPA 6020B: CCF	R Rule Appendix III-IV To	tal Metals Exp	Aliguot #: 22-1	1016-06-C01-A02	Analyst: EB
Arsenic ND ug/L 1.0 10/12/2022 AB22-1013-1013-1014 Barium ND ug/L 5.0 10/12/2022 AB22-1013-1013-1014 Beryllium ND ug/L 1.0 10/12/2022 AB22-1013-1013-1014-1014-1014-1014-1014-1014	Parameter(s)	Result	Flag Units	•		Tracking
Barium ND ug/L 5.0 10/12/2022 AB22-1013-8 Beryllium ND ug/L 1.0 10/12/2022 AB22-1013-8 Boron ND ug/L 20.0 10/12/2022 AB22-1013-7 Cadmium ND ug/L 1000.0 10/16/2022 AB22-1013-7 Calcium ND ug/L 1000.0 10/12/2022 AB22-1013-7 Chromium ND ug/L 6.0 10/12/2022 AB22-1013-7 Cobalt ND ug/L 1.0 10/12/2022 AB22-1013-7 Copper ND ug/L 1.0 10/12/2022 AB22-1013-7 Iron ND ug/L 1.0 10/12/2022 AB22-1013-7 Lead ND ug/L 1.0 10/12/2022 AB22-1013-7 Lead ND ug/L 1.0 10/12/2022 AB22-1013-7 Magnesium ND ug/L 1.0 10/12/2022 AB22-1013-7 Malagnesium ND ug/L <td>Antimony</td> <td>ND</td> <td>ug/L</td> <td>1.0</td> <td>10/12/2022</td> <td>AB22-1013-04</td>	Antimony	ND	ug/L	1.0	10/12/2022	AB22-1013-04
Beryllium ND ug/L 1.0 10/12/2022 AB22-1013-8 Boron ND ug/L 20.0 10/12/2022 AB22-1013-8 Cadmium ND ug/L 10.0 10/12/2022 AB22-1013-8 Calcium ND ug/L 1000.0 10/16/2022 AB22-1013-103-103-103-103-103-103-103-103-10	Arsenic	ND	ug/L	1.0	10/12/2022	AB22-1013-04
Boron ND ug/L 20.0 10/12/2022 AB22-1013-2013-2013-2013-2013-2013-2013-20	Barium	ND	ug/L	5.0	10/12/2022	AB22-1013-04
Cadmium ND ug/L 0.2 10/12/2022 AB22-1013-1013-1016 Calcium ND ug/L 1000.0 10/16/2022 AB22-1013-1016 Chromium ND ug/L 1.0 10/12/2022 AB22-1013-1016 Cobalt ND ug/L 6.0 10/12/2022 AB22-1013-1016 Copper ND ug/L 1.0 10/12/2022 AB22-1013-1016 Iron ND ug/L 20.0 10/12/2022 AB22-1013-1016 Lead ND ug/L 1.0 10/12/2022 AB22-1013-1013-1016 Lead ND ug/L 10.0 10/12/2022 AB22-1013-1013-1016 Lead ND ug/L 10.0 10/12/2022 AB22-1013-1013-1016 Lead ND ug/L 10.0 10/12/2022 AB22-1013-1013-1016 Magnesium ND ug/L 5.0 10/12/2022 AB22-1013-1013-1016 Magnesium ND ug/L 5.0 10/12/2022 AB22-1013-1015-1016	Beryllium	ND	ug/L	1.0	10/12/2022	AB22-1013-04
Calcium ND ug/L 1000.0 10/16/2022 AB22-1013-1013-1014-1014-1014-1014-1014-1014	Boron	ND	ug/L	20.0	10/12/2022	AB22-1013-04
Chromium ND ug/L 1.0 10/12/2022 AB22-1013-1013-1014-1014-1014-1014-1014-1014	Cadmium	ND	ug/L	0.2	10/12/2022	AB22-1013-04
Cobalt ND ug/L 6.0 10/12/2022 AB22-1013-AB22-1013-BD2-PD2-PD2-PD2-PD2-PD2-PD2-PD2-PD2-PD2-P	Calcium	ND	ug/L	1000.0	10/16/2022	AB22-1013-04
Copper ND ug/L 1.0 10/12/2022 AB22-1013-1013-1010 Iron ND ug/L 20.0 10/12/2022 AB22-1013-1013-1012 Lead ND ug/L 1.0 10/12/2022 AB22-1013-1013-1012 Lithium ND ug/L 10.0 10/12/2022 AB22-1013-1013-1012 Magnesium ND ug/L 1000.0 10/16/2022 AB22-1013-1013-1012 Manganese ND ug/L 5.0 10/12/2022 AB22-1013-1013-1013-1012 Molybdenum ND ug/L 5.0 10/12/2022 AB22-1013-1013-1013-1012 Nickel ND ug/L 2.0 10/12/2022 AB22-1013-1013-1013-1012 Potassium ND ug/L 1.00 10/16/2022 AB22-1013-1013-1013-1012 Selenium ND ug/L 1.00 10/16/2022 AB22-1013-1013-1013-1012 Silver ND ug/L 1.0 10/12/2022 AB22-1013-1013-1013-1012 Sodium ND ug/L 1.0 10/12	Chromium	ND	ug/L	1.0	10/12/2022	AB22-1013-04
Iron ND ug/L 20.0 10/12/2022 AB22-1013-AB22-1013-AB22-1013-BD Lead ND ug/L 1.0 10/12/2022 AB22-1013-AB22-1013-BD Lithium ND ug/L 10.0 10/12/2022 AB22-1013-BD Magnesium ND ug/L 1000.0 10/16/2022 AB22-1013-BD Manganese ND ug/L 5.0 10/12/2022 AB22-1013-BD Molybdenum ND ug/L 5.0 10/12/2022 AB22-1013-BD Nickel ND ug/L 2.0 10/12/2022 AB22-1013-BD Potassium ND ug/L 1.0 10/16/2022 AB22-1013-BD Selenium ND ug/L 1.0 10/12/2022 AB22-1013-BD Sodium ND ug/L 0.2 10/12/2022 AB22-1013-BD Thallium ND ug/L 1000.0 10/16/2022 AB22-1013-BD Vanadium ND ug/L 2.0 10/12/2022 AB22-1013-BD	Cobalt	ND	ug/L	6.0	10/12/2022	AB22-1013-04
Lead ND ug/L 1.0 10/12/2022 AB22-1013-1013-1014 Lithium ND ug/L 10.0 10/12/2022 AB22-1013-1013-1014 Magnesium ND ug/L 1000.0 10/16/2022 AB22-1013-1013-1014 Manganese ND ug/L 5.0 10/12/2022 AB22-1013-1013-1014 Molybdenum ND ug/L 5.0 10/12/2022 AB22-1013-1013-1014 Nickel ND ug/L 2.0 10/12/2022 AB22-1013-1013-1014 Potassium ND ug/L 100.0 10/16/2022 AB22-1013-1013-1013-1014 Selenium ND ug/L 1.0 10/12/2022 AB22-1013-1013-1013-1014 Silver ND ug/L 100.0 10/16/2022 AB22-1013-1013-1013-1013-1014 Sodium ND ug/L 1000.0 10/12/2022 AB22-1013-1013-1013-1013-1014 Vanadium ND ug/L 2.0 10/12/2022 AB22-1013-1013-1013-1014 Anions by EPA 300.0 Aqueous, NO2, NO3 Aliquot #: 22-1016-06-C0	Copper	ND	ug/L	1.0	10/12/2022	AB22-1013-04
Lithium ND ug/L 10.0 10/12/2022 AB22-1013-AB22-	Iron	ND	ug/L	20.0	10/12/2022	AB22-1013-04
Magnesium ND ug/L 1000.0 10/16/2022 AB22-1013-AB	Lead	ND	ug/L	1.0	10/12/2022	AB22-1013-04
Manganese ND ug/L 5.0 10/12/2022 AB22-1013-1013-1013-1013-1013-1013-1013-10	Lithium	ND	ug/L	10.0	10/12/2022	AB22-1013-04
Molybdenum ND ug/L 5.0 10/12/2022 AB22-1013-1013-1013-1013-1013-1013-1013-10	Magnesium	ND	ug/L	1000.0	10/16/2022	AB22-1013-04
Nickel ND ug/L 2.0 10/12/2022 AB22-1013-1013-1016/2022 Potassium ND ug/L 100.0 10/16/2022 AB22-1013-1013-1016/2022 Selenium ND ug/L 1.0 10/12/2022 AB22-1013-1013-1016/2022 Silver ND ug/L 0.2 10/12/2022 AB22-1013-1013-1016/2022 Sodium ND ug/L 1000.0 10/16/2022 AB22-1013-1013-1016/2022 Thallium ND ug/L 2.0 10/12/2022 AB22-1013-1013-1013-1016-1016/2022 Vanadium ND ug/L 10.0 10/12/2022 AB22-1013-1013-1016-1016-1016-1016-1016-1013-1016-1016	Manganese	ND	ug/L	5.0	10/12/2022	AB22-1013-04
Potassium ND ug/L 100.0 10/16/2022 AB22-1013-1013-1013-1013-1013-1013-1013-10	Molybdenum	ND	ug/L	5.0	10/12/2022	AB22-1013-04
Selenium ND ug/L 1.0 10/12/2022 AB22-1013-1013-1014-1013-1014-1013-1013-1014-1013-1013	Nickel	ND	ug/L	2.0	10/12/2022	AB22-1013-04
Silver ND ug/L 0.2 10/12/2022 AB22-1013-1013-1013-1013-1013-1013-1013-10	Potassium	ND	ug/L	100.0	10/16/2022	AB22-1013-04
Sodium ND ug/L 1000.0 10/16/2022 AB22-1013-1013-1014 Thallium ND ug/L 2.0 10/12/2022 AB22-1013-1013-1014 Vanadium ND ug/L 2.0 10/12/2022 AB22-1013-1013-1014 Zinc ND ug/L 10.0 10/12/2022 AB22-1013-1013-1014 Anions by EPA 300.0 Aqueous, NO2, NO3 Aliquot #: 22-1016-06-C02-A01 Analyst: DN Parameter(s) Result Flag Units RL Analysis Date Tracking Nitrate ND ug/L 100.0 10/05/2022 AB22-1005-1005-1005-1005-1005-1005-1005-10	Selenium	ND	ug/L	1.0	10/12/2022	AB22-1013-04
Thallium ND ug/L 2.0 10/12/2022 AB22-1013-1013-1013-1013-1013-1013-1013-10	Silver	ND	ug/L	0.2	10/12/2022	AB22-1013-04
Vanadium ND ug/L 2.0 10/12/2022 AB22-1013-1013-10.0 Zinc ND ug/L 10.0 10/12/2022 AB22-1013-10.0 Anions by EPA 300.0 Aqueous, NO2, NO3 Aliquot #: 22-1016-06-C02-A01 Analyst: DN Parameter(s) Result Flag Units RL Analysis Date Tracking Nitrate ND ug/L 100.0 10/05/2022 AB22-1005-1005-1005-1005-1005-1005-1005-10	Sodium	ND	ug/L	1000.0	10/16/2022	AB22-1013-04
Zinc ND ug/L 10.0 10/12/2022 AB22-1013-1013-1013-1013-1013-1013-1013-10	Thallium	ND	ug/L	2.0	10/12/2022	AB22-1013-04
Anions by EPA 300.0 Aqueous, NO2, NO3 Aliquot #: 22-1016-06-C02-A01 Analyst: DN Parameter(s) Result Flag Units RL Analysis Date Tracking Nitrate ND ug/L 100.0 10/05/2022 AB22-1005-1005-1005-1005-1005-1005-1005-10	Vanadium	ND	ug/L	2.0	10/12/2022	AB22-1013-04
Parameter(s) Result Flag Units RL Analysis Date Tracking Nitrate ND ug/L 100.0 10/05/2022 AB22-1005-1005-1005-1005-1005-1005-1005-10	Zinc	ND	ug/L	10.0	10/12/2022	AB22-1013-04
Nitrate ND ug/L 100.0 10/05/2022 AB22-1005-1005-1005-1005-1005-1005-1005-10	Anions by EPA 300.0 Aque	eous, NO2, NO3		Aliquot #: 22-1	Analyst: DMW	
Nitrite ND ug/L 100.0 10/05/2022 AB22-1005- Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL Aliquot #: 22-1016-06-C03-A01 Analyst: C Parameter(s) Result Flag Units RL Analysis Date Tracki	Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Nitrite ND ug/L 100.0 10/05/2022 AB22-1005- Nitrogen-Ammonia by SM4500NH3(h), Groundwater HL Aliquot #: 22-1016-06-C03-A01 Analyst: C Parameter(s) Result Flag Units RL Analysis Date Tracki	Nitrate	ND	ug/L	100.0	10/05/2022	AB22-1005-05
Parameter(s) Result Flag Units RL Analysis Date Tracki			_			AB22-1005-05
,	Nitrogen-Ammonia by SM4	500NH3(h), Groundwate	er HL	Aliquot #: 22-1	1016-06-C03-A01	Analyst: CLE
Ammonia ND ug/L 25.0 10/13/2022 AB22-1013-	Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
	Ammonia	ND	ug/L	25.0	10/13/2022	AB22-1013-09



Analytical Report

Report Date: 10/24/22

A CENTURY OF EXCELLENCE

Field Sample ID: EB-DEK-BAP

Lab Sample ID: 22-1016-06

Sample Site: **DEK Bottom Ash Pond** Laboratory Project: **22-1016**

Collect Date: 10/04/2022 Collect Time: 12:00 PM

Matrix: Water

Sulfide, Total by SM 4500 S2D				Aliquot #: 22-1	1016-06-C04-A01	Analyst: Merit
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	40.0	10/07/2022	AB22-1016-02
Total Organic Carbon by SM 531			Aliquot #: 22-1	1016-06-C05-A01	Analyst: BAL	
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	1700		ug/L	1000.0	10/11/2022	AB22-1016-07
Dissolved Organic Carbon by SM 5310B, Aqueous				Aliquot #: 22-1	1016-06-C06-A01	Analyst: BAL
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	1100		ug/L	1000.0	10/11/2022	AB22-1016-08



Analytical Report Date: 10/24/22

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Data Qualifiers	Exception Summary
	No exceptions occurred.

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Chemistry Department

PROC CHEM-1.2.01 PAGE 1 OF 2 REVISION 4 ATTACHMENT A

General Standard Operating Procedure

TITLE: SAMPLE LOG-IN - SHIPMENT INSPECTION FORM

Partition of	20.10	y Kr	2101/		
ct Log-In Number:	12-10	11/17	21016	4	
ction Date:	22		Inspection By:		
le Origin/Project Nar	ne:				
ent Delivered By: E	nter the type of	f shipment car	rier.		
		,		PS Air	borne
Tracking Number:_	27874	765802	Shipping For	n Attached: Y	No
ing Containers:/Ente	r the type and	number of shi	pping containers recei	ved.	
Cooler_	Cardboard B	ox	Custom Case	Envelop	oe/Mailer
Loose/Unpackaged	Containers		Other		4
tion of Shipment: En	iter the as-rece	ived condition	of the shipment conta	iner.	
Damaged Shipment	Observed: No	one V	Dented	Lea	iking
	- 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				
ent Security: Enter i	f any of the shi	pping contain	ers were opened befor	e receipt.	
					9
. /			The state of the state of		
CoC W	Vork Request_		Air Data Sheet_	Other	_
erature of Containers	: Measure the	temperature o	of several sample conta	iners.	
As-Received Tempe	erature Range	1.D. 1.8°c	Samples Receive	ed on Ice: Yes X	No
		A.V. and the state of the state			
		10 mm		and the same of th	
			V.	s received.	
	Care Control	Soil	Other	Broken	Leaking
	/	_	_	_	-
Quart/Liter (g/p)		_			-
	r)	_	-	_	-
	310		-	_	-
125 mL (plastic)	JP	_		1	
Od and add dates					
24 mL vial (glass) 50 mL (plastic)	5		-		
	te Origin/Project Nament Delivered By: E Pony Other/Hand Carry (Tracking Number:_ ing Containers:/ Enter Cooler Loose/Unpackaged tion of Shipment: Enter Damaged Shipment Other ent Security: Enter if Shipping Containers and Documents: Enter CoC Vorature of Containers As-Received Tempe M&TE # and Expirater and Type of Container Container Type VOA (#OmL) or form Quart/Liter (g/p)	te Origin/Project Name: Pony	tent Delivered By: Enter the type of shipment can Pony FedEx UPS Other/Hand Carry (whom) Tracking Number: 1914 195302 Ing Containers/Enter the type and number of shi Cooler Cardboard Box Loose/Unpackaged Containers tion of Shipment: Enter the as-received condition Damaged Shipment Observed: None Other ent Security: Enter if any of the shipping contain Shipping Containers Received: Opened and Documents: Enter the type of documents encl CoC Work Request erature of Containers: Measure the temperature of As-Received Temperature Range(), 1.9°c M&TE # and Expiration 18407 5.25.25 er and Type of Containers: Enter the total numb Container Type Water VOA (flomt) or form! Quart/Liter (g/p) 9-oz (amber glass) 2-oz (amber glass)	Inspection By: [Affice Origin/Project Name:	Inspection By: (AFT) To Origin/Project Name: Interest Delivered By: Enter the type of shipment carrier. Pony FedEx UPS USPS Ain Other/Hand Carry (whom) Tracking Number: 27 8 7 4 15 5 20 2 Ing Containers/ Enter the type and number of shipping containers received. Cooler Cardboard Box Custom Case Enveloped Loose/Unpackaged Containers Other tion of Shipment: Enter the as-received condition of the shipment container. Damaged Shipment Observed: None Dented Lead Other ent Security: Enter if any of the shipping containers were opened before receipt. Shipping Containers Received: Opened Sealed end Documents: Enter the type of documents enclosed with the shipment. Coc Work Request Air Data Sheet Other erature of Containers: Measure the temperature of several sample containers. As-Received Temperature Rangel 1.1.1.2° Samples Received on Ice: Yes are and Type of Containers: Enter the total number of sample containers received. Container Type Water Soil Other Broken VOA (flomLor form) 14 Quart/Liter (g/p) 9-oz (amber glass)

CHAIN OF CUSTODY



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Page | of |

SAMPLING SITE / CUSTOMER: Q4-2022 DEK Bottom Ash Pond Wells						AP CC or WO#:					ANALYSIS REQUESTED						QA REQUIREMENT:				
				22-1016	REQUESTER:	REQUESTER: Harold Register					(Attach List if More Space is Needed)							QA REQUIREMENT.			
SAM	PLING TEAM: /	Andreis c	unaley		TURNAROUND TIME REQUIRED: □ 24 HR □ 48 HR □ 3 DAYS □ STANDARD ☒ OTHER												on	□ NPDES ⊠ TNI			
SEN	D REPORT TO:	Caleb Batts			email:	phone:							1						no	Carb	□ ISO 17025
	COPY TO:	Harold Regis	ter		MATRIX CODES: GW = Groundwater OX = Other			CC	ONT	ΓAI	NEF	es	1						Carb	nic	☐ 10 CFR 50 APP. B
TRC			W = Groundwater			F	PRE	SEF	RVA	TIVE	- se						mic	Orga	☐ INTERNAL INFO		
	LAB	SAMPLE COLI	LECTION	XIX	S = Soil / General Solid WP = Wipe O = Oil WT = Gene	eral Waste	AL#			.,			Total Metals	Suc	Ammonia		Alkalinity	ide	Total Organic Carbon	Dissolved Organic Carbon	□ OTHER
S	AMPLE ID	DATE	TIME	MATRIX	FIELD SAMPLE ID / LO	CATION	TOTAL	None	HNO	H ₂ SO	NaOH	MeOH	Tota	Anions	Amr	TDS	Alka	Sulfide	Tota	Diss	REMARKS
	22-1016-01	1014/22	\$95	GW	DEK-MW-15002		9	4	1	1	1 2		x	x	x	x	x	x	x	x	
	-02	10/4/22	1055	GW	DEK-MW-15005		9	4	1	1	1 2	2	x	x	x	x	x	x	x	x	
	-03	10/4/22	947	GW	DEK-MW-15006		9	4	1	1	1 2		x	x	x	x	x	x	x	x	
	-04	10/9/22	-	GW	DUP-DEK-BAP-01		9	4	1	1	1 2		x	x	x	x	x	x	x	x	
	-05	10/4/22	1055	W	FB-DEK-BAP		6	2	1	1	1 2	2	x	x	x			x	x	x	
	+ -06	10/4/12	1200	W	EB-DEK-BAP		6	2	1	1	1 2		x	x	x			x	x	x	
RELI	NQUISHED BY:	2 %	-	DATE/	TIME: R 0-4-22 /1615	Fedex							C	DMM	ENTS						
RELI	NQUISHED BY:		1	DATE/	TIME: R	ECEIVED BY:									d on I						TE#: 015402 Due Date: 5-25-23
	1 EST (<i></i>			10 -03/4	2-1016 Page 19 o	f 49		_		-								_		



2105 Pless Drive Brighton, Michigan 48114 Phone (810)229-7575 Fax (810)229-8650 E-mail bai-brighton@sbcglobal.net

October 13, 2022

Consumers Energy Company 135 W. Trail St. Jackson, MI 49201

Subject: Q4-2022 DEK Bottom Ash Pond Wells

22-1016

Dear Mr. Blaj:

Thank you for making Brighton Analytical, L.L.C. your laboratory of choice. Attached are the results for the samples submitted on 10/10/2022 for the above mentioned project. NELAP/TNI Accredited Analysis and EGLE Drinking Water Certified Analysis will be identified in their respective reporting formats. Hard copies can be supplied at your request for a fee of \$20.00 per copy.

The invoice for this project will be emailed separately. If you have any questions concerning the data or invoice, please don't hesitate to contact our office. We welcome your comments and suggestions to improve our quality systems. Please reference Brighton Analytical, L.L.C. Project ID 85181 when calling or emailing. We thank you for this opportunity to partner with you on this project and hope to work with you again in the future.

Sincerely, Brighton Analytical, L.L.C.







2105 Pless Drive Brighton, Michigan 48114 Phone: (810)229-7575 (810)229-8650 e-mail:bai-brighton@sbcglobal.net EGLE Certified #9404 NELAC Accredited #176507

Sample Date: 10/04/2022 Submit Date: 10/10/2022

Report Date: 10/13/2022 To:

Consumers Energy Company

135 W. Trail St. Jackson, MI 49201

BA Report Number:

85181

Project Name:

Q4-2022 DEK Bottom Ash Pond Wells

BA Sample ID: CS00888 Project Number: 22-1016

Sample ID: 22_1016_01 DFK_MW_15002

Sample 1D. 22-1010-01 DER-IVIV-15002									
Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date			
Organic Analysis									
Dissolved Organic Carbon Total Organic Carbon	6600 6000	ug/L ug/L	1000 1000	SM5310B SM5310B	RG RG	10/11/2022 10/11/2022			

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date



2105 Pless Drive Brighton, Michigan 48114 Phone: (810)229-7575 (810)229-8650 e-mail:bai-brighton@sbcglobal.net EGLE Certified #9404 NELAC Accredited #176507

Sample Date: 10/04/2022 Submit Date: 10/10/2022

Report Date: 10/13/2022

To:

Consumers Energy Company

135 W. Trail St. Jackson, MI 49201

BA Report Number:

BA Sample ID:

85181

CS00889

Project Name:

Q4-2022 DEK Bottom Ash Pond Wells

Project Number:

22-1016

Sample ID: 22-1016-02 DEK-MW-15005

22-1010-02 DEK-171V-13003									
Parameters	Result	Result Units DL		Method Reference	Analyst	Analysis Date			
Organic Analysis Dissolved Organic Carbon Total Organic Carbon	7500 5900	ug/L ug/L	1000 1000	SM5310B SM5310B	RG RG	10/11/2022 10/11/2022			

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date



2105 Pless Drive Brighton, Michigan 48114 Phone: (810)229-7575 (810)229-8650 e-mail:bai-brighton@sbcglobal.net EGLE Certified #9404 NELAC Accredited #176507

Sample Date: 10/04/2022 Submit Date: 10/10/2022

Report Date: 10/13/2022

To:

Consumers Energy Company

135 W. Trail St. Jackson, MI 49201

BA Report Number:

85181

Project Name:

Q4-2022 DEK Bottom Ash Pond Wells

BA Sample ID: **CS00890**

Project Number: 22-1016

Sample ID: 22-1016-03 DEK-MW-15006

Sample 1D. 22-1010-03 DEK-WW-15000										
Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date				
Organic Analysis										
Dissolved Organic Carbon Total Organic Carbon	5200 3500	ug/L ug/L	1000 1000	SM5310B SM5310B	RG RG	10/11/2022 10/11/2022				

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date



2105 Pless Drive Brighton, Michigan 48114 Phone: (810)229-7575 (810)229-8650 e-mail:bai-brighton@sbcglobal.net EGLE Certified #9404 NELAC Accredited #176507

Sample Date: 10/04/2022 Submit Date: 10/10/2022

Report Date: 10/13/2022

To:

Consumers Energy Company

135 W. Trail St. Jackson, MI 49201

BA Report Number:

85181

Project Name:

Q4-2022 DEK Bottom Ash Pond Wells

BA Sample ID: **CS00891**

Project Number: 22-1016

Sample ID: 22-1016-04 DUP-DEK-BAP-01

Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date			
Organic Analysis									
Dissolved Organic Carbon Total Organic Carbon	6300 6400	ug/L ug/L	1000 1000	SM5310B SM5310B	RG RG	10/11/2022 10/11/2022			

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date



2105 Pless Drive Brighton, Michigan 48114 Phone: (810)229-7575 (810)229-8650 e-mail:bai-brighton@sbcglobal.net EGLE Certified #9404 NELAC Accredited #176507

Sample Date: 10/04/2022 Submit Date: 10/10/2022

Report Date: 10/13/2022

To:

Consumers Energy Company

135 W. Trail St. Jackson, MI 49201

BA Report Number: 85

BA Sample ID:

85181

CS00892

Project Name:
Project Number:

Q4-2022 DEK Bottom Ash Pond Wells

22-1016

Sample ID: 22-1016-05 FB-DEK-BAP

		22 1010 0	JID DEIL D	111		
Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon Total Organic Carbon	1500 1700	ug/L ug/L	1000 1000	SM5310B SM5310B	RG RG	10/12/2022 10/12/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date



2105 Pless Drive Brighton, Michigan 48114 Phone: (810)229-7575 (810)229-8650 e-mail:bai-brighton@sbcglobal.net EGLE Certified #9404 NELAC Accredited #176507

Sample Date: 10/04/2022 Submit Date: 10/10/2022

Report Date: 10/13/2022

To:

Consumers Energy Company

135 W. Trail St. Jackson, MI 49201

BA Report Number: 85

85181

Project Name:

Q4-2022 DEK Bottom Ash Pond Wells

BA Sample ID: **CS00893**

Project Number: 22-1016

Sample ID: 22-1016-06 EB-DEK-BAP

	San	pic 1D. 22-1010-0	O ED-DEK-D	АГ		
Parameters	Result	Units	DL	Method Reference	Analyst	Analysis Date
Organic Analysis						
Dissolved Organic Carbon Total Organic Carbon	1100 1700	ug/L ug/L	1000 1000	SM5310B SM5310B	RG RG	10/12/2022 10/12/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date

CHAIN OF CUSTODY

Consumers Energy Count on Us"

CONSUMERS ENERGY COMPANY - LABORATORY SERVICES 135 WEST TRAIL ST., JACKSON, MI 49201 • (517) 788-1251

8518 \
Page of

3	TO CHARLE OF CLARKE	THE POLICE			TO STOCK THE MEDIA							
SAL	SAMPLING SITE / COSTOMER:	OSTOMEK:			PROJECT NUMBER:	SAP CC or WO#:	<u>#</u> :				ANAL YSIS REQUESTED	OA DEOLITDEMENT.
9	Q4-2022 DEK Bottom Ash Pond Wells	om Ash Pond We	slls		22-1016	REQUESTER: Emil Blaj	Emil B	laj			(Attach List if More Space is Needed)	VA KEUUIKEMENI:
SAN	SAMPLING TEAM:				TURNAROUND TIME REQUIRED:							□ NPDES
					□ 24 HR □ 48 HR □ 3 DAYS 図 ST	STANDARD □ OTHER	TER				uoq	⊠ TNI
SE	SEND REPORT TO:	Emil Blaj			email: Emil.Blaj@cmsenergy.com	phone:				uoc	Carl	□ ISO 17025
	COPY TO:				MATRIX CODES: GW = Groundwater OX = Other		0	CONTAINERS	ERS	Carl	oinag	☐ 10 CFR 50 APP. B
					WW = Wastewater $SL = Sludge$ $W = Water / Aqueous Liquid$ $A = Air$	že	- 1	PRESERVATIVE	VATIVE	oinsg	giO b	☐ INTERNAL INFO
	LAB	SAMPLE COLLECTION	ECTION		S = Soil / General Solid WP = Wipe O = Oil WT = General Waste	eral Waste	LVL #	۶(H	JO LE	80JA60	□ OTHER
	SAMPLE ID	DATE	TIME	TAM	FIELD SAMPLE ID/LOG	ID / LOCATION		M ⁵ 2C H ⁵ 2C HMC MOUG	MeO	Othe	ssiQ	C _ REMARKS
	22-1016-01	10/04/2022	0845	GW	DEK-MW-15002		2		2	×	×	3886
22-10	-02	10/04/2022	1055	GW	DEK-MW-15005		2		2	×	×	588
16 Pa	-03	10/04/2022	0947	GW	DEK-MW-15006		2		2	×	×	0630
ge 27	-04	10/04/2022	,	GW	DUP-DEK-BAP-01		7		7	×	×	1500
of 49	-05	10/04/2022	1055	GW	FB-DEK-BAP		2		2	×	×	258
	90-	10/04/2022	1200	GW	EB-DEK-BAP		7		7	×	×	893
E T	RELINQUISHED BY:	N Opportunity	W.	DATE/TIME: 10.10.1	22 1555	RECEIVED BY:				CON PR :	COMMENTS: PR #22101090	
REL	RELINQUISHED BY:			DATE/TIME:		RECEIVED BY:				Rece	ce? Fres 🗆 No	TE#:
										Tem	Temperature: W.O. Cal. I	Cal. Due Date:



BRIGHTON ANALYTICAL, LLC

QUALITY ASSURANCE/QUALITY CONTROL

Analyst:	RG	Parameter:	тос
Analysis Date:	10/11/2022	Method Reference:	EPA 415.1/SM5310B/9060

		SPIKE - ACC	CURACY	1.30	
Laboratory ID	Spike level PPB	Background PPB	Recoveries (%)	Acceptable Range (%)	Method Blank Concentration
CS00881	TV=10000	2900	115/112	80 - 120	ND
			74		
Laboratory ID	Observed A PPB	Observed B PPB	RPD (%)	Acceptable Range(%)	
CS00881	13400	14100	5.10	<u>< 20</u>	
		MISCELLA	NEOUS		
		Standard ID#	%Recoveries		
Independent Secondar	ry Reference Material:	#4295.1	102		
Method Standard (Lal	o. Control Spike):	#3046.6	106		

COBBBBCLITO.	
COMMENTS:	

Analyst:	RG	Parameter:	тос
Analysis Date:	10/11/2022	Method Reference:	EPA 415.1/SM5310B/9060

		SPIKE - ACC	CURACY		
Laboratory ID	Spike level PPB	Background PPB	Recoveries (%)	Acceptable Range (%)	Method Blank Concentration
CS00877	TV=10000	4900	108/102	80 - 120	ND
Laboratory ID	Observed A PPB	Observed B PPB	RPD (%)	Acceptable Range(%)	
CS00877	15700	15100	3.90	<u>< 20</u>	
		MISCELLA	NEOUS		
		Standard ID#	%Recoveries		
Independent Secondar	y Reference Material:	#4295.1	102		
Method Standard (Lab	o. Control Spike):	#3046.6	106		

COBBBBCNITC.	
COMMENTS:	
	-

Analyst:	RG	Parameter:	DOC
Analysis Date:	10/11/2022	Method Reference:	EPA 415.1/SM5310B/9060

		SPIKE - ACC	CURACY		
Laboratory ID	Spike level PPB	Background PPB	Recoveries (%)	Acceptable Range (%)	Method Blank Concentration
CS00877	TV=10000	5100	104/110	80 - 120	ND
Laboratory ID	Observed A PPB	Observed B PPB	RPD (%)	Acceptable Range(%)	
CS00877	15500	16100	3.80	<u><</u> 20	
	,	MISCELLA	NEOUS		
		Standard ID#	%Recoveries		
Independent Seconda	ry Reference Material:	#4295.1	102		
Method Standard (La	b. Control Spike):	#3046.6	106		

COMMENTS:	

Analyst:	alyst: RG Parameter:		тос	
Analysis Date:	10/12/2022	Method Reference:	EPA 415.1/SM5310B/9060	

SPIKE - ACCURACY					
Laboratory ID	Spike level PPB	Background PPB	Recoveries (%)	Acceptable Range (%)	Method Blank Concentration
CS00896	TV=10000	7000	101/99	80 - 120	ND
Laboratory ID	Observed A PPB	Observed B PPB	RPD (%)	Acceptable Range(%)	
CS00896	17000	16900	0.59	<u>< </u> 20	
	Y	MISCELLAI	NEOUS		
		Standard ID #	%Recoveries		
Independent Secondar	y Reference Material:	#4295.1	99		
Method Standard (Lab	o. Control Spike):	#3046.6	100		

COMMENTS:			
	AND THE STATE OF T		

Analyst: _	RG	Parameter:	тос	
Analysis Date:	10/12/2022	Method Reference:	EPA 415.1/SM5310B/9060	

		SPIKE - ACC	CURACY		
Laboratory ID	Spike level PPB	Background PPB	Recoveries (%)	Acceptable Range (%)	Method Blank Concentration
CS00906	TV=10000	5000	102/106	80 - 120	ND
Laboratory ID	Observed A PPB	Observed B PPB	RPD (%)	Acceptable Range(%)	
CS00906	15300	15700	2.60	<u>< 20</u>	
		MISCELLA	NEOUS		
		Standard ID #	%Recoveries		
Independent Secondar	y Reference Material:	#4295.1	99		
Method Standard (Lab	o. Control Spike):	#3046.6	100		

COMMENTS:	

Analyst:	RG	Parameter:	DOC
Analysis Date:	10/12/2022	Method Reference:	EPA 415.1/SM5310B/9060

SPIKE - ACCURACY					
Laboratory ID	Spike level PPB	Background PPB	Recoveries (%)	Acceptable Range (%)	Method Blank Concentration
CS00906	TV=10000	6000	107/106	80 - 120	ND
Laboratory ID	Observed A PPB	Observed B PPB	RPD (%)	Acceptable Range(%)	
CS00906	16700	16600	0.60	<u>< 20</u>	
		MISCELLAN	NEOUS		
		Standard ID#	%Recoveries		
Independent Secondar	ry Reference Material:	#4295.1	99		
Method Standard (Lal	b. Control Spike):	#3046.6	100		

COMMENTS:	

REPRESENTATIVE BATCH QUALITY CONTROL Accuracy & Precision

Analyst:	RG	Parameter:	DOC
Analysis Date:	10/12/2022	Method Reference:	EPA 415.1/SM5310B/9060

		SPIKE - ACC	URACY		
Laboratory ID	Spike level PPB	Background PPB	Recoveries (%)	Acceptable Range (%)	Method Blank Concentration
CS00896	TV=10000	14000	99/91	80 - 120	ND
Laboratory ID	Observed A PPB	Observed B PPB	RPD (%)	Acceptable Range(%)	
CS00896	24100	23300	3.40	<u>< 20</u>	
		MISCELLAI	NEOUS		
		Standard ID #	%Recoveries		
Independent Seconda	ry Reference Material:	#4295.1	99		
Method Standard (La	ab. Control Spike):	#3046.6	100		

COMMENTS:	



Report ID: S41138.01(01) Generated on 10/07/2022

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): S41138.01-S41138.06

Project: 22-1016 PR#22101089 Collected Date(s): 10/04/2022

Submitted Date/Time: 10/07/2022 08:15

Sampled by: Unknown P.O. #: 4400106050

Table of Contents

Cover Page (Page 1)

General Report Notes (Page 2)

Report Narrative (Page 2)

Laboratory Certifications (Page 3)

Qualifier Descriptions (Page 3)

Glossary of Abbreviations (Page 3)

Method Summary (Page 4)

Sample Summary (Page 5)

Maya Murshak Technical Director

Naya Mushah



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.

Full accreditation certificates are available upon request. Starred (*) analytes are not 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.

Report Narrative

There is no additional narrative for this analytical report



Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
В	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
Н	Sample submitted and run outside of holding time
1	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
0	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
Т	No correction for total solids
X	Elevated reporting limit due to matrix interference
Υ	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
е	Reported value estimated due to interference
j	Analyte also found in associated method blank
р	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
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 4450 S2 D 2011

Report to Consumers Energy Company Project: 22-1016 PR#22101089

P2age 460 Page 39 of 49



Sample Summary (6 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S41138.01	22-1016-01 (DEK-MW-15002)	Groundwater	10/04/22 08:45
S41138.02	22-1016-02 (DEK-MW-15005)	Groundwater	10/04/22 10:55
S41138.03	22-1016-03 (DEK-MW-15006)	Groundwater	10/04/22 09:47
S41138.04	22-1016-04 (DUP-DEK-BAP-01)	Groundwater	10/04/22 00:01
S41138.05	22-1016-05 (FB-DEP-BAP)	Groundwater	10/04/22 10:55
S41138.06	22-1016-06 (EB-DEP-BAP)	Groundwater	10/04/22 12:00



Lab Sample ID: S41138.01

Sample Tag: 22-1016-01 (DEK-MW-15002) Collected Date/Time: 10/04/2022 08:45

Matrix: Groundwater COC Reference:

Sample Containers

#	Туре	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.4	IR

Inorganics

Method: SM4500-S2 D, Run Date: 10/07/22 14:04, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	1.41	0.04	0.010	ma/L	2	18496-25-8	



Lab Sample ID: S41138.02

Sample Tag: 22-1016-02 (DEK-MW-15005) Collected Date/Time: 10/04/2022 10:55

Matrix: Groundwater COC Reference:

Sample Containers

#	Туре	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.4	IR

Inorganics

Method: SM4500-S2 D, Run Date: 10/07/22 14:06, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	0.08	0.02	0.005	mg/L	1	18496-25-8	



Lab Sample ID: S41138.03

Sample Tag: 22-1016-03 (DEK-MW-15006) Collected Date/Time: 10/04/2022 09:47

Matrix: Groundwater COC Reference:

Sample Containers

#	Туре	Preservative(s)	Refrigerated?	Arrival Temp. (C)	I nermometer #
1	125ml Plastic	NaOH	Yes	3.4	IR

Inorganics

Method: SM4500-S2 D, Run Date: 10/07/22 14:08, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	0.08	0.02	0.005	mg/L	1	18496-25-8	



Lab Sample ID: S41138.04

Sample Tag: 22-1016-04 (DUP-DEK-BAP-01) Collected Date/Time: 10/04/2022 00:01

Matrix: Groundwater COC Reference:

Sample Containers

#	Туре	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.4	IR

Inorganics

Method: SM4500-S2 D, Run Date: 10/07/22 14:10, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	1.36	0.04	0.010	mg/L	2	18496-25-8	



Lab Sample ID: S41138.05

Sample Tag: 22-1016-05 (FB-DEP-BAP) Collected Date/Time: 10/04/2022 10:55

Matrix: Groundwater COC Reference:

Sample Containers

#	Туре	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.4	IR

Inorganics

Method: SM4500-S2 D, Run Date: 10/07/22 14:12, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	



Lab Sample ID: S41138.06

Sample Tag: 22-1016-06 (EB-DEP-BAP) Collected Date/Time: 10/04/2022 12:00

Matrix: Groundwater COC Reference:

Sample Containers

#	Туре	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.4	IR

Inorganics

Method: SM4500-S2 D, Run Date: 10/07/22 14:14, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	

Merit Laboratories Login Checklist

Lab Set ID:S41138

Client: CONSUMERS (Consumers Energy)

Project: 22-1016 PR#22101089

Submitted: 10/07/2022 08:15 Login User: PFD

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				Description	Note
Samp	ole Receiv	ving			
01.	X Yes	□No	□ N/A	Samples are received at 4C +/- 2C Thermometer #	IR 3.4
02.	X Yes	No	□ N/A	Received on ice/ cooling process begun	
03.	Yes	X No	□ N/A	Samples shipped	
04.	X Yes	No	N/A	Samples left in 24 hr. drop box	
05.	X Yes	No	□ N/A	Are there custody seals/tape or is the drop box locked	
Chaiı	of Custo	ody			
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:	
Prese	ervation				
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	e Conditio	ons			
13.	X Yes	No	□ N/A	All bottles intact	
14.	X Yes	No	N/A	Appropriate analytical bottles are used	
15.	X Yes	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 or TOX bottles contain headspace	
_					
Corre	ective action	on for all	exceptions	is to call the client and to notify the project manager.	
Clien	t Review I	Ву:		Date:	

Merit Laboratories Bottle Preservation Check

Lab Set ID: S41138 Submitted: 10/07/2022 08:15

Client: CONSUMERS (Consumers Energy)

Project: 22-1016 PR#22101089

Initial Preservation Check: 10/07/2022 09:13 PFD

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
S41138.01	125ml Plastic NaOH	>12			
S41138.02	125ml Plastic NaOH	>12			
S41138.03	125ml Plastic NaOH	>12			
S41138.04	125ml Plastic NaOH	>12			
S41138.05	125ml Plastic NaOH	>12			
S41138.06	125ml Plastic NaOH	>12			



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

REPOR		1	Laboratories, Inc.	CHAIR	NOFO	US	STOI	Y	RE	CO	RD							11	NVOIC	E TO
CONTACT NAME E	mil Blaj						CON	TACT N	AME									X SAME		
COMPANY Cons	sumers E	nergy					СОМ	PANY												
ADDRESS 135 V	V. Trail S	treet					ADDRESS													
Jackson Jackson				STATE MI ZIP	CODE 492	201	CITY STATE ZIP CODE													
PHONE NO. 517-	788-5888	2	FAX NO. 517-788-2533	P.O. NO. 440010	6050		PHONE NO. E-MAIL ADDRESS													
E-MAIL ADDRESS	-MAIL ADDRESS emil.blaj@cmsenergy.com			QUOTE NO.							A	NALYS	IS (ATT/	ACH LIST	IF MC	RE SP	ACE IS	REQUIRE	D)	
PROJECT NO MAM				SAMPLER(S) - PLEASE	PRINT/SIGN	NAM	E			N/A	1			H			C	ertification	ons	
	TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☑ STANDARD ☐ OTHER _				R_													P Drink		
DELIVERABLE	S REQUIRE	ED ST	TO LEVEL II LEVEL III	LEVEL IV EDI	о 🗌 отн	IER					le le			11				DoD	NPDE	:5
	SW=GROUN SL=SLUDGI		WW=WASTEWATER S=SO DRINKING WATER O=OIL		D=SOLID W=WASTE			ontai			Sulfide							roject Lo Detroit	Cations New	York
MERIT LAB NO.	YE	AR	SAMPLE IDENTIFICATION-DI		MATRIX	TLES	NONE	HNO,	НОН	MeOH	Total							Other _		
FOR LAB USE ONLY	DATE	TIME				ВОТПЕ	ž	Î	2	N O	-	-	++	++	+	-			structions	
11100-01	10/04/22	0845	22-1016-01 (DEK-MW-		GW	1	+	+	1	-	1		1	++	+		pre	eserved w	ith NaOH/Z	nAcetate
	10/04/22	1055	22-1016-02 (DEK-MW-		GW	1	+		1		1		1	+++	-					
	10/04/22	0947	22-1016-03 (DEK-MW-	15006)	GW	1	++	4	1	4	1				1		"			
	10/04/22	-	22-1016-04 (DUP-DEK-	BAP-01)	GW	1	11		1	4	1									
	10/04/22	1055	22-1016-05 (FB-DEK-B	AP)	GW	1			1		1						"			
.06	10/04/22	1200	22-1016-06 (EB-DEK-B	AP)	GW	1	\mathbb{H}	+	1	+	1		11	++	-		11			
						-														
RELINQUISHED BY: SIGNATURE/ORGANIZATION RECEIVED BY: DATE TIME TIME SIGNATURE/ORGANIZATION DATE TIME					SIGN	INQUIS NATURI EIVED NATURI	E/OR	GANIZ				Meri	trul	pple	300		10/1/22	875		
RELINQUISHED B' SIGNATURE/ORG/ RECEIVED BY: SIGNATURE/ORG/	ANIZATION			DAT DAT				L NO.				EAL INTAC YES D EAL INTAC YES D	NOD	INITIALS		NOTES		3.4 3.4	ARRIVAL	-



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

To: CDBatts, Karn/Weadock

From: EBlaj, T-258

Date: October 24, 2022

Subject: RCRA GROUNDWATER MONITORING – KARN BAP & LINED IMP. WELLS – 2022 Q4

CC: HDRegister, P22-521 Darby Litz, Project Manager

BLSwanberg, P22-119 TRC Companies, Inc.

1540 Eisenhower Place Ann Arbor, MI 48108

Chemistry Project: 22-1017

TRC Environmental, Inc. conducted groundwater monitoring at the DEKarn Bottom Ash Pond and Lined Impoundment Wells area on 10/04/2022, for the 4th 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 10/05/2022.

Samples for Total Sulfide have been subcontracted to Merit Laboratories, Inc. and the results are listed under the analyst initials "Merit". Samples for Total & Dissolved Organic Carbon have been subcontracted to Brighton Analytical LLC and the results are listed under the analyst initials "BAL". The original reports from both labs are attached. 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



Testing performed in accordance with the A2LA scope of accredidation specified in the listed certificate. The information contained in this report is the sole property of Consumers Energy. It cannot be reproduced except in full, and with consent from Consumers Energy, or the customer for which this report was issued.

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.

DEFINITIONS / QUALIFIERS

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

<u>Acronym</u>	<u>Description</u>
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	<u>Description</u>
*	Generic data flag, applicable description added in the corresponding notes section
В	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
Н	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



Work Order Sample Summary

Customer Name: Karn/Weadock Complex

Work Order ID: Q4-2022 DEK Bottom Ash Pond & Lined Impoundment

Date Received: 10/5/2022 **Chemistry Project:** 22-1017

Sample #	Field Sample ID	<u>Matrix</u>	Sample Date	<u>Site</u>
22-1017-01	DEK-MW-18001	Groundwater	10/04/2022 12:03 PM	DEK Bottom Ash Pond & Lined Impoundment
22-1017-02	DEK-MW-18001 MS	Groundwater	10/04/2022 12:03 PM	DEK Bottom Ash Pond & Lined Impoundment
22-1017-03	DEK-MW-18001 MSD	Groundwater	10/04/2022 12:03 PM	DEK Bottom Ash Pond & Lined Impoundment



10/24/22



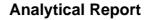
Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: DEK Bottom Ash Pond & Lined Impoundment Laboratory Project: 22-1017

 Field Sample ID:
 DEK-MW-18001
 Collect Date:
 10/04/2022

 Lab Sample ID:
 22-1017-01
 Collect Time:
 12:03 PM

Doromotor(o)	Danult	F1- ==	l le !te	n.	Analysis Data	Tanadala:
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/10/2022	AB22-1010-0
Metals by EPA 6020B: CCR	Rule Appendix III-IV To	tal Metals	s Ехр	Aliquot #: 22-1	017-01-C01-A02	Analyst: El
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/12/2022	AB22-1013-04
Arsenic	109		ug/L	1.0	10/12/2022	AB22-1013-0
Barium	135		ug/L	5.0	10/12/2022	AB22-1013-0
Beryllium	ND		ug/L	1.0	10/12/2022	AB22-1013-0
Boron	1060		ug/L	20.0	10/12/2022	AB22-1013-0
Cadmium	ND		ug/L	0.2	10/12/2022	AB22-1013-0
Calcium	58300		ug/L	1000.0	10/16/2022	AB22-1013-0
Chromium	ND		ug/L	1.0	10/12/2022	AB22-1013-0
Cobalt	ND		ug/L	6.0	10/12/2022	AB22-1013-0
Copper	ND		ug/L	1.0	10/12/2022	AB22-1013-0
Iron	894		ug/L	20.0	10/12/2022	AB22-1013-0
Lead	ND		ug/L	1.0	10/12/2022	AB22-1013-0
Lithium	23		ug/L	10.0	10/12/2022	AB22-1013-0
Magnesium	10900		ug/L	1000.0	10/16/2022	AB22-1013-0
Manganese	169		ug/L	5.0	10/12/2022	AB22-1013-0
Molybdenum	ND		ug/L	5.0	10/12/2022	AB22-1013-0
Nickel	2		ug/L	2.0	10/12/2022	AB22-1013-0
Potassium	4510		ug/L	100.0	10/16/2022	AB22-1013-0
Selenium	ND		ug/L	1.0	10/12/2022	AB22-1013-0
Silver	ND		ug/L	0.2	10/12/2022	AB22-1013-0
Sodium	103000		ug/L	1000.0	10/16/2022	AB22-1013-0
Thallium	ND		ug/L	2.0	10/12/2022	AB22-1013-0
Vanadium	ND		ug/L	2.0	10/12/2022	AB22-1013-0
Zinc	ND		ug/L	10.0	10/12/2022	AB22-1013-0
Anions by EPA 300.0 Aqueo	ous, NO2, NO3			Aliquot #: 22-1	017-01-C02-A01	Analyst: DMV
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Trackin
Nitrate	399		ug/L	100.0	10/05/2022	AB22-1005-0
Nitrite	ND		ug/L	100.0	10/05/2022	AB22-1005-0
Anions by EPA 300.0 CCR F	Rule Analyte List, CI, F,	SO4, Aqu	ieous	Aliquot #: 22-1	017-01-C02-A02	Analyst: DM\
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	62500		ug/L	1000.0	10/10/2022	AB22-1010-0



10/24/22



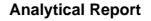
Laboratory Services
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Sample Site: DEK Bottom Ash Pond & Lined Impoundment Laboratory Project: 22-1017

 Field Sample ID:
 DEK-MW-18001
 Collect Date:
 10/04/2022

 Lab Sample ID:
 22-1017-01
 Collect Time:
 12:03 PM

Anions by EPA 300.0 CCR Rule Analyte List, CI, F, S			ieous	Aliquot #: 22-1	017-01-C02-A02	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	ND		ug/L	1000.0	10/05/2022	AB22-1010-05
Sulfate	140000		ug/L	1000.0	10/10/2022	AB22-1010-05
Nitrogen-Ammonia by SM4500NH	l3(h), Groundwater	HL		Aliquot #: 22-1017-01-C03-A01		Analyst: CLE
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	2400		ug/L	25.0	10/13/2022	AB22-1013-09
Total Dissolved Solids by SM 254	IOC			Aliquot #: 22-1	017-01-C04-A01	Analyst: CLH
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	551		mg/L	10.0	10/06/2022	AB22-1006-01
Alkalinity by SM 2320B				Aliquot #: 22-1	017-01-C05-A01	Analyst: DLS
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	200000		ug/L	10000.0	10/13/2022	AB22-1013-03
Alkalinity Bicarbonate	200000		ug/L	10000.0	10/13/2022	AB22-1013-03
Alkalinity Carbonate	ND		ug/L	10000.0	10/13/2022	AB22-1013-03
Sulfide, Total by SM 4500 S2D				Aliquot #: 22-1	017-01-C07-A01	Analyst: Merit
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	ND		ug/L	40.0	10/07/2022	AB22-1016-03
Total Organic Carbon by SM 5310	DB, Aqueous			Aliquot #: 22-1	017-01-C08-A01	Analyst: BAL
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	4900		ug/L	1000.0	10/11/2022	AB22-1016-07
Dissolved Organic Carbon by SM	5310B, Aqueous			Aliquot #: 22-1	017-01-C09-A01	Analyst: BAL
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Dissolved Organic Carbon	5100		ug/L	1000.0	10/11/2022	AB22-1016-08



Collect Date:

Collect Time:

10/24/22

10/04/2022

12:03 PM



Laboratory Services

A CENTURY OF EXCELLENCE

Sample Site: DEK Bottom Ash Pond & Lined Impoundment Laboratory Project: 22-1017

Field Sample ID: **DEK-MW-18001 MS**

Lab Sample ID: 22-1017-02

Mercury by EPA 7470A, To	tal, Aqueous		Aliquot #: 22-1	1017-02-C01-A01	Analyst: DMW
Parameter(s)	Result	Flag Units	s RL	Analysis Date	Tracking
Mercury	102	%	0.2	10/10/2022	AB22-1010-07
Metals by EPA 6020B: CCR	Rule Appendix III-IV To	tal Metals Exp	Aliquot #: 22-	1017-02-C01-A02	Analyst: EB
Parameter(s)	Result	Flag Units	s RL	Analysis Date	Tracking
Antimony	107	%	1.0	10/12/2022	AB22-1013-04
Arsenic	97	%	1.0	10/12/2022	AB22-1013-04
Barium	105	%	5.0	10/12/2022	AB22-1013-04
Beryllium	100	%	1.0	10/12/2022	AB22-1013-04
Boron	94	%	20.0	10/12/2022	AB22-1013-04
Cadmium	102	%	0.2	10/12/2022	AB22-1013-04
Calcium	104	%	1000.0	10/16/2022	AB22-1013-04
Chromium	96	%	1.0	10/12/2022	AB22-1013-04
Cobalt	97	%	6.0	10/12/2022	AB22-1013-04
Copper	90	%	1.0	10/12/2022	AB22-1013-04
Iron	113	%	20.0	10/12/2022	AB22-1013-04
Lead	100	%	1.0	10/12/2022	AB22-1013-04
Lithium	103	%	10.0	10/12/2022	AB22-1013-04
Magnesium	110	%	1000.0	10/16/2022	AB22-1013-04
Manganese	98	%	5.0	10/12/2022	AB22-1013-04
Molybdenum	114	%	5.0	10/12/2022	AB22-1013-04
Nickel	94	%	2.0	10/12/2022	AB22-1013-04
Potassium	102	%	100.0	10/16/2022	AB22-1013-04
Selenium	94	%	1.0	10/12/2022	AB22-1013-04
Silver	102	%	0.2	10/12/2022	AB22-1013-04
Sodium	111	%	1000.0	10/16/2022	AB22-1013-04
Thallium	100	%	2.0	10/12/2022	AB22-1013-04
Vanadium	99	%	2.0	10/12/2022	AB22-1013-04
Zinc	90	%	10.0	10/12/2022	AB22-1013-04
Anions by EPA 300.0 Aque	ous, NO2, NO3		Aliquot #: 22-1	1017-02-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag Units	s RL	Analysis Date	Tracking
Nitrate	81	%	100.0	10/05/2022	AB22-1005-05
Nitrite	87	%	100.0	10/05/2022	AB22-1005-05
Anions by EPA 300.0 CCR	Rule Analyte List, Cl, F,	SO4, Aqueous	Aliquot #: 22-1	1017-02-C02-A02	Analyst: DMW
Parameter(s)	Result	Flag Units	-	Analysis Date	Tracking
Chloride	102	%	1000.0	10/10/2022	AB22-1010-05



10/24/22



A CENTURY OF EXCELLENCE

Sample Site: **DEK Bottom Ash Pond & Lined Impoundment** Laboratory Project: **22-1017**

 Field Sample ID:
 DEK-MW-18001 MS
 Collect Date:
 10/04/2022

 Lab Sample ID:
 22-1017-02
 Collect Time:
 12:03 PM

Anions by EPA 300.0 CCR Rule Ana	ieous	Aliquot #: 22-1	017-02-C02-A02	Analyst: DMW		
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	90		%	1000.0	10/05/2022	AB22-1010-05
Sulfate	101		%	1000.0	10/10/2022	AB22-1010-05
Nitrogen-Ammonia by SM4500NH3(h), Groundwate	r HL		Aliquot #: 22-1	017-02-C03-A01	Analyst: CLE
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	110		%	25.0	10/13/2022	AB22-1013-09
Alkalinity by SM 2320B				Aliquot #: 22-1	017-02-C05-A01	Analyst: DLS
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	97.4		%	10000.0	10/13/2022	AB22-1013-03
Sulfide, Total by SM 4500 S2D				Aliquot #: 22-1	017-02-C07-A01	Analyst: Merit
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Parameter(s) Sulfide	Result 92	Flag	Units	-	Analysis Date 10/07/2022	Tracking AB22-1016-03
()	92	Flag		RL 40.0	•	•
Sulfide	92	Flag Flag		RL 40.0	10/07/2022	AB22-1016-03
Sulfide Total Organic Carbon by SM 5310B	92 , Aqueous		%	RL 40.0 Aliquot #: 22-1	10/07/2022 017-02-C08-A01	AB22-1016-03 Analyst: BAL
Sulfide Total Organic Carbon by SM 5310B. Parameter(s)	92 , Aqueous Result 108		% Units	RL 40.0 Aliquot #: 22-1 RL 1000.0	10/07/2022 017-02-C08-A01 Analysis Date	AB22-1016-03 Analyst: BAL Tracking
Sulfide Total Organic Carbon by SM 5310B Parameter(s) Total Organic Carbon	92 , Aqueous Result 108		% Units	RL 40.0 Aliquot #: 22-1 RL 1000.0	10/07/2022 017-02-C08-A01 Analysis Date 10/11/2022	AB22-1016-03 Analyst: BAL Tracking AB22-1016-07



10/24/22



Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: DEK Bottom Ash Pond & Lined Impoundment Laboratory Project: 22-1017

 Field Sample ID:
 DEK-MW-18001 MSD
 Collect Date:
 10/04/2022

 Lab Sample ID:
 22-1017-03
 Collect Time:
 12:03 PM

Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	105		%	0.2	10/10/2022	AB22-1010-07
Metals by EPA 6020B: CCR R	ule Appendix III-IV To	tal Metals	s Ехр	Aliquot #: 22-1	017-03-C01-A02	Analyst: EE
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	106		%	1.0	10/12/2022	AB22-1013-04
Arsenic	96		%	1.0	10/12/2022	AB22-1013-04
Barium	107		%	5.0	10/12/2022	AB22-1013-04
Beryllium	101		%	1.0	10/12/2022	AB22-1013-04
Boron	112		%	20.0	10/12/2022	AB22-1013-04
Cadmium	102		%	0.2	10/12/2022	AB22-1013-04
Calcium	108		%	1000.0	10/16/2022	AB22-1013-04
Chromium	91		%	1.0	10/12/2022	AB22-1013-04
Cobalt	95		%	6.0	10/12/2022	AB22-1013-04
Copper	88		%	1.0	10/12/2022	AB22-1013-04
Iron	113		%	20.0	10/12/2022	AB22-1013-04
Lead	98		%	1.0	10/12/2022	AB22-1013-04
Lithium	102		%	10.0	10/12/2022	AB22-1013-04
Magnesium	108		%	1000.0	10/16/2022	AB22-1013-04
Manganese	94		%	5.0	10/12/2022	AB22-1013-04
Molybdenum	115		%	5.0	10/12/2022	AB22-1013-04
Nickel	92		%	2.0	10/12/2022	AB22-1013-04
Potassium	105		%	100.0	10/16/2022	AB22-1013-04
Selenium	95		%	1.0	10/12/2022	AB22-1013-04
Silver	101		%	0.2	10/12/2022	AB22-1013-04
Sodium	109		%	1000.0	10/16/2022	AB22-1013-04
Thallium	99		%	2.0	10/12/2022	AB22-1013-04
Vanadium	96		%	2.0	10/12/2022	AB22-1013-04
Zinc	90		%	10.0	10/12/2022	AB22-1013-04
Anions by EPA 300.0 Aqueou	s, NO2, NO3			Aliquot #: 22-1	017-03-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Nitrate	81		%	100.0	10/05/2022	AB22-1005-05
Nitrite	87		%	100.0	10/05/2022	AB22-1005-05
Anions by EPA 300.0 CCR Ru	le Analyte List, Cl, F,	SO4, Aqu	ieous	Aliquot #: 22-1	017-03-C02-A02	Analyst: DMV
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	106		%	1000.0	10/10/2022	AB22-1010-05



10/24/22



A CENTURY OF EXCELLENCE

DEK Bottom Ash Pond & Lined Impoundment Laboratory Project: Sample Site: 22-1017

Field Sample ID: DEK-MW-18001 MSD Collect Date: 10/04/2022 Lab Sample ID: 22-1017-03 Collect Time: 12:03 PM

Matrix: Groundwater

Anions by EPA 300.0 CCR Rule Analyt	e List, CI, F, SC)4, Aqւ	ieous	Aliquot #: 22-1	017-03-C02-A02	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Fluoride	91		%	1000.0	10/05/2022	AB22-1010-05
Sulfate	105		%	1000.0	10/10/2022	AB22-1010-05
Nitrogen-Ammonia by SM4500NH3(h),	Groundwater H	łL		Aliquot #: 22-1	017-03-C03-A01	Analyst: CLE
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Ammonia	110		%	25.0	10/13/2022	AB22-1013-09
Alkalinity by SM 2320B				Aliquot #: 22-1	017-03-C05-A01	Analyst: DLS
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Alkalinity Total	97.9		%	10000.0	10/13/2022	AB22-1013-03
Sulfide, Total by SM 4500 S2D				Aliquot #: 22-1	017-03-C07-A01	Analyst: Merit
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Sulfide	92		%	40.0	10/07/2022	AB22-1016-03
Total Organic Carbon by SM 5310B, Ac	queous			Aliquot #: 22-1	017-03-C08-A01	Analyst: BAL
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Organic Carbon	102		%	1000.0	10/11/2022	AB22-1016-07
				A.I		A I C DAI
Dissolved Organic Carbon by SM 5310	B, Aqueous			Aliquot #: 22-1	017-03-C09-A01	Analyst: BAL
Dissolved Organic Carbon by SM 5310 Parameter(s)	Result	Flag	Units	Aliquot #: 22-1	Analysis Date	Tracking





Data Qualifiers Exception Summary

No exceptions occurred.

Report Date:

10/24/22

CONSUMERS ENERGY Chemistry Department

General Standard Operating Procedure

PROC CHEM-1.2.01 PAGE 1 OF 2 REVISION 4 ATTACHMENT A

TITLE: SAMPLE LOG-IN - SHIPMENT INSPECTION FORM

Project	t Log-In Number:	25-10	17 /2	21016			
	tion Date:		7 1-	Inspection B	v:CLA		
	Origin/Project Name			0.000			
200	ent Delivered By: Ent			dor			
Silipine					Lighe		
						Airb	
	Other/Hand Carry (what Tracking Number:	1874	765802	Shippin	g Form Attac	hed: Ye	No
Shippin	ng Containers: Enter t	he type and n	umber of ship	ping containers	received.		
		Cardboard Bo			ase	Fnyelon	e/Mailer
	Loose/Unpackaged C					Бичегор	
Conditi	ion of Shipment: Ente						
3,413,114	Damaged Shipment C		. /		ted	Lad	cing
	Other				icu	Lea	ding
	CoC Wo	ork Request_		Air Data Sl	neet	Other	
. samples	As-Received Tempera				Received on Io	ce: Yes X N	lo
	M&TE # and Expirati	on 15402	5.25.23				
Number	r and Type of Contair	ers: Enter th	ne total numbe	er of sample cor	ntainers recei	ved.	
	0	Water	Soil	Othe		4.2	
	Container Type	714	5011	Othe	<u>r </u>	Broken	Leaking
)-14.V	VOA (40mL)or 60ml)	714			<u> </u>	Broken	Leaking
)-14.O	() ()	→ <u>14</u> →18	<u>5011</u>		r	Broken	Leaking
	VOA (40mL) or (0ml) Quart/Liter (g/p)	714			r	Broken	Leaking
	VOA (#0mL) or 60ml) Quart/Liter (g/p) 9-oz (amber glass jar)	714			r	Broken	Leaking
o-14.0 o	VOA (flomL) (floml) Quart/Liter (g/p) 9-oz (amber glass jar) 2-oz (amber glass)	→ 14 > 18			r	Broken	Leaking

CHAIN OF CUSTODY



CONSUMERS ENERGY COMPANY - LABORATORY SERVICES

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

Page l of l

SAMPLING SITE / CU				PROJECT NUMBER:	SAP CC or WO	O#:						ANALYSIS REQUESTED (Attach List if More Space is Needed)					QA REQUIREMENT:			
Q4-2022 DEK Botto	m Ash Pond & l	Lined Imp	ound.	22-1017 REQUESTER: Ha				Regis	ster				(Atta	ch Lis	st if N	Aore S	Space	is Ne	eded)	QA REQUIREMENT:
SAMPLING TEAM: Andrew U	shaley			TURNAROUND TIME REQUIRED: □ 24 HR □ 48 HR □ 3 DAYS □ S	RNAROUND TIME REQUIRED: 24 HR □ 48 HR □ 3 DAYS □ STANDARD ☒ OTHER												□ NPDES ⊠ TNI			
SEND REPORT TO:	Caleb Batts			email: phone:														_	arbon	☐ ISO 17025
COPY TO:	Harold Regist	er		MATRIX CODES: GW = Groundwater OX = Oth	er		CC	ONT	AIN	ERS								arboi	nic C	☐ 10 CFR 50 APP. B
	TRC			WW = Wastewater SL = Sluc W = Water / Aqueous Liquid A = Air		2007/2007/2007/2007		RESERVATIVE		als						nic C	Organ	☐ INTERNAL INFO		
LAB	SAMPLE COLL	ECTION	XI	S = Soil / General Solid WP = Wi	pe neral Waste	TOTAL#		1100				Metals	ns	onia		inity	9	Orga	lved	□ OTHER
SAMPLE ID	DATE	TIME	MATRIX	FIELD SAMPLE ID / LO	FIELD SAMPLE ID / LOCATION		None	HNO	NaOH NaOH	HCI	MeOH	Total	Anions	Ammonia	TDS	Alkalinity	Sulfide	Total Organic Carbon	Dissolved Organic Carbon	REMARKS
22-1017-01	10/4/22	1203	GW	DEK-MW-18001		9	4	1	1 1	2		x	x	x	x	x	x	x	x	
-02			GW	DEK-MW-18001 MS		8	3	1	1 1	2		x	x	x		x	x	x	x	
-03		-1	GW	DEK-MW-18001 MSD		8	3	1	1 1	2		x	x	x		x	x	x	x	
									Ų.											
						+			+											
									+	H										
									-	H										
									+											
RELINQUISHED BY:	Thy		DATE/	TIME: 0-4-22 /1615	RECEIVED BY:				101			112	MMI							
RELINQUISHED BY:			DATE/	O5-32 le:30	RECEIVED BY:							Re	mpera	d on I	ce?	1.8	s 🗆 °C	No	M&	TE#: 0154.2 Due Date: 5-25-23



2105 Pless Drive Brighton, Michigan 48114 Phone (810)229-7575 Fax (810)229-8650 E-mail bai-brighton@sbcglobal.net

October 13, 2022

Consumers Energy Company 135 W. Trail St. Jackson, MI 49201

Subject: Q4-2022 DEK Bottom Ash Pond & Lined Impound

22-1017

Dear Mr. Blaj:

Thank you for making Brighton Analytical, L.L.C. your laboratory of choice. Attached are the results for the samples submitted on 10/10/2022 for the above mentioned project. NELAP/TNI Accredited Analysis and EGLE Drinking Water Certified Analysis will be identified in their respective reporting formats. Hard copies can be supplied at your request for a fee of \$20.00 per copy.

The invoice for this project will be emailed separately. If you have any questions concerning the data or invoice, please don't hesitate to contact our office. We welcome your comments and suggestions to improve our quality systems. Please reference Brighton Analytical, L.L.C. Project ID 85178 when calling or emailing. We thank you for this opportunity to partner with you on this project and hope to work with you again in the future.

Sincerely, Brighton Analytical, L.L.C.







Brighton Analytical LLC

2105 Pless Drive Brighton, Michigan 48114 Phone: (810)229-7575 (810)229-8650 e-mail:bai-brighton@sbcglobal.net EGLE Certified #9404 NELAC Accredited #176507

Sample Date: 10/04/2022 Submit Date: 10/10/2022

Report Date: 10/13/2022

To:

Consumers Energy Company

135 W. Trail St. Jackson, MI 49201

BA Report Number: 85

BA Sample ID:

85178

CS00877

Project Name:

Q4-2022 DEK Bottom Ash Pond & Lined Impound

Project Number: 2

22-1017

Sample ID: 22-1017-01 DEK-MW-18001

			I DEIX IVI VV	10001		
Parameters	Result Units DL		Method Reference	Analyst	Analysis Date	
Organic Analysis						
Dissolved Organic Carbon Total Organic Carbon	5100 4900	ug/L ug/L	1000 1000	SM5310B SM5310B	RG RG	10/11/2022 10/11/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date

10/13/2022



Brighton Analytical LLC

2105 Pless Drive Brighton, Michigan 48114 Phone: (810)229-7575 (810)229-8650 e-mail:bai-brighton@sbcglobal.net EGLE Certified #9404 NELAC Accredited #176507

Sample Date: 10/04/2022 Submit Date: 10/10/2022

Report Date: 10/13/2022

To:

Consumers Energy Company

135 W. Trail St. Jackson, MI 49201

BA Report Number: 85

BA Sample ID:

85178

CS00878

Project Name:

Q4-2022 DEK Bottom Ash Pond & Lined Impound

Project Number:

22-1017

Sample ID: 22-1017-02 DEK-MW-18001 MS

	Sam	pic 1D. 22-101/-	UZ DEK-IVI V	V-10001 IVIS		
Parameters	Result Units DL		Method Reference	Analyst	Analysis Date	
Organic Analysis						
Dissolved Organic Carbon, MS, MSD Total Organic Carbon MS, MSD	104% 108%	% %		SM5310B SW846 9060	RG RG	10/11/2022 10/11/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date

10/13/2022



Brighton Analytical LLC

2105 Pless Drive Brighton, Michigan 48114 Phone: (810)229-7575 (810)229-8650 e-mail:bai-brighton@sbcglobal.net EGLE Certified #9404 NELAC Accredited #176507

Sample Date: 10/04/2022 Submit Date: 10/10/2022

Report Date: 10/13/2022

To:

Consumers Energy Company

135 W. Trail St. Jackson, MI 49201

BA Report Number: 8

BA Sample ID:

85178

CS00879

Project Name:

Q4-2022 DEK Bottom Ash Pond & Lined Impound

Project Number:

22-1017

Sample ID: 22-1017-03 DEK-MW-18001 MSD

	~ · · · · · · · · · · · · · · · · · · ·	22-1017-	OS DEIX-IVI V	1-10001 MISD		
Parameters	Result Units DL		Method Reference	Analyst	Analysis Date	
Organic Analysis Dissolved Organic Carbon, MS, MSD Total Organic Carbon MS, MSD	110% 102%	% %		SM5310B SW846 9060	RG RG	10/11/2022 10/11/2022

DL=Reported detection limit for analytical method requested. Some compounds require special analytical methods to achieve EGLE designated target detection limits (TDL).

Released by

Date

10/13/2022

CHAIN OF CUSTODY

85178

CONSUMERS ENERGY COMPANY - LABORATORY SERVICES 135 WEST TRAIL ST., JACKSON, MI 49201 • (517) 788-1251

Count on Us

Consumers Energy

Page____of___

SAMPLING SITE / CUSTOMER:	CUSTOMER:			PROJECT NUMBER:	SAP CC or WO#:	#:		ANALYSIS REOLIESTED	red	
Q4-2022 DEK Be	Q4-2022 DEK Bottom Ash Pond & Lined Impound.	Lined Im	pound.	22-1017	REQUESTER: Emil Blaj	Emil Blaj		(Attach List if More Space is Needed)	Needed)	QA REQUIREMENT:
SAMPLING TEAM:	fi			TURNAROUND TIME REQUIRED:						□ NPDES
				☐ 24 HR ☐ 48 HR ☐ 3 DAYS ☐ STANDARD	NDARD ⊠ OTHER	ER	1	l		INI 🛭
SEND REPORT TO:	O: Emil Blaj			email:Emil.Blaj@cmsenergy.com	phone:					☐ ISO 17025
COPY TO:						CONTAINERS	RS			☐ 10 CFR 50 APP. B
				WW = Wastewater SL = Sludge W = Water / Aqueous Liquid A = Air		PRESERVATIVE	ATIVE			☐ INTERNAL INFO
LAB	SAMPLE COLLECTION	ECTION	RIX	S = Soil / General Solid WP = Wipe O = Oil WT = General Waste	Waste	ν(Ε(ll Orga		□ ОТНЕК
SAMPLE ID	DATE	TIME	TAM	FIELD SAMPLE ID/LOCATION	ATION	TOT Mond HNC HNC NaO	MeC Othe			REMARKS
22-1017-01	10/04/2022	1203	GW	DEK-MW-18001		2	2	×	3	£ 7.3°
22-10	10/04/2022	1203	GW	DEK-MW-18001 MS		2	2	×		8 72
€0 17 Pag	10/04/2022	1203	GW	DEK-MW-18001 MSD		2	2	×		b/ 8
e 18 (
of 31										
RELINQUISHED BY:	SHED BY:	(8	DATE/TIME: [O.] 0.2	2 (555 (RECEIVED BY:			COMMENTS: PR #22101090		
RELINQUISHED BY:	ίΥ:		DATE/TIME:		RECEIVED BY:			Received on Ice? Nes No	M&TE#	Date:



BRIGHTON ANALYTICAL, LLC

QUALITY ASSURANCE/QUALITY CONTROL

REPRESENTATIVE BATCH QUALITY CONTROL Accuracy & Precision

Analyst:	RG	Parameter:	DOC
Analysis Date:	10/11/2022	Method Reference:	EPA 415.1/SM5310B/9060

		SPIKE - ACC	URACY		
Laboratory ID	Spike level PPB	Background PPB	Recoveries	Acceptable Range (%)	Method Blank Concentration
CS00877	TV=10000	5100	104/110	80 - 120	ND
Laboratory ID	Observed A PPB	Observed B PPB	RPD (%)	Acceptable Range(%)	
CS00877	15500	16100	3.80	<u>< 20</u>	
		MISCELLA	NEOUS		
W 1910		Standard ID#	%Recoveries		
ndependent Secondar	y Reference Material:	#4295.1	102		
Method Standard (Lal	o. Control Spike):	#3046.6	106		

COMMENTS:	



Report ID: S41139.01(01) Generated on 10/07/2022

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): S41139.01-S41139.03

Project: 22-1017 PR#22101089 Collected Date(s): 10/04/2022

Submitted Date/Time: 10/07/2022 08:15

Sampled by: Unknown P.O. #: 4400106050

Table of Contents

Cover Page (Page 1)

General Report Notes (Page 2)

Report Narrative (Page 2)

Laboratory Certifications (Page 3)

Qualifier Descriptions (Page 3)

Glossary of Abbreviations (Page 3)

Method Summary (Page 4)

Sample Summary (Page 5)

Maya Murshak Technical Director

Naya Mushah



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.

Full accreditation certificates are available upon request. Starred (*) analytes are not 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.

Report Narrative

There is no additional narrative for this analytical report



Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description Description
!	Result is outside of stated limit criteria
В	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
Н	Sample submitted and run outside of holding time
1	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
0	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
Т	No correction for total solids
X	Elevated reporting limit due to matrix interference
Υ	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
е	Reported value estimated due to interference
j	Analyte also found in associated method blank
р	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
х	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 4450 S2 D 2011



Sample Summary (3 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time	
S41139.01	22-1017-01 (DEK-MW-18001)	Groundwater	10/04/22 12:03	
S41139.02	22-1017-02 (DEK-MW-18001 Field MS)	Groundwater	10/04/22 12:03	
S41139.03	22-1017-03 (DEK-MW-18001 Field MSD)	Groundwater	10/04/22 12:03	



Lab Sample ID: S41139.01

Sample Tag: 22-1017-01 (DEK-MW-18001) Collected Date/Time: 10/04/2022 12:03

Matrix: Groundwater COC Reference:

Sample Containers

#	Туре	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.4	IR

Inorganics

Method: SM4500-S2 D, Run Date: 10/07/22 10:36, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	Not detected	0.02	0.005	mg/L	1	18496-25-8	



Lab Sample ID: S41139.02

Sample Tag: 22-1017-02 (DEK-MW-18001 Field MS)

Collected Date/Time: 10/04/2022 12:03

Matrix: Groundwater COC Reference:

Sample Containers

#	Туре	Preservative(s)	Refrigerated?	Arrival Temp. (C)	I nermometer #
1	125ml Plastic	NaOH	Yes	3.4	IR

Inorganics

Method: SM4500-S2 D, Run Date: 10/07/22 10:40, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	0.183	0.02	0.005	ma/L	1	18496-25-8	1

1-* Sample spiked @ 0.200 mg/L



Lab Sample ID: S41139.03

Sample Tag: 22-1017-03 (DEK-MW-18001 Field MSD)

Collected Date/Time: 10/04/2022 12:03

Matrix: Groundwater COC Reference:

Sample Containers

#	Туре	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	NaOH	Yes	3.4	IR

Inorganics

Method: SM4500-S2 D, Run Date: 10/07/22 10:42, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Sulfide	0.184	0.02	0.005	ma/L	1	18496-25-8	1

1-* Sample spiked @ 0.200 mg/L

Merit Laboratories Login Checklist

Lab Set ID:S41139

Client: CONSUMERS (Consumers Energy)

Project: 22-1017 PR#22101089

Submitted: 10/07/2022 08:15 Login User: PFD

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

Selec	tion			Description	Note			
Samp	ole Receiv	/ing						
01.	X Yes	No	□ N/A	Samples are received at 4C +/- 2C Thermometer #	IR 3.4			
02.	X Yes	☐ No	□ N/A	Received on ice/ cooling process begun				
03.	Yes	X No	□ N/A	Samples shipped				
04.	X Yes	☐ No	□ N/A	Samples left in 24 hr. drop box				
05.	X Yes	No	□ N/A	Are there custody seals/tape or is the drop box locked				
Chaiı	of Custo	ody						
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:				
Prese	ervation							
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	e Conditio	ons						
13.	X Yes	No	□ N/A	All bottles intact				
14.	X Yes	No	N/A	Appropriate analytical bottles are used				
15.	X Yes	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 or TOX bottles contain headspace				
Corre	ective action	on for all	exceptions	is to call the client and to notify the project manager.				
Clien	t Review I	Зу:		Date:				

Merit Laboratories Bottle Preservation Check

Lab Set ID: S41139 Submitted: 10/07/2022 08:15

Client: CONSUMERS (Consumers Energy)

Project: 22-1017 PR#22101089

Initial Preservation Check: 10/07/2022 09:14 PFD

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
S41139.01	125ml Plastic NaOH	>12			
S41139.02	125ml Plastic NaOH	>12			
S41139.03	125ml Plastic NaOH	>12			



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

C.O.C. PAG	F#	1	OF .	1
U.U.U. FAG	- 10		_ 01 .	

REPOR			Laboratories, Inc.	CHAIN	OF	CU	ST	ODY	RE	CO	RD						1	NVOICE T
CONTACT NAME E	mil Blaj						C	ONTAC	T NAM	E							¥ SAM	
	sumers E						0	OMPAN	YY									
ADDRESS 135 V	W. Trail S	Street					A	DDRES	S									
Jackson Jackson				STATE MI ZIP C	ODE 49	201	C	TY									STATE	ZIP CODE
PHONE NO. 517-	788-5888		FAX NO. 517-788-2533	P.O. NO. 4400106	050		P	HONE	NO.				E-MA	L ADDRESS				
E-MAIL ADDRESS	emil.blaj(a)cmsen	ergy.com	QUOTE NO.			1					ANALY	SIS (ATT	ACH LIST	FMORE	SPACE	IS REQUIR	ED)
PROJECT NO./NAM				SAMPLER(S) - PLEASE P	RINT/SIGN	NAM V	E.			N/A	7	TT		H	H	T	Certificat	
			1 DAY 2 DAYS 3 D	AYS STANDARD	ОТН	ER _												AP Drinking Wa
DELIVERABLE	S REQUIR	ED S	TD X LEVEL II LEVEL III	LEVEL IV EDD	ОТ	HER					_ e						∐D₀D	NPDES
	GW≃GROUN SL=SLUDG		WW=WASTEWATER S=S0 EDRINKING WATER 0=OIL		=SOLID W=WAST				tainer ervativ		Sulfide						Project Lo	ocations New York
MERIT LAB NO.	YE	AR	SAMPLE IDENTIFICATION-DI		MATRIX	# OF	NONE	HNO,	H,SO,	MeOH	Total						Other _	
FOR LAB USE ONLY	DATE	TIME	770			-	Ž	I	I Z	2 6	1	++	++	++	++	+		nstructions
4/13/201	10/04/22	1203	22-1017-01 (DEK-MW-		GW	1	+	+	1	H	1		++	++	++	+	preserved v	with NaOH/ZnAcet
707	10/04/22		22-1017-02 (DEK-MW-1		GW	1	+	+	1	H	1		++	++	-	-		
-03	10/04/22	1203	22-1017-03 (DEK-MW-1	8001 Field MSD)	GW	1	+	+	1	1	1	11	++	-	++	-		
					+	_	-			1	\vdash	1	+	++	-	+	Please spik	e MS/MSD and rep
					-	-	1	+		1	-	11	1		++	-	spike cond	centration and/or r
					+	-	+	+	+	H		++	++	++	++	+		
					+	+	+	+	+	H	\vdash	++	++	++	++	+		
						1	+	+	+	H	H	+	+++	++	++	-		
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RELINQUISHED B' SIGNATURE/ORG/ RECEIVED BY; SIGNATURE/ORG/	ANIZATION	4.0	onsumers every	DATE DATE	Z ZJ	ME 45	F	SIGNAT	UISHED URE/OF	RGANIZ				Mer	it Dry	o Ba	6	10/9/20 81
RELINQUISHED BY SIGNATURE/ORGA	Y:	-		DATE	TIN	ME	4 -	SEAL N	_			SEAL INTA	TON	INITIALS	N	OTES:	TEMP. ON	ARRIVAL
RECEIVED BY: SIGNATURE/ORG/				DATE	TIN	ME .	5	SEAL N	0.			SEAL INTA		INITIALS			3.	4



Environment Testing

ANALYTICAL REPORT

Eurofins Canton 180 S. Van Buren Avenue Barberton, OH 44203 Tel: (330)497-9396

Laboratory Job ID: 240-174326-1

Client Project/Site: Karn/Weadock CCR DEK Bottom Ash Pond

For:

TRC Environmental Corporation. 1540 Eisenhower Place Ann Arbor, Michigan 48108-7080

Attn: Darby Litz

Authorized for release by: 11/10/2022 4:21:15 PM

Kris Brooks, Project Manager II (330)966-9790

Kris.Brooks@et.eurofinsus.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the {0} Project Manager.

Table of Contents

Cover Page	1
Table of Contents	2
Definitions/Glossary	3
Case Narrative	4
Method Summary	5
Sample Summary	6
Client Sample Results	7
Tracer Carrier Summary	12
QC Sample Results	13
QC Association Summary	14
Lab Chronicle	15
Certification Summary	17
Chain of Custody	18
Receipt Chacklists	23

-5

4

6

8

9

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12

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Definitions/Glossary

Client: TRC Environmental Corporation. Job ID: 240-174326-1

Project/Site: Karn/Weadock CCR DEK Bottom Ash Pond

Qualifiers

Rad

Qualifier **Qualifier Description**

Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
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¤ Listed under the "D" column to designate that the result is reported on a dry weight basis

%R Percent Recovery **CFL** Contains Free Liquid CFU Colony Forming Unit CNF Contains No Free Liquid

Duplicate Error Ratio (normalized absolute difference) **DER**

Dil Fac **Dilution Factor**

DL Detection Limit (DoD/DOE)

DL, RA, RE, IN Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample

DLC Decision Level Concentration (Radiochemistry)

Estimated Detection Limit (Dioxin) **EDL** LOD Limit of Detection (DoD/DOE) LOQ Limit of Quantitation (DoD/DOE)

MCL EPA recommended "Maximum Contaminant Level" MDA Minimum Detectable Activity (Radiochemistry) MDC Minimum Detectable Concentration (Radiochemistry)

MDL Method Detection Limit ML Minimum Level (Dioxin) MPN Most Probable Number Method Quantitation Limit MQL

NC Not Calculated

ND Not Detected at the reporting limit (or MDL or EDL if shown)

NEG Negative / Absent POS Positive / Present

PQL Practical Quantitation Limit

PRES Presumptive QC **Quality Control**

Relative Error Ratio (Radiochemistry) **RER**

Reporting Limit or Requested Limit (Radiochemistry) RL

RPD Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin) **TEQ** Toxicity Equivalent Quotient (Dioxin)

Too Numerous To Count **TNTC**

Case Narrative

Client: TRC Environmental Corporation.

Project/Site: Karn/Weadock CCR DEK Bottom Ash Pond

Job ID: 240-174326-1

Laboratory: Eurofins Canton

Narrative

Job Narrative 240-174326-1

Comments

The EPA Method 903.0 Radium-226, EPA Method 904.0 Radium-228, and Ra226_Ra228 Combined Radium 226 and Radium 228 analyses were performed at the Eurofins St. Loius laboratory.

Receipt

The samples were received on 10/8/2022 9:50 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 6 coolers at receipt time were 0.8°C, 1.2°C, 1.4°C, 2.2°C, 3.1°C and 4.1°C

Gas Flow Proportional Counter

Method 903.0: Radium-226 batch 586489Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference DateDEK-MW-15002 (240-174326-1), DEK-MW-15005 (240-174326-2), DEK-MW-15006 (240-174326-3), DUP-DEK-BAP-01 (240-174326-4), EB-DEK-BAP (240-174326-5), (LCS 160-586489/2-A), (MB 160-586489/1-A), (180-145631-A-1-A) and (180-145631-A-1-B DU)

Method 904.0: Radium-228 batch 586571Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference DateDEK-MW-15002 (240-174326-1), DEK-MW-15005 (240-174326-2), DEK-MW-15006 (240-174326-3), DUP-DEK-BAP-01 (240-174326-4), EB-DEK-BAP (240-174326-5), (LCS 160-586571/2-A), (MB 160-586571/1-A), (180-145631-A-1-C) and (180-145631-A-1-D DU)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Rad

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Job ID: 240-174326-1

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Method Summary

Client: TRC Environmental Corporation.

Project/Site: Karn/Weadock CCR DEK Bottom Ash Pond

Method	Method Description	Protocol	Laboratory
903.0	Radium-226 (GFPC)	EPA	EET SL
904.0	Radium-228 (GFPC)	EPA	EET SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	EET SL
PrecSep STD	Preparation, Precipitate Separation (Standard In-Growth)	None	EET SL
PrecSep 0	Preparation, Precipitate Separation	None	EET SL

Protocol References:

EPA = US Environmental Protection Agency

None = None

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

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Job ID: 240-174326-1

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Sample Summary

Client: TRC Environmental Corporation.
Project/Site: Karn/Weadock CCR DEK Bottom Ash Pond

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-174326-1	DEK-MW-15002	Water	10/04/22 08:45	10/08/22 09:50
240-174326-2	DEK-MW-15005	Water	10/04/22 10:55	10/08/22 09:50
240-174326-3	DEK-MW-15006	Water	10/04/22 09:47	10/08/22 09:50
240-174326-4	DUP-DEK-BAP-01	Water	10/04/22 00:00	10/08/22 09:50
240-174326-5	EB-DEK-BAP	Water	10/04/22 12:00	10/08/22 09:50

Client: TRC Environmental Corporation.

Project/Site: Karn/Weadock CCR DEK Bottom Ash Pond

Client Sample ID: DEK-MW-15002

Date Collected: 10/04/22 08:45 Date Received: 10/08/22 09:50

Lab Sample ID: 240-174326-1

Matrix: Water

Method: EPA 903	3.0 - Radium	-226 (GFP	C)							
			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.219		0.112	0.114	1.00	0.132	pCi/L	10/19/22 12:19	11/09/22 15:56	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	94.4		40 - 110					10/19/22 12:19	11/09/22 15:56	1

motriou: El 7100	4.0 - Radium	-220 (01 1	C)							
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.81		0.596	0.619	1.00	0.692	pCi/L	10/19/22 13:40	11/02/22 13:54	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	94.4		40 - 110					10/19/22 13:40	11/02/22 13:54	1
Y Carrier	85.2		40 - 110					10/19/22 13:40	11/02/22 13:54	1

Method: TAL-STL F	Ra226_Ra	228 - Com	bined Radi	um-226 an	d Radiur	n-228				
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	2.03		0.606	0.629	5.00	0.692	pCi/L		11/10/22 13:17	1

Client: TRC Environmental Corporation.

Project/Site: Karn/Weadock CCR DEK Bottom Ash Pond

Client Sample ID: DEK-MW-15005

Date Collected: 10/04/22 10:55 Date Received: 10/08/22 09:50

Lab Sample ID: 240-174326-2

Matrix: Water

Method: EPA 903	.0 - Radium	-226 (GFP	C)							
		•	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.544		0.158	0.165	1.00	0.118	pCi/L	10/19/22 12:19	11/09/22 15:56	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	94.9		40 - 110					10/19/22 12:19	11/09/22 15:56	1

Method: EPA 904	4.0 - Radium	-228 (GFP	C)							
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	3.11		0.743	0.796	1.00	0.774	pCi/L	10/19/22 13:40	11/02/22 13:54	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	94.9		40 - 110					10/19/22 13:40	11/02/22 13:54	1
Y Carrier	86.7		40 - 110					10/19/22 13:40	11/02/22 13:54	1

Method: TAL-STL F	Ra226_Ra	228 - Com	bined Radi	um-226 an	d Radiur	n-228				
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	3.66		0.760	0.813	5.00	0.774	pCi/L		11/10/22 13:17	1

Client: TRC Environmental Corporation.

Project/Site: Karn/Weadock CCR DEK Bottom Ash Pond

Client Sample ID: DEK-MW-15006

Date Collected: 10/04/22 09:47 Date Received: 10/08/22 09:50

Lab Sample ID: 240-174326-3

Matrix: Water

Method: EPA 90	3.0 - Radium	-226 (GFP	C) Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.242		0.127	0.129	1.00	0.153	pCi/L	10/19/22 12:19	11/09/22 15:56	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	85.8		40 - 110					10/19/22 12:19	11/09/22 15:56	1

		-228 (GFP	•	T-4-1						
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.43		0.626	0.640	1.00	0.835	pCi/L	10/19/22 13:40	11/02/22 13:54	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	85.8		40 - 110					10/19/22 13:40	11/02/22 13:54	1
Y Carrier	84.9		40 - 110					10/19/22 13:40	11/02/22 13:54	1

Method: TAL-STL F	Ra226_Ra	228 - Com	bined Radi	um-226 an	d Radiur	n-228				
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.67		0.639	0.653	5.00	0.835	pCi/L		11/10/22 13:17	1

Client: TRC Environmental Corporation.

Project/Site: Karn/Weadock CCR DEK Bottom Ash Pond

Client Sample ID: DUP-DEK-BAP-01

Date Collected: 10/04/22 00:00 Date Received: 10/08/22 09:50

Lab Sample ID: 240-174326-4

Matrix: Water

Job ID: 240-174326-1

Method: EPA 903.0 - Radium-226	(GFPC)

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.287		0.134	0.136	1.00	0.152	pCi/L	10/19/22 12:19	11/09/22 15:56	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ra Carrier	87.5		40 _ 110					10/19/22 12:19	11/09/22 15:56	

Method: EPA 904	4.0 - Radium	-228 (GFP	Count Uncert.	Total						
Analyte	Result	Qualifier	oncert. (2σ+/-)	Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	2.70		0.731	0.772	1.00	0.781	pCi/L	10/19/22 13:40	11/02/22 13:54	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	87.5		40 - 110					10/19/22 13:40	11/02/22 13:54	1
Y Carrier	84.9		40 - 110					10/19/22 13:40	11/02/22 13:54	1

Method: TAL-STL Ra226 Ra228 - Combined Radium-226 and Radium-228

	_		Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium	2.99		0.743	0.784	5.00	0.781	pCi/L		11/10/22 13:17	1

Client: TRC Environmental Corporation.

Project/Site: Karn/Weadock CCR DEK Bottom Ash Pond

Client Sample ID: EB-DEK-BAP

Date Collected: 10/04/22 12:00 Date Received: 10/08/22 09:50 Lab Sample ID: 240-174326-5

Matrix: Water

Job ID: 240-174326-1

Method: EPA	903.0 - Radiun	n-226 (GFPC)

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0316	U	0.0767	0.0768	1.00	0.142	pCi/L	10/19/22 12:19	11/09/22 15:56	1
Carrier		Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	100		40 - 110					10/19/22 12:19	11/09/22 15:56	1

Method: EPA 904	4.0 - Radium	-228 (GFP	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.21		0.499	0.511	1.00	0.628	pCi/L	10/19/22 13:40	11/02/22 13:55	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	100		40 - 110					10/19/22 13:40	11/02/22 13:55	1
Y Carrier	84.5		40 - 110					10/19/22 13:40	11/02/22 13:55	1

Method: TAL-STL Ra226 Ra228 - Combined Radium-226 and Radium-228

	_		Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium	1.24		0.505	0.517	5.00	0.628	pCi/L		11/10/22 13:17	1

Tracer/Carrier Summary

Client: TRC Environmental Corporation.

Project/Site: Karn/Weadock CCR DEK Bottom Ash Pond

Method: 903.0 - Radium-226 (GFPC)

Matrix: Water Prep Type: Total/NA

			Percent Yield (Acceptance Limits)
		Ва	
Lab Sample ID	Client Sample ID	(40-110)	
240-174326-1	DEK-MW-15002	94.4	
240-174326-2	DEK-MW-15005	94.9	
240-174326-3	DEK-MW-15006	85.8	
240-174326-4	DUP-DEK-BAP-01	87.5	
240-174326-5	EB-DEK-BAP	100	
LCS 160-586489/2-A	Lab Control Sample	99.8	
MB 160-586489/1-A	Method Blank	99.8	
Tracer/Carrier Legen	d		
Ba = Ba Carrier			

Method: 904.0 - Radium-228 (GFPC)

Matrix: Water Prep Type: Total/NA

				Percent Yield (Acceptance Limits)
		Ва	Υ	
Lab Sample ID	Client Sample ID	(40-110)	(40-110)	
240-174326-1	DEK-MW-15002	94.4	85.2	
240-174326-2	DEK-MW-15005	94.9	86.7	
240-174326-3	DEK-MW-15006	85.8	84.9	
240-174326-4	DUP-DEK-BAP-01	87.5	84.9	
240-174326-5	EB-DEK-BAP	100	84.5	
LCS 160-586571/2-A	Lab Control Sample	99.8	87.1	
MB 160-586571/1-A	Method Blank	99.8	83.7	

Ba = Ba Carrier

Y = Y Carrier

Eurofins Canton

Client: TRC Environmental Corporation.

Project/Site: Karn/Weadock CCR DEK Bottom Ash Pond

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-586489/1-A

Matrix: Water

Matrix: Water

Analyte

Radium-226

Analysis Batch: 589429

Client Sample ID: Method Blank

Prep Type: Total/NA

Job ID: 240-174326-1

Prep Batch: 586489

MB MB Uncert. Uncert. Analyte Result Qualifier $(2\sigma + / -)$ $(2\sigma + / -)$ RL **MDC** Unit Prepared Analyzed Dil Fac Radium-226 -0.01471 Ū 0.0601 0.0601 1.00 0.127 pCi/L 10/19/22 12:19 11/09/22 15:55

Total

Count

MB

Carrier **%Yield Qualifier** Limits Prepared Analyzed Dil Fac Ba Carrier 99.8 40 - 110 10/19/22 12:19 11/09/22 15:55

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 586489

Analysis Batch: 589429

MB MB

Total

LCS LCS %Rec **Spike** Uncert. Added Result Qual $(2\sigma + / -)$ RL%Rec Limits MDC Unit 11.3 11.66 1.20 1.00 0.0930 pCi/L 103 75 - 125

LCS LCS

Lab Sample ID: LCS 160-586489/2-A

Carrier %Yield Qualifier Limits Ba Carrier 99.8 40 - 110

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-586571/1-A

Matrix: Water

Analysis Batch: 588252

Client Sample ID: Method Blank

Prep Type: Total/NA **Prep Batch: 586571**

			Count	Total					
	MB	MB	Uncert.	Uncert.					
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC Un	nit Prepared	Analyzed	Dil Fac
Radium-228	1.001		0.423	0.433	1.00	0.557 pC	Ci/L 10/19/22 13:40	11/02/22 13:54	1

Carrier **%Yield Qualifier** Limits Prepared Analyzed Dil Fac 10/19/22 13:40 11/02/22 13:54 Ba Carrier 99.8 40 - 110 40 - 110 10/19/22 13:40 11/02/22 13:54 Y Carrier 83.7

Lab Sample ID: LCS 160-586571/2-A

Matrix: Water

Analysis Batch: 588252

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 586571

			Total				
	Spike	LCS LCS	Uncert.				%Rec
Analyte	Added	Result Qual	(2σ+/-)	RL	MDC Unit	%Rec	Limits
Radium-228	8.48	9.458	1.48	1.00	0.776 pCi/L	112	75 - 125

	LCS	LUS	
Carrier	%Yield	Qualifier	Limits
Ba Carrier	99.8		40 - 110
Y Carrier	87.1		40 - 110

Eurofins Canton

11/10/2022

QC Association Summary

Client: TRC Environmental Corporation.

Project/Site: Karn/Weadock CCR DEK Bottom Ash Pond

Prep Batch: 586489

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-174326-1	DEK-MW-15002	Total/NA	Water	PrecSep STD	
240-174326-2	DEK-MW-15005	Total/NA	Water	PrecSep STD	
240-174326-3	DEK-MW-15006	Total/NA	Water	PrecSep STD	
240-174326-4	DUP-DEK-BAP-01	Total/NA	Water	PrecSep STD	
240-174326-5	EB-DEK-BAP	Total/NA	Water	PrecSep STD	
MB 160-586489/1-A	Method Blank	Total/NA	Water	PrecSep STD	
LCS 160-586489/2-A	Lab Control Sample	Total/NA	Water	PrecSep STD	

Prep Batch: 586571

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-174326-1	DEK-MW-15002	Total/NA	Water	PrecSep_0	
240-174326-2	DEK-MW-15005	Total/NA	Water	PrecSep_0	
240-174326-3	DEK-MW-15006	Total/NA	Water	PrecSep_0	
240-174326-4	DUP-DEK-BAP-01	Total/NA	Water	PrecSep_0	
240-174326-5	EB-DEK-BAP	Total/NA	Water	PrecSep_0	
MB 160-586571/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-586571/2-A	Lab Control Sample	Total/NA	Water	PrecSep 0	

Job ID: 240-174326-1

11/10/2022

Lab Chronicle

Client: TRC Environmental Corporation.

Project/Site: Karn/Weadock CCR DEK Bottom Ash Pond

Client Sample ID: DEK-MW-15002

Date Collected: 10/04/22 08:45 Date Received: 10/08/22 09:50

Lab Sample ID: 240-174326-1

Matrix: Water

Job ID: 240-174326-1

	Batch	Batch		Dilution	Batch			Prepared
Prep Type	Type	Method	Run	Factor	Number	Analyst	Lab	or Analyzed
Total/NA	Prep	PrecSep STD			586489	ZR	EET SL	10/19/22 12:19
Total/NA	Analysis	903.0		1	589429	FLC	EET SL	11/09/22 15:56
Total/NA	Prep	PrecSep_0			586571	CMM	EET SL	10/19/22 13:40
Total/NA	Analysis	904.0		1	588252	JCB	EET SL	11/02/22 13:54
Total/NA	Analysis	Ra226_Ra228		1	589622	MLK	EET SL	11/10/22 13:17

Client Sample ID: DEK-MW-15005

Date Collected: 10/04/22 10:55 Date Received: 10/08/22 09:50

Lab Sample ID: 240-174326-2

Matrix: Water

	Batch	Batch		Dilution	Batch			Prepared
Prep Type	Type	Method	Run	Factor	Number	Analyst	Lab	or Analyzed
Total/NA	Prep	PrecSep STD			586489	ZR	EET SL	10/19/22 12:19
Total/NA	Analysis	903.0		1	589429	FLC	EET SL	11/09/22 15:56
Total/NA	Prep	PrecSep_0			586571	CMM	EET SL	10/19/22 13:40
Total/NA	Analysis	904.0		1	588252	JCB	EET SL	11/02/22 13:54
Total/NA	Analysis	Ra226_Ra228		1	589622	MLK	EET SL	11/10/22 13:17

Client Sample ID: DEK-MW-15006

Date Collected: 10/04/22 09:47

Date Received: 10/08/22 09:50

Lab Sample ID: 240-174326-3

Lab Sample ID: 240-174326-4

Matrix: Water

Matrix: Water

-	Batch	Batch		Dilution	Batch			Prepared
Prep Type	Type	Method	Run	Factor	Number	Analyst	Lab	or Analyzed
Total/NA	Prep	PrecSep STD			586489	ZR	EET SL	10/19/22 12:19
Total/NA	Analysis	903.0		1	589429	FLC	EET SL	11/09/22 15:56
Total/NA	Prep	PrecSep_0			586571	CMM	EET SL	10/19/22 13:40
Total/NA	Analysis	904.0		1	588252	JCB	EET SL	11/02/22 13:54
Total/NA	Analysis	Ra226_Ra228		1	589622	MLK	EET SL	11/10/22 13:17

Client Sample ID: DUP-DEK-BAP-01

Date Collected: 10/04/22 00:00

Date Received: 10/08/22 09:50

	Batch	Batch		Dilution	Batch			Prepared
Prep Type	Туре	Method	Run	Factor	Number	Analyst	Lab	or Analyzed
Total/NA	Prep	PrecSep STD			586489	ZR	EET SL	10/19/22 12:19
Total/NA	Analysis	903.0		1	589429	FLC	EET SL	11/09/22 15:56
Total/NA	Prep	PrecSep_0			586571	CMM	EET SL	10/19/22 13:40
Total/NA	Analysis	904.0		1	588252	JCB	EET SL	11/02/22 13:54
Total/NA	Analysis	Ra226_Ra228		1	589622	MLK	EET SL	11/10/22 13:17

Page 15 of 23

Lab Chronicle

Job ID: 240-174326-1 Client: TRC Environmental Corporation.

Project/Site: Karn/Weadock CCR DEK Bottom Ash Pond

Client Sample ID: EB-DEK-BAP

Date Received: 10/08/22 09:50

Lab Sample ID: 240-174326-5 Date Collected: 10/04/22 12:00 **Matrix: Water**

	Batch	Batch		Dilution	Batch			Prepared
Prep Type	Type	Method	Run	Factor	Number	Analyst	Lab	or Analyzed
Total/NA	Prep	PrecSep STD			586489	ZR	EET SL	10/19/22 12:19
Total/NA	Analysis	903.0		1	589429	FLC	EET SL	11/09/22 15:56
Total/NA	Prep	PrecSep_0			586571	CMM	EET SL	10/19/22 13:40
Total/NA	Analysis	904.0		1	588252	JCB	EET SL	11/02/22 13:55
Total/NA	Analysis	Ra226_Ra228		1	589622	MLK	EET SL	11/10/22 13:17

Laboratory References:

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Accreditation/Certification Summary

Client: TRC Environmental Corporation.

Project/Site: Karn/Weadock CCR DEK Bottom Ash Pond

Laboratory: Eurofins St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	20-001	05-06-25
ANAB	Dept. of Defense ELAP	L2305	04-06-25
ANAB	Dept. of Energy	L2305.01	04-06-25
ANAB	ISO/IEC 17025	L2305	04-06-25
Arizona	State	AZ0813	12-08-22
California	Los Angeles County Sanitation Districts	10259	06-30-22 *
California	State	2886	07-01-22 *
Connecticut	State	PH-0241	03-31-23
Florida	NELAP	E87689	06-30-23
HI - RadChem Recognition	State	n/a	06-30-23
Illinois	NELAP	200023	11-30-23
Iowa	State	373	12-01-22
Kansas	NELAP	E-10236	10-31-22 *
Kentucky (DW)	State	KY90125	12-31-22
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-22
Louisiana (All)	NELAP	04080	06-30-23
Louisiana (DW)	State	LA011	12-31-22
Maryland	State	310	09-30-23
MI - RadChem Recognition	State	9005	06-30-23
Missouri	State	780	06-30-25
Nevada	State	MO000542020-1	07-31-23
New Jersey	NELAP	MO002	06-30-23
New York	NELAP	11616	04-01-23
North Dakota	State	R-207	06-30-23
NRC	NRC	24-24817-01	12-31-22
Oklahoma	NELAP	9997	08-31-23
Oregon	NELAP	4157	09-01-23
Pennsylvania	NELAP	68-00540	02-28-23
South Carolina	State	85002001	06-30-23
Texas	NELAP	T104704193	07-31-23
US Fish & Wildlife	US Federal Programs	058448	07-31-23
USDA	US Federal Programs	P330-17-00028	03-11-23
Utah	NELAP	MO000542021-14	07-31-23
Virginia	NELAP	10310	06-14-24
Washington	State	C592	08-30-23
West Virginia DEP	State	381	12-31-22

Job ID: 240-174326-1

Eurofins Canton

 $^{^{\}star} \ \text{Accreditation/Certification renewal pending - accreditation/certification considered valid}.$

Eurofins Canton

180 S. Van Buren Avenue Barberton, OH 44203 Phone (330) 497-9396 Phone (330) 497-0772	190 Chain of Custody Record	ustody R	ecord		Environment Testing America
Client Information	Sampler Andrew (Shalle)		Lab PM: Brooks, Kris M	Carrier Tracking No(s):	COC No: 240-99541-29052.1
Cilent Contact: Jacob Krenz	12	0-	E-Mail: Kris.Brooks@et.eurofinsus.com	State of Origin:	Page:
Company: TRC Environmental Corporation.			Analys	Analysis Requested	
Address: 1540 Eisenhower Place	Due Date Requested:				Preservation Codes:
City. Ann Arbor	TAT Requested (days):				B - NaOH O - ASNaO2
State, Zip: MI, 48108-7080	Compliance Project: A Yes A No				
Phone: 734-971-7080(Tel) 734-971-9022(Fax)	PO#: 178827		((
Email: JKrenz@trccompanies.com	WO#:				I - Ice J - DI Water
Project Name: Karn/Weadock CCR DEK Bottom Ash Pond	Project #: 24024154		PPC		L · EDA Z · other (specify)
Site;	SSOW#:		SD-€S		Other:
Sample Identification	Sample Time (=ccomp.	Matrix (W-water. S-solid. O-wwatering)	M/2M m1 pc/ 6.8935.8A ,0.800 7.8935.8A ,0.800		ofal Number
	X	-			Special instructions/Note:
DEK-MW-15002	1014/22 245 B	Water	~		
DEK-MW-15005		Water	× ×		
DEK-MW-15006	10/4/22 947 G	Water	×××		
DUP-DEK-BAP-01		Water	××		
EB-DEK-BAP	10/4/2 1200 G	Water	× ×		
		Water			
				240-174326 Chain of Custody	
Possible Hazard Identification Non-Hazard Flammable Skin Irritant	Poison B Unknown Radiological	iical	Sample Disposal (A fee m	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) Return To Client Moni	retained longer than 1 month) Archive For Months
Othe			Special Instructions/QC Requirements	uirements:	
Empty Kit Relinquished by:	Date:		Time:	Method of Shipment;	
Reinquish d by	Date/Time (0-7-32/10/6	Company	Received W	Calerine:	122 10:15 Company
Relinquished by:	Date The 122 10:15	Company	Received by.	Date/Time:	8 22 9SS Company Company
Custody Seals Intact: Custody Seal No.:			Cooler Temperature(s) °C and Other Remarks:	Other Remarks:	
A res A No					Ver. 01/16/2019
			1		

Eurofins - Canton Sample Receipt Form/Narrative Login #:
Barberton Facility
Client Site Name Cooler Received on 10-8-22 Opened on 10-8-22 Opened on 10-8-22
FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off Eurofins Courier Other
Receipt After-Hanse Drop off Date/Time Storage Location
Eurofins Cooler # Foam Box Client Cooler Box Other Packing material used: Rubble Wrap Foam Plastic Bag None Other COOLANT: Wet Ice Blue Ice Dry Ice Watch None 1. Cooler temperature upon-receipt IR GUN# IR-13 (CF +0.7 °C) Observed Cooler Temp. °C Corrected Cooler Temp. IR GUN#IR-15 (CF 0.0 °C) Observed Cooler Temp. °C Corrected Cooler Temp. °C 2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 2 C Yes No -Were the seals on the outside of the cooler(s) signed & dated? -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? -Were tamper/custody seals intact and uncompromised? 3. Shippers' packing slip attached to the cooler(s)? 4. Did custody papers accompany the sample(s)? 5. Were the custody papers relinquished & signed in the appropriate place? 6. Was/were the person(s) who collected the samples clearly identified on the COC? 7. Did all bottles arrive in good condition (Unbroken)? 8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? 9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and nample type of grab/comp(Y/N)? 10. Were correct bottle(s) used for the test(s) indicated?
11. Sufficient quantity received to perform indicated analyses? 12. Are these work share samples and all listed on the COC? If yes, Questions 13-17 have been checked at the originating laboratory. 13. Were all preserved sample(s) at the correct pH upon receipt? 14. Were VOAs on the COC? 15. Were air bubbles >6 mm in any VOA vials? 16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # Yes No NA pH Strip Lot# HC286797 Yes No NA
17. Was a LL Hg or Me Hg trip blank present? Yes No Yes Yes No Yes Yes No Yes Yes No Yes
Concerning
18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES
19. SAMPLE CONDITION
Sample(s) were received after the recommended holding time had expired.
Sample(s) were received in a broken container.
Sample(s) were received with bubble >6 mm in diameter. (Notify PM)
20. SAMPLE PRESERVATION
Sample(s) were further preserved in the laboratory.
Sample(s) were further preserved in the laboratory. Time preserved: Preservative(s) added/Lot number(s):
VOA Sample Preservation - Date/Time VOAs Frozen:

Coolant	
(Circle)	
College Blue les Device	
Water None	
Wellice Blue Ice Dry Ice	
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Cooler Description	IR Gun #	n Sample Receipt Mu Observed	Corrected	Coolant
(Circle)	(Circle)	Temp °C	Temp °C	(Circle)
TA Client Box Other	IR-13 (R-150	31	3-1	Water None
TA Client Box Other	R-13 (R-15	1-4	1.4	Wet ice Blue ice Di Water None
TA Client Box Other	IR-13 IE-16	22	2.2	Wet Ich Blue Ice Dr Water None
TA Client Box Other	IR-13 IE-18	1-d	1-2	Weller None
Cont Box Other	IR-13 IK-76	4-1	4.1	Well Ice Blue Ice Dr Water None
TA Client Box Other	IR-13 MC35	0-8	0-8	Wellice Blue Ice Dr
TA Client Box Other	IR-13 IR-16	0, 8	0,3	Water None Wellice Blue Ice Dr
TA Client Box Other	R-13 R-16			Water None Wet Ice Sive Ice Dr
TA Client Box Other	IR-13 IR-15			Water None Wet Ice Blue Ice Dr
	IR-13 IR-16			Water None Wet Ice Stre Ice Dry
	R-13 R-16			Water None Wellice Sive Ice Dry
	R-13 R-16			Water None Watice Sive Ice Dry
TA Client Sox Other	R-13 R-16		`	Water None Wat Ice Blue Ice Dry
TA Client Box Other	R-13 R-16			Water None Wet Ice Blue Ice Dry
TA Client Box Other	IR-13 IR-16		·····	Water None Wet Ice Blue Ice Dry
TA Client Box Other	R-13 R-15			Water None Wellice Blue Ice Dry
TA Client Box Other	R-13 R-15			Water None Wet Ice Blue Ice Dry
TA Client Box Other				Water None Wettice Sive ice Dry
TA Client Box Other	IR-13 IR-16			Water None
TA Client Box Other	R-13 R-15			Water None
TA Client Box Other	IR-13 IR-15			Wet ice - Blue ice Dry Water None
TA Client Box Other	M-13 M-15			Wet ice Blue ice Dry Water None
TA Client Box Other	IR-13 IR-15			Wet ice Blue ice Dry Water None
TA Client Sox Other	R-13 R-15			Wel ice Blue ice Dry Water None
TA Client Box Other	IR-13 IR-15			Wel Ice Blue Ice Dry Water None
TA Client Box Other	IR-13 IR-16			Wat Ice Blue Ice Dry Water Hone
TA Client Box Other	M-13 M-15			Wet Ice Blue Ice Dry Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry Water None
TA Client Box Other	R-13 R-15			Wet Ice Sive Ice Dry Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Sive Ice Dry Water None
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Ice Dry I Water None
TA Client Sox Other	R-13 R-15			Wet ice Sive ice Dry i Water None
TA Client Box Other	R-13 IR-15			Wel ice Sive ice Dry i Water Hone
TA Client Box Other	R-13 R-15			Wet Ice Blue Ice Dry I
TA Client Box Other	IR-13 IR-15			Water None Wet Ice Blue Ice Dry I
OTTO OTTO				Water None

WI-NC-099 Cooler Receipt Form Page 2 - Multiple Coolers

EB-DEK-BAP

EB-DEK-BAP

Temperature readings: _ Container Preservative Temp Added (mls) Lot # Client Sample ID Lab ID Container Type pН DEK-MW-15002 240-174326-A-1 Plastic 1 liter - Nitric Acid <2 <2 DEK-MW-15002 240-174326-B-1 Plastic 1 liter - Nitric Acid DEK-MW-15005 240-174326-A-2 Plastic 1 liter - Nitric Acid <2 DEK-MW-15005 240-174326-B-2 Plastic 1 liter - Nitric Acid <2 DEK-MW-15006 240-174326-A-3 Plastic 1 liter - Nitric Acid <2 DEK-MW-15006 240-174326-B-3 Plastic 1 liter - Nitric Acid <2 Plastic 1 liter - Nitric Acid DUP-DEK-BAP-01 240-174326-A-4 <2 DUP-DEK-BAP-01 Plastic 1 liter - Nitric Acid <2 240-174326-B-4

Plastic 1 liter - Nitric Acid

Plastic 1 liter - Nitric Acid

240-174326-A-5

240-174326-B-5

<2

<2

13

Environment Testing 💸 eurofins

Chain of Custody Record

180 S. Van Buren Avenue **Eurofins Canton**

Barberton, OH 44203

Phone: 330-497-9396 Fax: 330-497-0772

N - None
O - AsNaO2
P - Na2O4S
O - Na2SO3
R - Na2SO3
T - TSD Dodecahydrate
U - Acetone
V - MCAA TVA protocol - Ra-226+228 action limit at TVA protocol - Ra-226+228 action limit at 5.0 pcirt. TVA protocol - Ra-226+228 action limit at TVA protocol - Ra-226+228 action limit at 5.0 pc/l. TVA protocol - Ra-226+228 action limit at 5.0 pci/L. Special Instructions/Note: Z - other (specify) Preservation Codes A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
F - NaNSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid COC No: 240-158469.1 240-174326-1 Page 1 of 1 I - Ice J - DI Water K - EDTA 5.0 pCi/L Total Number of containers N 8 2 Carrier Tracking No(s): State of Origin: Michigan **Analysis Requested** Accreditations Required (See note): Kris.Brooks@et.eurofinsus.com Ra226Ra228_GFPC × × × × × 1st_lecSep_0 Standard Target List × × × × × Lab PM: Brooks, Kris M 03.0/PrecSep_STD Standard Target List × × × × Perform MS/MSD (Yes or No) Field Filtered Sample (Yes or No.) E-Mail: Preservation Code: (W=water, S=solid, O=waste/oil, BT=Tesue, Water Water Water Water Water A=Alr) (C=comp, Sample G=grab) Type Eastern 10:55 Eastern 09:47 Eastern Eastern Eastern FAT Requested (days): Due Date Requested: 11/8/2022 Sample Date 10/4/22 10/4/22 10/4/22 10/4/22 10/4/22 Project #: 24024154 Phone: # 0,0 Client Information (Sub Contract Lab) Project Name: Karn/Weadock CCR Groundwater Monitoring Sample Identification - Client ID (Lab ID) 314-298-8566(Tel) 314-298-8757(Fax) DUP-DEK-BAP-01 (240-174326-4) JEK-MW-15002 (240-174326-1) JEK-MW-15005 (240-174326-2) ФЕК-МW-15006 (240-174326-3) TestAmerica Laboratories, Inc. EB-DEK-BAP (240-174326-5) 13715 Rider Trail North, Shipping/Receiving State, Zip: MO, 63045 Client Contact Earth City

Note: Since laboratory accreditations are subject to change. Eurofins Environment Testing North Central, LLC places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory or other instructions will be provided. Any changes to accreditation is the State of Origin isted above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing North Central, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins Environment Testing North Central, LLC.

Possible Hazard Identification			County Month California, LLC.
		Cample Diseased / A fee	
Unconfirmed		e may be assessed if samples	retained longer than 1 month)
		Return To Client Disposed But of	
Deliverable Requested: I, II, IV, Other (specify)	Primary Deliverable Rank: 2	Usar Dy Lat	Archive For Months
		Special Instructions/QC Requirements:	
Empty Kit Relinquished by:			
	Date:	Time:	
Relinguished by:	DeloTime		
t		Company Receiver by:	
	35000	では、これには、これには、これには、これには、これには、これには、これには、これに	Corribany
The siluatorisated by:			
		Company Received by	Townson Co.
Relinquished by:		DLT I	うにはいくらいる
2	Date/Time:	Company Received by	CALL CKY SAME
O			Company
Custody Seals Intact Custody Seal No		Autum K. Johnson	
		Cooler Temperatura(s) Or and Other Demodes	
NA SAY <		Constitution (a) Cario Circi natigines.	

Login Sample Receipt Checklist

Client: TRC Environmental Corporation.

Job Number: 240-174326-1

Login Number: 174326
List Source: Eurofins St. Louis
List Number: 2
List Creation: 10/11/22 01:02 PM

Creator: Worthington, Sierra M

Creator: Worthington, Sierra M		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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12



Environment Testing

ANALYTICAL REPORT

Eurofins Canton 180 S. Van Buren Avenue Barberton, OH 44203 Tel: (330)497-9396

Laboratory Job ID: 240-174334-1

Client Project/Site: Karn/Weadock CCR DEK Bottom Ash Pond & Impoundment

For:

TRC Environmental Corporation. 1540 Eisenhower Place Ann Arbor, Michigan 48108-7080

Attn: Darby Litz

Authorized for release by: 11/11/2022 8:17:08 PM

Kris Brooks, Project Manager II (330)966-9790

Kris.Brooks@et.eurofinsus.com

LINKS



Have a Question?



Visit us at:

www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the {0} Project Manager.

Table of Contents

Cover Page	1
Table of Contents	2
Definitions/Glossary	3
Case Narrative	4
Method Summary	5
Sample Summary	6
Client Sample Results	7
Tracer Carrier Summary	8
QC Sample Results	9
QC Association Summary	10
Lab Chronicle	11
Certification Summary	12
Chain of Custody	13
Racaint Chacklists	18

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14

Definitions/Glossary

Client: TRC Environmental Corporation. Job ID: 240-174334-1

Project/Site: Karn/Weadock CCR DEK Bottom Ash Pond &

Impoundment

Qualifiers

R	a	d	

MDA

Qualifier	Qualifier Description
G	The Sample MDC is greater than the requested RL.
U	Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
n	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)

LOD Limit of Detection (DoD/DOE) Limit of Quantitation (DoD/DOE) 100 MCL EPA recommended "Maximum Contaminant Level"

MDC Minimum Detectable Concentration (Radiochemistry) MDL Method Detection Limit MLMinimum Level (Dioxin) MPN Most Probable Number MQL Method Quantitation Limit

NC Not Calculated

Not Detected at the reporting limit (or MDL or EDL if shown) ND

Minimum Detectable Activity (Radiochemistry)

NEG Negative / Absent POS Positive / Present

PQL Practical Quantitation Limit

PRES Presumptive QC **Quality Control**

RER Relative Error Ratio (Radiochemistry)

Reporting Limit or Requested Limit (Radiochemistry) RL

RPD Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin) TEQ Toxicity Equivalent Quotient (Dioxin)

TNTC Too Numerous To Count

Case Narrative

Client: TRC Environmental Corporation.

Project/Site: Karn/Weadock CCR DEK Bottom Ash Pond & Impoundment

Job ID: 240-174334-1

Laboratory: Eurofins Canton

Narrative

Job Narrative 240-174334-1

Receipt

The sample was received on 10/8/2022 9:55 AM. Unless otherwise noted below, the sample arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 6 coolers at receipt time were 0.8°C, 1.2°C, 1.4°C, 2.2°C, 3.1°C and 4.1°C

Gas Flow Proportional Counter

Method 903.0: Radium-226 batch 586581Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.DEK-MW-18001 (240-174334-1), (LCS 160-586581/2-A), (MB 160-586581/1-A), (240-174332-A-1-A) and (240-174332-B-1-A DU)

Method 904.0: Radium-228 batch 586588The detection goal was not met for the following sample(s). The samples and batch QC were prepped at full volume. Matrix interferences are suspected because the method blank achieved the detection goal demonstrating acceptable sample preparation and instrument performance: DEK-MW-18001 (240-174334-1). Analytical results are reported with the detection limit achieved.

Method 904.0: Radium-228 batch 586588Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference DateDEK-MW-18001 (240-174334-1), (LCS 160-586588/2-A), (MB 160-586588/1-A), (240-174332-A-1-B) and (240-174332-B-1-B DU)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Rac

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

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Job ID: 240-174334-1

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Method Summary

Client: TRC Environmental Corporation.

Project/Site: Karn/Weadock CCR DEK Bottom Ash Pond &

Impoundment

Method **Method Description** Protocol Laboratory 903.0 Radium-226 (GFPC) EET SL EPA Radium-228 (GFPC) 904.0 EPA EET SL Ra226_Ra228 Combined Radium-226 and Radium-228 TAL-STL EET SL PrecSep STD Preparation, Precipitate Separation (Standard In-Growth) None EET SL PrecSep_0 Preparation, Precipitate Separation EET SL None

Protocol References:

EPA = US Environmental Protection Agency

None = None

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Job ID: 240-174334-1

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Sample Summary

Client: TRC Environmental Corporation.

Project/Site: Karn/Weadock CCR DEK Bottom Ash Pond &

Impoundment

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-174334-1	DEK-MW-18001	Water	10/04/22 12:03	10/08/22 09:55

Job ID: 240-174334-1

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Client Sample Results

Client: TRC Environmental Corporation.

Project/Site: Karn/Weadock CCR DEK Bottom Ash Pond &

Impoundment

Client Sample ID: DEK-MW-18001

Lab Sample ID: 240-174334-1

Matrix: Water

Job ID: 240-174334-1

Date Collected: 10/04/22 12:03 Date Received: 10/08/22 09:55

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.264		0.167	0.168	1.00	0.232	pCi/L	10/19/22 14:28	11/11/22 09:52	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	51.7		40 - 110					10/19/22 14:28	11/11/22 09:52	
Method: EPA 904.0		(GFPC)	Count	Total						·
- -	0 - Radium-228	(GFPC) Qualifier		Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Method: EPA 904.	0 - Radium-228	Qualifier	Count Uncert.	Uncert.	RL 1.00	MDC 1.05				Dil Fac
Method: EPA 904.0	0 - Radium-228	Qualifier	Count Uncert. (2σ+/-)	Uncert. (2σ+/-)				Prepared	Analyzed	Dil Fac
Method: EPA 904.0 Analyte Radium-228	0 - Radium-228	Qualifier G	Count Uncert. (2σ+/-) 0.771	Uncert. (2σ+/-)				Prepared 10/19/22 15:04	Analyzed 11/04/22 13:50	1

	_		Count	Total						
			Count	iotai						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium	1.93		0.789	0.805	5.00	1.05	pCi/L		11/11/22 16:43	1

Tracer/Carrier Summary

Client: TRC Environmental Corporation.

Project/Site: Karn/Weadock CCR DEK Bottom Ash Pond &

Impoundment

Method: 903.0 - Radium-226 (GFPC)

Matrix: Water Prep Type: Total/NA

240-174334-1 DEK-MW-18001 51.7 LCS 160-586581/2-A Lab Control Sample 85.8	Percent Yield (Acceptance Limits)			
240-174334-1 DEK-MW-18001 51.7 LCS 160-586581/2-A Lab Control Sample 85.8		Ва		
LCS 160-586581/2-A Lab Control Sample 85.8		(40-110)	Client Sample ID	Lab Sample ID
· · · · · · · · · · · · · · · · · · ·	 	51.7	DEK-MW-18001	240-174334-1
MB 160-586581/1-A Method Blank 79.9		85.8	Lab Control Sample	LCS 160-586581/2-A
		79.9	Method Blank	MB 160-586581/1-A
Tracer/Carrier Legend				Tracer/Carrier Legend

Method: 904.0 - Radium-228 (GFPC)

Matrix: Water Prep Type: Total/NA

		Ва	Υ
Lab Sample ID	Client Sample ID	(40-110)	(40-110)
240-174334-1	DEK-MW-18001	51.7	82.2
LCS 160-586588/2-A	Lab Control Sample	85.8	88.6
MB 160-586588/1-A	Method Blank	79.9	77.0

Y = Y Carrier

Eurofins Canton

11/11/2022

Job ID: 240-174334-1

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Project/Site: Karn/Weadock CCR DEK Bottom Ash Pond &

Impoundment

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-586581/1-A Client Sample ID: Method Blank

Matrix: Water

Analysis Batch: 589758

Prep Type: Total/NA

Prep Batch: 586581

MB MB Uncert. Uncert. Analyte Result Qualifier $(2\sigma + / -)$ $(2\sigma + / -)$ RL MDC Unit Prepared Dil Fac Analyzed Radium-226 Ū 0.0568 0.0568 1.00 0.118 pCi/L 0.005428 10/19/22 14:28 11/11/22 09:51

Total

Count

MB MB

Carrier Qualifier Limits Dil Fac %Yield Prepared Analyzed Ba Carrier 79.9 40 - 110 10/19/22 14:28 11/11/22 09:51

Lab Sample ID: LCS 160-586581/2-A Client Sample ID: Lab Control Sample

Matrix: Water

Analysis Batch: 589758

Prep Type: Total/NA

Prep Batch: 586581

Total Spike LCS LCS %Rec Uncert. RL %Rec Analyte Added MDC Unit Result Qual $(2\sigma + / -)$ Limits Radium-226 11.3 9.891 1.07 1.00 0.134 pCi/L 87 75 - 125

LCS LCS

Carrier %Yield Qualifier Limits 85.8 40 - 110 Ba Carrier

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-586588/1-A Client Sample ID: Method Blank

Total

Count

Matrix: Water

Analysis Batch: 588685

Prep Type: Total/NA

Prep Batch: 586588

	МВ	MB	Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.2209	U	0.372	0.373	1.00	0.640	pCi/L	10/19/22 15:04	11/04/22 13:44	1
	MB	MB								

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	79.9		40 - 110	10/19/22 15:04	11/04/22 13:44	1
Y Carrier	77.0		40 - 110	10/19/22 15:04	11/04/22 13:44	1

Total

Lab Sample ID: LCS 160-586588/2-A **Client Sample ID: Lab Control Sample**

Matrix: Water

Analysis Batch: 588685

Prep Type: Total/NA

Prep Batch: 586588

Spike LCS LCS Uncert. %Rec (2σ+/-) Analyte Added Result Qual RL MDC Unit %Rec Limits Radium-228 8.47 9.405 1.31 1.00 0.553 pCi/L 111 75 - 125

LCS LCS

Carrier %Yield Qualifier Limits Ba Carrier 85.8 40 - 110 88.6 40 - 110 Y Carrier

Eurofins Canton

11/11/2022

QC Association Summary

Client: TRC Environmental Corporation.

Project/Site: Karn/Weadock CCR DEK Bottom Ash Pond &

Impoundment

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Prep Batch: 586581

Lab Sample ID 240-174334-1	Client Sample ID DEK-MW-18001	Prep Type Total/NA	Water	Method PrecSep STD	Prep Batch
MB 160-586581/1-A	Method Blank	Total/NA	Water	PrecSep STD	
LCS 160-586581/2-A	Lab Control Sample	Total/NA	Water	PrecSep STD	

Prep Batch: 586588

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-174334-1	DEK-MW-18001	Total/NA	Water	PrecSep_0	
MB 160-586588/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-586588/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

Job ID: 240-174334-1

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Lab Chronicle

Client: TRC Environmental Corporation.

Project/Site: Karn/Weadock CCR DEK Bottom Ash Pond &

Impoundment

Client Sample ID: DEK-MW-18001

Lab Sample ID: 240-174334-1 Date Collected: 10/04/22 12:03

Matrix: Water

Job ID: 240-174334-1

Date Received: 10/08/22 09:55

	Batch	Batch		Dilution	Batch			Prepared
Prep Type	Type	Method	Run	Factor	Number	Analyst	Lab	or Analyzed
Total/NA	Prep	PrecSep STD			586581	ZR	EET SL	10/19/22 14:28
Total/NA	Analysis	903.0		1	589758	FLC	EET SL	11/11/22 09:52
Total/NA	Prep	PrecSep_0			586588	ZR	EET SL	10/19/22 15:04
Total/NA	Analysis	904.0		1	588708	FLC	EET SL	11/04/22 13:50
Total/NA	Analysis	Ra226_Ra228		1	589771	MLK	EET SL	11/11/22 16:43

Laboratory References:

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Accreditation/Certification Summary

Client: TRC Environmental Corporation.

Project/Site: Karn/Weadock CCR DEK Bottom Ash Pond &

Impoundment

Laboratory: Eurofins St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	20-001	05-06-25
ANAB	Dept. of Defense ELAP	L2305	04-06-25
ANAB	Dept. of Energy	L2305.01	04-06-25
ANAB	ISO/IEC 17025	L2305	04-06-25
Arizona	State	AZ0813	12-08-22
California	Los Angeles County Sanitation Districts	10259	06-30-22 *
California	State	2886	07-01-22 *
Connecticut	State	PH-0241	03-31-23
Florida	NELAP	E87689	06-30-23
HI - RadChem Recognition	State	n/a	06-30-23
Illinois	NELAP	200023	11-30-23
lowa	State	373	12-01-22
Kansas	NELAP	E-10236	10-31-22 *
Kentucky (DW)	State	KY90125	12-31-22
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-22
Louisiana (All)	NELAP	04080	06-30-23
Louisiana (DW)	State	LA011	12-31-22
Maryland	State	310	09-30-23
MI - RadChem Recognition	State	9005	06-30-23
Missouri	State	780	06-30-25
Nevada	State	MO000542020-1	07-31-23
New Jersey	NELAP	MO002	06-30-23
New York	NELAP	11616	04-01-23
North Dakota	State	R-207	06-30-23
NRC	NRC	24-24817-01	12-31-22
Oklahoma	NELAP	9997	08-31-23
Oregon	NELAP	4157	09-01-23
Pennsylvania	NELAP	68-00540	02-28-23
South Carolina	State	85002001	06-30-23
Texas	NELAP	T104704193	07-31-23
US Fish & Wildlife	US Federal Programs	058448	07-31-23
USDA	US Federal Programs	P330-17-00028	03-11-23
Utah	NELAP	MO000542021-14	07-31-23
Virginia	NELAP	10310	06-14-24
Washington	State	C592	08-30-23
West Virginia DEP	State	381	12-31-22

Job ID: 240-174334-1

Eurofins Canton

 $^{{}^{\}star}\operatorname{Accreditation/Certification\ renewal\ pending\ -\ accreditation/certification\ considered\ valid}.$

Barberton, OH 44203 Phone (330) 497-9396 Phone (330) 497-0772

180 S. Van Buren Avenue **Eurofins Canton**

Chain of Custody Record

Environment Testing

swentofins ...

0 - Ashao2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate Special Instructions/Note: Z - other (specify) U - Acetone V - MCAA W - pH 4-5 Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

Return To Client Disposal By Lab Mont COC No: 240-99542-29053.1 Preservation Codes H - Ascorbic Acid A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH
G - Amchlor - Ice J - DI Water - J - TrA Page: Page Job#: Total Number of containers Method of Shipment State of Origin: **Analysis Requested** Cooler Temperature(s) C and Other Remarks: Special Instructions/QC Requirements E-Mail: Kris.Brooks@et.eurofinsus.com 903.0, Ra226Ra228_GFPC Lab PM: Brooks, Kris M Time: 240-174334 Chain of Custody BT=TISSUE, A#Air) (W=water, Sesolid, O=wastefoll, Water Preservation Code Matrix Water Company Type (C=comp, G=grab) - 9239 Radiological Sample 41:01 James / A Yes A No 1016 Sample 5021 012-18.1 Time Sampler Andrew Unknown Date: (days) Compliance Project: Due Date Requested: (0-7-22 Date/Time: Sample Date Project #: 24024154 SSOW#: PO#: 178827 WO# Poison B Skin Irritant Possible Hazard Identification

A Non-Hazard Flammable Skin Irriti
Deliverable Requested: I, II, III, IV, Other (specify) Karn/Weadock CCR DEK Bottom Ash Pond & I Custody Seals Intact: Custody Seal No. 734-971-7080(Tel) 734-971-9022(Fax) TRC Environmental Corporation. JKrenz@trccompanies.com Empty Kit Relinquished by: Address: 1540 Eisenhower Place Client Information Sample Identification State, Zip: MI, 48108-7080 **DEK-MW-18001** Jacob Krenz Ann Arbor

W7-NC-099

mo Tolsius Excursion Form	meT see				
Wellice the ice by ice			1K-13 IK-15	Clent Box Other	AT
Met Ice pive Ice Dry Ice			SI-M CI-M	Clerk fox Other	AT
Melice the Ice Dylice			er-m er-m	Clent bex other	. AT
Wellice the Ice Dylice			ar-m cr-m	Clent tox Other	AT
Melice the Ice Dylice			SI-31 EI-31	Clent tox Other	AT
Melice the Ice Divice			SI-M EI-M	Clent tox Other	AT
Melice the Ice Dy ice			SI-M EI-M	Clerit Box Other	AT
Melice the ice by ice			SI-AI ET-AI	Clent box Other	AT
Met Ice Ine Ice Dry Ice			St-Al CI-Al	Clent tox Other	AT
Wellice the ice by ice			81-31 E1-31	Clerk box Other	AT
Melice the ice by ice			81-34 E1-31	Cleri tox Other	AT
Wellice Blue Ice Dry Ice	**************************************		81-31 E1-31	Clent Box Other	AT
Wet ice the ice by ice			IR-13 IR-15	Clent Box Other	AT
Wellice the Ice Dry Ice			R-13 IR-15	Clent Box Other	AT
Wet Ice - Blue Ice Dry Ice			SI-M EI-M	Clent box Other	AT
Melice the ice by ice			81-M C1-M	Clent tox Other	AT
Wellice the Ice by Ice			N-13 IR-16	Clent tox Other	AT
Melice the Ice Dryice			BI-M EI-M	Clent box Other	AT
Melice pine ice put ice			SI-M CI-M	Clent tox Other	AT
Melice pine ice pulce			SI-M CI-M	Clent box Other	AT
Melice the ice by ice			SI-M CI-M	Clent box Other	AT
Majer to by ice			21-AI E1-AI	Clent tox Other	AT
Wei ice the ice by ice			SI-M EI-M	Clent box Other	AT
Melice the ice bryice			ei-m ei-m	Clent tox Other	AT
Wellice the ice by ice			91-M C1-M	Clent tox Other	AT
Mei ice phe ice più ice			81-31 R-15	Clent tox Other	AT
Wellice the Ice Dry Ice			31-31 ET-31	Creut fox Other	AT
Wellice Blue Ice Dry Ice			31-31 ET-31	Clent tox Other	AT
Malice Blue ice Bry ice	3.0	8-0	9 GH 81-10	. Creut pox Other	WI)
anoli Note		177	81-31 E1-31	Clent Box Other	10
Melice the ice by ice	6-1	P-1	81-3H E1-3H	Clent tox Other	W
Wellich Blue Ice Dry Ice	CC	86		Clent tox Other	TH.
Wellice the ice by ice	7.7	17-1	Aria (R.15	Clent box Other	F)
Moler None	1-5	13	4(-11) (1-11		VI)
(Circle)	J° qmaT	O⁰ qmaT	(ələiə)	(elonio)	
Coolant	Corrected	Observed	# uno Al	nolet Description	_

-: # ujBo7

10/8/2022

Login Container Summary Report

240-174334

Temperature readings:				
Client Sample ID	<u>Lab ID</u>	Container Type	Container pH Temp	Preservative Added (mls) Lot #
DEK-MW-18001	240-174334-A-1	Plastic 1 liter - Nitric Acid	<2	
DEK-MW-18001	240-174334-B-1	Plastic 1 liter - Nitric Acid	<2	

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Eurofins Canton

180 S. Van Buren Avenue Barberton, OH 44203 Phone: 330-497-9396 Fax: 330-497-0772

** eurofins Environment Testing America Chain of Custody Record

Client Information (Sub Contract Lab)			Brook	Lao P.W. Brooks Kris M			Camer Tra	Camer Tracking No(s):	COC No:		Г
Client Contact: Shipping/Becaiving	Phone:		E-Mail:				State of Or	cio	240-158469.1	9.1	7
Company			Kris.B	Kris.Brooks@et.eurofinsus.com	eurofins.	ns.com	Michigan	-	Page 1 of 1	_	
TestAmerica Laboratories, Inc.			<u> </u>	Accreditations Required (See note):	Required	See note):			Job #:		Т
Address:	Due Date Requested:		T						240-174334-1	4-1	
City:	11/8/2022					Analysis I	Analysis Requested		Preservation Codes	n Codes: M - Hexane	_
Earth City	I A I Requested (days):								A - HCL B - NaOH		
State, Zip: MO, 63045	1								C - Zn Acetal D - Nitric Acid		
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO#:				19				F - MaHSO4 F - MeOH G - Amchlor	R - Na2S203 S - H2SO4	
Email:	WO #:		OK NO	(0)	Jeg.						
Project Name: Kam/Weadock CCR Groundwater Monitoring	Project #: 24024154			is or h	isT bis				J - Di Water K - EDTA L - EDA		
Site:	SSOW#:		lame	N) OS							
Sample Identification - Client ID (Lab ID)	Sample Date Time		Matrix (Www.ter. Smoolid. Owweste/cil. BT=Tssue.	M .SM myche 2_de85e19\0.50	04.0/PrecSep_0 14.0/PrecSep_0 14.0_822s9362s				o redmuk las		
		Preservation Code:			- 1		TOTAL PROPERTY.			Special Instructions/Note:	
DEK-MW-18001 (240-174334-1)	10(472) 12:03				-				X		
7	7	>	Water	×	×				2 TVA protoco	TVA protocol - Ra-226+228 action limit at	
of									200		1
18											
				E	F	-			38 38		
					-		1				
					Ŧ	+	1				
				-	-						
											,
Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing North Central, LLC places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing North Central, LLC laboratory or other instructions will be provided. Any changes to	int Testing North Central, LLC places bove for analysis/tests/matrix being a entral, LLC attention immediately. If a	the ownership of manalyzed, the sample	othod, analyte s must be sh tations are cu	& accreditation back to date	o the Eurol	ance upon out sub	contract laborato	nes. This sample shi	ipment is forwarded ur	nder chain-of-custody. If the I be provided. Any changes to	
Possible Hazard Identification				Samula	Jenoes	A for main of	usiony attesting	to said complicance t	to Eurofins Environme	ant Testing North Central, LLC.	
Unconfirmed					Return To Client	(A ree may b	assessed if san	samples are re	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)	an 1 month)	
Deilverable Requested: I, III, IV, Other (specify)	Primary Deliverable Rank: 2	21		Special Ir	struction	Special Instructions/QC Requirements:	nents:		Archive For	Months	
Empty Kit Relinquished by:	Date:		Time:	le:			Method	Method of Shipmont:			
Relings shed by:	Date/Time:	Company		Received	a Line	4		Date/Time:		Company	
Relinquished by:	VI .	Company	\ \{\sigma}	Received by:		1	*				
Relinquished by:	Date/Time:	, accomo			17	Setting Ich		OCT 1	1 2022 NRT	5 6 8 5 F	
Constant Seals Intact: Custody Seal No			<u>.</u>	Keceived by	A A	Autumn R. Johnson	บรอก	Date/Time:		Company	
Δ Yes Δ No				Cooler	Temperatu	Cooler Temperature(s) °C and Other Remarks:	Remarks:				
				14	13	11 12		8	567		1

Login Sample Receipt Checklist

Client: TRC Environmental Corporation.

Job Number: 240-174334-1

List Source: Eurofins St. Louis
List Number: 2
List Creation: 10/11/22 01:02 PM

Creator: Worthington, Sierra M

Creator: Worthington, Sierra M		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
s the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

11/11/2022

Eurofins Canton



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

To: CDBatts, Karn/Weadock

From: EBlaj, T-258

Date: October 27, 2022

Subject: RCRA GROUNDWATER MONITORING – DEK-JCW BACKGROUND WELLS – 2022 Q4

CC: HDRegister, P22-521 Darby Litz, Project Manager

BLSwanberg, P22-119 TRC Companies, Inc.

1540 Eisenhower Place Ann Arbor, MI 48108

Chemistry Project: 22-1023

TRC Environmental, Inc. conducted groundwater monitoring at the Karn/Weadock Background Wells area on 10/04/2022 and 10/05/2021, for the 4th Quarter monitoring 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 10/06/2022.

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



Testing performed in accordance with the A2LA scope of accredidation 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, when applicable; 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:

<u>Acronym</u>	<u>Description</u>
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

<u>Qualifier</u>	<u>Description</u>
*	Generic data flag, applicable description added in the corresponding notes section
В	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
Н	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



Work Order Sample Summary

Customer Name: Karn/Weadock Complex

Work Order ID: Q4_2022 DEK & JCW RCRA Background Wells

Date Received: 10/6/2022 **Chemistry Project:** 22-1023

Sample #	Field Sample ID	<u>Matrix</u>	Sample Date	<u>Site</u>
22-1023-01	MW-15002	Groundwater	10/05/2022 08:55 AM	DEK JCW Background
22-1023-02	MW-15008	Groundwater	10/04/2022 03:08 PM	DEK JCW Background
22-1023-03	MW-15016	Groundwater	10/05/2022 09:56 AM	DEK JCW Background
22-1023-04	MW-15019	Groundwater	10/04/2022 04:10 PM	DEK JCW Background
22-1023-05	DUP-Background	Groundwater	10/04/2022 12:00 AM	DEK JCW Background
22-1023-06	FB-Background	Water	10/05/2022 08:55 AM	DEK JCW Background

10/27/22



Laboratory Services
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Sample Site: **DEK JCW Background** Laboratory Project: **22-1023**

 Field Sample ID:
 MW-15002
 Collect Date:
 10/05/2022

 Lab Sample ID:
 22-1023-01
 Collect Time:
 08:55 AM

Matrix: Groundwater

Metals by EPA 6020B: CCR Rule Apper	ndix III-IV Tot	ai Metais	s Exp	Aliquot #: 22-1	023-01-C01-A01	Analyst: EE
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/18/2022	AB22-1018-03
Arsenic	9		ug/L	1.0	10/18/2022	AB22-1018-03
Barium	600		ug/L	5.0	10/18/2022	AB22-1018-03
Beryllium	ND		ug/L	1.0	10/18/2022	AB22-1018-03
Boron	147		ug/L	20.0	10/18/2022	AB22-1018-03
Cadmium	ND		ug/L	0.2	10/18/2022	AB22-1018-03
Calcium	214000		ug/L	1000.0	10/18/2022	AB22-1018-03
Chromium	2		ug/L	1.0	10/18/2022	AB22-1018-03
Cobalt	ND		ug/L	6.0	10/18/2022	AB22-1018-03
Copper	2		ug/L	1.0	10/18/2022	AB22-1018-03
Iron	15300		ug/L	20.0	10/18/2022	AB22-1018-03
Lead	ND		ug/L	1.0	10/18/2022	AB22-1018-03
Lithium	16		ug/L	10.0	10/18/2022	AB22-1018-03
Magnesium	31600		ug/L	1000.0	10/18/2022	AB22-1018-03
Molybdenum	ND		ug/L	5.0	10/18/2022	AB22-1018-03
Nickel	7		ug/L	2.0	10/18/2022	AB22-1018-03
Potassium	3930		ug/L	100.0	10/18/2022	AB22-1018-03
Selenium	36		ug/L	1.0	10/18/2022	AB22-1018-03
Silver	ND		ug/L	0.2	10/18/2022	AB22-1018-03
Sodium	1090000		ug/L	1000.0	10/18/2022	AB22-1018-03
Thallium	ND		ug/L	2.0	10/18/2022	AB22-1018-03
Vanadium	11		ug/L	2.0	10/18/2022	AB22-1018-03
Zinc	ND		ug/L	10.0	10/18/2022	AB22-1018-03
Mercury by EPA 7470A, Total, Aqueous	S			Aliquot #: 22-1	023-01-C01-A02	Analyst: CLE
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/19/2022	AB22-1019-01
Anions by EPA 300.0 CCR Rule Analyte	e List, CI, F, S	5O4, Aqւ	ieous	Aliquot #: 22-1	023-01-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	1820000		ug/L	1000.0	10/18/2022	AB22-1017-07
Fluoride	ND		ug/L	1000.0	10/17/2022	AB22-1017-07
Sulfate	2660		ug/L	1000.0	10/17/2022	AB22-1017-07
Total Dissolved Solids by SM 2540C				Aliquot #: 22-1	023-01-C03-A01	Analyst: CLE
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	4210	∝g	mg/L	10.0	10/11/2022	AB22-1010-06
Total Dissolved Collas	7210		mg/∟	10.0	10/11/2022	AD22-1010-00

10/27/22



A CENTURY OF EXCELLENCE

Sample Site: **DEK JCW Background** Laboratory Project: **22-1023**

 Field Sample ID:
 MW-15008
 Collect Date:
 10/04/2022

 Lab Sample ID:
 22-1023-02
 Collect Time:
 03:08 PM

Matrix: Groundwater

	endix III-IV To			Aliquot #: 22-1	023-02-C01-A01	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/18/2022	AB22-1018-03
Arsenic	2		ug/L	1.0	10/18/2022	AB22-1018-03
Barium	70		ug/L	5.0	10/18/2022	AB22-1018-03
Beryllium	ND		ug/L	1.0	10/18/2022	AB22-1018-03
Boron	175		ug/L	20.0	10/18/2022	AB22-1018-03
Cadmium	ND		ug/L	0.2	10/18/2022	AB22-1018-03
Calcium	113000		ug/L	1000.0	10/18/2022	AB22-1018-03
Chromium	1		ug/L	1.0	10/18/2022	AB22-1018-03
Cobalt	ND		ug/L	6.0	10/18/2022	AB22-1018-03
Copper	1		ug/L	1.0	10/18/2022	AB22-1018-03
Iron	17500		ug/L	20.0	10/18/2022	AB22-1018-03
Lead	ND		ug/L	1.0	10/18/2022	AB22-1018-03
Lithium	21		ug/L	10.0	10/18/2022	AB22-1018-03
Magnesium	16500		ug/L	1000.0	10/18/2022	AB22-1018-03
Molybdenum	ND		ug/L	5.0	10/18/2022	AB22-1018-03
Nickel	4		ug/L	2.0	10/18/2022	AB22-1018-03
Potassium	2970		ug/L	100.0	10/18/2022	AB22-1018-03
Selenium	ND		ug/L	1.0	10/18/2022	AB22-1018-03
Silver	ND		ug/L	0.2	10/18/2022	AB22-1018-03
Sodium	147000		ug/L	1000.0	10/18/2022	AB22-1018-03
Thallium	ND		ug/L	2.0	10/18/2022	AB22-1018-03
Vanadium	6		ug/L	2.0	10/18/2022	AB22-1018-03
Zinc	ND		ug/L	10.0	10/18/2022	AB22-1018-03
Mercury by EPA 7470A, Total, Aqueou	ıs			Aliquot #: 22-1	023-02-C01-A02	Analyst: CLE
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/19/2022	AB22-1019-01
Anions by EPA 300.0 CCR Rule Analy	te List, CI, F,	SO4, Aqı	ieous	Aliquot #: 22-1	023-02-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	261000		ug/L	1000.0	10/18/2022	AB22-1017-07
Fluoride	ND		ug/L	1000.0	10/17/2022	AB22-1017-07
Sulfate	19300		ug/L	1000.0	10/17/2022	AB22-1017-07
Total Dissolved Solids by SM 2540C				Aliquot #: 22-1	023-02-C03-A01	Analyst: CLE
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking



A CENTURY OF EXCELLENCE

Report Date: 10/27/22

Sample Site: Laboratory Project: **DEK JCW Background** 22-1023

Collect Date: Field Sample ID: MW-15016 10/05/2022 Lab Sample ID: 22-1023-03 Collect Time: 09:56 AM

Matrix: Groundwater

Metals by EPA 6020B: CCR Rule Appe	ndix III-IV To	tal Metals	s Ехр	Aliquot #: 22-1	023-03-C01-A01	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/18/2022	AB22-1018-03
Arsenic	3		ug/L	1.0	10/18/2022	AB22-1018-03
Barium	115		ug/L	5.0	10/18/2022	AB22-1018-03
Beryllium	ND		ug/L	1.0	10/18/2022	AB22-1018-03
Boron	690		ug/L	20.0	10/18/2022	AB22-1018-03
Cadmium	ND		ug/L	0.2	10/18/2022	AB22-1018-03
Calcium	289000		ug/L	1000.0	10/18/2022	AB22-1018-03
Chromium	ND		ug/L	1.0	10/18/2022	AB22-1018-03
Cobalt	ND		ug/L	6.0	10/18/2022	AB22-1018-03
Copper	3		ug/L	1.0	10/18/2022	AB22-1018-03
Iron	427		ug/L	20.0	10/18/2022	AB22-1018-03
Lead	ND		ug/L	1.0	10/18/2022	AB22-1018-03
Lithium	91		ug/L	10.0	10/18/2022	AB22-1018-03
Magnesium	38600		ug/L	1000.0	10/18/2022	AB22-1018-03
Molybdenum	6		ug/L	5.0	10/18/2022	AB22-1018-03
Nickel	12		ug/L	2.0	10/18/2022	AB22-1018-03
Potassium	15600		ug/L	100.0	10/18/2022	AB22-1018-03
Selenium	2		ug/L	1.0	10/18/2022	AB22-1018-03
Silver	ND		ug/L	0.2	10/18/2022	AB22-1018-03
Sodium	141000		ug/L	1000.0	10/18/2022	AB22-1018-03
Thallium	ND		ug/L	2.0	10/18/2022	AB22-1018-03
Vanadium	2		ug/L	2.0	10/18/2022	AB22-1018-03
Zinc	11		ug/L	10.0	10/18/2022	AB22-1018-03
Mercury by EPA 7470A, Total, Aqueou	s			Aliquot #: 22-1	023-03-C01-A02	Analyst: CLE
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/19/2022	AB22-1019-01
Anions by EPA 300.0 CCR Rule Analyt	e List, CI, F,	SO4, Aqı	ieous	Aliquot #: 22-1	023-03-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	236000		ug/L	1000.0	10/18/2022	AB22-1017-07
Fluoride	ND		ug/L	1000.0	10/17/2022	AB22-1017-07
Sulfate	639000		ug/L	1000.0	10/18/2022	AB22-1017-07
Total Dissolved Solids by SM 2540C				Aliquot #: 22-1	023-03-C03-A01	Analyst: CLE
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	1760	J	mg/L	10.0	10/10/2022	AB22-1010-08
		1023 Page				

10/27/22



Laboratory Services
A CENTURY OF EXCELLENCE

Sample Site: **DEK JCW Background** Laboratory Project: **22-1023**

 Field Sample ID:
 MW-15019
 Collect Date:
 10/04/2022

 Lab Sample ID:
 22-1023-04
 Collect Time:
 04:10 PM

Matrix: Groundwater

Metals by EPA 6020B: CCR Rule Appe	ndix III-IV To	tal Metals	s Ехр	Aliquot #: 22-1	023-04-C01-A01	Analyst: EB
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Antimony	ND		ug/L	1.0	10/18/2022	AB22-1018-03
Arsenic	2		ug/L	1.0	10/18/2022	AB22-1018-03
Barium	308		ug/L	5.0	10/18/2022	AB22-1018-03
Beryllium	ND		ug/L	1.0	10/18/2022	AB22-1018-03
Boron	297		ug/L	20.0	10/18/2022	AB22-1018-03
Cadmium	ND		ug/L	0.2	10/18/2022	AB22-1018-03
Calcium	139000		ug/L	1000.0	10/18/2022	AB22-1018-03
Chromium	ND		ug/L	1.0	10/18/2022	AB22-1018-03
Cobalt	ND		ug/L	6.0	10/18/2022	AB22-1018-03
Copper	1		ug/L	1.0	10/18/2022	AB22-1018-03
Iron	20700		ug/L	20.0	10/18/2022	AB22-1018-03
Lead	ND		ug/L	1.0	10/18/2022	AB22-1018-03
Lithium	12		ug/L	10.0	10/18/2022	AB22-1018-03
Magnesium	34100		ug/L	1000.0	10/18/2022	AB22-1018-03
Molybdenum	ND		ug/L	5.0	10/18/2022	AB22-1018-03
Nickel	5		ug/L	2.0	10/18/2022	AB22-1018-03
Potassium	1980		ug/L	100.0	10/18/2022	AB22-1018-03
Selenium	1		ug/L	1.0	10/18/2022	AB22-1018-03
Silver	ND		ug/L	0.2	10/18/2022	AB22-1018-03
Sodium	216000		ug/L	1000.0	10/18/2022	AB22-1018-03
Thallium	ND		ug/L	2.0	10/18/2022	AB22-1018-03
Vanadium	3		ug/L	2.0	10/18/2022	AB22-1018-03
Zinc	ND		ug/L	10.0	10/18/2022	AB22-1018-03
Mercury by EPA 7470A, Total, Aqueou	S			Aliquot #: 22-1	023-04-C01-A02	Analyst: CLE
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Mercury	ND		ug/L	0.2	10/19/2022	AB22-1019-01
Anions by EPA 300.0 CCR Rule Analyt	e List, CI, F,	SO4, Aqu	ieous	Aliquot #: 22-1	023-04-C02-A01	Analyst: DMW
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Chloride	355000		ug/L	1000.0	10/18/2022	AB22-1017-07
Fluoride	ND		ug/L	1000.0	10/17/2022	AB22-1017-07
Sulfate	59700		ug/L	1000.0	10/17/2022	AB22-1017-07
Total Dissolved Solids by SM 2540C				Aliquot #: 22-1	023-04-C03-A01	Analyst: CLE
Parameter(s)	Result	Flag	Units	RL	Analysis Date	Tracking
Total Dissolved Solids	1190	J	mg/L	10.0	10/10/2022	AB22-1010-08
***		1023 Page				

Collect Time:

10/27/22

12:00 AM



Laboratory Services A CENTURY OF EXCELLENCE

Sample Site: **DEK JCW Background** Laboratory Project: 22-1023

Field Sample ID: **DUP-Background**

Lab Sample ID: 22-1023-05 Matrix: Groundwater

Collect Date: 10/04/2022

Metals by EPA 6020B: CCR Rule Appendix III-IV Total Metals Exp Aliquot #: 22-1023-05-C01-A01 Analyst: EB Parameter(s) Result Flag Units RL **Analysis Date** Tracking Antimony ND ug/L 1.0 10/18/2022 AB22-1018-03 2 Arsenic ug/L 1.0 10/18/2022 AB22-1018-03 **Barium** 70 ug/L 5.0 10/18/2022 AB22-1018-03 Beryllium ND ug/L 1.0 10/18/2022 AB22-1018-03 **Boron** 181 ug/L 20.0 10/18/2022 AB22-1018-03 Cadmium ND ug/L 0.2 10/18/2022 AB22-1018-03 Calcium 112000 ug/L 1000.0 10/18/2022 AB22-1018-03 Chromium 1 ug/L 10/18/2022 1.0 AB22-1018-03 Cobalt ND ug/L 6.0 10/18/2022 AB22-1018-03 Copper ND ug/L 1.0 10/18/2022 AB22-1018-03 Iron 17700 ug/L 20.0 10/18/2022 AB22-1018-03 Lead ND ug/L 10/18/2022 AB22-1018-03 1.0 Lithium 20 ua/L 10.0 10/18/2022 AB22-1018-03 Magnesium 17200 ug/L 1000.0 10/18/2022 AB22-1018-03 Molybdenum ND ug/L 5.0 10/18/2022 AB22-1018-03 Nickel 4 10/18/2022 ug/L 2.0 AB22-1018-03 Potassium 2470 ug/L 100.0 10/18/2022 AB22-1018-03 ND Selenium ug/L 1.0 10/18/2022 AB22-1018-03 Silver ND ug/L 0.2 10/18/2022 AB22-1018-03 Sodium 146000 1000.0 ug/L 10/18/2022 AB22-1018-03 2.0 **Thallium** ND ug/L 10/18/2022 AB22-1018-03 Vanadium 6 2.0 10/18/2022 AB22-1018-03 ug/L Zinc ND ug/L 10.0 10/18/2022 AB22-1018-03 Mercury by EPA 7470A, Total, Aqueous Aliquot #: 22-1023-05-C01-A02 **Analyst: CLE** Units Result Flag RL Parameter(s) **Analysis Date** Tracking Mercury ND ug/L 0.2 10/19/2022 AB22-1019-01 Anions by EPA 300.0 CCR Rule Analyte List, CI, F, SO4, Aqueous Aliquot #: 22-1023-05-C02-A01 Analyst: DMW Parameter(s) Result Flag Units RL **Analysis Date Tracking** Chloride 246000 10/18/2022 ug/L 1000.0 AB22-1017-07 Fluoride ND ug/L 10/17/2022 AB22-1017-07 1000.0 Sulfate 18800 ug/L 10/17/2022 AB22-1017-07 1000.0 **Total Dissolved Solids by SM 2540C** Aliquot #: 22-1023-05-C03-A01 **Analyst: CLE** Result Parameter(s) Flag Units RL **Analysis Date Tracking Total Dissolved Solids** 885

mg/L

10.0

10/10/2022

AB22-1010-08



10/27/22



A CENTURY OF EXCELLENCE

Sample Site: **DEK JCW Background** Laboratory Project: **22-1023**

Field Sample ID: FB-Background Collect Date: 10/05/2022
Lab Sample ID: 22-1023-06 Collect Time: 08:55 AM

Matrix: Water

Metals by EPA 6020B: CCR R	Rule Appendix III-IV Tot	al Metals Exp	Aliquot #: 22-1	023-06-C01-A01	Analyst: EB
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Antimony	ND	ug/L	1.0	10/18/2022	AB22-1018-03
Arsenic	ND	ug/L	1.0	10/18/2022	AB22-1018-03
Barium	ND	ug/L	5.0	10/18/2022	AB22-1018-03
Beryllium	ND	ug/L	1.0	10/18/2022	AB22-1018-03
Boron	ND	ug/L	20.0	10/18/2022	AB22-1018-03
Cadmium	ND	ug/L	0.2	10/18/2022	AB22-1018-03
Calcium	ND	ug/L	1000.0	10/18/2022	AB22-1018-03
Chromium	ND	ug/L	1.0	10/18/2022	AB22-1018-03
Cobalt	ND	ug/L	6.0	10/18/2022	AB22-1018-03
Copper	ND	ug/L	1.0	10/18/2022	AB22-1018-03
Iron	ND	ug/L	20.0	10/18/2022	AB22-1018-03
Lead	ND	ug/L	1.0	10/18/2022	AB22-1018-03
Lithium	ND	ug/L	10.0	10/18/2022	AB22-1018-03
Magnesium	ND	ug/L	1000.0	10/18/2022	AB22-1018-03
Molybdenum	ND	ug/L	5.0	10/18/2022	AB22-1018-03
Nickel	ND	ug/L	2.0	10/18/2022	AB22-1018-03
Potassium	ND	ug/L	100.0	10/18/2022	AB22-1018-03
Selenium	ND	ug/L	1.0	10/18/2022	AB22-1018-03
Silver	ND	ug/L	0.2	10/18/2022	AB22-1018-03
Sodium	ND	ug/L	1000.0	10/18/2022	AB22-1018-03
Thallium	ND	ug/L	2.0	10/18/2022	AB22-1018-03
Vanadium	ND	ug/L	2.0	10/18/2022	AB22-1018-03
Zinc	ND	ug/L	10.0	10/18/2022	AB22-1018-03
Mercury by EPA 7470A, Total	l, Aqueous		Aliquot #: 22-1	023-06-C01-A02	Analyst: CLE
Parameter(s)	Result	Flag Units	RL	Analysis Date	Tracking
Mercury	ND	ug/L	0.2	10/19/2022	AB22-1019-01





Report Date: 10/27/22

Data Qualifiers	Exception Summary
	No exceptions occurred.

CONSUMERS **ENERGY**

Chemistry Department

General Standard Operating Procedure

PROC CHEM-1.2.01 PAGE 1 OF 2 **REVISION 4** ATTACHMENT A

TITLE: SAMPLE LOG-IN - SHIPMENT INSPECTION FORM

Proje	ect Log-In Number:	22-1023				
	ection Date: 10.6-7			ection By:	M	
Samp	ple Origin/Project Name	: 04-2022	JCM-DEK	Background	L wells	
Ship	Pony Other/Hand Carry (wl Tracking Number: 21	FedEx	UPS	_ USPS		rborne
PL:					iched. Tes	
Snipj	Cooler Cookaged Cooler	Cardboard Box _	Cr	ntamers received. sstom Case		
Cond	Damaged Shipment O	bserved: None_		Dented		aking
	nent Security: Enter if a Shipping Containers F osed Documents: Enter t	Received: Opene	d	Sealed		
	CoC Wo	7. 1.4			Other	
Тетр	As-Received Tempera M&TE # and Expirati	ture Range 3.6	5-1°C San	sample containers		No
Numb	oer and Type of Contain	ers: Enter the to	tal number of san	ple containers rece	eived.	
0.0-14.0	Container Type VOA (40mL or 60mL)	Water S	<u></u>	Other	Broken	<u>Leaking</u>
COH NO: 13-640-508	Quart/Liter (g/p) 9-oz (amber glass jar)					
Lot: 22240	2-oz (amber glass)					-
EXP: 8.1.22	125 mL (plastic) 24 mL vial (glass) 250	<u> </u>				

CHAIN OF CUSTODY



CONSUMERS ENERGY COMPANY - LABORATORY SERVICES

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Page _ of _ l

SAM	PLING SITE / CU	STOMER:			PROJECT NUMBER:	SAP CC or WC)#:							A	NAL	YSIS	REC	QUES	TED	QA REQUIREMENT:
Q4-2	022 JCW-DEK	Background W	ells		22-1023	REQUESTER:	Harc	ld R	egis	ter			10	(Attac	h Lis	t if M	ore Sp	pace is	Needed)	QA REQUIREMENT:
	PLING TEAM: VID TEAM:	s haley			TURNAROUND TIME REQUIRED: □ 24 HR □ 48 HR □ 3 DAYS □ STA	ANDARD ⊠ OTH	ER_													□ NPDES ☑ TNI
	D REPORT TO:	Caleb Batts			email:	phone:												□ ISO 17025		
1	COPY TO:	Harold Regis	ter		MATRIX CODES: GW = Groundwater OX = Other WW = Wastewater SL = Sludge W = Water / Aqueous Liquid A = Air				-	-	ERS	VE	sls							☐ 10 CFR 50 APP. B☐ INTERNAL INFO
	LAB	SAMPLE COLI	LECTION	XIX	S = Soil / General Solid WP = Wipe O = Oil WT = Gene		TOTAL#			7 -		m .	Il Metals	suc						□ OTHER
S.	AMPLE ID	DATE	TIME	MATRIX	FIELD SAMPLE ID / LOC	FIELD SAMPLE ID / LOCATION	TOTA None HNO3 H3SO4 NAOH HCI MGOH Other		Total	Anions	TDS	SOL				REMARKS				
10	22-1023-01	10/5/22	855	GW	MW-15002		3	2	1				x	x	x					
П	-02	10/4/22	1508	GW	MW-15008		3	2	I				x	x	x					
	-03	1015/22	956	GW	MW-15016		3	2	1				x	x	x					
	-04	10/4/22	1610	GW	MW-15019		3	2	1				x	x	x					
	-05	0/4/22	-	GW	DUP-Background		3	2	1				x	x	x					
	→ -06	1015/22	855	W	FB- Background		1						x							
									4		Ц									
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DELT	NQUISHED BY:			DATE/	TIME: R	ECEIVED BY:							000	MME	NITO					
KELI	He?	2			T-22 /1700	Fedex								IVIIVIE	INIS					
RELI	red 5	×	.1	DATE/	TIME: R	ECEIVED BY:							7.5			ce? [4		□ No		Date: 5-25-23
					2	2-1023 Page 13 of	13				-		-							



ANALYTICAL REPORT

Eurofins Canton 180 S. Van Buren Avenue Barberton, OH 44203 Tel: (330)497-9396

Laboratory Job ID: 240-174329-1

Client Project/Site: Karn/Weadock CCR Background Well

For:

🗱 eurofins

TRC Environmental Corporation. 1540 Eisenhower Place Ann Arbor, Michigan 48108-7080

Attn: Darby Litz

Authorized for release by: 11/10/2022 4:24:07 PM

Kris Brooks, Project Manager II (330)966-9790

Kris.Brooks@et.eurofinsus.com

LINKS

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Have a Question?



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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the {0} Project Manager.

Table of Contents

Cover Page	1
Table of Contents	2
Definitions/Glossary	3
Case Narrative	4
Method Summary	5
Sample Summary	6
Client Sample Results	7
Tracer Carrier Summary	13
QC Sample Results	14
QC Association Summary	15
Lab Chronicle	16
Certification Summary	18
Chain of Custody	19
Receipt Checklists	24

9

4

6

8

10

11

13

Definitions/Glossary

Client: TRC Environmental Corporation. Job ID: 240-174329-1

Project/Site: Karn/Weadock CCR Background Well

Qualifiers

Rad

Qualifier Qualifier Description

U Result is less than the sample detection limit.

Glossary

Abbreviation These commonly used abbreviations may or may not be present in this report.

Listed under the "D" column to designate that the result is reported on a dry weight basis

%R Percent Recovery
CFL Contains Free Liquid
CFU Colony Forming Unit
CNF Contains No Free Liquid

DER Duplicate Error Ratio (normalized absolute difference)

Dil Fac Dilution Factor

DL Detection Limit (DoD/DOE)

DL, RA, RE, IN Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample

DLC Decision Level Concentration (Radiochemistry)

EDL Estimated Detection Limit (Dioxin)

LOD Limit of Detection (DoD/DOE)

LOQ Limit of Quantitation (DoD/DOE)

MCL EPA recommended "Maximum Contaminant Level"

MDA Minimum Detectable Activity (Radiochemistry)

MDC Minimum Detectable Concentration (Radiochemistry)

MDL Method Detection Limit
ML Minimum Level (Dioxin)
MPN Most Probable Number
MQL Method Quantitation Limit

NC Not Calculated

ND Not Detected at the reporting limit (or MDL or EDL if shown)

NEG Negative / Absent
POS Positive / Present

PQL Practical Quantitation Limit

PRES Presumptive
QC Quality Control

RER Relative Error Ratio (Radiochemistry)

RL Reporting Limit or Requested Limit (Radiochemistry)

RPD Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin)
TEQ Toxicity Equivalent Quotient (Dioxin)

TNTC Too Numerous To Count

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1

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Case Narrative

Client: TRC Environmental Corporation.

Project/Site: Karn/Weadock CCR Background Well

Job ID: 240-174329-1

Laboratory: Eurofins Canton

Narrative

Job Narrative 240-174329-1

Comments

All analysis were performed at Eurofins St. Louis Laboratory.

Receipt

The samples were received on 10/8/2022 9:55 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 6 coolers at receipt time were 0.8° C, 1.2° C, 1.4° C, 2.2° C, 3.1° C and 4.1° C.

RAD

Method 903.0: Radium-226 batch 586489

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date

MW-15002 (240-174329-1), MW-15008 (240-174329-2), MW-15016 (240-174329-3), MW-15019 (240-174329-4), DUP-BACKGROUND (240-174329-5), FB-BACKGROUND (240-174329-6), (LCS 160-586489/2-A), (MB 160-586489/1-A), (180-145631-A-1-A) and (180-145631-A-1-B DU)

Method 904.0: Radium-228 batch 586571

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date

MW-15002 (240-174329-1), MW-15008 (240-174329-2), MW-15016 (240-174329-3), MW-15019 (240-174329-4), DUP-BACKGROUND (240-174329-5), FB-BACKGROUND (240-174329-6), (LCS 160-586571/2-A), (MB 160-586571/1-A), (180-145631-A-1-C) and (180-145631-A-1-D DU)

Method 904.0: Radium-228 batch 586571

The sample duplicate (DUP) precision was outside control limits. Sample matrix interference is suspected. (180-145631-A-1-D DU)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

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Job ID: 240-174329-1

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Method Summary

Client: TRC Environmental Corporation.

Project/Site: Karn/Weadock CCR Background Well

Method	Method Description	Protocol	Laboratory
903.0	Radium-226 (GFPC)	EPA	EET SL
904.0	Radium-228 (GFPC)	EPA	EET SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	EET SL
PrecSep STD	Preparation, Precipitate Separation (Standard In-Growth)	None	EET SL
PrecSep 0	Preparation Precipitate Separation	None	FFT SI

Protocol References:

EPA = US Environmental Protection Agency

None = None

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Job ID: 240-174329-1

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Sample Summary

Client: TRC Environmental Corporation.
Project/Site: Karn/Weadock CCR Background Well

1 - b 0 l - ID	Olland Canada ID	B. B 4 - 1 - 1	0 - 11 41	D
Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-174329-1	MW-15002	Water	10/05/22 08:55	10/08/22 09:55
240-174329-2	MW-15008	Water	10/04/22 15:08	10/08/22 09:55
240-174329-3	MW-15016	Water	10/05/22 09:56	10/08/22 09:55
240-174329-4	MW-15019	Water	10/04/22 16:10	10/08/22 09:55
240-174329-5	DUP-BACKGROUND	Water	10/04/22 00:00	10/08/22 09:55
240-174329-6	FB-BACKGROUND	Water	10/05/22 08:55	10/08/22 09:55

Job ID: 240-174329-1

Client Sample Results

Client: TRC Environmental Corporation. Job ID: 240-174329-1

Project/Site: Karn/Weadock CCR Background Well

Client Sample ID: MW-15002

Lab Sample ID: 240-174329-1

Date Collected: 10/05/22 08:55 **Matrix: Water** Date Received: 10/08/22 09:55

Method: EPA 903	3.0 - Radium	-226 (GFP	C)							
		•	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.850		0.196	0.210	1.00	0.131	pCi/L	10/19/22 12:19	11/09/22 15:56	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	97.5		40 - 110					10/19/22 12:19	11/09/22 15:56	1

Method: EPA 904	4.0 - Radium	-228 (GFP	C)							
		•	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	мрс	Unit	Prepared	Analyzed	Dil Fac
Radium-228	2.69		0.687	0.730	1.00	0.743		10/19/22 13:40	11/02/22 13:55	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	97.5		40 - 110					10/19/22 13:40	11/02/22 13:55	1
Y Carrier	86.0		40 - 110					10/19/22 13:40	11/02/22 13:55	1

Method: TAL-STL F	Ra226_Ra	228 - Com	bined Radi	um-226 an	d Radiur	n-228				
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	3.54		0.714	0.760	5.00	0.743	pCi/L		11/10/22 13:17	1

11/10/2022

Client Sample Results

Client: TRC Environmental Corporation. Job ID: 240-174329-1

Project/Site: Karn/Weadock CCR Background Well

Client Sample ID: MW-15008

Lab Sample ID: 240-174329-2

Date Collected: 10/04/22 15:08 **Matrix: Water** Date Received: 10/08/22 09:55

Method: EPA 903	3.0 - Radium	-226 (GFP	C)							
		•	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.265	·	0.118	0.120	1.00	0.125	pCi/L	10/19/22 12:19	11/09/22 15:58	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	98.3		40 - 110					10/19/22 12:19	11/09/22 15:58	1

		•	Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.62		0.594	0.612	1.00	0.754	pCi/L	10/19/22 13:40	11/02/22 13:55	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	98.3		40 - 110					10/19/22 13:40	11/02/22 13:55	1
Y Carrier	87.9		40 - 110					10/19/22 13:40	11/02/22 13:55	1

Method: TAL-STL F	Ra226_Ra	228 - Com	bined Radi	um-226 an	d Radiur	n-228				
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.88		0.606	0.624	5.00	0.754	pCi/L		11/10/22 13:17	1

Client: TRC Environmental Corporation. Job ID: 240-174329-1

Project/Site: Karn/Weadock CCR Background Well

Client Sample ID: MW-15016

Lab Sample ID: 240-174329-3 Date Collected: 10/05/22 09:56 Date Received: 10/08/22 09:55

Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

		•	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.151	U	0.112	0.113	1.00	0.158	pCi/L	10/19/22 12:19	11/09/22 15:58	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	85.0		40 - 110					10/19/22 12:19	11/09/22 15:58	

Method: EPA 904.0 - Radium-228 (GFPC) Count Total Uncert. Uncert. Analyte Result Qualifier $(2\sigma + / -)$ RL**MDC** Unit Prepared Analyzed Dil Fac $(2\sigma +/-)$ 0.636 0.789 pCi/L 10/19/22 13:40 11/02/22 13:55 Radium-228 1.56 0.619 1.00

Carrier	% Yieia	Quaimer Limits	Prepared	Anaiyzea	DII Fac
Ba Carrier	85.0	40 - 110	10/19/22 13:40	11/02/22 13:55	1
Y Carrier	86.7	40 - 110	10/19/22 13:40	11/02/22 13:55	1

Method: TAL-STL Ra226 Ra228 - Combined Radium-226 and Radium-228

	_		Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.71		0.629	0.646	5.00	0.789	pCi/L		11/10/22 13:17	1

Client: TRC Environmental Corporation. Job ID: 240-174329-1

Project/Site: Karn/Weadock CCR Background Well

Client Sample ID: MW-15019

Lab Sample ID: 240-174329-4

Date Collected: 10/04/22 16:10 **Matrix: Water** Date Received: 10/08/22 09:55

Method: EPA 903	3.0 - Radium	-226 (GFP	C)							
			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.478		0.153	0.159	1.00	0.132	pCi/L	10/19/22 12:19	11/09/22 15:58	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	97.5		40 - 110					10/19/22 12:19	11/09/22 15:58	1

	4.0 - Radium	(0	•,							
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	2.11		0.628	0.657	1.00	0.684	pCi/L	10/19/22 13:40	11/02/22 13:55	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	97.5		40 - 110					10/19/22 13:40	11/02/22 13:55	1
Y Carrier	83.7		40 - 110					10/19/22 13:40	11/02/22 13:55	1

Method: TAL-STL F	Ra226_Ra	228 - Com	bined Radi	ium-226 an	d Radiur	n-228				
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium	2.59		0.646	0.676	5.00	0.684	pCi/L		11/10/22 13:17	1

Client: TRC Environmental Corporation. Job ID: 240-174329-1

Project/Site: Karn/Weadock CCR Background Well

Client Sample ID: DUP-BACKGROUND

Lab Sample ID: 240-174329-5 Date Collected: 10/04/22 00:00 **Matrix: Water**

Date Received: 10/08/22 09:55

Method: EPA 90	3.0 - Radium	-226 (GFP	C)							
			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.439		0.157	0.162	1.00	0.163	pCi/L	10/19/22 12:19	11/09/22 16:00	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	95.8		40 - 110					10/19/22 12:19	11/09/22 16:00	1

Method: EPA 904	4.0 - Radium	-228 (GFP	C)							
Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.77		0.702	0.720	1.00	0.956	pCi/L	10/19/22 13:40	11/02/22 13:55	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	95.8		40 - 110					10/19/22 13:40	11/02/22 13:55	1
Y Carrier	85.6		40 - 110					10/19/22 13:40	11/02/22 13:55	1

Method: TAL-STL F	Ra226_Ra	228 - Com	bined Radi	um-226 an	d Radiur	n-228				
	_		Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium	2.21		0.719	0.738	5.00	0.956	pCi/L		11/10/22 13:17	1

Client: TRC Environmental Corporation. Job ID: 240-174329-1

Project/Site: Karn/Weadock CCR Background Well

Client Sample ID: FB-BACKGROUND

Lab Sample ID: 240-174329-6 Date Collected: 10/05/22 08:55 **Matrix: Water**

Date Received: 10/08/22 09:55

Method: EPA 903	3.0 - Radium	-226 (GFP	C)							
		•	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0435	U	0.0662	0.0663	1.00	0.114	pCi/L	10/19/22 12:19	11/09/22 16:00	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	96.8		40 - 110					10/19/22 12:19	11/09/22 16:00	1

Method: EPA 904	4.0 - Radium	-228 (GFP	C)							
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.51		0.458	0.478	1.00	0.512	pCi/L	10/19/22 13:40	11/02/22 13:55	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	96.8		40 - 110					10/19/22 13:40	11/02/22 13:55	1
Y Carrier	87.5		40 - 110					10/19/22 13:40	11/02/22 13:55	1

Method: TAL-STL F	Ra226_Ra	228 - Com	bined Radi	um-226 an	d Radiur	n-228				
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.55		0.463	0.483	5.00	0.512	pCi/L		11/10/22 13:17	1

Tracer/Carrier Summary

Client: TRC Environmental Corporation.

Project/Site: Karn/Weadock CCR Background Well

Method: 903.0 - Radium-226 (GFPC)

Matrix: Water Prep Type: Total/NA

			Percent Yield (Acceptance Limits)
		Ва	
Lab Sample ID	Client Sample ID	(40-110)	
240-174329-1	MW-15002	97.5	
240-174329-2	MW-15008	98.3	
240-174329-3	MW-15016	85.0	
240-174329-4	MW-15019	97.5	
240-174329-5	DUP-BACKGROUND	95.8	
240-174329-6	FB-BACKGROUND	96.8	
LCS 160-586489/2-A	Lab Control Sample	99.8	
MB 160-586489/1-A	Method Blank	99.8	
Tracer/Carrier Legen	d		

Method: 904.0 - Radium-228 (GFPC)

Matrix: Water Prep Type: Total/NA

				Percent Yield (Acceptance Limits)
		Ва	Y	
Lab Sample ID	Client Sample ID	(40-110)	(40-110)	
240-174329-1	MW-15002	97.5	86.0	
240-174329-2	MW-15008	98.3	87.9	
240-174329-3	MW-15016	85.0	86.7	
240-174329-4	MW-15019	97.5	83.7	
240-174329-5	DUP-BACKGROUND	95.8	85.6	
240-174329-6	FB-BACKGROUND	96.8	87.5	
LCS 160-586571/2-A	Lab Control Sample	99.8	87.1	
MB 160-586571/1-A	Method Blank	99.8	83.7	

Ba = Ba Carrier

Y = Y Carrier

Eurofins Canton

Job ID: 240-174329-1

Client: TRC Environmental Corporation.

Project/Site: Karn/Weadock CCR Background Well

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-586489/1-A

Matrix: Water

Analysis Batch: 589429

Client Sample ID: Method Blank

Prep Type: Total/NA

Job ID: 240-174329-1

Prep Batch: 586489

MB MB Uncert. Uncert. Analyte Result Qualifier $(2\sigma + / -)$ $(2\sigma + / -)$ RL **MDC** Unit Prepared Analyzed Dil Fac Radium-226 -0.01471 U 0.0601 0.0601 1.00 0.127 pCi/L 10/19/22 12:19 11/09/22 15:55

Total

MB

Carrier %Yield Qualifier Limits Prepared Analyzed Dil Fac Ba Carrier 99.8 40 - 110 10/19/22 12:19 11/09/22 15:55

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 586489

Matrix: Water Analysis Batch: 589429

Total

LCS LCS %Rec **Spike** Uncert. Analyte Added Result Qual $(2\sigma + / -)$ RL %Rec Limits MDC Unit Radium-226 11.3 11.66 1.20 1.00 0.0930 pCi/L 103 75 - 125

Count

LCS LCS Carrier %Yield Qualifier Limits Ba Carrier 99.8 40 - 110

Lab Sample ID: LCS 160-586489/2-A

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-586571/1-A

Matrix: Water

Analysis Batch: 588252

Client Sample ID: Method Blank

Prep Type: Total/NA **Prep Batch: 586571**

Total Count MB MB Uncert. Uncert. **MDC** Unit Analyte Result Qualifier $(2\sigma + / -)$ $(2\sigma + / -)$ RL Prepared Analyzed Dil Fac Radium-228 0.423 0.433 1.00 0.557 pCi/L 10/19/22 13:40 11/02/22 13:54 1 001

MB MB %Yield

Carrier Qualifier Limits Prepared Analyzed Dil Fac Ba Carrier 99.8 40 - 110 10/19/22 13:40 11/02/22 13:54 40 - 110 10/19/22 13:40 11/02/22 13:54 Y Carrier 83.7

Lab Sample ID: LCS 160-586571/2-A

Matrix: Water

Analysis Batch: 588252

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 586571

Total **Spike** LCS LCS Uncert. %Rec Analyte Added Result Qual $(2\sigma + / -)$ RL MDC Unit %Rec Limits Radium-228 1.48 1.00 0.776 pCi/L 75 - 125 8.48 9.458 112

LCS LCS Carrier %Yield Qualifier Limits Ba Carrier 99.8 Y Carrier

40 - 110 87.1 40 - 110

Eurofins Canton

QC Association Summary

Client: TRC Environmental Corporation.
Project/Site: Karn/Weadock CCR Background Well

Job ID: 240-174329-1

Prep Batch: 586489

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-174329-1	MW-15002	Total/NA	Water	PrecSep STD	
240-174329-2	MW-15008	Total/NA	Water	PrecSep STD	
240-174329-3	MW-15016	Total/NA	Water	PrecSep STD	
240-174329-4	MW-15019	Total/NA	Water	PrecSep STD	
240-174329-5	DUP-BACKGROUND	Total/NA	Water	PrecSep STD	
240-174329-6	FB-BACKGROUND	Total/NA	Water	PrecSep STD	
MB 160-586489/1-A	Method Blank	Total/NA	Water	PrecSep STD	
LCS 160-586489/2-A	Lab Control Sample	Total/NA	Water	PrecSep STD	

Prep Batch: 586571

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-174329-1	MW-15002	Total/NA	Water	PrecSep_0	
240-174329-2	MW-15008	Total/NA	Water	PrecSep_0	
240-174329-3	MW-15016	Total/NA	Water	PrecSep_0	
240-174329-4	MW-15019	Total/NA	Water	PrecSep_0	
240-174329-5	DUP-BACKGROUND	Total/NA	Water	PrecSep_0	
240-174329-6	FB-BACKGROUND	Total/NA	Water	PrecSep_0	
MB 160-586571/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-586571/2-A	Lab Control Sample	Total/NA	Water	PrecSep 0	

Lab Chronicle

Client: TRC Environmental Corporation.

Project/Site: Karn/Weadock CCR Background Well

Client Sample ID: MW-15002

Date Collected: 10/05/22 08:55 Date Received: 10/08/22 09:55

Lab Sample ID: 240-174329-1

Matrix: Water

Job ID: 240-174329-1

	Batch	Batch		Dilution	Batch			Prepared
Prep Type	Type	Method	Run	Factor	Number	Analyst	Lab	or Analyzed
Total/NA	Prep	PrecSep STD			586489	ZR	EET SL	10/19/22 12:19
Total/NA	Analysis	903.0		1	589429	FLC	EET SL	11/09/22 15:56
Total/NA	Prep	PrecSep_0			586571	CMM	EET SL	10/19/22 13:40
Total/NA	Analysis	904.0		1	588252	JCB	EET SL	11/02/22 13:55
Total/NA	Analysis	Ra226_Ra228		1	589622	MLK	EET SL	11/10/22 13:17

Client Sample ID: MW-15008 Lab Sample ID: 240-174329-2 **Matrix: Water**

Date Collected: 10/04/22 15:08 Date Received: 10/08/22 09:55

	Batch	Batch		Dilution	Batch			Prepared
Prep Type	Type	Method	Run	Factor	Number	Analyst	Lab	or Analyzed
Total/NA	Prep	PrecSep STD			586489	ZR	EET SL	10/19/22 12:19
Total/NA	Analysis	903.0		1	589429	FLC	EET SL	11/09/22 15:58
Total/NA	Prep	PrecSep_0			586571	CMM	EET SL	10/19/22 13:40
Total/NA	Analysis	904.0		1	588252	JCB	EET SL	11/02/22 13:55
Total/NA	Analysis	Ra226_Ra228		1	589622	MLK	EET SL	11/10/22 13:17

Lab Sample ID: 240-174329-3 Client Sample ID: MW-15016

Date Collected: 10/05/22 09:56 **Matrix: Water** Date Received: 10/08/22 09:55

_	Batch	Batch		Dilution	Batch			Prepared
Prep Type	Type	Method	Run	Factor	Number	Analyst	Lab	or Analyzed
Total/NA	Prep	PrecSep STD			586489	ZR	EET SL	10/19/22 12:19
Total/NA	Analysis	903.0		1	589429	FLC	EET SL	11/09/22 15:58
Total/NA	Prep	PrecSep_0			586571	CMM	EET SL	10/19/22 13:40
Total/NA	Analysis	904.0		1	588252	JCB	EET SL	11/02/22 13:55
Total/NA	Analysis	Ra226_Ra228		1	589622	MLK	EET SL	11/10/22 13:17

Lab Sample ID: 240-174329-4 **Client Sample ID: MW-15019**

Date Collected: 10/04/22 16:10 Date Received: 10/08/22 09:55

_	Batch	Batch		Dilution	Batch			Prepared
Prep Type	Type	Method	Run	Factor	Number	Analyst	Lab	or Analyzed
Total/NA	Prep	PrecSep STD			586489	ZR	EET SL	10/19/22 12:19
Total/NA	Analysis	903.0		1	589429	FLC	EET SL	11/09/22 15:58
Total/NA	Prep	PrecSep_0			586571	CMM	EET SL	10/19/22 13:40
Total/NA	Analysis	904.0		1	588252	JCB	EET SL	11/02/22 13:55
Total/NA	Analysis	Ra226_Ra228		1	589622	MLK	EET SL	11/10/22 13:17

Eurofins Canton

Matrix: Water

Lab Chronicle

Client: TRC Environmental Corporation.

Project/Site: Karn/Weadock CCR Background Well

Lab Sample ID: 240-174329-5

Client Sample ID: DUP-BACKGROUND Date Collected: 10/04/22 00:00

Matrix: Water

Job ID: 240-174329-1

Date Received: 10/08/22 09:55

	Batch	Batch		Dilution	Batch			Prepared
Prep Type	Type	Method	Run	Factor	Number	Analyst	Lab	or Analyzed
Total/NA	Prep	PrecSep STD			586489	ZR	EET SL	10/19/22 12:19
Total/NA	Analysis	903.0		1	589434	FLC	EET SL	11/09/22 16:00
Total/NA	Prep	PrecSep_0			586571	CMM	EET SL	10/19/22 13:40
Total/NA	Analysis	904.0		1	588252	JCB	EET SL	11/02/22 13:55
Total/NA	Analysis	Ra226_Ra228		1	589622	MLK	EET SL	11/10/22 13:17

Client Sample ID: FB-BACKGROUND Lab Sample ID: 240-174329-6

Date Collected: 10/05/22 08:55 **Matrix: Water**

Date Received: 10/08/22 09:55

	Batch	Batch		Dilution	Batch			Prepared
Prep Type	Type	Method	Run	Factor	Number	Analyst	Lab	or Analyzed
Total/NA	Prep	PrecSep STD			586489	ZR	EET SL	10/19/22 12:19
Total/NA	Analysis	903.0		1	589434	FLC	EET SL	11/09/22 16:00
Total/NA	Prep	PrecSep_0			586571	CMM	EET SL	10/19/22 13:40
Total/NA	Analysis	904.0		1	588252	JCB	EET SL	11/02/22 13:55
Total/NA	Analysis	Ra226_Ra228		1	589622	MLK	EET SL	11/10/22 13:17

Laboratory References:

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Accreditation/Certification Summary

Client: TRC Environmental Corporation.

Project/Site: Karn/Weadock CCR Background Well

Laboratory: Eurofins St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	20-001	05-06-25
ANAB	Dept. of Defense ELAP	L2305	04-06-25
ANAB	Dept. of Energy	L2305.01	04-06-25
ANAB	ISO/IEC 17025	L2305	04-06-25
Arizona	State	AZ0813	12-08-22
California	Los Angeles County Sanitation Districts	10259	06-30-22 *
California	State	2886	07-01-22 *
Connecticut	State	PH-0241	03-31-23
Florida	NELAP	E87689	06-30-23
HI - RadChem Recognition	State	n/a	06-30-23
Illinois	NELAP	200023	11-30-23
lowa	State	373	12-01-22
Kansas	NELAP	E-10236	10-31-22 *
Kentucky (DW)	State	KY90125	12-31-22
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-22
Louisiana (All)	NELAP	04080	06-30-23
Louisiana (DW)	State	LA011	12-31-22
Maryland	State	310	09-30-23
MI - RadChem Recognition	State	9005	06-30-23
Missouri	State	780	06-30-25
Nevada	State	MO000542020-1	07-31-23
New Jersey	NELAP	MO002	06-30-23
New York	NELAP	11616	04-01-23
North Dakota	State	R-207	06-30-23
NRC	NRC	24-24817-01	12-31-22
Oklahoma	NELAP	9997	08-31-23
Oregon	NELAP	4157	09-01-23
Pennsylvania	NELAP	68-00540	02-28-23
South Carolina	State	85002001	06-30-23
Texas	NELAP	T104704193	07-31-23
US Fish & Wildlife	US Federal Programs	058448	07-31-23
USDA	US Federal Programs	P330-17-00028	03-11-23
Utah	NELAP	MO000542021-14	07-31-23
Virginia	NELAP	10310	06-14-24
Washington	State	C592	08-30-23
West Virginia DEP	State	381	12-31-22

Job ID: 240-174329-1

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 $^{^{\}star} \ \text{Accreditation/Certification renewal pending - accreditation/certification considered valid}.$

Eurofins Canton

Eurofins Canton 180 S. Van Buren Avenue Barberton, OH 44203 Phone (330) 497-936 Phone (330) 497-0772	MICHIGAN Chain of Custody Record	ody Record		💸 eurofins Environment Testing America
Client Information	Sample:	Lab PM Brooks, Kris M	Carrier Tracking No(s):	COC No: 240-99536-29047.1
Client Contact. Jacob Krenz	210	E-Mail Kris Brooks@et eurofinsus com	State of Origin:	Page Of Dage
Сопрану TRC Environmental Corporation.	Md	Analysis Requested	aguested	# qor
Address: 1540 Eisenhower Place	Due Date Requested:			Ö
City. Ann Arbor	TAT Requested (days):			A - HCL B - NaOH C - Zo Acetate
State, Zip: MI, 48108-7080	Compliance Project: A Yes A No	T		
Phone: 734-971-7080(Tel) 734-971-9022(Fax)	PO#. 178829	(6		
Email: JKrenz@trccompanies.com	WO#:			1 - Ice J - Di Water
Project Name: Karn/Weadock CCR Background Well	Project #. 24024154	be 01.	aninet	K - EDTA L - EDA
Site	:#XOSS	SD (Y	oo too	Other:
	Sample Type (C=comp,	Matrix (waveser (waveser) Waveser (waveser) Waves	(sal Number o	
Sample Identification	7 (E06	101	Special Instructions/Note:
MW-15002	1	Microse National Part of the P		
MAY 15000	727 527	/7 2: 2		
WW-15008	D 14/22 1808 C	Water NN X X		
MW-15016	1015122 956 C	Water N Y Y		
MW-15019	10/4/22/1610 6	water R X X		
DUP-Background	11/	Water V 1/2 X X		
FB-Background	4 63	water NN X X		
		Water		
			240-174329 Chain of Custody	
				- 1000
Possible Hazard Identification		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)	assessed if samples are retain	ed longer than 1 month)
Ne Skin Irritant V, Other (specify)	Poison B Unknown Radiological	Return To Client Disk	Disposal By Lab Arch	Archive For Months
Empty Kjt Relinquished by:	Date:	Time:	Method of Shipment:	
Relinquisted by Manager A	Date/Time: Co	Company Received by	Date/Time: 72/22	10 15 Company TAC
Reinquidhed by MAG	122 10:15	Company Received by	Date Time 8.77	955
			Pare IIIIe.	Company
A Yes A No				Var. 01.16.2010

Barberton Eacility Client T R Cooler unpacked by:
Cooler Impacked DV.
Cheft She Name
Cooler Received on 10-8-22 Opened on 10-8-22
FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off Eurofins Courier Other
Receipt After-house Droppoff Date/Time Storage Location
Eurofins Cooler # Poem Box Client Cooler Box Other
Packing material used Rubble-Wrap Foam Plastic Bag None Other
COOLANT: Wet Ice Blue Ice Dry Ice Water Mone
1. Cooler temperature upon-receipt See Multiple Cooler Form
IR GUN# IR-13 (CF +0.7 °C) Observed Cooler Temp. °C Corrected Cooler Temp. °C
IR GUN #IR-15 (CF 0.0°C) Observed Cooler Temp. C Corrected Cooler Temp. C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1290 Yes No
-Were the seals on the outside of the cooler(s) signed & dated?
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No Receiving:
-Were tamper/custody seals intact and uncompromised?
3. Shippers' packing slip attached to the cooler(s)?
4. Did custody papers accompany the sample(s)? Oil and Grease TOC
5. Were the custody papers relinquished & signed in the appropriate place?
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)?
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? Yes No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?
10. Were correct bottle(s) used for the test(s) indicated?
11. Sufficient quantity received to perform indicated analyses?
12. Are these work share samples and all listed on the COC? Yes (No.)
If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC286797
14. Were VOAs on the COC?
15. Were air bubbles >6 mm in any VOA vials? Larger than this.
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # Yes No
18 101 10 00 00 00 01 11 1
17. Was a LL Hg or Me Hg trip blank present? Yes No
Contacted PM Date by via Verbal Voice Mail Other
Contacted PM Date by via Verbal Voice Mail Other
Contacted PM Date by via Verbal Voice Mail Other Concerning
Contacted PM Date by via Verbal Voice Mail Other
Contacted PM Date by via Verbal Voice Mail Other Concerning
Contacted PM Date by via Verbal Voice Mail Other Concerning
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Contacted PM Date by via Verbal Voice Mail Other Concerning
Concerning
Concerning 18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES additional next page Samples processed by: 19. SAMPLE CONDITION
Concerning 18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES additional next page Samples processed by: 19. SAMPLE CONDITION Sample(s) were received after the recommended holding time had expired.
Concerning
Concerning 18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES additional next page Samples processed by: 19. SAMPLE CONDITION Sample(s) were received after the recommended holding time had expired.
Concerning 18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES additional next page Samples processed by: 19. SAMPLE CONDITION Sample(s) were received after the recommended holding time had expired. Sample(s) were received in a broken container. Sample(s) were received with bubble >6 mm in diameter. (Notify PM)
Concerning
Concerning 18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES
Concerning 18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES
Concerning 18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES additional next page Samples processed by: 19. SAMPLE CONDITION Sample(s)
Concerning 18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES
Contacted PM Date by via Verbal Voice Mail Other Concerning 18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES

Cooler Description	IR Gun #	Observed	Corrected	Coo (Cire
(Circle)	(Circle)	Temp °C	Temp °C	Wellice, Blue
TA Client Box Other	R-13 (R-15'	31	3-1	Wet ice Bive
TA Client Box Other		1-4	1.4	Water
TA Client Box Other	IR-13 I <u>(€18</u>	22	2.3	Wet ich Blue Water
TA Client Box Other	R-13 K-15	1-d	1-2	(Net Re Stue Water
Clent Box Other	IR-13 IK-16	4-1	4-1	Wallet Blue
CTA Client Box Other	IR-13 MC-15	0-8	0-8	Wet Ice Nive
TA Client Box Other	R-13 R-15			Wet Ice Nue Water
TA Client Box Other	IR-13 IR-16			Wellice Blue Water
TA Client Box Other	R-13 IR-15			Wellce Sive
TA Client Box Other	R-13 R-15			Water Water
TA Client Box Other	R-13 IR-15		· · · · · · · · · · · · · · · · · · ·	Wellice Sive
	R-13 R-15			Water Blue
TA Client Box Other	R-13 IR-15			Water Blue
TA Client Box Other	IR-13 IR-15			Water Wellice Sive I
TA Client Box Other	R-13 R-15			Water Blue
TA Client Box Other				Wet ice Blue
TA Client Box Other	R-13 R-15			Water
TA Client Box Other	IR-13 IR-15			Water
TA Client Box Other	IR-13 IR-15			Wet Ice Blue I Water
TA Client Box Other	IR-13 IR-15			Wet Ice Blue I Water
TA Client Box Other	IR-13 IR-15			Wet Ice - Blue I Water
TA Client Box Other	IR-13 IR-15			Wet Ice Blue It
TA Client Box Other	IR-13 IR-15			Wet Ice Blue Is Water
TA Client Box Other	IR-13 IR-15			Wellce Blue I Water
TA Client Box Other	IR-13 IR-15			Wellice Blue II Water
TA Client Box Other	IR-13 IR-15			Wellce Blue k
TA Client Box Other	IR-13 IR-15			Water Number
-	IR-13 IR-15			Wet ice Sive ic
	IR-13 IR-15			Water Bue ic
	IR-13 IR-15			Water N
TA Client Box Other	IR-13 IR-15			Water N
TA Client Box Other	R-13 R-15			Water N Wet Ice Blue Ic
TA Client Box Other	R-13 R-15			Water N
TA Client Box Other				Water N Wet Ice Blue Ic
TA Client Box Other	IR-13 IR-15			Water N
TA Client Sox Other	1R-13 IR-15			Water N
Y. 15 - 17 . 15 (1) .			□ See Ten	perature Excursion

Login Container Summary Report

240-174329

Temperature readings:

Client Sample ID	<u>Lab ID</u>	Container Type	Containe pH Te	er Preservative mp Added (mls) Lot #
MW-15002	240-174329-A-1	Plastic 1 liter - Nitric Acid	<2	
MW-15002	240-174329-B-1	Plastic 1 liter - Nitric Acid	<2	
MW-15008	240-174329-A-2	Plastic 1 liter - Nitric Acid	<2	
MW-15008	240-174329-B-2	Plastic 1 liter - Nitric Acid	<2	
MW-15016	240-174329-A-3	Plastic 1 liter - Nitric Acid	<2	
MW-15016	240-174329-B-3	Plastic 1 liter - Nitric Acid	<2	
MW-15019	240-174329-A-4	Plastic 1 liter - Nitric Acid	<2	
MW-15019	240-174329-B-4	Plastic 1 liter - Nitric Acid	<2	
DUP-BACKGROUND	240-174329-A-5	Plastic 1 liter - Nitric Acid	<2	
DUP-BACKGROUND	240-174329-B-5	Plastic 1 liter - Nitric Acid	<2	
FB-BACKGROUND	240-174329-A-6	Plastic 1 liter - Nitric Acid	<2	
FB-BACKGROUND	240-174329-B-6	Plastic 1 liter - Nitric Acid	<2	

Chain of Custody Record

180 S. Van Buren Avenue **Eurofins Canton**

Barberton, OH 44203 Phone: 330-497-9396 Fax: 330-497-0772

				5	DISCESS. PLIS B							240 450400 4		
Client Contact:	Phone:			F-Mail:					1			240-158469.1		
Shipping/Receiving				Kris B	Prooks@e	t eurofir	e-waii: Kris Brooks@et eumfinsus com		State of Origin:	igin:		Page:		
Company:					ccreditation	1s Recuire	Accreditations Beauined (See note)		Michigan			Page 1 of 1		
l estamenca Laboratones, Inc.												240 474220 4		
Address: 13715 Rider Trail North,	Due Date Requested: 11/8/2022											Preservation Codes:	odes:	
City. Earth City	TAT Requested (days):					L			Alarysis Requested	F	200	A - HCL B - NaOH	M - Hexane N - None	
State, Zip. MO, 63045							· · · · · · · · · · · · · · · · · · ·					C - Zn Acetate D - Nitric Acid	O - AsNaO2 P - Na2O4S Q - Na2SO3	
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO#:											F - MeOH G - Amchlor		
Email:	#OM				(0							H - Ascorbic Acid I - Ice		rate
Project Name: Karn/Weadock CCR Groundwater Monitoring	Project #: 24024154				N 10 00						grenisi	J - DI Water K - EDTA L - EDA	W - pH 4-5 Y - Trizma	
SIG:	SSOW#:				Nas	Stano	0.4					Other:	2 - omer (specify)	
	i vi	Sample	Sample (Type		d Filtened Som MS/M	0_qe2o919\0	36Ra228_GF				Number o			
Sample Identification - Client ID (Lab ID)	Sample Date			A-Air)	Per	.406	7701				siol	Special	Special Instructions (Motor	
			Preservation Code:	Code:	X						×		istractions/Note	
MW-15002 (240-174329-1)	10/5/22 0	08:55 Fastern		Water	×	×	×				?	IVA protocol - R	TVA protocol - Ra-226+228 action limit at	it at
MW-15008 (240-174329-2)	10/4/22	15:08 Factorn		Water	×	+-	×					5.0 pCi/L. TVA protocol - R	5.0 pCi/L. TVA protocol - Ra-226+228 action limit at	itat
MW-15016 (240-174329-3)	10/5/22	09:56		Water	×	+	×	+		-	_	5.0 pCi/L. TVA protocol - R	5.0 pCi/L. TVA protocol - Ra-226+228 action limit at	it at
MW-15019 (240-174329-4)	10/4/22 F	16:10 Fastern		Water	×	×	×	+		+		5.0 pCi/L. TVA protocol - R	5.0 pCi/L. TVA protocol - Ra-226+228 action limit at	it at
DUP-BACKGROUND (240-174329-5)	10/4/22 Ea	Eastern	-	Water	×	×				-		5.0 pci/L. TVA protocol - R	5.0 pci/L. TVA protocol - Ra-226+228 action limit at	itat
FB-BACKGROUND (240-174329-6)	10/5/22 ⁰ Ea	08:55 Eastern		Water	×	×				+-		5.0 pCi/L. TVA protocol - R	5.0 pCi/L. TVA protocol - Ra-226+228 action limit at	itat
										-				

es not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing North Central, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins Environment Testing North Central, LLC. Possible Hazard Identification

Possible Hazard Identification			
		Sample Disposal (A fee may be accessed if samples and sale in the samples and sale in the	
Unconfirmed		Saldinas ii passassa sa faii.	
Deliverable Decreased: 1 II IV One		Ketum 10 Cirent Disposal By Lab Archive For	
Conversion requested: 1, II, III, IV, Other (specify)	Primary Deliverable Rank: 2	Requirements:	
Empty Kit Belinguished h			
chips the result quisited by.	Date:	Time: Method of Shiomant	
Relinquighed by:	Doto/Time		
		Company Receive by: Company	
2			
Some of the second of the seco	Date/Time:	Received ha	
		- Constant	
Relinquished by:	Date/Time	Medium of the	
20		Date/Time:	
		Autumn R. Johnson	
Custody Seals Intact: Custody Seal No.:			
∆ Yes ∧ No		Cooler I emperature(s) "C and Other Remarks:	
		2 3 4 5 6 7 8 9 11 11 11 11 11 11	
		2 3 3 4	

Login Sample Receipt Checklist

Client: TRC Environmental Corporation.

Job Number: 240-174329-1

Login Number: 174329
List Source: Eurofins St. Louis
List Number: 2
List Creation: 10/11/22 01:02 PM

Creator: Worthington, Sierra M

Creator: Worthington, Sierra W		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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Date: January 30, 2023

To: J.R. Register, Consumers Energy

From: Darby Litz, TRC

Kristin Lowery, TRC

Project No.: 464095.0001.0000 Phase 2 Task 2

Subject: Second Semiannual 2022 Nature and Extent Data Summary, DE Karn Bottom Ash

Pond, Consumers Energy, Essexville, Michigan

Introduction

In response to the United States Environmental Protection Agency's (U.S. EPA's) Resource Conservation and Recovery Act (RCRA) Coal Combustion Residual rule ("CCR Rule") promulgated on April 17, 2015, as amended, Consumers Energy Company (Consumers Energy) has conducted groundwater monitoring at the DE Karn Bottom Ash Pond CCR Unit. During the statistical evaluation of the initial assessment monitoring event (May 2018) for the Karn Bottom Ash Pond, arsenic was present in one or more downgradient monitoring well(s) at statistically significant levels exceeding the Groundwater Protection Standards (GWPSs)¹.

The CCR Rule 40 CFR §257.96(a) requires that an owner or operator initiate an assessment of corrective measures (ACM) to prevent further release, to remediate any releases, and to restore impacted areas to original conditions if any Appendix IV constituent has been detected at a statistically significant level exceeding a GWPS. The Assessment of Corrective Measures (ACM) (TRC, September 2019) was initiated on April 14, 2019 and was certified and submitted to the Michigan Department of Environment, Great Lakes, and Energy (EGLE) on September 11, 2019 in accordance with the schedule in §257.96.

Per §257.95(g)(1), in the event that the facility determines, pursuant to §257.93(h), that there is a statistical exceedance of the GWPSs for one or more of the Appendix IV constituents, the facility must characterize the nature and extent of the release of CCR as well as any site conditions that may affect the remedy selected. Installation of additional monitoring wells at locations downgradient of the Karn Bottom Ash Pond groundwater monitoring system was not necessary or feasible due to the presence of existing monitoring wells sampled under the groundwater surface water interface (GSI) Compliance Monitoring Program administered under a Michigan-approved Hydrogeological Monitoring Plan (HMP) (Consumers Energy, 2019), and the proximity of the surface water bodies. Monitoring wells designated for nature and extent characterization are shown on Figures 1 and 2 and data collected over the past year (February 2022 through October 2022) from these nature and extent groundwater monitoring wells are included in Tables 1 and 2.

¹ TRC. 2019. Statistical Evaluation of Initial Assessment Monitoring Sampling Event, DE Karn Bottom Ash Pond, Consumers Energy Company, Essexville, Michigan. January 14.

Approach

Given the proximity of the Karn Bottom Ash Pond to the Karn Landfill at the Karn property, the nature and extent of contamination was assessed from a site-wide perspective rather than on a per CCR unit basis. The nature and extent of groundwater impacted by a release from the Karn Bottom Ash Pond overlaps with groundwater impacted by operation of the Karn Landfill. Additionally, looking at impacted groundwater on a site-wide basis was more practical from a risk mitigation standpoint, given:

- The likely age of the release(s);
- A long operational history of ash management;
- The historical use of CCR as fill; and
- The influence of geochemistry on several of the Appendix IV constituent concentrations in groundwater.

Groundwater Nature and Extent Relative to Groundwater Protection Standards

As discussed in the ACM, the nature and extent of contamination (e.g. arsenic) in groundwater relative to GWPSs has been defined per the RCRA CCR Rule requirements based on the site-specific hydrogeology. Although arsenic concentrations exceed the GWPS in on-site groundwater monitoring locations, arsenic is delineated within the limits of the property owned by Consumers Energy and there are currently no adverse effects on human health or the environment from either surface water or groundwater due to CCR management at the Karn Bottom Ash Pond. The property is owned and operated by Consumers Energy and groundwater is not used for drinking water. There are no on-site drinking water wells and there are no surface water potable water intakes within 3 miles of the site, so the drinking water pathway is not complete.

The distribution of arsenic relative to the Karn Bottom Ash Pond groundwater monitoring system in the shallow water-bearing unit as compared to the GWPS is presented in Figure 1. Three categories were assigned to groundwater data collected from February 2022 to October 2022, as follows:

- White No Exceedances: all concentrations were below the GWPS
- Yellow Two or More Exceedances: individual observations above the GWPS²
- Orange Statistically Significant GWPS Exceedances³

The highest concentrations of arsenic observed in the vicinity of the Karn Bottom Ash Pond have been observed at DEK-MW-15003, a monitoring well located to the north of the bottom ash pond and associated with the shifted "highest" elevation of mounded groundwater relative to the Karn Bottom Ash Pond. Although historically the point source discharge of sluiced bottom ash into the Karn Bottom Ash Pond created localized mounding of the potentiometric surface, the new Karn Lined Impoundment went into service on June 7, 2018 and has been continuously collecting the process water and bottom ash that went into the former bottom ash pond. Since the former bottom ash pond is no longer being

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² Although an exceedance is defined as a single detection above the GWPS, confidence intervals will be used to determine compliance per the CCR Rule using the Karn Bottom Ash Pond monitoring well network. Compliance with the GWPSs established under § 257.95(h) will be achieved by demonstrating that concentrations of constituents listed in Appendix IV to this part have not exceeded the GWPSs for a period of three consecutive years using the statistical procedures and performance standards in § 257.93(f) and (g).

³ Lower confidence limit is above the GWPS based upon most recent assessment monitoring statistical evaluation using the eight most recent sampling events (April 2019 through October 2022).

hydraulically loaded with sluiced ash and has been dewatered by gravity, the characteristic groundwater mound centered within the pooled area is no longer present. The groundwater elevation data collected from the groundwater monitoring system of the former bottom ash pond in October 2022 demonstrate a reduction in groundwater elevation measurements by several feet when compared to groundwater elevations measured prior to June 2018. Given this shift in groundwater flow direction, DEK-MW-15003 and DEK-MW-15004 are now located upgradient to side gradient of the CCR unit and are no longer representative of groundwater chemistry downgradient of the Karn Bottom Ash Pond. DEK-MW-15003 and DEK-MW-15004 cannot reliably be used to assess the effectiveness of the CCR removal activities and are influenced by the long operational history of ash management in this area of the site. As such, these two wells were removed from the certified downgradient monitoring well network. DEK-MW-15003 and DEK-MW-15004 are instead used as part of the nature and extent monitoring well network for the purposes of informing the ongoing remedy selection and risk mitigation evaluations. The recertification was included in Appendix D of the *October 2021 Assessment Monitoring Data Summary and Statistical Evaluation*4.

Recent data show that groundwater quality is improving for select constituents (e.g., decreases in arsenic concentrations) since sluicing to the Karn Bottom Ash Pond ceased in June 2018 when the bottom ash and transport water was diverted to the Karn Lined Impoundment. TRC used Sanitas™ to compare groundwater data collected while the pond was still in operation ("background" for the purposes of the statistical comparison. December 2015 to June 2018) to data collected once hydraulic loading ceased ("compliance" for the purposes of the statistical comparison, June 2018 to present), as shown by the time-series charts and student t-test results (Attachment A). Arsenic concentrations in groundwater at DEK-MW-15002, DEK-MW-15003, and DEK-MW-180015 from June 2018 to present are lower than concentrations observed while the pond was in operation (prior to June 2019). Arsenic has been the only constituent to have triggered corrective action. The decrease in concentrations of arsenic at DEK-MW-15002, DEK-MW-15003, and DEK-MW-18001 indicate that discontinuing the hydraulic loading to the Karn Bottom Ash Pond and the completed source removal of CCR was successful in removing a source of arsenic; however, attainment of the GWPS at all of the Bottom Ash Pond downgradient monitoring wells may not be feasible due to influences other than the former pond, such as the presence and former operation of the nearby Karn Landfill. Arsenic in the nature and extent monitoring wells located along the landfill perimeter bordering Saginaw Bay also exhibit concentrations above the GWPS. Although arsenic is present above the GWPS, the drinking water pathway is not complete as there are no drinking water wells on-site. Redox conditions, which affect contaminant transport, are still stabilizing in the Bottom Ash Pond Area following removal activities and will continue to be evaluated further.

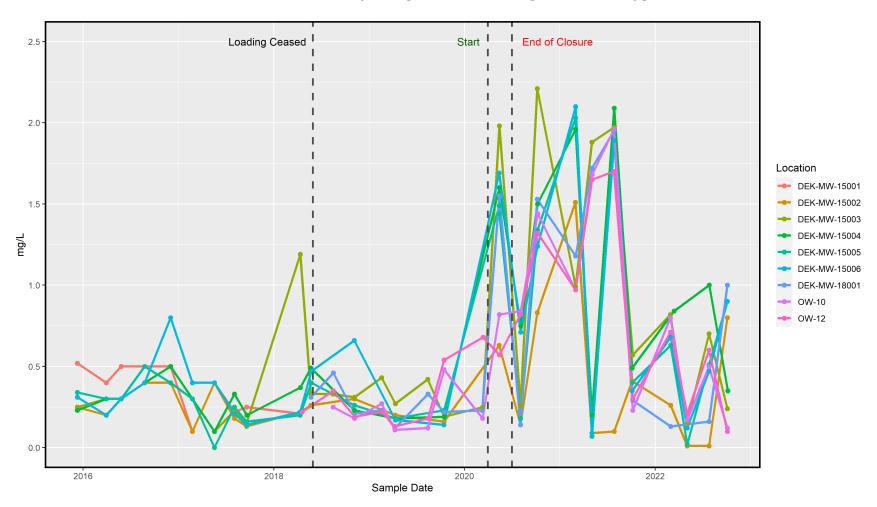
As shown on the charts below, the dissolved oxygen concentration and oxidation-reduction potential (ORP) showed highly variable results following CCR removal activities.

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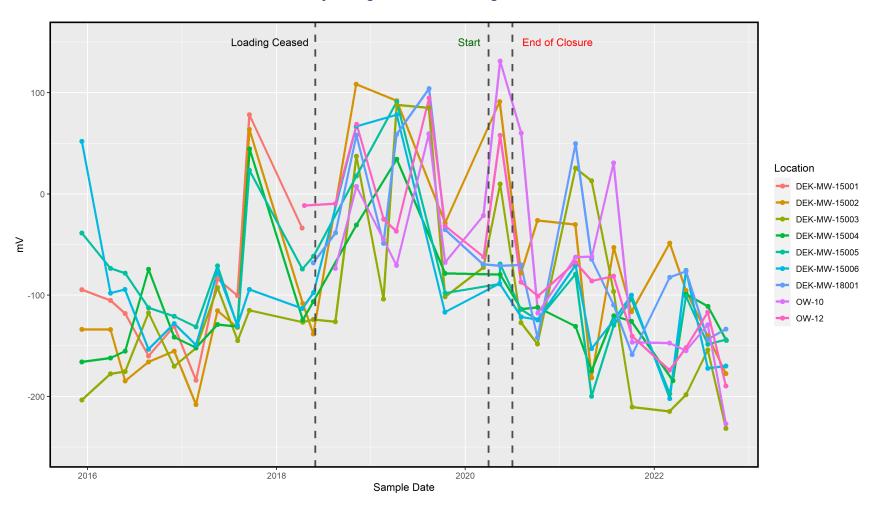
⁴ TRC. January 2022. October 2021 Assessment Monitoring Data Summary and Statistical Evaluation – DE Karn Power Plant, Bottom Ash Pond CCR Unit. Prepared for Consumers Energy Company.

⁵ Monitoring well DEK-MW-18001 was installed in May 2018, following decommissioning of monitoring well DEK-MW-15001. DEK-MW-15001 is located approximately 80 feet northwest of DEK-MW-18001 and was decommissioned due to the installation of the Karn Lined Impoundment. Due to the close proximity of the wells, data collected at DEK-MW-15001 from 2015 to April 2018 is used as the "background" for DEK-MW-18001.

Groundwater Chemistry Changes Post-Dewatering - Dissolved Oxygen



Groundwater Chemistry Changes Post-Dewatering - Oxidation-Reduction Potential



Specifically, dissolved oxygen transitioned from the suboxic/anoxic state of 0.5 mg/L or less to an oxic state of greater than 1.5 mg/L immediately following CCR removal. In the same time period, the electric potential transitioned from a moderately negative electric potential near -100 mV to a moderately positive electric potential of +100 mV. The observed trends for these two key field-measured parameters demonstrate that the preferred equilibrium redox state (e.g. preferred redox couple chemistry) also shifted during the time period immediately following CCR removal. Data from 2022 indicate that trends in the redox conditions may be stabilizing at values similar to pre-dewatering conditions based on measurements of dissolved oxygen in the anoxic range of 0.5 – 1.0 mg/L and negative electric potential.

Groundwater Nature and Extent Relative to GSI

The drinking water pathway is not complete. Due to the presence of the surrounding surface water bodies, another relevant pathway is the groundwater surface water interface pathway. Monitoring performed under the Michigan-approved GSI Compliance Monitoring Program demonstrates protection of human health and the environment with criteria determined to be protective at the potential point of exposure. Transect/porewater GSI compliance sampling data collected quarterly show that biogeochemical conditions are contributing to the reduction of arsenic in groundwater as observed in transect push-point samples located along the water's edge of Saginaw Bay, where arsenic concentrations are generally much lower than the arsenic concentrations observed in the perimeter dike wells. Compliance with water quality criteria is demonstrated on a quarterly basis by evaluating the total chronic loading based on contribution from each GSI compliance sample location with respect to the total flux observed in the state-authorized site-specific mixing zone, per the HMP.

The distribution of arsenic in the shallow water-bearing unit as compared to the mixing zone GSI criteria is presented in Figure 2. Three categories were assigned to the data from February 2022 to October 2022⁶, as follows:

- White No Exceedances: all concentrations were below the mixing zone GSI criteria
- Light Blue Two consecutive exceedances of the chronic mixing zone GSI criterion
- Dark Blue Two consecutive exceedances of the acute mixing zone GSI criterion

Groundwater monitoring locations along the DE Karn Intake Channel and boundary between the coal ash management areas and the power plant complex (DEK-MW-15002, DEK-MW-15005, DEK-MW-15006, and DEK-MW-18001) document contaminant concentrations of arsenic are less than the authorized mixing zone-based chronic concentration of 100 ug/L. Total chronic loading, calculated from concentrations observed in transect groundwater samples collected from push-point samplers advanced at locations T1-3GSI through T6-3GSI, remains below the chronic mixing zone GSI criterion, indicating current conditions are protective of the GSI pathway.

Summary

The nature and extent of arsenic in the shallow water-bearing unit is defined in accordance with the Federal CCR rule. Risk from potential exposure to groundwater is managed. The drinking water

⁶ Given the dynamic nature of the groundwater surface water interactions, it is appropriate to look at a shorter timeframe for data analysis (one year).

pathway is not complete. Monitoring performed under the Michigan-approved GSI Compliance Monitoring Program demonstrates protection of human health and the environment with criteria determined to be protective at the potential point of exposure (i.e., state-authorized site-specific mixing zone criteria).

Attachments

Table 1	Summary of Groundwater Sampling Results (Analytical): DE Karn Nature and Extent Monitoring Wells
Table 2	Summary of Groundwater Sampling Results (Analytical): DE Karn Nature and Extent GSI Monitoring Locations
Figure 1 Figure 2	Nature and Extent Summary: GWPS Exceedances Nature and Extent Summary: GSI Pathway Compliance

Attachment A Statistical Evaluation

Summary of Groundwater Sampling Results (Analytical) DE Karn Nature and Extent Monitoring Wells Essexville, Michigan

								Sa	mple Location:			W-15003				W-15004				<u>/-01</u>	
									Sample Date:	2/28/2022	5/3/2022	7/26/2022	10/4/2022	3/14/2022	5/4/2022	7/27/2022	10/6/2022	2/28/2022	5/2/2022	7/26/2022	10/4/2022
Constituent	Unit	GWPS*	MI Residential**	MI Non- Residential**	MI GSI^	MI AMV***	MI FAV***	Chronic MZ^	Acute MZ^^												
Appendix III																					
Boron	ug/L	NA	500	500	4,000	34,000	69,000	44,000	69,000	821	760	773	891	986	914	965	1,340	5,290	5,630	5,620	5,440
Calcium	mg/L	NA	NC	NC	500EE	NC	NC	NC	NC	26.3	30.0	27.1	26.1	67.3	69.2	73.7	62.2	81.8	82.3	126	111
Chloride	mg/L	NA	250 ^E	250 ^E	50	320,000	640,000	NC	NC	54.7	57.0	58.6	60.8	69.5	63.4	69.2	70.6	95.8	89.7	81.8	78.9
Fluoride	ug/L	4,000	NC	NC	NC	9,800	20,000	NC	NC	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000		1		
Sulfate	mg/L	NA	250 ^E	250 ^E	500EE	600,000	1,200,000	NC	NC	37.2	41.2	39.3	39	226	219	245	98.9	< 1	< 1	117	84.8
Total Dissolved Solids	mg/L	NA	500 ^E	500E	500	NC	NC	NC	NC	262	275	272	317	600	629	660	567		-		
pH, Field	su	NA	6.5 - 8.5 ^E	6.5 - 8.5 ^E	6.5 - 9.0	NC	NC	NC	NC	8.1	7.9	8.1	8.3	7.5	7.3	7.1	7.4	8.2	8.1	8.0	8.4
Appendix IV																					İ
Antimony	ug/L	6	6.0	6.0	2.0	1,100	2,300	NC	NC	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1				
Arsenic	ug/L	21 ¹	10	10	10	340	680	100	680	577	349	475	401	187	171	157	56	11	9	7	7
Barium	ug/L	2,000	2,000	2,000	1,200	3,400	6,800	NC	NC	49	44	40	44	138	134	142	90				
Beryllium	ug/L	4	4.0	4.0	33	300	600	NC	NC	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1				
Cadmium	ug/L	5	5.0	5.0	2.5	12	24	NC	NC	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2				
Chromium	ug/L	100	100	100	11	16	32	NC	NC	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	2	1	2	1
Cobalt	ug/L	15	40	100	100	370	740	NC	NC	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6				
Fluoride	ug/L	4,000	NC	NC	NC	9,800	20,000	NC	NC	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000		-		
Lead	ug/L	15	4.0	4.0	14	250	500	NC	NC	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1				
Lithium	ug/L	180	170	350	440	910	1,800	NC	NC	20	21	20	23	34	35	37	16	79	83	108	106
Mercury	ug/L	2	2.0	2.0	0.20#	1.4	2.8	NC	NC	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2				
Molybdenum	ug/L	100	73	210	120	29,000	58,000	NC	NC	30	21	23	25	20	12	10	13	< 5	< 5	< 5	< 5
Radium-226/228	pci/L	5	NC	NC	NC	NC	NC	NC	NC		0.799		2.15								
Selenium	ug/L	50	50	50	5.0	62	120	55	120	2	1	1	< 1	2	2	2	< 1	4	3	3	3
Thallium	ug/L	2	2.0	2.0	2.0	47	94	NC	NC	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2				
MI Part 115 Parameters																					1
Iron	ug/L	NA	300E	300E	500,000EE	NC	NC	NC	NC	225	130	169	84	3,630	3,640	3,900	1,950	253	244	402	254
Copper	ug/L	NA	1,000E	1,000 ^E	20	33	66	NC	NC	< 1	< 1	< 1	< 1	< 1	1	< 1	< 1				
Nickel	ug/L	NA	100	100	120	1,000	2,100	NC	NC	< 2	< 2	< 2	< 2	4	4	2	3				
Silver	ug/L	NA	34	98	0.2	0.54	1.1	NC	NC	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2				
Vanadium	ug/L	NA	4.5	62	27	79	160	NC	NC	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	2	< 2	< 2	< 2
Zinc	ug/L	NA	2,400	5,000E	260	260	520	NC	NC	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10		-		

Notes:

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

SU - standard units; pH is a field parameter.

NA - not applicable. NC - no criteria.

-- - not analyzed.

- * GWPS (Groundwater Protection Standard) is the higher of the Maximum Contaminant Level (MCL)/Regional Screening Level from 83 FR 36435 (RSL) and Upper Tolerance Limit (UTL) as established in TRC's Technical Memorandum dated October 15, 2018.
- ** Michigan Part 201 Generic Drinking Water Cleanup Criteria, December 21, 2020.
- ^ 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}.
- *** Aquatic Maximum (AMV) and Final Acute Values (FAV) are taken from EGLE Rule 323.1057 Part 4 Water Quality Standards (Rule 57), March 15, 2018. Hardness-dependent criteria calculated using site-specific hardness of 258 mg CaCO3/L (average of SW-01 [Lake Huron] and SW-02 [Saginaw River] collected in April 2018). Chromium AMV & FAV criteria are based on hexavalent chromium.
- M Mixing Zone (MZ) GSI Criteria from Michigan Department of Environmental Quality (MDEQ) approval letter dated December 23, 2015.
- # 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 EGLE 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}. BOLD font denotes concentrations detected above laboratory reporting limits.

Result Indicates an exceedance of one or more applicable health-based drinking water and GSI criteria. Result Indicates an exceedance of acute-based GSI criteria.

All metals were analyzed as total unless otherwise specified.

1 - Constituent triggered an Assessment of Corrective Measures for the Karn Bottom Ash Pond as described in TRC's letter report dated Januarary 14, 2019.

Page 1 of 5 January 2023

Summary of Groundwater Sampling Results (Analytical) DE Karn Nature and Extent Monitoring Wells Essexville, Michigan

								Sai	mple Location:			<u>/-03</u>				V-06				/-08	
									Sample Date:	2/28/2022	5/2/2022	7/26/2022	10/4/2022	2/28/2022	5/2/2022	7/26/2022	10/4/2022	2/28/2022	5/2/2022	7/26/2022	10/4/2022
Constituent	Unit	GWPS*	MI Residential**	MI Non- Residential**	MI GSI^	MI AMV***	MI FAV***	Chronic MZ^	Acute MZ^^												
Appendix III																					
Boron	ug/L	NA	500	500	4,000	34,000	69,000	44,000	69,000	9,120	8,580	8,360	8,710	745	1,020	618	530	4,850	4,450	4,900	4,800
Calcium	mg/L	NA	NC	NC	500EE	NC	NC	NC	NC	131	124	119	118	110	158	102	91.2	177	160	169	155
Chloride	mg/L	NA	250 ^E	250 ^E	50	320,000	640,000	NC	NC	75.5	85.3	77.7	85.8	7.73	13.3	24.9	25.4	53.8	51.4	51.9	52.1
Fluoride	ug/L	4,000	NC	NC	NC	9,800	20,000	NC	NC												
Sulfate	mg/L	NA	250 ^E	250 ^E	500EE	600,000	1,200,000	NC	NC	< 1	< 1	< 1	< 1	80.3	190	90.1	92.8	274	241	291	268
Total Dissolved Solids	mg/L	NA	500E	500E	500	NC	NC	NC	NC	-	-										
pH, Field	su	NA	6.5 - 8.5 ^E	6.5 - 8.5 ^E	6.5 - 9.0	NC	NC	NC	NC	8.2	7.6	7.9	8.4	7.1	7.0	7.2	7.4	7.0	7.1	7.0	7.1
Appendix IV																					
Antimony	ug/L	6	6.0	6.0	2.0	1,100	2,300	NC	NC	-											
Arsenic	ug/L	21¹	10	10	10	340	680	100	680	3	4	3	4	124	111	164	183	97	100	94	97
Barium	ug/L	2,000	2,000	2,000	1,200	3,400	6,800	NC	NC												
Beryllium	ug/L	4	4.0	4.0	33	300	600	NC	NC												
Cadmium	ug/L	5	5.0	5.0	2.5	12	24	NC	NC												
Chromium	ug/L	100	100	100	11	16	32	NC	NC	2	2	2	2	2	2	1	< 1	2	< 1	< 1	< 1
Cobalt	ug/L	15	40	100	100	370	740	NC	NC												
Fluoride	ug/L	4,000	NC	NC	NC	9,800	20,000	NC	NC												
Lead	ug/L	15	4.0	4.0	14	250	500	NC	NC												
Lithium	ug/L	180	170	350	440	910	1,800	NC	NC	89	92	92	89	34	52	38	35	98	111	110	105
Mercury	ug/L	2	2.0	2.0	0.20#	1.4	2.8	NC	NC	-	-										
Molybdenum	ug/L	100	73	210	120	29,000	58,000	NC	NC	< 5	< 5	< 5	< 5	< 5	< 5	8	8	32	21	20	22
Radium-226/228	pci/L	5	NC	NC	NC	NC	NC	NC	NC	1	ł										
Selenium	ug/L	50	50	50	5.0	62	120	55	120	2	3	4	3	< 1	1	1	1	2	2	3	2
Thallium	ug/L	2	2.0	2.0	2.0	47	94	NC	NC	-	-										
MI Part 115 Parameters																					
Iron	ug/L	NA	300E	300E	500,000EE	NC	NC	NC	NC	141	386	295	181	1,630	2,670	1,510	1,120	9,150	8,550	9,960	9,190
Copper	ug/L	NA	1,000E	1,000 ^E	20	33	66	NC	NC		-										
Nickel	ug/L	NA	100	100	120	1,000	2,100	NC	NC	-	-										
Silver	ug/L	NA	34	98	0.2	0.54	1.1	NC	NC		-										
Vanadium	ug/L	NA	4.5	62	27	79	160	NC	NC	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Zinc	ug/L	NA	2,400	5,000€	260	260	520	NC	NC		-										

Notes:

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

SU - standard units; pH is a field parameter.

NA - not applicable. NC - no criteria.

-- - not analyzed.

- * GWPS (Groundwater Protection Standard) is the higher of the Maximum Contaminant Level (MCL)/Regional Screening Level from 83 FR 36435 (RSL) and Upper Tolerance Limit (UTL) as established in TRC's Technical Memorandum dated October 15, 2018.
- ** Michigan Part 201 Generic Drinking Water Cleanup Criteria, December 21, 2020.
- ^ 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}.
- *** Aquatic Maximum (AMV) and Final Acute Values (FAV) are taken from EGLE Rule 323.1057 Part 4 Water Quality Standards (Rule 57), March 15, 2018. Hardness-dependent criteria calculated using site-specific hardness of 258 mg CaCO3/L (average of SW-01 [Lake Huron] and SW-02 [Saginaw River] collected in April 2018). Chromium AMV & FAV criteria are based on hexavalent chromium.
- M Mixing Zone (MZ) GSI Criteria from Michigan Department of Environmental Quality (MDEQ) approval letter dated December 23, 2015.
- # 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 EGLE 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}. BOLD font denotes concentrations detected above laboratory reporting limits.

Result Indicates an exceedance of one or more applicable health-based drinking water and GSI criteria. Result Indicates an exceedance of acute-based GSI criteria.

All metals were analyzed as total unless otherwise specified.

1 - Constituent triggered an Assessment of Corrective Measures for the Karn Bottom Ash Pond as described in TRC's letter report dated Januarary 14, 2019.

Page 2 of 5 January 2023

Summary of Groundwater Sampling Results (Analytical) DE Karn Nature and Extent Monitoring Wells Essexville, Michigan

								Sar	mple Location:			<u>/-10</u>				V-12				V-14	
									Sample Date:	2/28/2022	5/2/2022	7/26/2022	10/4/2022	2/28/2022	5/2/2022	7/26/2022	10/4/2022	2/28/2022	5/2/2022	7/26/2022	10/4/2022
Constituent	Unit	GWPS*	MI Residential**	MI Non- Residential**	MI GSI^	MI AMV***	MI FAV***	Chronic MZ^	Acute MZ^^												
Appendix III																					
Boron	ug/L	NA	500	500	4,000	34,000	69,000	44,000	69,000	4,680	5,550	5,100	4,550	3,850	3,870	4,040	4,140	2,760	2,980	2,900	2,740
Calcium	mg/L	NA	NC	NC	500EE	NC	NC	NC	NC	181	180	186	172	178	201	190	186	221	191	204	241
Chloride	mg/L	NA	250 ^E	250 ^E	50	320,000	640,000	NC	NC	62.6	62.4	56.7	56.5	71.5	59.2	68.3	67.2	77.1	63.7	69	57.8
Fluoride	ug/L	4,000	NC	NC	NC	9,800	20,000	NC	NC												
Sulfate	mg/L	NA	250 ^E	250 ^E	500EE	600,000	1,200,000	NC	NC	119	77.2	108	156	239	240	265	250	390	256	282	573
Total Dissolved Solids	mg/L	NA	500E	500 ^E	500	NC	NC	NC	NC												
pH, Field	su	NA	6.5 - 8.5 ^E	6.5 - 8.5 ^E	6.5 - 9.0	NC	NC	NC	NC	7.2	7.2	7.1	7.1	7.2	7.2	7.2	7.2	7.1	7.1	7.1	7.0
Appendix IV																					
Antimony	ug/L	6	6.0	6.0	2.0	1,100	2,300	NC	NC												
Arsenic	ug/L	21 ¹	10	10	10	340	680	100	680	616	621	616	326	537	389	312	386	358	352	421	118
Barium	ug/L	2,000	2,000	2,000	1,200	3,400	6,800	NC	NC												
Beryllium	ug/L	4	4.0	4.0	33	300	600	NC	NC												
Cadmium	ug/L	5	5.0	5.0	2.5	12	24	NC	NC												
Chromium	ug/L	100	100	100	11	16	32	NC	NC	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	1	1	< 1	< 1
Cobalt	ug/L	15	40	100	100	370	740	NC	NC												
Fluoride	ug/L	4,000	NC	NC	NC	9,800	20,000	NC	NC												
Lead	ug/L	15	4.0	4.0	14	250	500	NC	NC												
Lithium	ug/L	180	170	350	440	910	1,800	NC	NC	123	137	131	131	105	110	119	114	90	86	81	99
Mercury	ug/L	2	2.0	2.0	0.20#	1.4	2.8	NC	NC												
Molybdenum	ug/L	100	73	210	120	29,000	58,000	NC	NC	12	5	< 5	7	7	10	7	9	27	13	8	13
Radium-226/228	pci/L	5	NC	NC	NC	NC	NC	NC	NC												
Selenium	ug/L	50	50	50	5.0	62	120	55	120	3	3	2	2	4	5	6	4	10	10	5	27
Thallium	ug/L	2	2.0	2.0	2.0	47	94	NC	NC												
MI Part 115 Parameters																					
Iron	ug/L	NA	300E	300 ^E	500,000EE	NC	NC	NC	NC	5,120	5,150	5,760	3,520	2,380	3,140	1,800	3,070	3,270	2,770	3,400	164
Copper	ug/L	NA	1,000E	1,000E	20	33	66	NC	NC									·		`	
Nickel	ug/L	NA	100	100	120	1,000	2,100	NC	NC												
Silver	ug/L	NA	34	98	0.2	0.54	1.1	NC	NC												
Vanadium	ug/L	NA	4.5	62	27	79	160	NC	NC	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Zinc	ug/L	NA	2,400	5,000 ^E	260	260	520	NC	NC												

Notes:

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

SU - standard units; pH is a field parameter.

NA - not applicable. NC - no criteria.

-- - not analyzed.

- * GWPS (Groundwater Protection Standard) is the higher of the Maximum Contaminant Level (MCL)/Regional Screening Level from 83 FR 36435 (RSL) and Upper Tolerance Limit (UTL) as established in TRC's Technical Memorandum dated October 15, 2018.
- ** Michigan Part 201 Generic Drinking Water Cleanup Criteria, December 21, 2020.
- ^ 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}.
- *** Aquatic Maximum (AMV) and Final Acute Values (FAV) are taken from EGLE Rule 323.1057 Part 4 Water Quality Standards (Rule 57), March 15, 2018. Hardness-dependent criteria calculated using site-specific hardness of 258 mg CaCO3/L (average of SW-01 [Lake Huron] and SW-02 [Saginaw River] collected in April 2018). Chromium AMV & FAV criteria are based on hexavalent chromium.
- M Mixing Zone (MZ) GSI Criteria from Michigan Department of Environmental Quality (MDEQ) approval letter dated December 23, 2015.
- # 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 EGLE 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}. BOLD font denotes concentrations detected above laboratory reporting limits.

Result Indicates an exceedance of one or more applicable health-based drinking water and GSI criteria. Indicates an exceedance of acute-based GSI criteria.

Result All metals were analyzed as total unless otherwise specified.

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Page 3 of 5 January 2023

Summary of Groundwater Sampling Results (Analytical) DE Karn Nature and Extent Monitoring Wells Essexville, Michigan

								Sa	mple Location:			V-16	1			V-22				<u>/-23</u>	
									Sample Date:	2/28/2022	5/2/2022	7/26/2022	10/4/2022	3/1/2022	5/3/2022	7/27/2022	10/6/2022	3/1/2022	5/3/2022	7/27/2022	10/6/2022
Constituent	Unit	GWPS*	MI Residential**	MI Non- Residential**	MI GSI^	MI AMV***	MI FAV***	Chronic MZ^	Acute MZ^^												
Appendix III																					
Boron	ug/L	NA	500	500	4,000	34,000	69,000	44,000	69,000	1,110	1,120	1,360	1,510	6,590	7,450	6,870	6,930	6,700	6,840	6,760	6,830
Calcium	mg/L	NA	NC	NC	500EE	NC	NC	NC	NC	381	378	381	338	87.8	75.4	75.4	75.3	150	154	157	181
Chloride	mg/L	NA	250 ^E	250 ^E	50	320,000	640,000	NC	NC	122	105	113	104	100	96.6	95.4	104	57.8	57.6	56.9	55.4
Fluoride	ug/L	4,000	NC	NC	NC	9,800	20,000	NC	NC									-			
Sulfate	mg/L	NA	250 ^E	250 ^E	500EE	600,000	1,200,000	NC	NC	1,360	1,240	1,210	1,210	195	176	168	176	271	269	273	438
Total Dissolved Solids	mg/L	NA	500 ^E	500 ^E	500	NC	NC	NC	NC					565	535	550	593	948	898	886	871
pH, Field	su	NA	6.5 - 8.5 ^E	6.5 - 8.5 ^E	6.5 - 9.0	NC	NC	NC	NC	7.2	7.2	7.2	7.3	6.4	7.2	7.0	6.9	7.0	6.9	6.7	6.8
Appendix IV																					
Antimony	ug/L	6	6.0	6.0	2.0	1,100	2,300	NC	NC												
Arsenic	ug/L	21 ¹	10	10	10	340	680	100	680	3	2	2	1	656	574	516	559	32	92	47	53
Barium	ug/L	2,000	2,000	2,000	1,200	3,400	6,800	NC	NC												
Beryllium	ug/L	4	4.0	4.0	33	300	600	NC	NC												
Cadmium	ug/L	5	5.0	5.0	2.5	12	24	NC	NC									-			
Chromium	ug/L	100	100	100	11	16	32	NC	NC	1	< 1	< 1	< 1	2	< 1	< 1	< 1	2	11	2	1
Cobalt	ug/L	15	40	100	100	370	740	NC	NC												
Fluoride	ug/L	4,000	NC	NC	NC	9,800	20,000	NC	NC												
Lead	ug/L	15	4.0	4.0	14	250	500	NC	NC												
Lithium	ug/L	180	170	350	440	910	1,800	NC	NC	115	127	123	114	106	133	131	129	94	112	115	122
Mercury	ug/L	2	2.0	2.0	0.20#	1.4	2.8	NC	NC												
Molybdenum	ug/L	100	73	210	120	29,000	58,000	NC	NC	18	20	23	30	1,380	1,180	1,110	1,190	45	53	44	46
Radium-226/228	pci/L	5	NC	NC	NC	NC	NC	NC	NC							-					
Selenium	ug/L	50	50	50	5.0	62	120	55	120	6	7	6	12	4	3	4	3	3	5	3	2
Thallium	ug/L	2	2.0	2.0	2.0	47	94	NC	NC												
MI Part 115 Parameters																					
Iron	ug/L	NA	300E	300E	500,000EE	NC	NC	NC	NC	209	268	100	25	746	263	89	256	31,800	48,500	37,000	44,000
Copper	ug/L	NA	1,000 ^E	1,000E	20	33	66	NC	NC										-		
Nickel	ug/L	NA	100	100	120	1,000	2,100	NC	NC										-		
Silver	ug/L	NA	34	98	0.2	0.54	1.1	NC	NC										-		
Vanadium	ug/L	NA	4.5	62	27	79	160	NC	NC	< 2	< 2	< 2	< 2	8	3	3	3	4	33	5	< 2
Zinc	ug/L	NA	2,400	5,000E	260	260	520	NC	NC												

Notes:

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

SU - standard units; pH is a field parameter.

NA - not applicable.

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- ^ 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}.
- *** Aquatic Maximum (AMV) and Final Acute Values (FAV) are taken from EGLE Rule 323.1057 Part 4 Water Quality Standards (Rule 57), March 15, 2018. Hardness-dependent criteria calculated using site-specific hardness of 258 mg CaCO3/L (average of SW-01 [Lake Huron] and SW-02 [Saginaw River] collected in April 2018). Chromium AMV & FAV criteria are based on hexavalent chromium.
- M Mixing Zone (MZ) GSI Criteria from Michigan Department of Environmental Quality (MDEQ) approval letter dated December 23, 2015.
- # 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 EGLE policy and procedure 09-014 dated June 20, 2012.
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Result Indicates an exceedance of one or more applicable health-based drinking water and GSI criteria. Result Indicates an exceedance of acute-based GSI criteria.

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Page 4 of 5 January 2023

Summary of Groundwater Sampling Results (Analytical) DE Karn Nature and Extent Monitoring Wells Essexville, Michigan

		Sample Location:									OV	<i>I</i> -10			OV	V-11		OW-12				
									Sample Date:	2/28/2022	5/3/2022	7/26/2022	10/4/2022	3/1/2022	5/3/2022	7/26/2022	10/4/2022	2/28/2022	5/3/2022	7/26/2022	10/4/2022	
Constituent	Unit	GWPS*	MI Residential**	MI Non- Residential**	MI GSI^	MI AMV***	MI FAV***	Chronic MZ^	Acute MZ^^		•	•	•		•	•						
Appendix III																						
Boron	ug/L	NA	500	500	4,000	34,000	69,000	44,000	69,000	955	1,180	1,090	1,100	3,310	3,370	3,330	3,470	914	917	1,230	1,090	
Calcium	mg/L	NA	NC	NC	500EE	NC	NC	NC	NC	90.7	98.3	101	118	7.97	8.26	5.33	7.13	72.5	90.3	84.8	70.7	
Chloride	mg/L	NA	250 ^E	250 ^E	50	320,000	640,000	NC	NC	51.7	68.7	58	66	61.7	61.3	61.6	62.5	57.8	64.9	55.5	61.8	
Fluoride	ug/L	4,000	NC	NC	NC	9,800	20,000	NC	NC	< 1,000	< 1,000	< 1,000	< 1,000	3,250	2,790	2,710	3,460	< 1,000	< 1,000	< 1,000	< 1,000	
Sulfate	mg/L	NA	250 ^E	250 ^E	500EE	600,000	1,200,000	NC	NC	3.51	2.32	2.67	46.4	22	20.7	19.9	19.3	150	206	169	150	
Total Dissolved Solids	mg/L	NA	500E	500 ^E	500	NC	NC	NC	NC	448	545	568	612	219	229	235	260	533	663	601	531	
pH, Field	su	NA	6.5 - 8.5 ^E	6.5 - 8.5 ^E	6.5 - 9.0	NC	NC	NC	NC	7.3	7.1	7.2	7.1	9.5	9.5	9.8	9.6	7.3	7.1	7.1	7.2	
Appendix IV																						
Antimony	ug/L	6	6.0	6.0	2.0	1,100	2,300	NC	NC	< 1	< 1	< 1	< 1	4	2	4	2	< 1	< 1	< 1	< 1	
Arsenic	ug/L	21 ¹	10	10	10	340	680	100	680	6	2	2	3	783	671	682	667	120	93	111	104	
Barium	ug/L	2,000	2,000	2,000	1,200	3,400	6,800	NC	NC	157	136	163	157	30	27	17	28	87	98	90	80	
Beryllium	ug/L	4	4.0	4.0	33	300	600	NC	NC	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
Cadmium	ug/L	5	5.0	5.0	2.5	12	24	NC	NC	< 0.2	< 0.2	< 0.2	< 0.2	0.3	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	
Chromium	ug/L	100	100	100	11	16	32	NC	NC	2	2	2	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
Cobalt	ug/L	15	40	100	100	370	740	NC	NC	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	< 6	
Fluoride	ug/L	4,000	NC	NC	NC	9,800	20,000	NC	NC	< 1,000	< 1,000	< 1,000	< 1,000	3,250	2,790	2,710	3,460	< 1,000	< 1,000	< 1,000	< 1,000	
Lead	ug/L	15	4.0	4.0	14	250	500	NC	NC	< 1	< 1	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
Lithium	ug/L	180	170	350	440	910	1,800	NC	NC	19	30	27	31	< 10	< 10	< 10	< 10	33	35	36	34	
Mercury	ug/L	2	2.0	2.0	0.20#	1.4	2.8	NC	NC	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	
Molybdenum	ug/L	100	73	210	120	29,000	58,000	NC	NC	< 5	< 5	< 5	< 5	231	197	173	178	17	14	17	21	
Radium-226/228	pci/L	5	NC	NC	NC	NC	NC	NC	NC	-	< 0.632		1.96	-	< 0.525		1.35		0.620		1.91	
Selenium	ug/L	50	50	50	5.0	62	120	55	120	3	2	2	10	6	3	5	4	2	1	1	2	
Thallium	ug/L	2	2.0	2.0	2.0	47	94	NC	NC	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	
MI Part 115 Parameters																						
Iron	ug/L	NA	300E	300 ^E	500,000EE	NC	NC	NC	NC	1,200	4,140	3,350	1,350	82	45	31	128	4,830	5,790	6,080	5,800	
Copper	ug/L	NA	1,000E	1,000E	20	33	66	NC	NC	2	2	3	1	< 1	2	< 1	1	< 1	1	< 1	< 1	
Nickel	ug/L	NA	100	100	120	1,000	2,100	NC	NC	6	4	3	3	3	2	2	2	4	4	< 2	3	
Silver	ug/L	NA	34	98	0.2	0.54	1.1	NC	NC	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	
Vanadium	ug/L	NA	4.5	62	27	79	160	NC	NC	8	3	5	5	1,150	660	1,500	693	< 2	< 2	< 2	< 2	
Zinc	ug/L	NA	2,400	5,000€	260	260	520	NC	NC	< 10	< 10	< 10	< 10	< 10	< 10	< 10	181	< 10	< 10	< 10	< 10	

Notes:

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

SU - standard units; pH is a field parameter.

NA - not applicable. NC - no criteria.

-- - not analyzed.

- * GWPS (Groundwater Protection Standard) is the higher of the Maximum Contaminant Level (MCL)/Regional Screening Level from 83 FR 36435 (RSL) and Upper Tolerance Limit (UTL) as established in TRC's Technical Memorandum dated October 15, 2018.
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Page 5 of 5 January 2023

Summary of Groundwater Sampling Results (Analytical) DE Karn Nature and Extent GSI Monitoring Locations Essexville, Michigan

Sample Location:												T1-3GSI				3GSI		T3-3GSI				
			2/28/2022	5/4/2022	7/25/2022	10/3/2022	2/28/2022	5/4/2022	7/25/2022	10/3/2022	2/28/2022	5/4/2022	7/25/2022	10/3/2022								
Constituent	Unit	GWPS*	MI Residential**	MI Non- Residential**	MI GSI^	MI AMV***	MI FAV***	Chronic MZ^^	Acute MZ^^													
Appendix III																						
Boron	ug/L	NA	500	500	4,000	34,000	69,000	44,000	69,000		43	48	321		4,030	5,240	5,030		65	705	404	
Calcium	mg/L	NA	NC	NC	500EE	NC	NC	NC	NC		68.5	37.8	82.5		212	152	178		63.5	144	141	
Chloride	mg/L	NA	250 ^E	250 ^E	50	320,000	640,000	NC	NC		45.6	51.5	48.7		49.2	68.2	61.6		46.5	45.9	66.6	
Sulfate	mg/L	NA	250 ^E	250 ^E	500EE	600,000	1,200,000	NC	NC		24.2	23.9	< 1		121	16.5	79		25	< 1	< 1	
pH, Field	su	NA	6.5 - 8.5 ^E	6.5 - 8.5 ^E	6.5 - 9.0	NC	NC	NC	NC		7.6	7.3	7.0		6.7	6.5	6.8		7.2	6.7	6.8	
Appendix IV																						
Arsenic	ug/L	21 ¹	10	10	10	340	680	100 ²	680		2	5	3		< 1	< 1	< 1		8	< 1	1	
Chromium	ug/L	100	100	100	11	16	32	NC	NC		1	1	2		2	2	1		2	1	2	
Lithium	ug/L	180	170	350	440	910	1,800	NC	NC		< 10	< 10	14		102	115	116		< 10	116	52	
Molybdenum	ug/L	100	73	210	120	29,000	58,000	NC	NC		< 5	6	< 5		< 5	< 5	< 5		< 5	< 5	< 5	
Selenium	ug/L	50	50	50	5.0	62	120	NC	NC		2	1	< 1		2	2	2		1	2	1	
MI Part 115 Parameters																						
Iron	ug/L	NA	300E	300E	500,000EE	NC	NC	NC	NC		911	568	2,190		161	164	106		2,700	1,700	2,750	
Vanadium	ug/L	NA	4.5	62	27	260	520	NC	NC		< 2	< 2	< 2		< 2	2	< 2		< 2	< 2	< 2	

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

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NA - not applicable.

NC - no criteria.

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- ^ 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).
- *** Aquatic Maximum (AMV) and Final Acute Values (FAV) are taken from EGLE Rule 323.1057 Part 4 Water Quality Standards (Rule 57), March 15, 2018. Hardness-dependent criteria calculated using site-specific hardness of 258 mg CaCO3/L (average of SW-01 [Lake Huron] and SW-02 [Saginaw River] collected in April 2018). Chromium AMV & FAV criteria are based on hexavalent chromium.
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- ^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}.

BOLD font denotes concentrations detected above laboratory reporting limits.

Indicates an exceedance of one or more applicable health-based drinking water and GSI criteria. Result Indicates an exceedance of acute-based GSI criteria.

All metals were analyzed as total unless otherwise specified.

Transect samples were unable to be collected during the first quarter 2022 event due to site conditions.

- 1 Constituent triggered an Assessment of Corrective Measures for the Karn Bottom Ash Pond as described in TRC's letter report dated Januarary 14, 2019.
- ² Compliance demonstrated on a mass flux basis.

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Page 1 of 2 January 2023

Summary of Groundwater Sampling Results (Analytical) DE Karn Nature and Extent GSI Monitoring Locations Essexville, Michigan

	T4-3GSI					T5-	3GSI		T6-3GSI												
Sample Location: Sample Date:													10/3/2022	2/28/2022			10/3/2022	2/28/2022			10/3/2022
Constituent	Unit	GWPS*	MI Residential**	MI Non- Residential**	MI GSI^	MI AMV***	MI FAV***	Chronic MZ^^	'						* "=*==	1				,	
Appendix III																					
Boron	ug/L	NA	500	500	4,000	34,000	69,000	44,000	69,000		2,300	878	448		288	1,600	1,150		187	321	139
Calcium	mg/L	NA	NC	NC	500EE	NC	NC	NC	NC		72.5	104	73.5		231	101	62.8		73.6	73.5	51.1
Chloride	mg/L	NA	250 ^E	250 ^E	50	320,000	640,000	NC	NC		42.2	47.5	48.3		61	18.4	48.3		32	31.5	54.4
Sulfate	mg/L	NA	250 ^E	250 ^E	500EE	600,000	1,200,000	NC	NC		2.8	< 1	< 1		410	172	6.95		72.4	28.9	13.9
pH, Field	su	NA	6.5 - 8.5 ^E	6.5 - 8.5 ^E	6.5 - 9.0	NC	NC	NC	NC		7.3	7.1	7.2		7.3	7.2	7.4		7.6	7.4	7.6
Appendix IV																					
Arsenic	ug/L	21¹	10	10	10	340	680	100 ²	680		14	84	6		352	525	187		< 1	2	1
Chromium	ug/L	100	100	100	11	16	32	NC	NC		1	2	1		1	2	1		1	< 1	< 1
Lithium	ug/L	180	170	350	440	910	1,800	NC	NC		36	22	35		49	62	43		18	32	18
Molybdenum	ug/L	100	73	210	120	29,000	58,000	NC	NC		< 5	< 5	< 5		< 5	< 5	< 5		5	< 5	6
Selenium	ug/L	50	50	50	5.0	62	120	NC	NC		2	2	< 1		3	1	< 1		2	1	< 1
MI Part 115 Parameters																					
Iron	ug/L	NA	300E	300 ^E	500,000EE	NC	NC	NC	NC		743	14,300	770		333	149	86		156	220	84
Vanadium	ug/L	NA	4.5	62	27	260	520	NC	NC		< 2	< 2	< 2		< 2	< 2	< 2		< 2	< 2	< 2

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-- - not analyzed.

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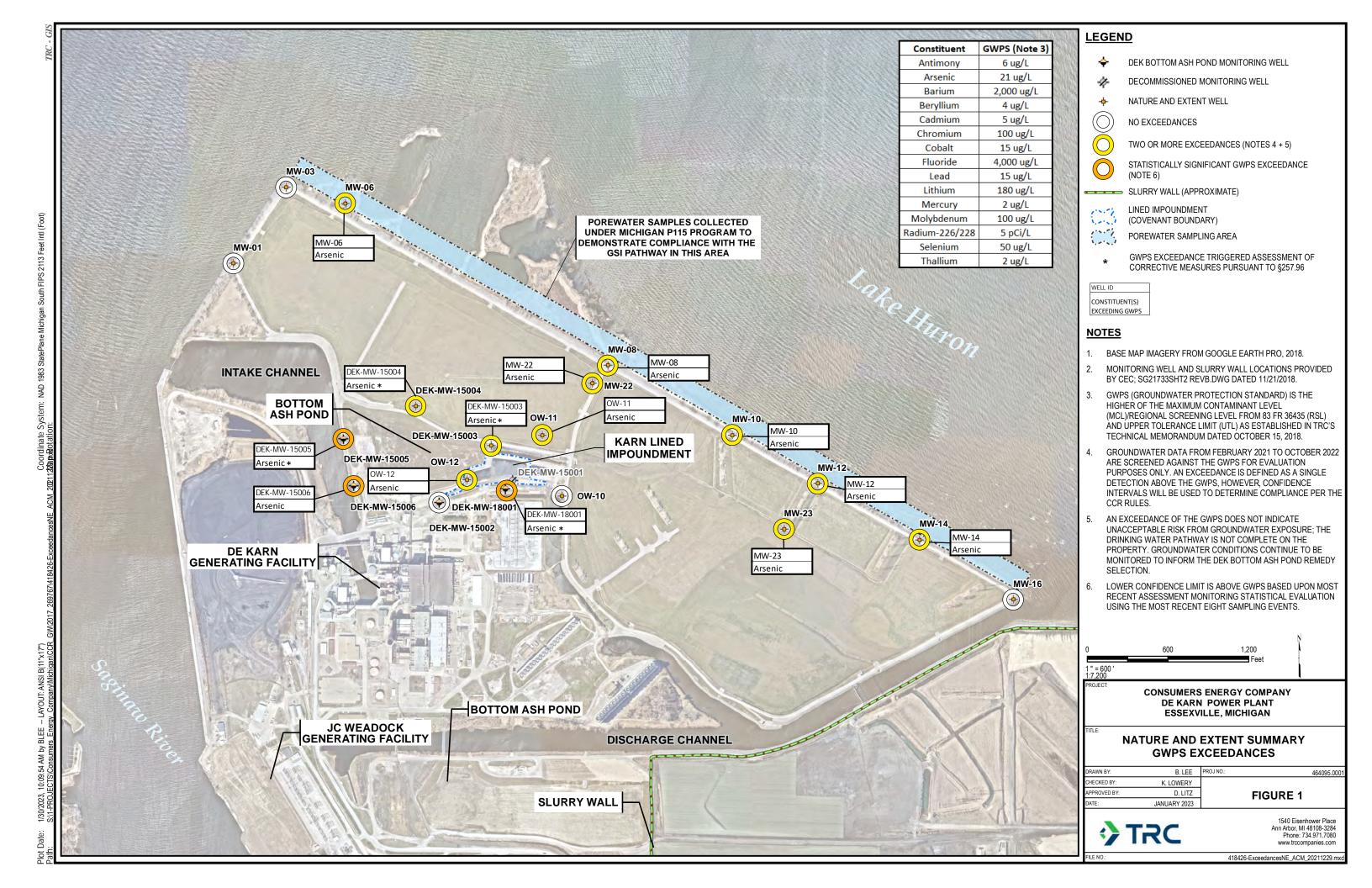
All metals were analyzed as total unless otherwise specified.

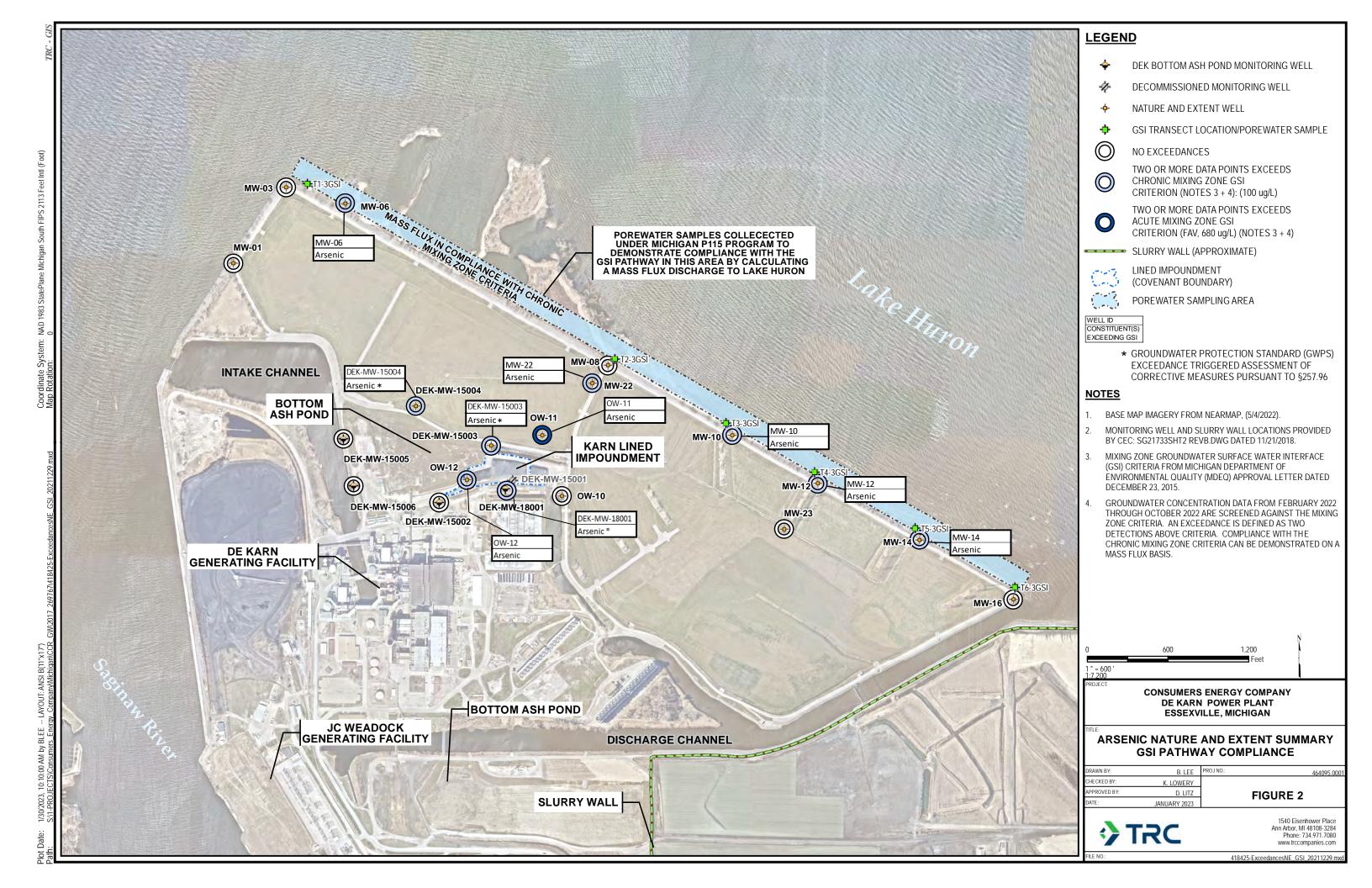
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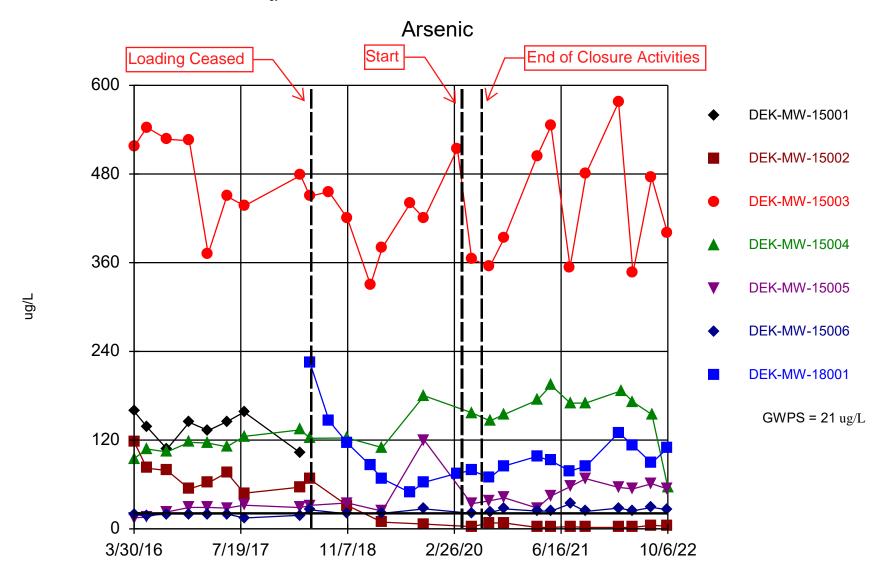
Page 2 of 2 January 2023

Figures



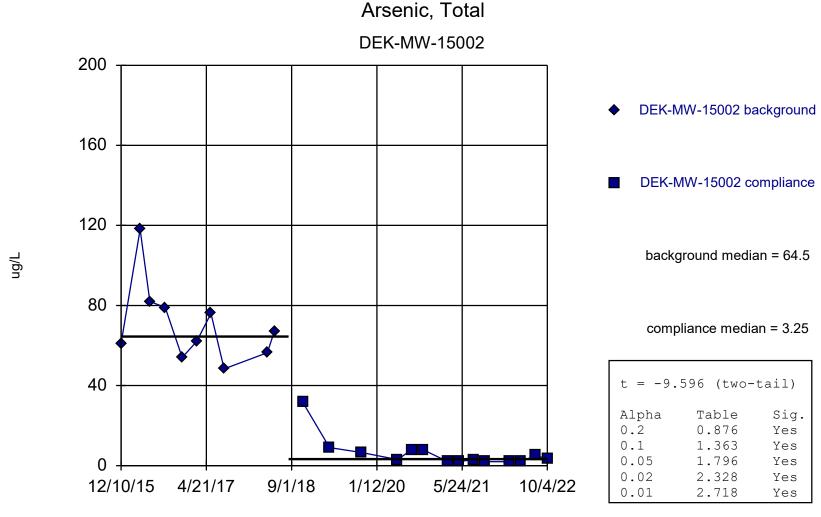


Attachment A Statistical Evaluation

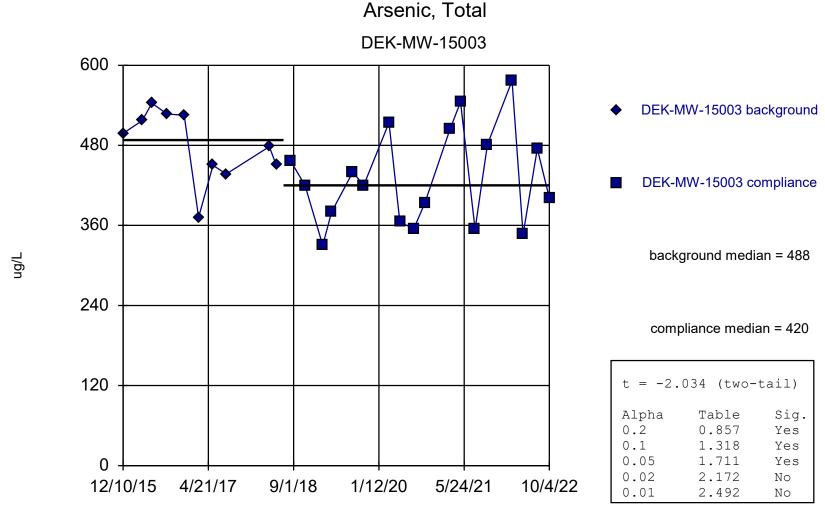


Time Series Analysis Run 12/21/2022 11:01 AM

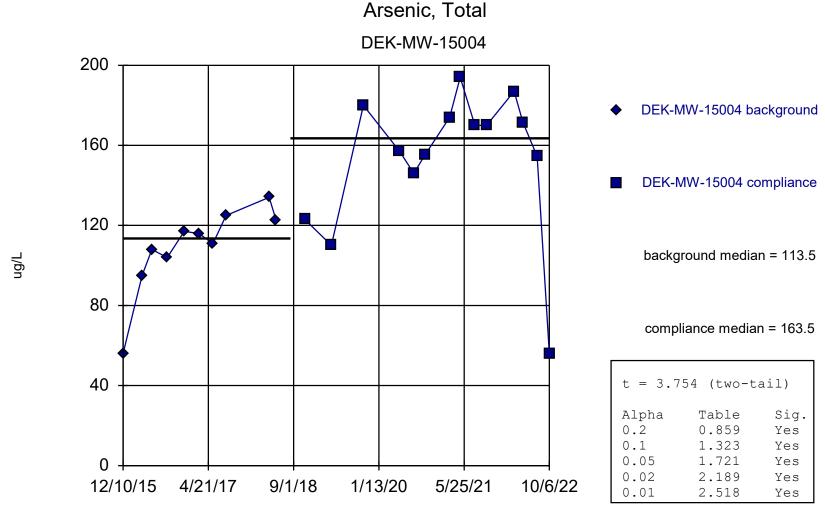
Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4



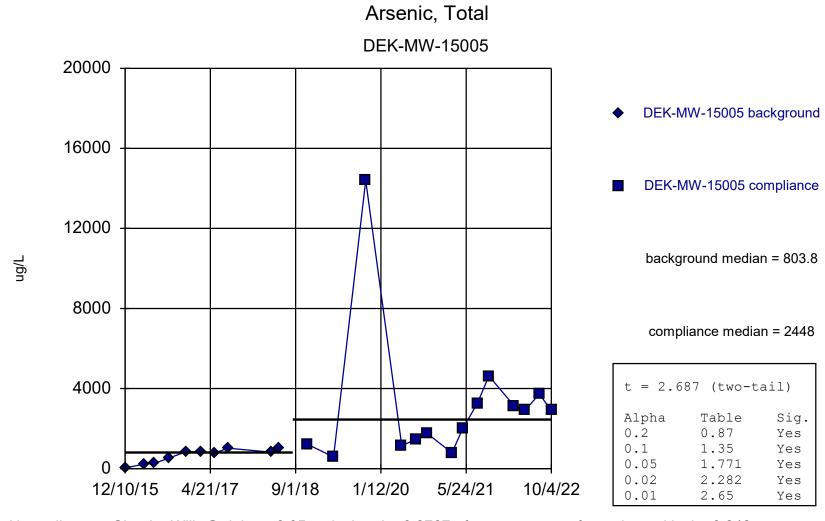
Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8668, critical = 0.842.



Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9262, critical = 0.842.



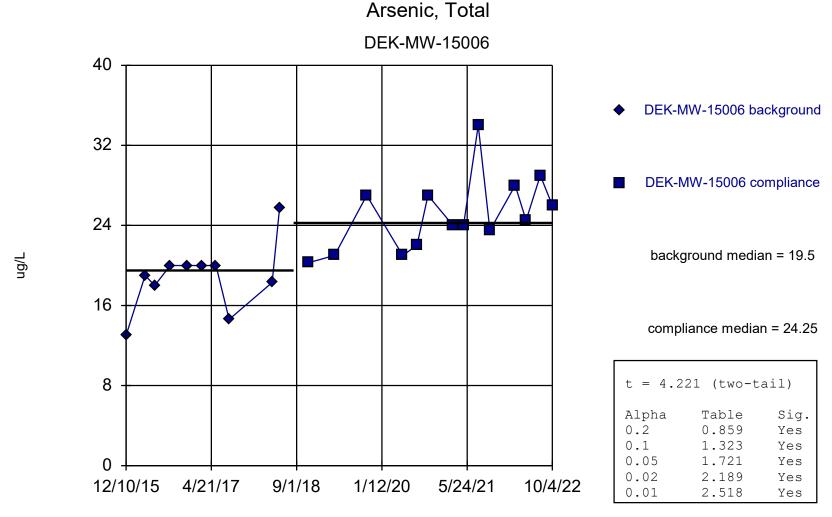
Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.852, critical = 0.842.



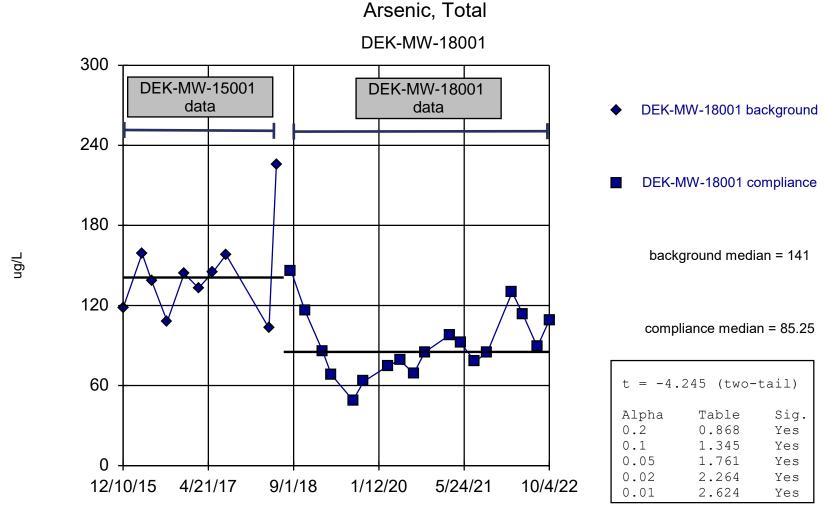
Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8767 after square transformation, critical = 0.842.

Welch's t-test Analysis Run 1/3/2023 11:44 AM

Client: Consumers Energy Data: DEK_HMPCCR_Sanitas_22Q4



Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8992, critical = 0.842.



Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8737, critical = 0.842.

	DEK-MW-15002	DEK-MW-15002
12/10/2015	61	
3/30/2016	118	
5/26/2016	82	
8/24/2016	79	
12/1/2016	54	
2/23/2017	62	
5/18/2017	76	
8/3/2017	48.3	
4/12/2018	56.4	
5/23/2018	67	
11/5/2018		31.7
4/11/2019		9
10/15/2019		6.5
5/13/2020		3
8/3/2020		8
10/6/2020		8 (D)
3/1/2021		2
5/3/2021		2
7/28/2021		3 (D)
10/4/2021		2
3/1/2022		2 (D)
5/3/2022		2
7/26/2022		5
10/4/2022		3.5 (D)

	DEK-MW-15003	DEK-MW-15003
12/10/2015	498	
3/30/2016	517	
5/26/2016	543	
8/24/2016	527	
12/1/2016	525	
2/23/2017	372	
5/18/2017	450	
8/4/2017	437	
4/12/2018	478	
5/23/2018	450	
8/16/2018		456
11/6/2018		420
2/18/2019		330
4/11/2019		380
8/13/2019		440
10/15/2019		420
3/11/2020		514 (D)
5/14/2020		365
8/3/2020		355
10/6/2020		393
3/2/2021		504
5/3/2021		545
7/27/2021		354
10/7/2021		481
2/28/2022		577
5/3/2022		346.5 (D)
7/26/2022		475
10/4/2022		401

	DEK-MW-15004	DEK-MW-15004
12/10/2015	56	
3/30/2016	95	
5/26/2016	108	
8/24/2016	104	
12/1/2016	117	
2/23/2017	116	
5/18/2017	111	
8/3/2017	125 (D)	
4/12/2018	134	
5/23/2018	122.5 (D)	
11/6/2018		123
4/11/2019		110
10/15/2019		180
5/14/2020		157
8/4/2020		146
10/7/2020		155
3/2/2021		174
5/3/2021		194
7/28/2021		170
10/4/2021		170
3/14/2022		187
5/4/2022		171.5 (D)
7/27/2022		154.5 (D)
10/6/2022		56

	DEK-MW-15005	DEK-MW-15005
12/10/2015	5	
3/30/2016	15	
5/26/2016	16	
8/24/2016	23	
12/1/2016	29	
2/23/2017	29	
5/18/2017	28	
8/3/2017	31.9	
4/11/2018	28.7 (D)	
5/24/2018	31.7	
11/6/2018		35
4/11/2019		24 (D)
10/15/2019		120 (D)
5/13/2020		34 (D)
8/3/2020		38 (D)
10/7/2020		42
3/2/2021		28 (D)
5/3/2021		44.5 (D)
7/28/2021		57
10/4/2021		68
3/1/2022		56
5/3/2022		54
7/26/2022		61 (D)
10/4/2022		54

	DEK-MW-15006	DEK-MW-15006
12/10/2015	13	
3/30/2016	19	
5/25/2016	18	
8/24/2016	20	
12/1/2016	20	
2/23/2017	20	
5/18/2017	20	
8/3/2017	14.6	
4/11/2018	18.3	
5/24/2018	25.7	
11/5/2018		20.25 (D)
4/11/2019		21
10/15/2019		27
5/13/2020		21
8/4/2020		22
10/7/2020		27
3/2/2021		24
5/3/2021		24
7/28/2021		34
10/4/2021		23.5 (D)
3/1/2022		28
5/3/2022		24.5 (D)
7/26/2022		29
10/4/2022		26

	DEK-MW-18001	DEK-MW-18001
12/10/2015	118	
3/30/2016	159	
5/26/2016	138	
8/24/2016	108	
12/1/2016	144	
2/23/2017	133	
5/18/2017	145	
8/3/2017	158	
4/10/2018	103	
5/23/2018	225	
8/17/2018		146
11/6/2018		116
2/18/2019		85.5 (D)
4/10/2019		68
8/14/2019		49
10/15/2019		63
3/9/2020		75
5/14/2020		79
8/3/2020		69
10/6/2020		85
3/2/2021		98
5/3/2021		92
7/27/2021		78
10/7/2021		85
3/1/2022		130
5/3/2022		113
7/26/2022		89
10/4/2022		109