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Department of Energy

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November 22, 2023

Mr. Todd Hendricks
Division of Waste Management
Kentucky Department for Environmental Protection
300 Sower Boulevard, 2nd Floor
Frankfort, Kentucky 40601

PPPO-02-10026249-24B

Ms. Jamie Nielsen
Division of Waste Management
Kentucky Department for Environmental Protection
300 Sower Boulevard, 2nd Floor
Frankfort, Kentucky 40601

Dear Mr. Hendricks and Ms. Nielsen:

C-746-U CONTAINED LANDFILL THIRD QUARTER CALENDAR YEAR 2023 (JULY–SEPTEMBER) COMPLIANCE MONITORING REPORT, PADUCAH GASEOUS DIFFUSION PLANT, PADUCAH, KENTUCKY, FRNP-RPT-0295/V3, PERMIT NUMBER SW07300014, SW07300015, SW07300045, AGENCY INTEREST ID NO. 3059

The subject report for the third quarter calendar year (CY) 2023 has been uploaded to the Kentucky eForms portal via the Kentucky Online Gateway. Other recipients outside the Solid Waste Branch are receiving this document via e-mail distribution (see distribution list). This report is required in accordance with Permit Condition ACTV0006, Special Condition Number 3, of Solid Waste Landfill Permit Number SW07300014, SW07300015, SW07300045 (Permit). This report includes groundwater analytical data, a validation summary, groundwater flow rate and direction determination, figures depicting well locations, and methane monitoring results.

The statistical analyses on the third quarter CY 2023 monitoring well data collected from the C-746-U Landfill were performed in accordance with Monitoring Condition GSTR0001, Standard Requirement 3, using the U.S. Environmental Protection Agency guidance document, *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Final Guidance* (1989). This report also serves as the statistical exceedance notification for the third quarter CY 2023, in accordance with Monitoring Condition GSTR0001, Standard Requirement 5, of the Permit.

If you have any questions or require additional information, please contact Ryan Callihan at (740) 970-0255.

Sincerely,

APRIL LADD Digitally signed by APRIL LADD Date: 2023.11.22 14:36:34 -06'00'

April Ladd
Paducah Site Lead
Portsmouth/Paducah Project Office

Enclosure:
C-746-U Contained Landfill Third Quarter Calendar Year 2023 (July–September) Compliance Monitoring Report, Paducah Gaseous Diffusion Plant, Paducah, Kentucky, FRNP-RPT-0295/V3

cc w/ enclosure:
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FRNP-RPT-0295/V3

C-746-U Contained Landfill
Third Quarter Calendar Year 2023
(July–September)
Compliance Monitoring Report,
Paducah Gaseous Diffusion Plant,
Paducah, Kentucky

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FRNP-RPT-0295/V3

C-746-U Contained Landfill
Third Quarter Calendar Year 2023
(July–September)
Compliance Monitoring Report,
Paducah Gaseous Diffusion Plant,
Paducah, Kentucky

Date Issued—November 2023

U.S. DEPARTMENT OF ENERGY
Office of Environmental Management

Prepared by
FOUR RIVERS NUCLEAR PARTNERSHIP, LLC,
managing the
Deactivation and Remediation Project at the
Paducah Gaseous Diffusion Plant
under Contract DE-EM0004895

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CONTENTS

FIGURES

TABLES

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ACRONYMS

CFR	*Code of Federal Regulations*
CY	calendar year
KAR	*Kentucky Administrative Regulations*
KDWM	Kentucky Division of Waste Management
KRS	*Kentucky Revised Statutes*
LEL	lower explosive limit
LRGA	Lower Regional Gravel Aquifer
LTL	lower tolerance limit
MCL	maximum contaminant level
MW	monitoring well
RGA	Regional Gravel Aquifer
UCRS	Upper Continental Recharge System
URGA	Upper Regional Gravel Aquifer
UTL	upper tolerance limit

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1. INTRODUCTION

This report, *C-746-U Contained Landfill Third Quarter Calendar Year 2023 (July–September) Compliance Monitoring Report, Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, is being submitted in accordance with Solid Waste Permit No. SW07300014, SW07300015, SW07300045.

The Groundwater, Surface Water, Leachate, and Methane Monitoring Sample Data Reporting Form is provided in Appendix A. The facility information sheet is provided in Appendix B. Groundwater analytical results are presented in groundwater sample analyses tables and laboratory reports, which are presented in Appendix C. The statistical analyses and qualification statement are provided in Appendix D. The groundwater flow rate and direction determinations are provided in Appendix E. Appendix F contains the notifications for all permit required parameters whose concentrations exceed the maximum contaminant level (MCL) for Kentucky solid waste facilities provided in 401 *KAR* 47:030 § 6 and for all permit required parameters listed in 40 *CFR* § 302.4, Appendix A, that do not have an MCL and whose concentrations exceed the historical background concentrations [upper tolerance limit (UTL), or both UTL and lower tolerance limit (LTL) for pH, as established at a 95% confidence]. Appendix G provides a chart of MCL and historical background UTL exceedances that have occurred, beginning in the third quarter, calendar year (CY) 2002. Methane monitoring results are documented on the approved C-746-U Landfill Methane Monitoring Report form provided in Appendix H. The form includes pertinent remarks/observations as required by 401 *KAR* 48:090 § 5. Surface water analyses are provided in Appendix I. Analytical laboratory certification is provided in Appendix J. Laboratory analytical methods used to analyze the included data set are provided in Appendix K. Micro-purging stability parameter results are provided in Appendix L.

1.1 BACKGROUND

The C-746-U Landfill is an operating solid waste landfill located north of the Paducah Gaseous Diffusion Plant and north of the C-746-S&T Landfills. Construction and operation of the C-746-U Landfill were permitted in November 1996. The operation is regulated under Solid Waste Landfill Permit No. SW07300014, SW07300015, SW07300045. The permitted C-746-U Landfill area covers about 60 acres and includes a liner and leachate collection system. The C-746-U Landfill currently is operating in Phases 4, 5, and 6, with Phase 7 approved for receipt of waste as of September 27, 2019. A minor permit modification that included upgrades to the leachate storage capacity for Phases 6 and 7 was approved by KDWM on May 21, 2021 (FRNP 2021). Phases 1, 2, and 3 have long-term cover. Phases 8 through 23 have not been constructed.

1.2 MONITORING PERIOD ACTIVITIES

1.2.1 Groundwater Monitoring

Three zones are monitored at the site: the Upper Continental Recharge System (UCRS), the Upper Regional Gravel Aquifer (URGA), and the Lower Regional Gravel Aquifer (LRGA). There are 21 monitoring wells (MWs) under permit for the C-746-U Landfill: 9 UCRS wells, 6 URGA wells, and 6 LRGA wells. A map of the MW locations is presented in Figure 1. All MWs were sampled this quarter with the exception of MW359, MW368, MW376, and MW377 (screened in the UCRS), which had insufficient amounts of water to obtain samples; therefore, there are no laboratory analysis results for these locations.

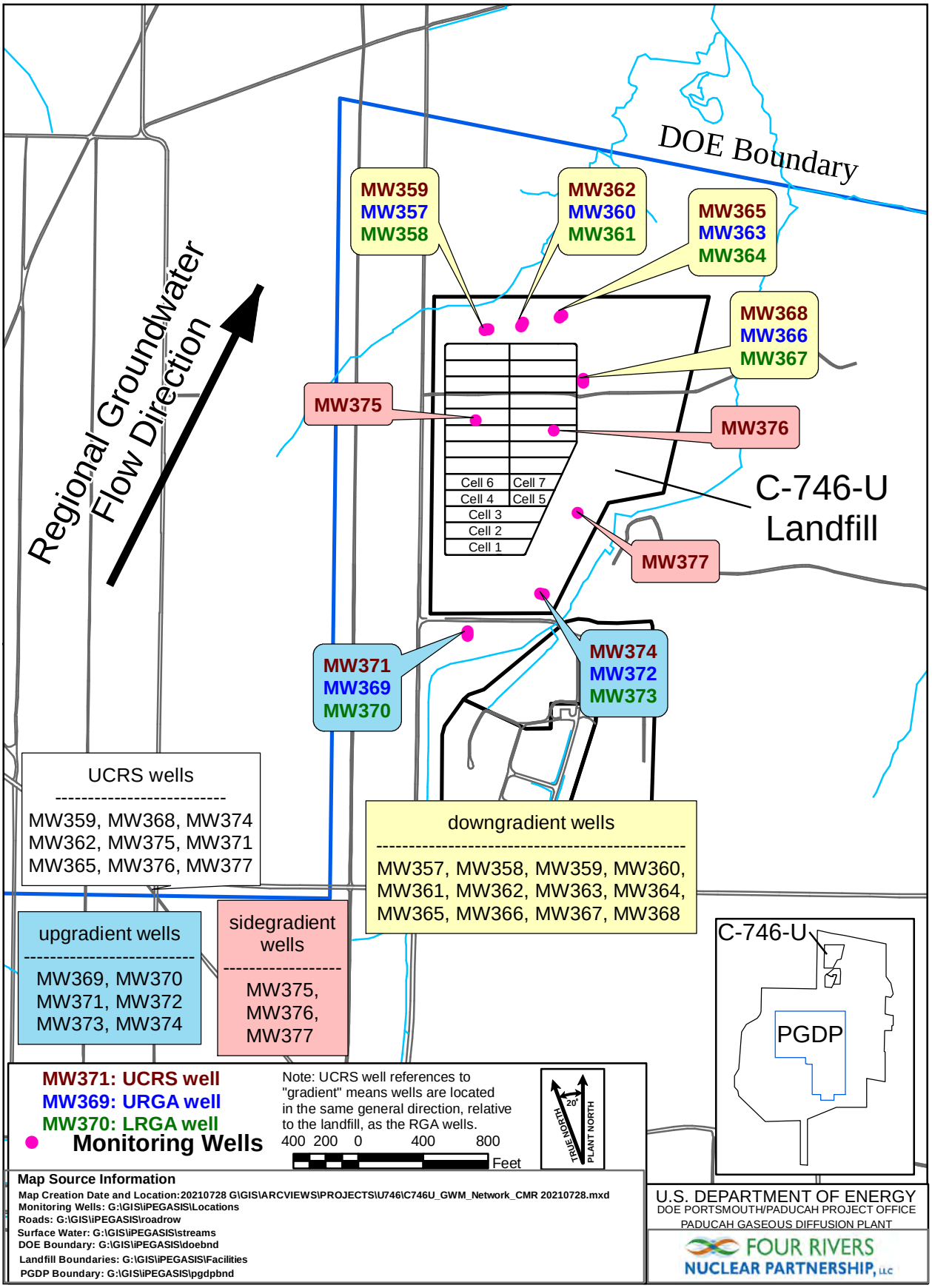

Figure 1. C-746-U Landfill Groundwater Monitoring Well Network

Consistent with the approved *Groundwater Monitoring Plan for the Solid Waste Permitted Landfills (C-746-S Residential Landfill, C-746-T Inert Landfill, and C-746-U Contained Landfill) at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, (Groundwater Monitoring Plan) UCRS wells are included in the monitoring program (LATA Kentucky 2014). Groundwater flow gradients are downward through the UCRS, but flow in the underlying Regional Gravel Aquifer (RGA) is lateral. Groundwater flow in the RGA typically is in a northeasterly direction in the vicinity of the C-746-U Landfill. The Ohio River and lower reaches of Little Bayou Creek are the discharge areas for the RGA flow system from the vicinity of the landfills.

Consistent with the conceptual site model, the constituent concentrations in UCRS wells are considered to be representative only of the conditions local to the well or sourced from overlying soils; thus, no discussion of potential "upgradient" sources is relevant to the discussion for the UCRS. Nevertheless, a UTL for background also has been calculated for UCRS wells using concentrations from UCRS wells located in the same direction (relative to the landfill) as those RGA wells identified as upgradient. The results from these wells are considered to represent historical "background" for UCRS water quality. Similarly, other gradient references for UCRS wells are identified using the same gradient references (relative to the landfill) that are attributed to nearby RGA wells. Results from UCRS wells are compared to this UTL and exceedances of these values are reported in the quarterly report.

Groundwater sampling was conducted within the third quarter 2023 in accordance with the Groundwater Monitoring Plan (LATA Kentucky 2014) using the Deactivation and Remediation Contractor procedure CP4-ES-2101, *Groundwater Sampling*. Groundwater sampling for the third quarter 2023 was conducted on July 18–25, 2023. The analytical laboratory used U.S. Environmental Protection Agency-approved methods, as applicable. Appropriate sample containers and preservatives were used. The parameters specified in Permit Condition GSTR0001, Special Condition 1, were analyzed for all locations sampled.

The groundwater flow rate and direction determination are provided in Appendix E. Depth-to-water was measured on July 24–25, 2023, in MWs of the C-746-U Landfill (see Appendix E, Table E.1), in MWs of the C-746-S&T Landfills, and in MWs of the surrounding region (shown on Appendix E, Figure E.4). Water level measurements in 39 vicinity wells define the potentiometric surface for the RGA. Typical regional flow in the RGA is northeastward, toward the Ohio River. During July, RGA groundwater flow in the area of the landfill was oriented northeast. The hydraulic gradient for the RGA in the vicinity of the C-746-U Landfill in July was 3.53×10^{-4} ft/ft (see Appendix E, Table E.2). The hydraulic gradients for the URGA and LRGA at the C-746-U Landfill were 6.08×10^{-4} ft/ft and 7.05×10^{-4} ft/ft, respectively (see Appendix E, Table E.2). Calculated groundwater flow rates (average linear velocity) at the C-746-U Landfill range from 1.03 to 1.76 ft/day for the URGA and 1.20 to 2.05 ft/day for the LRGA (see Appendix E, Table E.3).

1.2.2 Methane Monitoring

Methane monitoring was conducted in accordance with 401 *KAR* 48:090 § 5 and the approved Explosive Gas Monitoring Program (KEEC 2011), which is Technical Application Attachment 12, of the Solid Waste Permit. Industrial Hygiene staff monitored for the occurrence of methane in four on-site building locations and four locations along the landfill boundary on August 10, 2023. Appendix H provides a map of the monitoring locations (Appendix H, Figure H.1). Monitoring results identified that all locations were compliant with the regulatory requirement of < 100% lower explosive limit (LEL) at boundary locations and < 25% LEL at all other locations. The results are documented on the C-746-U Landfill Methane Monitoring Report provided in Appendix H.

1.2.3 Surface Water Monitoring

Surface water was monitored, as specified in 401 *KAR* 48:300 § 2, and the approved *Surface Water Monitoring Plan for C-746-U and C-746-S&T Landfills Permit Number SW07300014, SW07300015, SW07300045, Paducah Gaseous Diffusion Plant, Paducah, Kentucky, Agency Interest Number 3059* (FRNP 2021), which is Technical Application Attachment 24 of the Solid Waste Permit. Surface water sampling was performed on July 19, 2023, at three locations monitored for the C-746-U Landfill: (1) instream location L154, (2) downstream location L351, and (3) instream location L150 (Figure 2). Surface water results are provided in Appendix I.

1.3 KEY RESULTS

Groundwater data were evaluated in accordance with the approved Groundwater Monitoring Plan (LATA Kentucky 2014), which is Technical Application Attachment 25, of the Solid Waste Permit. Parameters that had concentrations that exceeded their respective MCL are listed in Table 1. Those constituents that exceeded their respective MCL were evaluated further against their historical background UTL. Table 2 identifies parameters (that do not have MCLs) with concentrations that exceeded the statistically derived historical background UTL[1] during the third quarter 2023, as well as parameters that exceeded their MCL and also exceeded their historical background UTL. Those constituents (present in downgradient wells) that exceed their historical background UTL were evaluated against their current UTL-derived background using the most recent eight quarters of data from wells considered to be background. Constituents in downgradient wells that exceeded current background UTL are shown on Table 3.

Table 1. Summary of MCL Exceedances

UCRS	URGA	LRGA
None	MW357: Trichloroethene	MW370: Trichloroethene
	MW360: Trichloroethene	
	MW372: Trichloroethene	

[1] The UTL comparison for pH uses a two-sided test for both UTLs and LTLs. For the purposes of this report, the reference to "UTL exceedances" also includes the LTL for pH.

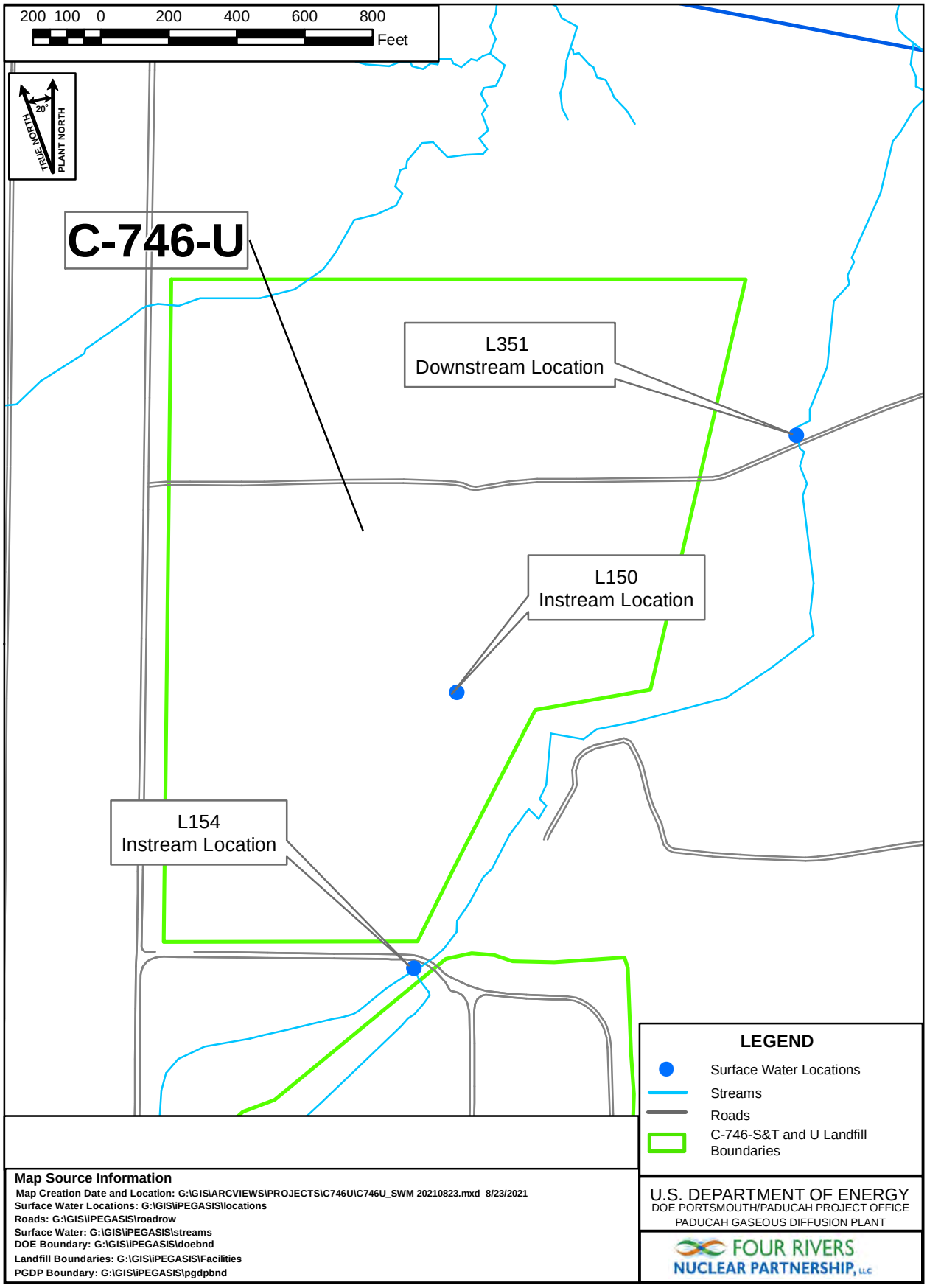

Figure 2. C-746-U Landfill Surface Water Monitoring Locations

Table 2. Exceedances of Statistically Derived Historical Background Concentrations

UCRS[a]	URGA	LRGA
MW362: Dissolved oxygen, oxidation-reduction potential,[b] sulfate	MW357: Oxidation-reduction potential[b]	MW358: Technetium-99
MW365: Dissolved oxygen, oxidation-reduction potential,[b] sulfate	MW360: Oxidation-reduction potential[b]	MW361:Oxidation-reduction potential,[b] technetium-99
MW371: Dissolved oxygen, oxidation-reduction potential,[b] sulfate	MW363: Oxidation-reduction potential[b]	MW364: Oxidation-reduction potential,[b] technetium-99
MW374: Oxidation-reduction potential,[b] sulfate	MW366: Oxidation-reduction potential[b]	MW367: Oxidation-reduction potential[b]
MW375: Oxidation-reduction potential,[b] sulfate	MW369: Oxidation-reduction potential[b]	MW370: Oxidation-reduction potential[b]
	MW372: Calcium, conductivity, dissolved solids, oxidation-reduction potential,[b] sulfate	MW373: Calcium, oxidation-reduction potential[b]

[a] Gradients in the UCRS are downward. UCRS gradient designations are identified using the same gradient reference (relative to the landfill) that is attributed to nearby RGA wells.
[b] Oxidation-reduction potential calibrated as Eh.
Sidegradient wells: MW375, MW376, MW377. Downgradient wells: MW357, MW358, MW359, MW360, MW361, MW362, MW363, MW364, MW365, MW366, MW367, MW368. Upgradient wells: MW369, MW370, MW371, MW372, MW373, MW374.

Table 3. Exceedances of Current Background UTL in Downgradient RGA Wells

URGA	LRGA
None	MW361: Technetium-99
	MW364: Technetium-99

The notification of the parameter that exceeded its MCL was submitted electronically to the KDWM, in accordance with 401 *KAR* 48:300 § 7, prior to the submittal of this report.

Any constituent that exceeded the MCL in downgradient wells would be subjected to a comparison against the UTL concentration calculated using historical concentrations from wells identified as background.

This report is the notification of parameters that had statistically significant increased concentrations relative to historical background concentrations, as required by Permit No. SW07300014, SW07300015, SW07300045, Condition GSTR0001, Standard Requirement 5, and 401 *KAR* 48:300 § 7.

The constituents that had exceedances of the statistically derived historical background UTL underwent additional statistical evaluation. The current quarter concentrations were compared to the current background UTLs that were developed using the most recent eight quarters of data from wells identified as background in order to determine if the current downgradient (compliance) well concentrations are consistent with current background values. Table 3 summarizes the evaluation against current background UTL for those constituents present in downgradient RGA wells with historical UTL exceedances. In accordance with the approved Groundwater Monitoring Plan, constituents in downgradient wells that exceed the historical UTL, but do not exceed the current UTL, are considered not to have a C-746-U Landfill source; therefore, they are Type 1 exceedances—not attributable to the C-746-U Landfill. Except for technetium-99 in MW361 and MW364, all UTL exceedances reported for this quarter were evaluated and considered to be Type 1 exceedances—not attributable to the C-746-U Landfill.

Technetium-99 in downgradient LRGA wells MW361 and MW364 exceeded both the historical background UTL and the current background UTL; therefore, these results are preliminarily considered to be Type 2 exceedances. To evaluate the preliminary Type 2 exceedances further, the parameters were subjected to the Mann-Kendall statistical test for trends using the most recent eight quarters of data. The results are summarized in Table 4. Technetium-99 in MW361 and MW364 indicated no trend and are considered to be Type 1 exceedances—not attributable to the C-746-U Landfill.

Table 4. C-746-U Landfills Downgradient Wells Trend Summary Utilizing the Previous Eight Quarters

Location	Well ID	Parameter	Sample Size	Alpha[1]	p-Value[2]	S[3]	Decision[4]
C-746-U Landfill	MW361	Technetium-99	8	0.05	0.119	-9	No Trend
	MW364	Technetium-99	8	0.05	0.36	-5	No Trend

[1] An alpha of 0.05 represents a 95% confidence interval.
[2] The p-value represents the risk of acceptance the H_a hypothesis of a trend, in terms of a percentage.
[3] The initial value of the Mann-Kendall statistic, S, is assumed to be 0 (e.g., no trend). If a data value from a later time period is higher than a data value from an earlier time period, S is incremented by 1. On the other hand, if the data value from a later time period is lower than a data value sampled earlier, S is decremented by 1. The net result of all such increments and decrements yields the final value of S. A very high positive value of S is an indicator of an increasing trend, and a very low negative value indicates a decreasing trend.
[4] The Mann-Kendall decision operates on two hypotheses; the H_0 and H_a. H_0 assumes there is no trend in the data, whereas H_a assumes either a positive or negative trend.
Note: Statistics generated using ProUCL.

All UTL exceedances reported for this quarter were evaluated and considered to be Type 1 exceedances—not attributable to the C-746-U Landfill.

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2. DATA EVALUATION/STATISTICAL SYNOPSIS

The statistical analyses conducted on the third quarter 2023 groundwater data collected from the C-746-U Landfill MWs were performed in accordance with the Groundwater Monitoring Plan (LATA Kentucky 2014). The statistical analyses for this report use data from the first eight quarters that were sampled for each parameter, beginning with the baseline sampling events in 2002, when available. The sampling dates associated with background data are listed next to the result in the statistical analysis sheets in Appendix D (Attachments D1 and D2).

Parameters that exceed the MCL for Kentucky solid waste facilities found in 401 *KAR* 47:030 § 6 were documented and evaluated further. Exceedances were reviewed against historical background results (UTL). If the MCL exceedance was found not to exceed the historical UTL, the exceedance was noted as a Type 1 exceedance—an exceedance not attributable to the C-746-U Landfill. If there was an exceedance of the MCL in a downgradient well and this constituent also exceeded the historical background, the quarterly result was compared to the current background UTL (developed using the most recent eight quarters of data from wells identified as background) to identify if this exceedance is attributable to upgradient/non-landfill sources. If the downgradient concentration was less than the current background, the exceedance was noted as a Type 1 exceedance. If a constituent exceeds its Kentucky solid waste facility MCL, historical background UTL, and current background UTL, it was reported as a Type 2 exceedance—source undetermined. Type 2 exceedances (undetermined source) were evaluated further using the Mann-Kendall test for trend. If there was no statistically significant increasing trend for a constituent in a downgradient well, the exceedance was reclassified as a Type 1 exceedance (not attributable to the C-746-U Landfill).

For those parameters that do not have a Kentucky solid waste facility MCL, the same process was used. If a constituent without an MCL exceeded its historical background UTL and its current background UTL, it was evaluated further to identify the source of the exceedance, if possible. If the source of the exceedance could not be identified, it was reported as a Type 2 exceedance—source undetermined. Type 2 exceedances (undetermined source) were evaluated further using the Mann-Kendall test for trend. If there was no statistically significant increasing trend for a constituent in a downgradient well, the exceedance was reclassified as a Type 1 exceedance (not attributable to the C-746-U Landfill).

To calculate the UTL, the data were divided into censored (nondetects) and uncensored (detected) observations. The one-sided tolerance interval statistical test was conducted only on parameters that had at least one uncensored observation. Results of the one-sided tolerance interval statistical test were used to determine whether the data showed a statistical exceedance in concentrations with respect to historical background concentrations (UTL).

For the statistical analysis of pH, a two-sided tolerance interval statistical test was conducted. The test well results were compared to both a UTL and LTL to determine if statistically significant deviations in concentrations existed with respect to background well data.

A stepwise list of the one-sided tolerance interval statistical procedures applied to the data is provided in Appendix D under Statistical Analysis Process. The statistical analysis was conducted separately for each parameter in each well. The MWs included in the statistical analyses are listed in Table 5.

Table 5. Monitoring Wells Included in Statistical Analysis

UCRS	URGA	LRGA
MW359[c]	MW357	MW358
MW362	MW360	MW361
MW365	MW363	MW364
MW368[c]	MW366	MW367
MW371[b]	MW369 (background)	MW370 (background)
MW374[b]	MW372 (background)	MW373 (background)
MW375		
MW376[c]		
MW377[c]		

[a] Map showing the MW locations is shown on Figure 1.
[b] In the same direction (relative to the landfill) as RGA wells considered to be upgradient.
[c] Well had insufficient water to permit a water sample for laboratory analysis.

2.1 STATISTICAL ANALYSIS OF GROUNDWATER DATA

Parameters requiring statistical analysis are summarized in Appendix D for each hydrogeological unit. A stepwise list for determining exceedances of statistically derived historical background concentrations is provided in Appendix D under Statistical Analysis Process. A comparison of the current quarter's results to the statistically derived historical background was conducted for parameters that do not have MCLs and also for those parameters whose concentrations exceed MCLs. Appendix G summarizes the occurrences (by well and by quarter) of historical UTLs and MCL exceedances. The constituents that had exceedances of the statistically derived historical background UTL underwent additional statistical evaluation. The current quarter concentrations were compared to the current background UTL developed using the most recent eight quarters of data from wells identified as upgradient in order to determine if the current downgradient concentrations are consistent with current background values.

2.1.1 Upper Continental Recharge System

In this quarter, 25 parameters, including those with MCLs, required statistical analysis in the UCRS. During the third quarter, dissolved oxygen, oxidation-reduction potential, and sulfate displayed concentrations that exceeded their respective historical UTL and are listed in Table 2. None of the parameters in downgradient UCRS wells exceeded the current background UTLs.

2.1.2 Upper Regional Gravel Aquifer

In this quarter, 26 parameters, including those with MCLs, required statistical analysis in the URGA. During the third quarter, calcium, conductivity, dissolved solids, oxidation-reduction potential, and sulfate displayed concentrations that exceeded their respective historical UTL and are listed in Table 2. None of the parameters in downgradient URGA wells exceeded the current background UTLs.

2.1.3 Lower Regional Gravel Aquifer

In this quarter, 27 parameters, including those with MCLs, required statistical analysis in the LRGA. During the third quarter, calcium, oxidation-reduction potential, and technetium-99 displayed concentrations that exceeded their respective historical UTL and are listed in Table 2. Technetium-99 in downgradient LRGA wells MW361 and MW364 exceeded the current background UTL.

2.2 DATA VERIFICATION AND VALIDATION

Data verification is the process of comparing a data set against a set standard or contractual requirements. In accordance with the approved Groundwater Monitoring Plan (LATA Kentucky 2014), data verification is performed for 100% of the data. Data are flagged as necessary.

Data validation was performed on 100% of the organic, inorganic, and radiochemical analytical data by a qualified individual independent from sampling, laboratory, project management, or other decision-making personnel. Data validation evaluates the laboratory adherence to analytical method requirements. Validation qualifiers are added by the independent validator and not the laboratory.

Field quality control samples are collected each sampling event. Field blanks, rinseate blanks, and trip blanks are obtained to ensure quality of field and laboratory practices and data are reported in the Groundwater Sample Analysis forms in Appendix C. Laboratory quality control samples, such as matrix spikes, matrix spike duplicates, and method blanks, are performed by the laboratory. Both field and laboratory quality control sample results are reviewed as part of the data verification/validation process.

Data verification and validation results for this data set indicated that all data were considered usable.

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3. PROFESSIONAL GEOLOGIST AUTHORIZATION

DOCUMENT IDENTIFICATION: *C-746-U Contained Landfill Third Quarter Calendar Year 2023 (July–September) Compliance Monitoring Report, Paducah Gaseous Diffusion Plant, Paducah, Kentucky* (FRNP-RPT-0295/V3)

Stamped and signed pursuant to my authority as a duly registered geologist under the provisions of *KRS* Chapter 322A.

Evan Clark PG265379 11/20/2023
Date

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4. REFERENCES

FRNP (Four Rivers Nuclear Partnership, LLC) 2021. *Surface Water Monitoring Plan for C-746-U and C-746-S&T Landfills Permit Number SW07300014, SW07300015, SW07300045, Paducah Gaseous Diffusion Plant, Paducah, Kentucky, Agency Interest Number 3059*, Solid Waste Landfill Permit No. SW07300014, SW07300015, SW07300045, Technical Application Attachment 24, Four Rivers Nuclear Partnership, LLC, Paducah, KY, March.

KEEC (Kentucky Energy and Environment Cabinet) 2011. Solid Waste Landfill Permit No. SW07300014, SW07300015, SW07300045, Division of Waste Management, Solid Waste Branch, Technical Application Attachment 12, "Explosive Gas Monitoring Program," January 21.

LATA Kentucky (LATA Environmental Services of Kentucky, LLC) 2014. *Groundwater Monitoring Plan for the Solid Waste Permitted Landfills (C-746-S Residential Landfill, C-746-T Inert Landfill, and C-746-U Contained Landfill) at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, PAD- PROJ-0139, Solid Waste Landfill Permit No. SW07300014, SW07300015, SW07300045, Technical Application Attachment 25, LATA Environmental Services of Kentucky, LLC, Kevil, KY, June.

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APPENDIX A

GROUNDWATER, SURFACE WATER, LEACHATE, AND METHANE MONITORING SAMPLE DATA REPORTING FORM

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GROUNDWATER, SURFACE WATER, LEACHATE, AND METHANE MONITORING SAMPLE DATA REPORTING FORM

NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WASTE MANAGEMENT
SOLID WASTE BRANCH
14 REILLY ROAD
FRANKFORT, KY 40601

Facility Name: U.S. DOE–Paducah Gaseous Diffusion Plant (As officially shown on DWM Permit Face) Activity: C-746-U Contained Landfill

Permit No: SW07300014, SW07300015, SW07300045 Finds/Unit No: _____ Quarter & Year 3rd Qtr. CY 2023

Please check the following as applicable:

_____ Characterization X Quarterly _____ Semiannual ____ Annual _____ Assessment

Please check applicable submittal(s): X Groundwater X Surface Water

_____ Leachate X Methane Monitoring

This form is to be utilized by those sites required by regulation (Kentucky Waste Management Regulations-401 *KAR* 48:300 and 45:160) or by statute (Kentucky Revised Statues Chapter 224) to conduct groundwater and surface water monitoring under the jurisdiction of the Division of Waste Management. **You must report any indication of contamination within forty-eight (48) hours of making the determination using statistical analyses, direct comparison, or other similar techniques. Submitting the lab report is NOT considered notification.** Instructions for completing the form are attached. Do not submit the instruction pages.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for such violations.

Myrna E. Redfield, Program Manager
Four Rivers Nuclear Partnership, LLC Date

April Ladd, Paducah Site Lead
U.S. Department of Energy Date

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APPENDIX B

FACILITY INFORMATION SHEET

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FACILITY INFORMATION SHEET

Sampling Date: Groundwater: July 2023; Surface water: July 2023; Methane: August 2023 | County: McCracken | Permit Nos. SW07300014, SW07300015, SW07300045

Facility Name: U.S. DOE—Paducah Gaseous Diffusion Plant
(As officially shown on DWM Permit Face)

Site Address: 5600 Hobbs Road (Street) | Kevil, Kentucky (City/State) | 42053 (Zip)

Phone No: (270) 441-6800 | Latitude: N 37° 07' 45" | Longitude: W 88° 47' 55"

OWNER INFORMATION

Facility Owner: U.S. DOE, Joel Bradburne, Manager, Portsmouth/Paducah Project Office | Phone No: (859) 219-4000

Contact Person: Bruce Ford | Phone No: (270) 441-5357

Contact Person Title: Director, Environmental Services, Four Rivers Nuclear Partnership, LLC

Mailing Address: 5511 Hobbs Road (Street) | Kevil, Kentucky (City/State) | 42053 (Zip)

SAMPLING PERSONNEL
(IF OTHER THAN LANDFILL OR LABORATORY)

Company: Four Rivers Nuclear Partnership, LLC

Contact Person: Chris Skinner | Phone No: (270) 441-5675

Mailing Address: 5511 Hobbs Road (Street) | Kevil, Kentucky (City/State) | 42053 (Zip)

LABORATORY RECORD #1

Laboratory: GEL Laboratories, LLC | Lab ID No: KY90129

Contact Person: Valerie Davis | Phone No: (843) 769-7391

Mailing Address: 2040 Savage Road (Street) | Charleston, South Carolina (City/State) | 29407 (Zip)

LABORATORY RECORD #2

Laboratory: N/A | Lab ID No: N/A

Contact Person: N/A | Phone No: N/A

Mailing Address: N/A (Street) | City/State | Zip

LABORATORY RECORD #3

Laboratory: N/A | Lab ID No: N/A

Contact Person: N/A | Phone No: N/A

Mailing Address: N/A (Street) | City/State | Zip

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APPENDIX C

GROUNDWATER SAMPLE ANALYSES AND LABORATORY REPORTS

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Paducah OREIS
GROUNDWATER MONITORING REPORT

Facility: C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

Sampling Point: MW357 DOWN **RGA Type:** URGA **Period:** 3rd Quarter 2023

AKGWA Well Tag #: 8004-4798 **SAMPLE ID:** MW357UG4-23 Sample Type: REG

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Bromide		0.336	mg/L	0.2	7/18/2023			SW846-9056A	=
Chloride	JW	30.7	mg/L	250	7/18/2023			SW846-9056A	=
Fluoride	J	0.156	mg/L	4	7/18/2023			SW846-9056A	=
Nitrate as Nitrogen	J	1.11	mg/L	10	7/18/2023			SW846-9056A	=
Sulfate		39.3	mg/L	2	7/18/2023			SW846-9056A	=
Barometric Pressure Reading		29.99	Inches/Hg		7/18/2023				X
Conductivity		416	umho/cm		7/18/2023				X
Depth to Water		45.76	ft		7/18/2023				X
Dissolved Oxygen		4.51	mg/L		7/18/2023				X
Eh (approx)		396	mV		7/18/2023				X
pH		5.96	Std Unit		7/18/2023				X
Temperature		71.9	deg F		7/18/2023				X
Turbidity		1.9	NTU		7/18/2023				X
Aluminum	U	0.05	mg/L	0.05	7/18/2023			SW846-6020B	=
Antimony	U	0.003	mg/L	0.003	7/18/2023			SW846-6020B	=
Arsenic	U	0.005	mg/L	0.005	7/18/2023			SW846-6020B	=
Barium		0.0713	mg/L	0.004	7/18/2023			SW846-6020B	=
Beryllium	U	0.0005	mg/L	0.0005	7/18/2023			SW846-6020B	=
Boron		0.37	mg/L	0.15	7/18/2023			SW846-6020B	=
Cadmium	U	0.001	mg/L	0.001	7/18/2023			SW846-6020B	=
Calcium		25.8	mg/L	0.2	7/18/2023			SW846-6020B	=
Chromium	U	0.01	mg/L	0.01	7/18/2023			SW846-6020B	=
Cobalt	U	0.001	mg/L	0.001	7/18/2023			SW846-6020B	=
Copper		0.00309	mg/L	0.002	7/18/2023			SW846-6020B	J
Iron	J	0.042	mg/L	0.1	7/18/2023			SW846-6020B	=
Lead	U	0.002	mg/L	0.002	7/18/2023			SW846-6020B	=
Magnesium		11.1	mg/L	0.03	7/18/2023			SW846-6020B	=
Manganese		0.00759	mg/L	0.005	7/18/2023			SW846-6020B	J
Molybdenum	U	0.001	mg/L	0.001	7/18/2023			SW846-6020B	=
Nickel		0.0021	mg/L	0.002	7/18/2023			SW846-6020B	J
Potassium		1.69	mg/L	0.3	7/18/2023			SW846-6020B	=
Rhodium	U	0.005	mg/L	0.005	7/18/2023			SW846-6020B	=
Selenium	U	0.005	mg/L	0.005	7/18/2023			SW846-6020B	=
Silver	U	0.001	mg/L	0.001	7/18/2023			SW846-6020B	=
Sodium		42.2	mg/L	0.25	7/18/2023			SW846-6020B	=
Tantalum	UN	0.005	mg/L	0.005	7/18/2023			SW846-6020B	=
Thallium	U	0.002	mg/L	0.002	7/18/2023			SW846-6020B	=
Uranium	U	0.0002	mg/L	0.0002	7/18/2023			SW846-6020B	=
Vanadium	U	0.02	mg/L	0.02	7/18/2023			SW846-6020B	=
Zinc	J	0.0148	mg/L	0.02	7/18/2023			SW846-6020B	=
Mercury	U	0.0002	mg/L	0.0002	7/18/2023			SW846-7470A	=
Barium, Dissolved		0.0722	mg/L	0.004	7/18/2023			SW846-6020B	=
Chromium, Dissolved	U	0.01	mg/L	0.01	7/18/2023			SW846-6020B	=
Uranium, Dissolved	U	0.0002	mg/L	0.0002	7/18/2023			SW846-6020B	=
PCB-1016	U	0.101	ug/L	0.101	7/18/2023			SW846-8082A	=
PCB-1221	U	0.101	ug/L	0.101	7/18/2023			SW846-8082A	=
PCB-1232	U	0.101	ug/L	0.101	7/18/2023			SW846-8082A	=

PCB-1242	U	0.101	ug/L	0.101	7/18/2023			SW846-8082A	=
PCB-1248	U	0.101	ug/L	0.101	7/18/2023			SW846-8082A	=
PCB-1254	U	0.101	ug/L	0.101	7/18/2023			SW846-8082A	=
PCB-1260	U	0.101	ug/L	0.101	7/18/2023			SW846-8082A	UJ
PCB-1268	U	0.101	ug/L	0.101	7/18/2023			SW846-8082A	=
Polychlorinated biphenyl	U	0.101	ug/L	0.101	7/18/2023			SW846-8082A	UJ
Radium-226	U	-0.0491	pCi/L	0.431	7/18/2023	0.166	0.166	AN-1418	=
Radium-228	U	1.89	pCi/L	4.64	7/18/2023	2.7	2.74	EPA-904-M	=
Strontium-90	U	0.0214	pCi/L	4.31	7/18/2023	2.14	2.14	EPA-905.0-M	=
Tritium	U	-57.5	pCi/L	233	7/18/2023	126	126	EPA-906.0-M	=
Technetium-99		46.1	pCi/L	18.6	7/18/2023	12.1	13.1	HASL 300, Tc-02-RC M	=
Thorium-230	U	1.09	pCi/L	2.61	7/18/2023	1.64	1.66	HASL 300, Th-01-RC M	=
Thorium-232	U	-0.0425	pCi/L	1.31	7/18/2023	0.628	0.63	HASL 300, Th-01-RC M	=
Alpha activity	U	2.93	pCi/L	7.89	7/18/2023	4.49	4.52	SW846-9310	=
Beta activity		17	pCi/L	6.64	7/18/2023	5.62	6.33	SW846-9310	=
1,2-Dibromo-3-chloropropane	U	0.0192	ug/L	0.0192	7/18/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	7/18/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	7/18/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Acetone	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Bromomethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Chlorobenzene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Ethylbenzene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Iodomethane	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Methylene chloride	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Styrene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Tetrachloroethene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Toluene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Total Xylene	U	3	ug/L	3	7/18/2023			SW846-8260D	=

trans-1,2-Dichloroethene	U	1	ug/L	1	7/18/2023	SW846-8260D	=
trans-1,3-Dichloropropene	U	1	ug/L	1	7/18/2023	SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5	ug/L	5	7/18/2023	SW846-8260D	=
Trichloroethene		5.3	ug/L	1	7/18/2023	SW846-8260D	=
Trichlorofluoromethane	U	1	ug/L	1	7/18/2023	SW846-8260D	=
Vinyl acetate	U	5	ug/L	5	7/18/2023	SW846-8260D	=
Vinyl chloride	U	1	ug/L	1	7/18/2023	SW846-8260D	=
Dissolved Solids		198	mg/L	10	7/18/2023	EPA-160.1	=
Iodide	U	0.5	mg/L	0.5	7/18/2023	EPA-300.0	=
Chemical Oxygen Demand (COD)	U	20	mg/L	20	7/18/2023	EPA-410.4	=
Cyanide	U	0.2	mg/L	0.2	7/18/2023	SW846-9012B	=
Total Organic Halides (TOX)	J	3.56	ug/L	10	7/18/2023	SW846-9020B	=
Total Organic Carbon (TOC)	U	2	mg/L	2	7/18/2023	SW846-9060A	=

Paducah OREIS
GROUNDWATER MONITORING REPORT

Facility: C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

Sampling Point: MW358 DOWN **RGA Type:** LRGA **Period:** 3rd Quarter 2023

AKGWA Well Tag #: 8004-4799 **SAMPLE ID:** MW358DUG4-23 Sample Type: FR

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Bromide		0.391	mg/L	0.2	7/18/2023			SW846-9056A	=
Chloride	JW	31.3	mg/L	250	7/18/2023			SW846-9056A	=
Fluoride	J	0.163	mg/L	4	7/18/2023			SW846-9056A	=
Nitrate as Nitrogen	J	0.671	mg/L	10	7/18/2023			SW846-9056A	=
Sulfate		52.5	mg/L	2	7/18/2023			SW846-9056A	=
Aluminum	J	0.0378	mg/L	0.05	7/18/2023			SW846-6020B	=
Antimony	U	0.003	mg/L	0.003	7/18/2023			SW846-6020B	=
Arsenic		0.00511	mg/L	0.005	7/18/2023			SW846-6020B	=
Barium		0.0798	mg/L	0.004	7/18/2023			SW846-6020B	=
Beryllium	U	0.0005	mg/L	0.0005	7/18/2023			SW846-6020B	=
Boron		0.241	mg/L	0.15	7/18/2023			SW846-6020B	=
Cadmium	U	0.001	mg/L	0.001	7/18/2023			SW846-6020B	=
Calcium		33.2	mg/L	0.2	7/18/2023			SW846-6020B	=
Chromium	U	0.01	mg/L	0.01	7/18/2023			SW846-6020B	=
Cobalt		0.041	mg/L	0.001	7/18/2023			SW846-6020B	=
Copper	J	0.000794	mg/L	0.002	7/18/2023			SW846-6020B	J
Iron		12.9	mg/L	0.1	7/18/2023			SW846-6020B	=
Lead	U	0.002	mg/L	0.002	7/18/2023			SW846-6020B	=
Magnesium		16.2	mg/L	0.03	7/18/2023			SW846-6020B	=
Manganese		2.01	mg/L	0.05	7/18/2023			SW846-6020B	=
Molybdenum	J	0.000559	mg/L	0.001	7/18/2023			SW846-6020B	=
Nickel		0.0546	mg/L	0.002	7/18/2023			SW846-6020B	=
Potassium		3.14	mg/L	0.3	7/18/2023			SW846-6020B	=
Rhodium	U	0.005	mg/L	0.005	7/18/2023			SW846-6020B	=
Selenium	U	0.005	mg/L	0.005	7/18/2023			SW846-6020B	=
Silver	U	0.001	mg/L	0.001	7/18/2023			SW846-6020B	=
Sodium		35.5	mg/L	0.25	7/18/2023			SW846-6020B	=
Tantalum	UN	0.005	mg/L	0.005	7/18/2023			SW846-6020B	=
Thallium	U	0.002	mg/L	0.002	7/18/2023			SW846-6020B	=
Uranium	U	0.0002	mg/L	0.0002	7/18/2023			SW846-6020B	=
Vanadium	U	0.02	mg/L	0.02	7/18/2023			SW846-6020B	=
Zinc	J	0.00976	mg/L	0.02	7/18/2023			SW846-6020B	=
Mercury	U	0.0002	mg/L	0.0002	7/18/2023			SW846-7470A	=
Barium, Dissolved		0.0661	mg/L	0.004	7/18/2023			SW846-6020B	=
Chromium, Dissolved	U	0.01	mg/L	0.01	7/18/2023			SW846-6020B	=
Uranium, Dissolved	U	0.0002	mg/L	0.0002	7/18/2023			SW846-6020B	=
PCB-1016	U	0.105	ug/L	0.105	7/18/2023			SW846-8082A	=
PCB-1221	U	0.105	ug/L	0.105	7/18/2023			SW846-8082A	=
PCB-1232	U	0.105	ug/L	0.105	7/18/2023			SW846-8082A	=
PCB-1242	U	0.105	ug/L	0.105	7/18/2023			SW846-8082A	=
PCB-1248	U	0.105	ug/L	0.105	7/18/2023			SW846-8082A	=
PCB-1254	U	0.105	ug/L	0.105	7/18/2023			SW846-8082A	=
PCB-1260	U	0.105	ug/L	0.105	7/18/2023			SW846-8082A	UJ
PCB-1268	U	0.105	ug/L	0.105	7/18/2023			SW846-8082A	=
Polychlorinated biphenyl	U	0.105	ug/L	0.105	7/18/2023			SW846-8082A	UJ
Radium-226	U	0.161	pCi/L	0.348	7/18/2023	0.238	0.239	AN-1418	=
Radium-228	U	3.86	pCi/L	4.77	7/18/2023	2.98	3.13	EPA-904-M	=

Strontium-90	U	0.101	pCi/L	6.37	7/18/2023	3.31	3.31	EPA-905.0-M	=
Tritium	U	-129	pCi/L	229	7/18/2023	119	119	EPA-906.0-M	UJ
Technetium-99		35.9	pCi/L	18.4	7/18/2023	11.7	12.4	HASL 300, Tc-02-RC M	=
Thorium-230	U	1.73	pCi/L	2.8	7/18/2023	1.89	1.91	HASL 300, Th-01-RC M	=
Thorium-232	U	-0.0427	pCi/L	1.21	7/18/2023	0.572	0.573	HASL 300, Th-01-RC M	=
Alpha activity	U	0.828	pCi/L	8.14	7/18/2023	3.94	3.94	SW846-9310	=
Beta activity		27.3	pCi/L	7.47	7/18/2023	6.93	8.23	SW846-9310	=
1,2-Dibromo-3-chloropropane	U	0.0191	ug/L	0.0191	7/18/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	7/18/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	7/18/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Acetone	J	1.81	ug/L	5	7/18/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Bromomethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Chlorobenzene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Ethylbenzene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Iodomethane	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Methylene chloride	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Styrene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Tetrachloroethene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Toluene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Total Xylene	U	3	ug/L	3	7/18/2023			SW846-8260D	=
trans-1,2-Dichloroethene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
trans-1,3-Dichloropropene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Trichloroethene		1.62	ug/L	1	7/18/2023			SW846-8260D	=
Trichlorofluoromethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Vinyl acetate	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Vinyl chloride	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Dissolved Solids		237	mg/L	10	7/18/2023			EPA-160.1	=

Iodide	U	0.5	mg/L	0.5	7/18/2023	EPA-300.0	=
Chemical Oxygen Demand (COD)	U	20	mg/L	20	7/18/2023	EPA-410.4	=
Cyanide	U	0.2	mg/L	0.2	7/18/2023	SW846-9012B	=
Total Organic Halides (TOX)	U	10	ug/L	10	7/18/2023	SW846-9020B	=
Total Organic Carbon (TOC)		2.16	mg/L	2	7/18/2023	SW846-9060A	J

Paducah OREIS
GROUNDWATER MONITORING REPORT

Facility: C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

Sampling Point: MW358 DOWN **RGA Type:** LRGA **Period:** 3rd Quarter 2023

AKGWA Well Tag #: 8004-4799 **SAMPLE ID:** MW358UG4-23 Sample Type: REG

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Bromide		0.379	mg/L	0.2	7/18/2023			SW846-9056A	=
Chloride	JW	29.6	mg/L	250	7/18/2023			SW846-9056A	=
Fluoride	J	0.178	mg/L	4	7/18/2023			SW846-9056A	=
Nitrate as Nitrogen	J	0.582	mg/L	10	7/18/2023			SW846-9056A	=
Sulfate		50.9	mg/L	2	7/18/2023			SW846-9056A	=
Barometric Pressure Reading		29.99	Inches/Hg		7/18/2023				X
Conductivity		528	umho/cm		7/18/2023				X
Depth to Water		45.92	ft		7/18/2023				X
Dissolved Oxygen		1.72	mg/L		7/18/2023				X
Eh (approx)		121	mV		7/18/2023				X
pH		6.25	Std Unit		7/18/2023				X
Temperature		72.3	deg F		7/18/2023				X
Turbidity		4.34	NTU		7/18/2023				X
Aluminum	J	0.0357	mg/L	0.05	7/18/2023			SW846-6020B	=
Antimony	U	0.003	mg/L	0.003	7/18/2023			SW846-6020B	=
Arsenic	J	0.00453	mg/L	0.005	7/18/2023			SW846-6020B	=
Barium		0.08	mg/L	0.004	7/18/2023			SW846-6020B	=
Beryllium	U	0.0005	mg/L	0.0005	7/18/2023			SW846-6020B	=
Boron		0.258	mg/L	0.15	7/18/2023			SW846-6020B	=
Cadmium	U	0.001	mg/L	0.001	7/18/2023			SW846-6020B	=
Calcium		33.6	mg/L	0.2	7/18/2023			SW846-6020B	=
Chromium	U	0.01	mg/L	0.01	7/18/2023			SW846-6020B	=
Cobalt		0.0442	mg/L	0.001	7/18/2023			SW846-6020B	=
Copper	J	0.000747	mg/L	0.002	7/18/2023			SW846-6020B	J
Iron		12	mg/L	0.1	7/18/2023			SW846-6020B	=
Lead	U	0.002	mg/L	0.002	7/18/2023			SW846-6020B	=
Magnesium		16.5	mg/L	0.03	7/18/2023			SW846-6020B	=
Manganese		1.98	mg/L	0.05	7/18/2023			SW846-6020B	=
Molybdenum	J	0.000549	mg/L	0.001	7/18/2023			SW846-6020B	=
Nickel		0.0536	mg/L	0.002	7/18/2023			SW846-6020B	=
Potassium		3.2	mg/L	0.3	7/18/2023			SW846-6020B	=
Rhodium	U	0.005	mg/L	0.005	7/18/2023			SW846-6020B	=
Selenium	U	0.005	mg/L	0.005	7/18/2023			SW846-6020B	=
Silver	U	0.001	mg/L	0.001	7/18/2023			SW846-6020B	=
Sodium		36	mg/L	0.25	7/18/2023			SW846-6020B	=
Tantalum	UN	0.005	mg/L	0.005	7/18/2023			SW846-6020B	=
Thallium	U	0.002	mg/L	0.002	7/18/2023			SW846-6020B	=
Uranium	U	0.0002	mg/L	0.0002	7/18/2023			SW846-6020B	=
Vanadium	U	0.02	mg/L	0.02	7/18/2023			SW846-6020B	=
Zinc	J	0.0103	mg/L	0.02	7/18/2023			SW846-6020B	=
Mercury	U	0.0002	mg/L	0.0002	7/18/2023			SW846-7470A	=
Barium, Dissolved		0.0726	mg/L	0.004	7/18/2023			SW846-6020B	=
Chromium, Dissolved	U	0.01	mg/L	0.01	7/18/2023			SW846-6020B	=
Uranium, Dissolved	U	0.0002	mg/L	0.0002	7/18/2023			SW846-6020B	=
PCB-1016	U	0.0988	ug/L	0.0988	7/18/2023			SW846-8082A	=
PCB-1221	U	0.0988	ug/L	0.0988	7/18/2023			SW846-8082A	=
PCB-1232	U	0.0988	ug/L	0.0988	7/18/2023			SW846-8082A	=

PCB-1242	U	0.0988	ug/L	0.0988	7/18/2023			SW846-8082A	=
PCB-1248	U	0.0988	ug/L	0.0988	7/18/2023			SW846-8082A	=
PCB-1254	U	0.0988	ug/L	0.0988	7/18/2023			SW846-8082A	=
PCB-1260	U	0.0988	ug/L	0.0988	7/18/2023			SW846-8082A	UJ
PCB-1268	U	0.0988	ug/L	0.0988	7/18/2023			SW846-8082A	=
Polychlorinated biphenyl	U	0.0988	ug/L	0.0988	7/18/2023			SW846-8082A	UJ
Radium-226	U	0.118	pCi/L	0.38	7/18/2023	0.234	0.234	AN-1418	=
Radium-228		4.93	pCi/L	4.22	7/18/2023	2.94	3.2	EPA-904-M	=
Strontium-90	U	-0.847	pCi/L	7.32	7/18/2023	3.92	3.92	EPA-905.0-M	=
Tritium	U	20.8	pCi/L	232	7/18/2023	131	131	EPA-906.0-M	=
Technetium-99		47	pCi/L	18.7	7/18/2023	12.2	13.3	HASL 300, Tc-02-RC M	=
Thorium-230	U	1.47	pCi/L	2.56	7/18/2023	1.73	1.75	HASL 300, Th-01-RC M	=
Thorium-232	U	0.189	pCi/L	2.09	7/18/2023	1.04	1.04	HASL 300, Th-01-RC M	=
Alpha activity	U	4.81	pCi/L	7.52	7/18/2023	4.84	4.92	SW846-9310	=
Beta activity		14.1	pCi/L	5.74	7/18/2023	4.94	5.48	SW846-9310	=
1,2-Dibromo-3-chloropropane	U	0.0189	ug/L	0.0189	7/18/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	7/18/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	7/18/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Acetone	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Bromomethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Chlorobenzene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Ethylbenzene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Iodomethane	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Methylene chloride	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Styrene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Tetrachloroethene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Toluene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Total Xylene	U	3	ug/L	3	7/18/2023			SW846-8260D	=

trans-1,2-Dichloroethene	U	1	ug/L	1	7/18/2023	SW846-8260D	=
trans-1,3-Dichloropropene	U	1	ug/L	1	7/18/2023	SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5	ug/L	5	7/18/2023	SW846-8260D	=
Trichloroethene		1.63	ug/L	1	7/18/2023	SW846-8260D	=
Trichlorofluoromethane	U	1	ug/L	1	7/18/2023	SW846-8260D	=
Vinyl acetate	U	5	ug/L	5	7/18/2023	SW846-8260D	=
Vinyl chloride	U	1	ug/L	1	7/18/2023	SW846-8260D	=
Dissolved Solids		241	mg/L	10	7/18/2023	EPA-160.1	=
Iodide	U	0.5	mg/L	0.5	7/18/2023	EPA-300.0	=
Chemical Oxygen Demand (COD)	U	20	mg/L	20	7/18/2023	EPA-410.4	=
Cyanide	U	0.2	mg/L	0.2	7/18/2023	SW846-9012B	=
Total Organic Halides (TOX)	U	10	ug/L	10	7/18/2023	SW846-9020B	=
Total Organic Carbon (TOC)		4.2	mg/L	2	7/18/2023	SW846-9060A	J

Paducah OREIS
GROUNDWATER MONITORING REPORT

Facility: C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

Sampling Point: MW360 DOWN **RGA Type:** URGA **Period:** 3rd Quarter 2023

AKGWA Well Tag #: 8004-4800 **SAMPLE ID:** MW360UG4-23 Sample Type: REG

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Bromide	J	0.14	mg/L	0.2	7/18/2023			SW846-9056A	=
Chloride	JW	7.73	mg/L	250	7/18/2023			SW846-9056A	J
Fluoride	J	0.199	mg/L	4	7/18/2023			SW846-9056A	=
Nitrate as Nitrogen	J	0.622	mg/L	10	7/18/2023			SW846-9056A	=
Sulfate		13.1	mg/L	0.4	7/18/2023			SW846-9056A	=
Barometric Pressure Reading		29.99	Inches/Hg		7/18/2023				X
Conductivity		396	umho/cm		7/18/2023				X
Depth to Water		39.12	ft		7/18/2023				X
Dissolved Oxygen		1.71	mg/L		7/18/2023				X
Eh (approx)		418	mV		7/18/2023				X
pH		6.07	Std Unit		7/18/2023				X
Temperature		67.1	deg F		7/18/2023				X
Turbidity		4.04	NTU		7/18/2023				X
Aluminum	J	0.0402	mg/L	0.05	7/18/2023			SW846-6020B	=
Antimony	U	0.003	mg/L	0.003	7/18/2023			SW846-6020B	=
Arsenic	U	0.005	mg/L	0.005	7/18/2023			SW846-6020B	=
Barium		0.196	mg/L	0.004	7/18/2023			SW846-6020B	=
Beryllium	U	0.0005	mg/L	0.0005	7/18/2023			SW846-6020B	=
Boron		0.0284	mg/L	0.015	7/18/2023			SW846-6020B	=
Cadmium	U	0.001	mg/L	0.001	7/18/2023			SW846-6020B	=
Calcium		18.9	mg/L	0.2	7/18/2023			SW846-6020B	=
Chromium	U	0.01	mg/L	0.01	7/18/2023			SW846-6020B	=
Cobalt		0.00147	mg/L	0.001	7/18/2023			SW846-6020B	J
Copper		0.0023	mg/L	0.002	7/18/2023			SW846-6020B	J
Iron		0.176	mg/L	0.1	7/18/2023			SW846-6020B	=
Lead	U	0.002	mg/L	0.002	7/18/2023			SW846-6020B	=
Magnesium		7.97	mg/L	0.03	7/18/2023			SW846-6020B	=
Manganese		0.0188	mg/L	0.005	7/18/2023			SW846-6020B	J
Molybdenum	U	0.001	mg/L	0.001	7/18/2023			SW846-6020B	=
Nickel	J	0.00171	mg/L	0.002	7/18/2023			SW846-6020B	J
Potassium		0.697	mg/L	0.3	7/18/2023			SW846-6020B	=
Rhodium	U	0.005	mg/L	0.005	7/18/2023			SW846-6020B	=
Selenium	J	0.00217	mg/L	0.005	7/18/2023			SW846-6020B	J
Silver	U	0.001	mg/L	0.001	7/18/2023			SW846-6020B	=
Sodium		59.6	mg/L	2.5	7/18/2023			SW846-6020B	=
Tantalum	UN	0.005	mg/L	0.005	7/18/2023			SW846-6020B	=
Thallium	U	0.002	mg/L	0.002	7/18/2023			SW846-6020B	=
Uranium	J	0.00007	mg/L	0.0002	7/18/2023			SW846-6020B	U
Vanadium	U	0.02	mg/L	0.02	7/18/2023			SW846-6020B	=
Zinc	J	0.00469	mg/L	0.02	7/18/2023			SW846-6020B	=
Mercury	U	0.0002	mg/L	0.0002	7/18/2023			SW846-7470A	=
Barium, Dissolved		0.192	mg/L	0.004	7/18/2023			SW846-6020B	=
Chromium, Dissolved	U	0.01	mg/L	0.01	7/18/2023			SW846-6020B	=
Uranium, Dissolved	U	0.0002	mg/L	0.0002	7/18/2023			SW846-6020B	=
PCB-1016	U	0.1	ug/L	0.1	7/18/2023			SW846-8082A	=
PCB-1221	U	0.1	ug/L	0.1	7/18/2023			SW846-8082A	=
PCB-1232	U	0.1	ug/L	0.1	7/18/2023			SW846-8082A	=

PCB-1242	U	0.1	ug/L	0.1	7/18/2023			SW846-8082A	=
PCB-1248	U	0.1	ug/L	0.1	7/18/2023			SW846-8082A	=
PCB-1254	U	0.1	ug/L	0.1	7/18/2023			SW846-8082A	=
PCB-1260	U	0.1	ug/L	0.1	7/18/2023			SW846-8082A	UJ
PCB-1268	U	0.1	ug/L	0.1	7/18/2023			SW846-8082A	=
Polychlorinated biphenyl	U	0.1	ug/L	0.1	7/18/2023			SW846-8082A	UJ
Radium-226	U	0.084	pCi/L	0.306	7/18/2023	0.193	0.193	AN-1418	=
Radium-228	U	1.66	pCi/L	4.7	7/18/2023	2.71	2.74	EPA-904-M	=
Strontium-90	U	-1.01	pCi/L	5.06	7/18/2023	2.52	2.52	EPA-905.0-M	=
Tritium	U	23.1	pCi/L	234	7/18/2023	132	133	EPA-906.0-M	=
Technetium-99	U	8.03	pCi/L	18.5	7/18/2023	10.9	11	HASL 300, Tc-02-RC M	=
Thorium-230	U	0.719	pCi/L	5.02	7/18/2023	2.66	2.67	HASL 300, Th-01-RC M	=
Thorium-232	U	0.639	pCi/L	3.44	7/18/2023	2.17	2.17	HASL 300, Th-01-RC M	=
Alpha activity	U	1.55	pCi/L	6.64	7/18/2023	3.4	3.41	SW846-9310	=
Beta activity	U	2.4	pCi/L	7.18	7/18/2023	4.12	4.14	SW846-9310	=
1,2-Dibromo-3-chloropropane	U	0.0188	ug/L	0.0188	7/18/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	7/18/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	7/18/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Acetone	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Bromomethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Chlorobenzene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Ethylbenzene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Iodomethane	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Methylene chloride	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Styrene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Tetrachloroethene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Toluene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Total Xylene	U	3	ug/L	3	7/18/2023			SW846-8260D	=

trans-1,2-Dichloroethene	U	1	ug/L	1	7/18/2023	SW846-8260D	=
trans-1,3-Dichloropropene	U	1	ug/L	1	7/18/2023	SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5	ug/L	5	7/18/2023	SW846-8260D	=
Trichloroethene		7.54	ug/L	1	7/18/2023	SW846-8260D	=
Trichlorofluoromethane	U	1	ug/L	1	7/18/2023	SW846-8260D	=
Vinyl acetate	U	5	ug/L	5	7/18/2023	SW846-8260D	=
Vinyl chloride	U	1	ug/L	1	7/18/2023	SW846-8260D	=
Dissolved Solids		216	mg/L	10	7/18/2023	EPA-160.1	=
Iodide	U	0.5	mg/L	0.5	7/18/2023	EPA-300.0	=
Chemical Oxygen Demand (COD)	U	20	mg/L	20	7/18/2023	EPA-410.4	=
Cyanide	U	0.2	mg/L	0.2	7/18/2023	SW846-9012B	=
Total Organic Halides (TOX)	J	7.88	ug/L	10	7/18/2023	SW846-9020B	=
Total Organic Carbon (TOC)	J	0.502	mg/L	2	7/18/2023	SW846-9060A	=

Paducah OREIS
GROUNDWATER MONITORING REPORT

Facility: C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

Sampling Point: MW361 DOWN **RGA Type:** LRGA **Period:** 3rd Quarter 2023

AKGWA Well Tag #: 8004-4795 **SAMPLE ID:** MW361UG4-23 Sample Type: REG

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Bromide		0.542	mg/L	0.2	7/18/2023			SW846-9056A	=
Chloride	JW	37.3	mg/L	250	7/18/2023			SW846-9056A	=
Fluoride	J	0.145	mg/L	4	7/18/2023			SW846-9056A	=
Nitrate as Nitrogen	J	1.13	mg/L	10	7/18/2023			SW846-9056A	=
Sulfate		80.6	mg/L	2	7/18/2023			SW846-9056A	=
Barometric Pressure Reading		29.99	Inches/Hg		7/18/2023				X
Conductivity		508	umho/cm		7/18/2023				X
Depth to Water		38.38	ft		7/18/2023				X
Dissolved Oxygen		3.87	mg/L		7/18/2023				X
Eh (approx)		424	mV		7/18/2023				X
pH		5.87	Std Unit		7/18/2023				X
Temperature		68.6	deg F		7/18/2023				X
Turbidity		1.66	NTU		7/18/2023				X
Aluminum	U	0.05	mg/L	0.05	7/18/2023			SW846-6020B	=
Antimony	U	0.003	mg/L	0.003	7/18/2023			SW846-6020B	=
Arsenic	U	0.005	mg/L	0.005	7/18/2023			SW846-6020B	=
Barium		0.0647	mg/L	0.004	7/18/2023			SW846-6020B	J
Beryllium	U	0.0005	mg/L	0.0005	7/18/2023			SW846-6020B	=
Boron		0.184	mg/L	0.015	7/18/2023			SW846-6020B	=
Cadmium	U	0.001	mg/L	0.001	7/18/2023			SW846-6020B	=
Calcium		34.4	mg/L	0.2	7/18/2023			SW846-6020B	=
Chromium	U	0.01	mg/L	0.01	7/18/2023			SW846-6020B	=
Cobalt	U	0.001	mg/L	0.001	7/18/2023			SW846-6020B	=
Copper		0.00206	mg/L	0.002	7/18/2023			SW846-6020B	J
Iron	U	0.1	mg/L	0.1	7/18/2023			SW846-6020B	=
Lead	U	0.002	mg/L	0.002	7/18/2023			SW846-6020B	=
Magnesium		15	mg/L	0.03	7/18/2023			SW846-6020B	=
Manganese		0.00657	mg/L	0.005	7/18/2023			SW846-6020B	J
Molybdenum	U	0.001	mg/L	0.001	7/18/2023			SW846-6020B	=
Nickel	J	0.00144	mg/L	0.002	7/18/2023			SW846-6020B	J
Potassium		2.39	mg/L	0.3	7/18/2023			SW846-6020B	=
Rhodium	U	0.005	mg/L	0.005	7/18/2023			SW846-6020B	=
Selenium	J	0.00161	mg/L	0.005	7/18/2023			SW846-6020B	J
Silver	U	0.001	mg/L	0.001	7/18/2023			SW846-6020B	=
Sodium		45.7	mg/L	0.25	7/18/2023			SW846-6020B	=
Tantalum	UN	0.005	mg/L	0.005	7/18/2023			SW846-6020B	=
Thallium	U	0.002	mg/L	0.002	7/18/2023			SW846-6020B	=
Uranium	U	0.0002	mg/L	0.0002	7/18/2023			SW846-6020B	UJ
Vanadium	U	0.02	mg/L	0.02	7/18/2023			SW846-6020B	=
Zinc	J	0.00711	mg/L	0.02	7/18/2023			SW846-6020B	=
Mercury	U	0.0002	mg/L	0.0002	7/18/2023			SW846-7470A	=
Barium, Dissolved		0.0846	mg/L	0.004	7/18/2023			SW846-6020B	J
Chromium, Dissolved	U	0.01	mg/L	0.01	7/18/2023			SW846-6020B	=
Uranium, Dissolved		0.00358	mg/L	0.0002	7/18/2023			SW846-6020B	J
PCB-1016	U	0.0987	ug/L	0.0987	7/18/2023			SW846-8082A	=
PCB-1221	U	0.0987	ug/L	0.0987	7/18/2023			SW846-8082A	=
PCB-1232	U	0.0987	ug/L	0.0987	7/18/2023			SW846-8082A	=

PCB-1242	U	0.0987	ug/L	0.0987	7/18/2023			SW846-8082A	=
PCB-1248	U	0.0987	ug/L	0.0987	7/18/2023			SW846-8082A	=
PCB-1254	U	0.0987	ug/L	0.0987	7/18/2023			SW846-8082A	=
PCB-1260	U	0.0987	ug/L	0.0987	7/18/2023			SW846-8082A	UJ
PCB-1268	U	0.0987	ug/L	0.0987	7/18/2023			SW846-8082A	=
Polychlorinated biphenyl	U	0.0987	ug/L	0.0987	7/18/2023			SW846-8082A	UJ
Radium-226	U	0.0321	pCi/L	0.424	7/18/2023	0.207	0.207	AN-1418	=
Radium-228	U	3.4	pCi/L	4.32	7/18/2023	2.7	2.84	EPA-904-M	=
Strontium-90	U	-0.788	pCi/L	5	7/18/2023	2.39	2.39	EPA-905.0-M	=
Tritium	U	-118	pCi/L	234	7/18/2023	122	122	EPA-906.0-M	=
Technetium-99		50.9	pCi/L	19.3	7/18/2023	13.4	14.6	HASL 300, Tc-02-RC M	=
Thorium-230	U	0.423	pCi/L	3.33	7/18/2023	1.71	1.72	HASL 300, Th-01-RC M	=
Thorium-232	U	0.706	pCi/L	2.16	7/18/2023	1.47	1.48	HASL 300, Th-01-RC M	=
Alpha activity	U	1.2	pCi/L	6.9	7/18/2023	3.4	3.41	SW846-9310	=
Beta activity		30.8	pCi/L	9.43	7/18/2023	7.98	9.48	SW846-9310	=
1,2-Dibromo-3-chloropropane	U	0.0191	ug/L	0.0191	7/18/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	7/18/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	7/18/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Acetone	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Bromomethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Chlorobenzene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Ethylbenzene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Iodomethane	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Methylene chloride	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Styrene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Tetrachloroethene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Toluene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Total Xylene	U	3	ug/L	3	7/18/2023			SW846-8260D	=

trans-1,2-Dichloroethene	U	1	ug/L	1	7/18/2023	SW846-8260D	=
trans-1,3-Dichloropropene	U	1	ug/L	1	7/18/2023	SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5	ug/L	5	7/18/2023	SW846-8260D	=
Trichloroethene		1.78	ug/L	1	7/18/2023	SW846-8260D	=
Trichlorofluoromethane	U	1	ug/L	1	7/18/2023	SW846-8260D	=
Vinyl acetate	U	5	ug/L	5	7/18/2023	SW846-8260D	=
Vinyl chloride	U	1	ug/L	1	7/18/2023	SW846-8260D	=
Dissolved Solids		272	mg/L	10	7/18/2023	EPA-160.1	=
Iodide	U	0.5	mg/L	0.5	7/18/2023	EPA-300.0	=
Chemical Oxygen Demand (COD)	U	20	mg/L	20	7/18/2023	EPA-410.4	=
Cyanide	U	0.2	mg/L	0.2	7/18/2023	SW846-9012B	=
Total Organic Halides (TOX)	J	3.6	ug/L	10	7/18/2023	SW846-9020B	=
Total Organic Carbon (TOC)	U	2	mg/L	2	7/18/2023	SW846-9060A	=

Paducah OREIS
GROUNDWATER MONITORING REPORT

Facility: C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

Sampling Point: MW362 DOWN **RGA Type:** UCRS **Period:** 3rd Quarter 2023

AKGWA Well Tag #: 8004-0986 **SAMPLE ID:** MW362UG4-23 Sample Type: REG

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Bromide	U	0.2	mg/L	0.2	7/18/2023			SW846-9056A	=
Chloride	JW	2.36	mg/L	250	7/18/2023			SW846-9056A	=
Fluoride	J	0.491	mg/L	4	7/18/2023			SW846-9056A	=
Nitrate as Nitrogen	J	0.407	mg/L	10	7/18/2023			SW846-9056A	=
Sulfate		28.5	mg/L	2	7/18/2023			SW846-9056A	=
Barometric Pressure Reading		30	Inches/Hg		7/18/2023				X
Conductivity		632	umho/cm		7/18/2023				X
Depth to Water		25.18	ft		7/18/2023				X
Dissolved Oxygen		6.96	mg/L		7/18/2023				X
Eh (approx)		402	mV		7/18/2023				X
pH		6.96	Std Unit		7/18/2023				X
Temperature		67.5	deg F		7/18/2023				X
Turbidity		5.89	NTU		7/18/2023				X
Aluminum		0.235	mg/L	0.05	7/18/2023			SW846-6020B	=
Antimony	U	0.003	mg/L	0.003	7/18/2023			SW846-6020B	=
Arsenic	U	0.005	mg/L	0.005	7/18/2023			SW846-6020B	=
Barium		0.0848	mg/L	0.004	7/18/2023			SW846-6020B	=
Beryllium	U	0.0005	mg/L	0.0005	7/18/2023			SW846-6020B	=
Boron		0.0198	mg/L	0.015	7/18/2023			SW846-6020B	=
Cadmium	U	0.001	mg/L	0.001	7/18/2023			SW846-6020B	=
Calcium		18.2	mg/L	0.2	7/18/2023			SW846-6020B	=
Chromium	U	0.01	mg/L	0.01	7/18/2023			SW846-6020B	=
Cobalt	U	0.001	mg/L	0.001	7/18/2023			SW846-6020B	=
Copper	J	0.00195	mg/L	0.002	7/18/2023			SW846-6020B	J
Iron		0.183	mg/L	0.1	7/18/2023			SW846-6020B	=
Lead	U	0.002	mg/L	0.002	7/18/2023			SW846-6020B	=
Magnesium		8.03	mg/L	0.03	7/18/2023			SW846-6020B	=
Manganese	J	0.00286	mg/L	0.005	7/18/2023			SW846-6020B	J
Molybdenum		0.00124	mg/L	0.001	7/18/2023			SW846-6020B	=
Nickel	J	0.00177	mg/L	0.002	7/18/2023			SW846-6020B	J
Potassium		0.337	mg/L	0.3	7/18/2023			SW846-6020B	=
Rhodium	U	0.005	mg/L	0.005	7/18/2023			SW846-6020B	=
Selenium	U	0.005	mg/L	0.005	7/18/2023			SW846-6020B	=
Silver	U	0.001	mg/L	0.001	7/18/2023			SW846-6020B	=
Sodium		127	mg/L	2.5	7/18/2023			SW846-6020B	=
Tantalum	UN	0.005	mg/L	0.005	7/18/2023			SW846-6020B	=
Thallium	U	0.002	mg/L	0.002	7/18/2023			SW846-6020B	=
Uranium		0.0035	mg/L	0.0002	7/18/2023			SW846-6020B	=
Vanadium	U	0.02	mg/L	0.02	7/18/2023			SW846-6020B	=
Zinc	U	0.02	mg/L	0.02	7/18/2023			SW846-6020B	=
Mercury	U	0.0002	mg/L	0.0002	7/18/2023			SW846-7470A	=
Barium, Dissolved		0.0637	mg/L	0.004	7/18/2023			SW846-6020B	=
Chromium, Dissolved	U	0.01	mg/L	0.01	7/18/2023			SW846-6020B	=
Uranium, Dissolved	U	0.0002	mg/L	0.0002	7/18/2023			SW846-6020B	=
PCB-1016	U	0.102	ug/L	0.102	7/18/2023			SW846-8082A	=
PCB-1221	U	0.102	ug/L	0.102	7/18/2023			SW846-8082A	=
PCB-1232	U	0.102	ug/L	0.102	7/18/2023			SW846-8082A	=

PCB-1242	U	0.102	ug/L	0.102	7/18/2023			SW846-8082A	=
PCB-1248	U	0.102	ug/L	0.102	7/18/2023			SW846-8082A	=
PCB-1254	U	0.102	ug/L	0.102	7/18/2023			SW846-8082A	=
PCB-1260	U	0.102	ug/L	0.102	7/18/2023			SW846-8082A	UJ
PCB-1268	U	0.102	ug/L	0.102	7/18/2023			SW846-8082A	=
Polychlorinated biphenyl	U	0.102	ug/L	0.102	7/18/2023			SW846-8082A	UJ
Radium-226	U	0.23	pCi/L	0.375	7/18/2023	0.28	0.28	AN-1418	=
Radium-228	U	2.59	pCi/L	4.32	7/18/2023	2.63	2.71	EPA-904-M	=
Strontium-90	U	0.185	pCi/L	5.57	7/18/2023	2.84	2.84	EPA-905.0-M	=
Tritium	U	-22	pCi/L	232	7/18/2023	128	128	EPA-906.0-M	=
Technetium-99	U	10.9	pCi/L	17.9	7/18/2023	10.7	10.8	HASL 300, Tc-02-RC M	=
Thorium-230	U	1.16	pCi/L	2.23	7/18/2023	1.48	1.5	HASL 300, Th-01-RC M	=
Thorium-232	U	1.02	pCi/L	1.14	7/18/2023	1.17	1.17	HASL 300, Th-01-RC M	=
Alpha activity	U	-0.654	pCi/L	9.64	7/18/2023	3.97	3.97	SW846-9310	=
Beta activity	U	1.47	pCi/L	6.47	7/18/2023	3.58	3.59	SW846-9310	=
1,2-Dibromo-3-chloropropane	U	0.0188	ug/L	0.0188	7/18/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	7/18/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	7/18/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Acetone	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Bromomethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Chlorobenzene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Ethylbenzene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Iodomethane	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Methylene chloride	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Styrene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Tetrachloroethene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Toluene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Total Xylene	U	3	ug/L	3	7/18/2023			SW846-8260D	=

trans-1,2-Dichloroethene	U	1	ug/L	1	7/18/2023	SW846-8260D	=
trans-1,3-Dichloropropene	U	1	ug/L	1	7/18/2023	SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5	ug/L	5	7/18/2023	SW846-8260D	=
Trichloroethene		4.59	ug/L	1	7/18/2023	SW846-8260D	=
Trichlorofluoromethane	U	1	ug/L	1	7/18/2023	SW846-8260D	=
Vinyl acetate	U	5	ug/L	5	7/18/2023	SW846-8260D	=
Vinyl chloride	U	1	ug/L	1	7/18/2023	SW846-8260D	=
Dissolved Solids		354	mg/L	10	7/18/2023	EPA-160.1	=
Iodide	U	0.5	mg/L	0.5	7/18/2023	EPA-300.0	=
Chemical Oxygen Demand (COD)	U	20	mg/L	20	7/18/2023	EPA-410.4	=
Cyanide	U	0.2	mg/L	0.2	7/18/2023	SW846-9012B	=
Total Organic Halides (TOX)		15.1	ug/L	10	7/18/2023	SW846-9020B	=
Total Organic Carbon (TOC)	J	1.49	mg/L	2	7/18/2023	SW846-9060A	=

Paducah OREIS
GROUNDWATER MONITORING REPORT

Facility: C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

Sampling Point: MW363 DOWN **RGA Type:** URGA **Period:** 3rd Quarter 2023

AKGWA Well Tag #: 8004-4796 **SAMPLE ID:** MW363UG4-23 Sample Type: REG

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Bromide	U	0.2	mg/L	0.2	7/20/2023			SW846-9056A	=
Chloride	JW	20.1	mg/L	250	7/20/2023			SW846-9056A	=
Fluoride	J	0.13	mg/L	4	7/20/2023			SW846-9056A	=
Nitrate as Nitrogen	J	4.41	mg/L	10	7/20/2023			SW846-9056A	=
Sulfate		29.9	mg/L	2	7/20/2023			SW846-9056A	=
Barometric Pressure Reading		29.99	Inches/Hg		7/20/2023				X
Conductivity		382	umho/cm		7/20/2023				X
Depth to Water		45.67	ft		7/20/2023				X
Dissolved Oxygen		4.53	mg/L		7/20/2023				X
Eh (approx)		380	mV		7/20/2023				X
pH		6.24	Std Unit		7/20/2023				X
Temperature		72.1	deg F		7/20/2023				X
Turbidity		4.73	NTU		7/20/2023				X
Aluminum	U	0.05	mg/L	0.05	7/20/2023			SW846-6020B	=
Antimony	U	0.003	mg/L	0.003	7/20/2023			SW846-6020B	=
Arsenic	U	0.005	mg/L	0.005	7/20/2023			SW846-6020B	=
Barium		0.126	mg/L	0.004	7/20/2023			SW846-6020B	=
Beryllium	U	0.0005	mg/L	0.0005	7/20/2023			SW846-6020B	=
Boron		0.0213	mg/L	0.015	7/20/2023			SW846-6020B	=
Cadmium	U	0.001	mg/L	0.001	7/20/2023			SW846-6020B	=
Calcium		22.4	mg/L	0.2	7/20/2023			SW846-6020B	J
Chromium	U	0.01	mg/L	0.01	7/20/2023			SW846-6020B	=
Cobalt		0.00172	mg/L	0.001	7/20/2023			SW846-6020B	J
Copper	J	0.00044	mg/L	0.002	7/20/2023			SW846-6020B	J
Iron		0.133	mg/L	0.1	7/20/2023			SW846-6020B	=
Lead	U	0.002	mg/L	0.002	7/20/2023			SW846-6020B	=
Magnesium		8.89	mg/L	0.03	7/20/2023			SW846-6020B	=
Manganese		0.204	mg/L	0.005	7/20/2023			SW846-6020B	=
Molybdenum	U	0.001	mg/L	0.001	7/20/2023			SW846-6020B	=
Nickel		0.0441	mg/L	0.002	7/20/2023			SW846-6020B	=
Potassium		1.98	mg/L	0.3	7/20/2023			SW846-6020B	=
Rhodium	U	0.005	mg/L	0.005	7/20/2023			SW846-6020B	=
Selenium	U	0.005	mg/L	0.005	7/20/2023			SW846-6020B	=
Silver	U	0.001	mg/L	0.001	7/20/2023			SW846-6020B	=
Sodium		38.8	mg/L	0.25	7/20/2023			SW846-6020B	=
Tantalum	U	0.005	mg/L	0.005	7/20/2023			SW846-6020B	=
Thallium	U	0.002	mg/L	0.002	7/20/2023			SW846-6020B	=
Uranium	U*	0.0002	mg/L	0.0002	7/20/2023			SW846-6020B	=
Vanadium	U	0.02	mg/L	0.02	7/20/2023			SW846-6020B	=
Zinc	U	0.02	mg/L	0.02	7/20/2023			SW846-6020B	=
Mercury	U	0.0002	mg/L	0.0002	7/20/2023			SW846-7470A	=
Barium, Dissolved		0.123	mg/L	0.004	7/20/2023			SW846-6020B	=
Chromium, Dissolved	U	0.01	mg/L	0.01	7/20/2023			SW846-6020B	=
Uranium, Dissolved	U*	0.0002	mg/L	0.0002	7/20/2023			SW846-6020B	=
PCB-1016	U	0.0966	ug/L	0.0966	7/20/2023			SW846-8082A	UJ
PCB-1221	U	0.0966	ug/L	0.0966	7/20/2023			SW846-8082A	=
PCB-1232	U	0.0966	ug/L	0.0966	7/20/2023			SW846-8082A	=

PCB-1242	U	0.0966	ug/L	0.0966	7/20/2023			SW846-8082A	=
PCB-1248	U	0.0966	ug/L	0.0966	7/20/2023			SW846-8082A	=
PCB-1254	U	0.0966	ug/L	0.0966	7/20/2023			SW846-8082A	=
PCB-1260	U	0.0966	ug/L	0.0966	7/20/2023			SW846-8082A	UJ
PCB-1268	U	0.0966	ug/L	0.0966	7/20/2023			SW846-8082A	=
Polychlorinated biphenyl	U	0.0966	ug/L	0.0966	7/20/2023			SW846-8082A	UJ
Radium-226	U	0.134	pCi/L	0.446	7/20/2023	0.264	0.264	AN-1418	=
Radium-228	U	0.0523	pCi/L	2.7	7/20/2023	1.45	1.45	EPA-904-M	=
Strontium-90	U	4.57	pCi/L	7.24	7/20/2023	4.4	4.47	EPA-905.0-M	=
Tritium	U	7.84	pCi/L	230	7/20/2023	129	129	EPA-906.0-M	=
Technetium-99	U	-2.22	pCi/L	19.8	7/20/2023	11.1	11.1	HASL 300, Tc-02-RC M	=
Thorium-230	U	-0.455	pCi/L	2.88	7/20/2023	1.03	1.03	HASL 300, Th-01-RC M	=
Thorium-232	U	-0.0427	pCi/L	1.47	7/20/2023	0.716	0.718	HASL 300, Th-01-RC M	=
Alpha activity	U	5.24	pCi/L	8.48	7/20/2023	5.37	5.44	SW846-9310	=
Beta activity		11	pCi/L	9.65	7/20/2023	6.49	6.74	SW846-9310	=
1,2-Dibromo-3-chloropropane	U	0.0195	ug/L	0.0195	7/20/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	7/20/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	7/20/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	7/20/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	7/20/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	7/20/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	7/20/2023			SW846-8260D	=
Acetone	U	5	ug/L	5	7/20/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	7/20/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	7/20/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Bromomethane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	7/20/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Chlorobenzene	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	7/20/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Ethylbenzene	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Iodomethane	U	5	ug/L	5	7/20/2023			SW846-8260D	=
Methylene chloride	U	5	ug/L	5	7/20/2023			SW846-8260D	=
Styrene	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Tetrachloroethene	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Toluene	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Total Xylene	U	3	ug/L	3	7/20/2023			SW846-8260D	=

trans-1,2-Dichloroethene	U	1	ug/L	1	7/20/2023	SW846-8260D	=
trans-1,3-Dichloropropene	U	1	ug/L	1	7/20/2023	SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5	ug/L	5	7/20/2023	SW846-8260D	=
Trichloroethene	U	1	ug/L	1	7/20/2023	SW846-8260D	=
Trichlorofluoromethane	U	1	ug/L	1	7/20/2023	SW846-8260D	=
Vinyl acetate	U	5	ug/L	5	7/20/2023	SW846-8260D	=
Vinyl chloride	U	1	ug/L	1	7/20/2023	SW846-8260D	=
Dissolved Solids		195	mg/L	10	7/20/2023	EPA-160.1	=
Iodide	U	0.5	mg/L	0.5	7/20/2023	EPA-300.0	=
Chemical Oxygen Demand (COD)	U	20	mg/L	20	7/20/2023	EPA-410.4	=
Cyanide	U	0.2	mg/L	0.2	7/20/2023	SW846-9012B	=
Total Organic Halides (TOX)	J	5.08	ug/L	10	7/20/2023	SW846-9020B	=
Total Organic Carbon (TOC)	J	1.31	mg/L	2	7/20/2023	SW846-9060A	=

Paducah OREIS
GROUNDWATER MONITORING REPORT

Facility: C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

Sampling Point: MW364 DOWN **RGA Type:** LRGA **Period:** 3rd Quarter 2023

AKGWA Well Tag #: 8004-4797 **SAMPLE ID:** MW364UG4-23 Sample Type: REG

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Bromide		0.458	mg/L	0.2	7/20/2023			SW846-9056A	=
Chloride	JW	37.9	mg/L	250	7/20/2023			SW846-9056A	J
Fluoride	J	0.126	mg/L	4	7/20/2023			SW846-9056A	=
Nitrate as Nitrogen	J	1.19	mg/L	10	7/20/2023			SW846-9056A	=
Sulfate		71.9	mg/L	2	7/20/2023			SW846-9056A	=
Barometric Pressure Reading		29.99	Inches/Hg		7/20/2023				X
Conductivity		476	umho/cm		7/20/2023				X
Depth to Water		45.36	ft		7/20/2023				X
Dissolved Oxygen		3.52	mg/L		7/20/2023				X
Eh (approx)		377	mV		7/20/2023				X
pH		5.96	Std Unit		7/20/2023				X
Temperature		64.3	deg F		7/20/2023				X
Turbidity		1.4	NTU		7/20/2023				X
Aluminum	U	0.05	mg/L	0.05	7/20/2023			SW846-6020B	=
Antimony	U	0.003	mg/L	0.003	7/20/2023			SW846-6020B	=
Arsenic	U	0.005	mg/L	0.005	7/20/2023			SW846-6020B	=
Barium		0.0581	mg/L	0.004	7/20/2023			SW846-6020B	=
Beryllium	U	0.0005	mg/L	0.0005	7/20/2023			SW846-6020B	=
Boron		0.145	mg/L	0.015	7/20/2023			SW846-6020B	=
Cadmium	U	0.001	mg/L	0.001	7/20/2023			SW846-6020B	=
Calcium		31.1	mg/L	0.2	7/20/2023			SW846-6020B	J
Chromium	U	0.01	mg/L	0.01	7/20/2023			SW846-6020B	=
Cobalt	U	0.001	mg/L	0.001	7/20/2023			SW846-6020B	=
Copper	J	0.00128	mg/L	0.002	7/20/2023			SW846-6020B	J
Iron	U	0.1	mg/L	0.1	7/20/2023			SW846-6020B	=
Lead	U	0.002	mg/L	0.002	7/20/2023			SW846-6020B	=
Magnesium		13.2	mg/L	0.03	7/20/2023			SW846-6020B	=
Manganese	J	0.00352	mg/L	0.005	7/20/2023			SW846-6020B	J
Molybdenum	U	0.001	mg/L	0.001	7/20/2023			SW846-6020B	=
Nickel	J	0.00119	mg/L	0.002	7/20/2023			SW846-6020B	J
Potassium		1.96	mg/L	0.3	7/20/2023			SW846-6020B	=
Rhodium	U	0.005	mg/L	0.005	7/20/2023			SW846-6020B	=
Selenium	U	0.005	mg/L	0.005	7/20/2023			SW846-6020B	=
Silver	U	0.001	mg/L	0.001	7/20/2023			SW846-6020B	=
Sodium		41.2	mg/L	0.25	7/20/2023			SW846-6020B	=
Tantalum	U	0.005	mg/L	0.005	7/20/2023			SW846-6020B	=
Thallium	U	0.002	mg/L	0.002	7/20/2023			SW846-6020B	=
Uranium	U*	0.0002	mg/L	0.0002	7/20/2023			SW846-6020B	UJ
Vanadium	U	0.02	mg/L	0.02	7/20/2023			SW846-6020B	=
Zinc		0.0215	mg/L	0.02	7/20/2023			SW846-6020B	=
Mercury	U	0.0002	mg/L	0.0002	7/20/2023			SW846-7470A	=
Barium, Dissolved		0.0567	mg/L	0.004	7/20/2023			SW846-6020B	=
Chromium, Dissolved	U	0.01	mg/L	0.01	7/20/2023			SW846-6020B	=
Uranium, Dissolved	U*	0.0002	mg/L	0.0002	7/20/2023			SW846-6020B	=
PCB-1016	U	0.1	ug/L	0.1	7/20/2023			SW846-8082A	UJ
PCB-1221	U	0.1	ug/L	0.1	7/20/2023			SW846-8082A	=
PCB-1232	U	0.1	ug/L	0.1	7/20/2023			SW846-8082A	=

PCB-1242	U	0.1	ug/L	0.1	7/20/2023			SW846-8082A	=
PCB-1248	U	0.1	ug/L	0.1	7/20/2023			SW846-8082A	=
PCB-1254	U	0.1	ug/L	0.1	7/20/2023			SW846-8082A	=
PCB-1260	U	0.1	ug/L	0.1	7/20/2023			SW846-8082A	UJ
PCB-1268	U	0.1	ug/L	0.1	7/20/2023			SW846-8082A	=
Polychlorinated biphenyl	U	0.1	ug/L	0.1	7/20/2023			SW846-8082A	UJ
Radium-226	U	0.226	pCi/L	0.544	7/20/2023	0.34	0.34	AN-1418	=
Radium-228	U	1.77	pCi/L	2.47	7/20/2023	1.53	1.59	EPA-904-M	=
Strontium-90	U	1.06	pCi/L	6.18	7/20/2023	3.4	3.4	EPA-905.0-M	=
Tritium	U	63.4	pCi/L	233	7/20/2023	134	135	EPA-906.0-M	=
Technetium-99		51.3	pCi/L	19.4	7/20/2023	12.7	13.9	HASL 300, Tc-02-RC M	=
Thorium-230	U	-0.17	pCi/L	3.24	7/20/2023	1.33	1.33	HASL 300, Th-01-RC M	=
Thorium-232	U	0.902	pCi/L	1.89	7/20/2023	1.62	1.62	HASL 300, Th-01-RC M	=
Alpha activity	U	-0.844	pCi/L	3	7/20/2023	1.01	1.01	SW846-9310	=
Beta activity		32	pCi/L	3.12	7/20/2023	4.27	6.72	SW846-9310	=
1,2-Dibromo-3-chloropropane	U	0.0191	ug/L	0.0191	7/20/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	7/20/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	7/20/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	7/20/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	7/20/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	7/20/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	7/20/2023			SW846-8260D	=
Acetone	U	5	ug/L	5	7/20/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	7/20/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	7/20/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Bromomethane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	7/20/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Chlorobenzene	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	7/20/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Ethylbenzene	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Iodomethane	U	5	ug/L	5	7/20/2023			SW846-8260D	=
Methylene chloride	U	5	ug/L	5	7/20/2023			SW846-8260D	=
Styrene	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Tetrachloroethene	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Toluene	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Total Xylene	U	3	ug/L	3	7/20/2023			SW846-8260D	=

trans-1,2-Dichloroethene	U	1	ug/L	1	7/20/2023	SW846-8260D	=
trans-1,3-Dichloropropene	U	1	ug/L	1	7/20/2023	SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5	ug/L	5	7/20/2023	SW846-8260D	=
Trichloroethene	J	0.39	ug/L	1	7/20/2023	SW846-8260D	=
Trichlorofluoromethane	U	1	ug/L	1	7/20/2023	SW846-8260D	=
Vinyl acetate	U	5	ug/L	5	7/20/2023	SW846-8260D	=
Vinyl chloride	U	1	ug/L	1	7/20/2023	SW846-8260D	=
Dissolved Solids		251	mg/L	10	7/20/2023	EPA-160.1	=
Iodide	U	0.5	mg/L	0.5	7/20/2023	EPA-300.0	=
Chemical Oxygen Demand (COD)	U	20	mg/L	20	7/20/2023	EPA-410.4	=
Cyanide	U	0.2	mg/L	0.2	7/20/2023	SW846-9012B	=
Total Organic Halides (TOX)	U	10	ug/L	10	7/20/2023	SW846-9020B	=
Total Organic Carbon (TOC)	J	0.802	mg/L	2	7/20/2023	SW846-9060A	=

Paducah OREIS
GROUNDWATER MONITORING REPORT

Facility: C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

Sampling Point: MW365 DOWN **RGA Type:** UCRS **Period:** 3rd Quarter 2023

AKGWA Well Tag #: 8004-0984 **SAMPLE ID:** MW365UG4-23 Sample Type: REG

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Bromide	U	0.2	mg/L	0.2	7/24/2023			SW846-9056A	=
Chloride	J	2.34	mg/L	250	7/24/2023			SW846-9056A	=
Fluoride	J	0.265	mg/L	4	7/24/2023			SW846-9056A	=
Nitrate as Nitrogen	J	0.725	mg/L	10	7/24/2023			SW846-9056A	=
Sulfate		54	mg/L	4	7/24/2023			SW846-9056A	=
Barometric Pressure Reading		30.06	Inches/Hg		7/24/2023				X
Conductivity		362	umho/cm		7/24/2023				X
Depth to Water		39.64	ft		7/24/2023				X
Dissolved Oxygen		6.32	mg/L		7/24/2023				X
Eh (approx)		358.4	mV		7/24/2023				X
pH		6.22	Std Unit		7/24/2023				X
Temperature		65.9	deg F		7/24/2023				X
Turbidity		3.45	NTU		7/24/2023				X
Aluminum	J	0.031	mg/L	0.05	7/24/2023			SW846-6020B	=
Antimony	U	0.003	mg/L	0.003	7/24/2023			SW846-6020B	=
Arsenic	U	0.005	mg/L	0.005	7/24/2023			SW846-6020B	=
Barium		0.0933	mg/L	0.004	7/24/2023			SW846-6020B	=
Beryllium	U	0.0005	mg/L	0.0005	7/24/2023			SW846-6020B	=
Boron	J	0.00763	mg/L	0.015	7/24/2023			SW846-6020B	=
Cadmium	U	0.001	mg/L	0.001	7/24/2023			SW846-6020B	=
Calcium		17.4	mg/L	0.2	7/24/2023			SW846-6020B	=
Chromium	U	0.01	mg/L	0.01	7/24/2023			SW846-6020B	=
Cobalt		0.00115	mg/L	0.001	7/24/2023			SW846-6020B	J
Copper		0.00406	mg/L	0.002	7/24/2023			SW846-6020B	J
Iron	J	0.0373	mg/L	0.1	7/24/2023			SW846-6020B	=
Lead	U	0.002	mg/L	0.002	7/24/2023			SW846-6020B	=
Magnesium		9.45	mg/L	0.03	7/24/2023			SW846-6020B	=
Manganese		0.0174	mg/L	0.005	7/24/2023			SW846-6020B	J
Molybdenum	U	0.001	mg/L	0.001	7/24/2023			SW846-6020B	=
Nickel		0.00533	mg/L	0.002	7/24/2023			SW846-6020B	J
Potassium	J	0.214	mg/L	0.3	7/24/2023			SW846-6020B	=
Rhodium	U	0.005	mg/L	0.005	7/24/2023			SW846-6020B	=
Selenium	U	0.005	mg/L	0.005	7/24/2023			SW846-6020B	=
Silver	U	0.001	mg/L	0.001	7/24/2023			SW846-6020B	=
Sodium		48.9	mg/L	0.25	7/24/2023			SW846-6020B	=
Tantalum	U	0.005	mg/L	0.005	7/24/2023			SW846-6020B	=
Thallium	U	0.002	mg/L	0.002	7/24/2023			SW846-6020B	=
Uranium	J	0.00012	mg/L	0.0002	7/24/2023			SW846-6020B	=
Vanadium	BJ	0.0134	mg/L	0.02	7/24/2023			SW846-6020B	U
Zinc	J	0.00796	mg/L	0.02	7/24/2023			SW846-6020B	=
Mercury	U	0.0002	mg/L	0.0002	7/24/2023			SW846-7470A	=
Barium, Dissolved		0.0964	mg/L	0.004	7/24/2023			SW846-6020B	=
Chromium, Dissolved	U	0.01	mg/L	0.01	7/24/2023			SW846-6020B	=
Uranium, Dissolved	J	0.000103	mg/L	0.0002	7/24/2023			SW846-6020B	=
PCB-1016	UY2	0.0951	ug/L	0.0951	7/24/2023			SW846-8082A	=
PCB-1221	U	0.0951	ug/L	0.0951	7/24/2023			SW846-8082A	=
PCB-1232	U	0.0951	ug/L	0.0951	7/24/2023			SW846-8082A	=

PCB-1242	U	0.0951	ug/L	0.0951	7/24/2023			SW846-8082A	=
PCB-1248	U	0.0951	ug/L	0.0951	7/24/2023			SW846-8082A	=
PCB-1254	U	0.0951	ug/L	0.0951	7/24/2023			SW846-8082A	=
PCB-1260	UY2	0.0951	ug/L	0.0951	7/24/2023			SW846-8082A	UJ
PCB-1268	U	0.0951	ug/L	0.0951	7/24/2023			SW846-8082A	=
Polychlorinated biphenyl	UY2	0.0951	ug/L	0.0951	7/24/2023			SW846-8082A	UJ
Radium-226	U	0.399	pCi/L	0.77	7/24/2023	0.597	0.598	AN-1418	=
Radium-228	U	1.13	pCi/L	3.82	7/24/2023	2.14	2.16	EPA-904-M	=
Strontium-90	U	-6.35	pCi/L	5.78	7/24/2023	1.96	1.96	EPA-905.0-M	=
Tritium	U	-31.4	pCi/L	243	7/24/2023	132	132	EPA-906.0-M	=
Technetium-99	U	2.67	pCi/L	18.9	7/24/2023	10.9	10.9	HASL 300, Tc-02-RC M	=
Thorium-230	U	1.32	pCi/L	3.07	7/24/2023	1.99	2.01	HASL 300, Th-01-RC M	=
Thorium-232	U	-0.0425	pCi/L	1.66	7/24/2023	0.827	0.829	HASL 300, Th-01-RC M	=
Alpha activity	U	2.75	pCi/L	7.14	7/24/2023	4.07	4.1	SW846-9310	=
Beta activity	U	6.25	pCi/L	9.92	7/24/2023	6.06	6.15	SW846-9310	=
1,2-Dibromo-3-chloropropane	U	0.0193	ug/L	0.0193	7/24/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	7/24/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	7/24/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	7/24/2023			SW846-8260D	=
Acetone	U	5	ug/L	5	7/24/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	7/24/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	7/24/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	7/24/2023			SW846-8260D	UJ
Bromomethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	7/24/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	7/24/2023			SW846-8260D	UJ
Chlorobenzene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Ethylbenzene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Iodomethane	U	5	ug/L	5	7/24/2023			SW846-8260D	=
Methylene chloride	U	5	ug/L	5	7/24/2023			SW846-8260D	=
Styrene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Tetrachloroethene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Toluene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Total Xylene	U	3	ug/L	3	7/24/2023			SW846-8260D	=

trans-1,2-Dichloroethene	U	1	ug/L	1	7/24/2023	SW846-8260D	=
trans-1,3-Dichloropropene	U	1	ug/L	1	7/24/2023	SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5	ug/L	5	7/24/2023	SW846-8260D	=
Trichloroethene	U	1	ug/L	1	7/24/2023	SW846-8260D	=
Trichlorofluoromethane	U	1	ug/L	1	7/24/2023	SW846-8260D	=
Vinyl acetate	U	5	ug/L	5	7/24/2023	SW846-8260D	=
Vinyl chloride	U	1	ug/L	1	7/24/2023	SW846-8260D	=
Dissolved Solids		211	mg/L	10	7/24/2023	EPA-160.1	=
Iodide	U	0.5	mg/L	0.5	7/24/2023	EPA-300.0	=
Chemical Oxygen Demand (COD)	U	20	mg/L	20	7/24/2023	EPA-410.4	=
Cyanide	UN	0.2	mg/L	0.2	7/24/2023	SW846-9012B	UJ
Total Organic Halides (TOX)	J	4.56	ug/L	10	7/24/2023	SW846-9020B	=
Total Organic Carbon (TOC)	J	1.44	mg/L	2	7/24/2023	SW846-9060A	=

Paducah OREIS
GROUNDWATER MONITORING REPORT

Facility: C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

Sampling Point: MW366 DOWN **RGA Type:** URGA **Period:** 3rd Quarter 2023

AKGWA Well Tag #: 8004-0982 **SAMPLE ID:** MW366UG4-23 Sample Type: REG

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Bromide		0.529	mg/L	0.2	7/24/2023			SW846-9056A	=
Chloride	J	39.9	mg/L	250	7/24/2023			SW846-9056A	=
Fluoride	J	0.17	mg/L	4	7/24/2023			SW846-9056A	=
Nitrate as Nitrogen	J	0.895	mg/L	10	7/24/2023			SW846-9056A	=
Sulfate		49.6	mg/L	4	7/24/2023			SW846-9056A	=
Barometric Pressure Reading		30.05	Inches/Hg		7/24/2023				X
Conductivity		479	umho/cm		7/24/2023				X
Depth to Water		46.01	ft		7/24/2023				X
Dissolved Oxygen		3.16	mg/L		7/24/2023				X
Eh (approx)		362	mV		7/24/2023				X
pH		6.05	Std Unit		7/24/2023				X
Temperature		69.4	deg F		7/24/2023				X
Turbidity		2.9	NTU		7/24/2023				X
Aluminum	J	0.0238	mg/L	0.05	7/24/2023			SW846-6020B	=
Antimony	U	0.003	mg/L	0.003	7/24/2023			SW846-6020B	=
Arsenic	U	0.005	mg/L	0.005	7/24/2023			SW846-6020B	=
Barium		0.107	mg/L	0.004	7/24/2023			SW846-6020B	=
Beryllium	U	0.0005	mg/L	0.0005	7/24/2023			SW846-6020B	=
Boron		0.0785	mg/L	0.015	7/24/2023			SW846-6020B	=
Cadmium	U	0.001	mg/L	0.001	7/24/2023			SW846-6020B	=
Calcium		31.4	mg/L	0.2	7/24/2023			SW846-6020B	=
Chromium	U	0.01	mg/L	0.01	7/24/2023			SW846-6020B	=
Cobalt	U	0.001	mg/L	0.001	7/24/2023			SW846-6020B	=
Copper	J	0.00144	mg/L	0.002	7/24/2023			SW846-6020B	J
Iron	U	0.1	mg/L	0.1	7/24/2023			SW846-6020B	=
Lead	U	0.002	mg/L	0.002	7/24/2023			SW846-6020B	=
Magnesium		14.8	mg/L	0.03	7/24/2023			SW846-6020B	=
Manganese	J	0.00266	mg/L	0.005	7/24/2023			SW846-6020B	J
Molybdenum	U	0.001	mg/L	0.001	7/24/2023			SW846-6020B	=
Nickel	J	0.000938	mg/L	0.002	7/24/2023			SW846-6020B	J
Potassium		1.95	mg/L	0.3	7/24/2023			SW846-6020B	=
Rhodium	U	0.005	mg/L	0.005	7/24/2023			SW846-6020B	=
Selenium	J	0.00267	mg/L	0.005	7/24/2023			SW846-6020B	J
Silver	U	0.001	mg/L	0.001	7/24/2023			SW846-6020B	=
Sodium		48	mg/L	0.25	7/24/2023			SW846-6020B	=
Tantalum	U	0.005	mg/L	0.005	7/24/2023			SW846-6020B	=
Thallium	U	0.002	mg/L	0.002	7/24/2023			SW846-6020B	=
Uranium	U	0.0002	mg/L	0.0002	7/24/2023			SW846-6020B	=
Vanadium	BJ	0.00775	mg/L	0.02	7/24/2023			SW846-6020B	U
Zinc	J	0.00779	mg/L	0.02	7/24/2023			SW846-6020B	=
Mercury	U	0.0002	mg/L	0.0002	7/24/2023			SW846-7470A	=
Barium, Dissolved		0.106	mg/L	0.004	7/24/2023			SW846-6020B	=
Chromium, Dissolved	U	0.01	mg/L	0.01	7/24/2023			SW846-6020B	=
Uranium, Dissolved	U	0.0002	mg/L	0.0002	7/24/2023			SW846-6020B	=
PCB-1016	UY2	0.0995	ug/L	0.0995	7/24/2023			SW846-8082A	=
PCB-1221	U	0.0995	ug/L	0.0995	7/24/2023			SW846-8082A	=
PCB-1232	U	0.0995	ug/L	0.0995	7/24/2023			SW846-8082A	=

PCB-1242	U	0.0995	ug/L	0.0995	7/24/2023			SW846-8082A	=
PCB-1248	U	0.0995	ug/L	0.0995	7/24/2023			SW846-8082A	=
PCB-1254	U	0.0995	ug/L	0.0995	7/24/2023			SW846-8082A	=
PCB-1260	UY2	0.0995	ug/L	0.0995	7/24/2023			SW846-8082A	UJ
PCB-1268	U	0.0995	ug/L	0.0995	7/24/2023			SW846-8082A	=
Polychlorinated biphenyl	UY2	0.0995	ug/L	0.0995	7/24/2023			SW846-8082A	UJ
Radium-226	U	0.0739	pCi/L	0.434	7/24/2023	0.232	0.232	AN-1418	=
Radium-228	U	4.67	pCi/L	4.81	7/24/2023	3.11	3.33	EPA-904-M	=
Strontium-90	U	-1.32	pCi/L	4.89	7/24/2023	2.18	2.19	EPA-905.0-M	=
Tritium	U	28.7	pCi/L	241	7/24/2023	136	136	EPA-906.0-M	=
Technetium-99		57.7	pCi/L	19.8	7/24/2023	14	15.4	HASL 300, Tc-02-RC M	=
Thorium-230	U	0.713	pCi/L	3.07	7/24/2023	1.72	1.73	HASL 300, Th-01-RC M	=
Thorium-232	U	1.11	pCi/L	1.58	7/24/2023	1.52	1.53	HASL 300, Th-01-RC M	=
Alpha activity	U	0.502	pCi/L	6.94	7/24/2023	3.28	3.28	SW846-9310	=
Beta activity		45.7	pCi/L	11.6	7/24/2023	10.2	12.8	SW846-9310	=
1,2-Dibromo-3-chloropropane	U	0.0188	ug/L	0.0188	7/24/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	7/24/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	7/24/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	7/24/2023			SW846-8260D	=
Acetone	U	5	ug/L	5	7/24/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	7/24/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	7/24/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	7/24/2023			SW846-8260D	UJ
Bromomethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	7/24/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	7/24/2023			SW846-8260D	UJ
Chlorobenzene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Ethylbenzene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Iodomethane	U	5	ug/L	5	7/24/2023			SW846-8260D	=
Methylene chloride	U	5	ug/L	5	7/24/2023			SW846-8260D	=
Styrene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Tetrachloroethene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Toluene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Total Xylene	U	3	ug/L	3	7/24/2023			SW846-8260D	=

trans-1,2-Dichloroethene	U	1	ug/L	1	7/24/2023	SW846-8260D	=
trans-1,3-Dichloropropene	U	1	ug/L	1	7/24/2023	SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5	ug/L	5	7/24/2023	SW846-8260D	=
Trichloroethene		2.17	ug/L	1	7/24/2023	SW846-8260D	=
Trichlorofluoromethane	U	1	ug/L	1	7/24/2023	SW846-8260D	=
Vinyl acetate	U	5	ug/L	5	7/24/2023	SW846-8260D	=
Vinyl chloride	U	1	ug/L	1	7/24/2023	SW846-8260D	=
Dissolved Solids		256	mg/L	10	7/24/2023	EPA-160.1	=
Iodide	U	0.5	mg/L	0.5	7/24/2023	EPA-300.0	=
Chemical Oxygen Demand (COD)	U	20	mg/L	20	7/24/2023	EPA-410.4	=
Cyanide	UN	0.2	mg/L	0.2	7/24/2023	SW846-9012B	=
Total Organic Halides (TOX)		24.5	ug/L	10	7/24/2023	SW846-9020B	=
Total Organic Carbon (TOC)	J	0.751	mg/L	2	7/24/2023	SW846-9060A	=

Paducah OREIS
GROUNDWATER MONITORING REPORT

Facility: C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

Sampling Point: MW367 DOWN **RGA Type:** LRGA **Period:** 3rd Quarter 2023

AKGWA Well Tag #: 8004-4793 **SAMPLE ID:** MW367UG4-23 Sample Type: REG

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Bromide	J	0.0996	mg/L	0.2	7/24/2023			SW846-9056A	=
Chloride	J	7.48	mg/L	250	7/24/2023			SW846-9056A	=
Fluoride	J	0.221	mg/L	4	7/24/2023			SW846-9056A	=
Nitrate as Nitrogen	U	10	mg/L	10	7/24/2023			SW846-9056A	=
Sulfate		21.6	mg/L	0.8	7/24/2023			SW846-9056A	=
Barometric Pressure Reading		30.07	Inches/Hg		7/24/2023				X
Conductivity		224	umho/cm		7/24/2023				X
Depth to Water		46.44	ft		7/24/2023				X
Dissolved Oxygen		1.67	mg/L		7/24/2023				X
Eh (approx)		245.9	mV		7/24/2023				X
pH		5.87	Std Unit		7/24/2023				X
Temperature		71.3	deg F		7/24/2023				X
Turbidity		6.43	NTU		7/24/2023				X
Aluminum	U	0.05	mg/L	0.05	7/24/2023			SW846-6020B	=
Antimony	U	0.003	mg/L	0.003	7/24/2023			SW846-6020B	=
Arsenic	J	0.00271	mg/L	0.005	7/24/2023			SW846-6020B	=
Barium		0.128	mg/L	0.004	7/24/2023			SW846-6020B	=
Beryllium	U	0.0005	mg/L	0.0005	7/24/2023			SW846-6020B	=
Boron		0.0184	mg/L	0.015	7/24/2023			SW846-6020B	=
Cadmium	U	0.001	mg/L	0.001	7/24/2023			SW846-6020B	=
Calcium		12.6	mg/L	0.2	7/24/2023			SW846-6020B	=
Chromium	U	0.01	mg/L	0.01	7/24/2023			SW846-6020B	=
Cobalt		0.00598	mg/L	0.001	7/24/2023			SW846-6020B	J
Copper		0.00273	mg/L	0.002	7/24/2023			SW846-6020B	J
Iron		7.11	mg/L	0.1	7/24/2023			SW846-6020B	=
Lead	J	0.000552	mg/L	0.002	7/24/2023			SW846-6020B	=
Magnesium		7.31	mg/L	0.03	7/24/2023			SW846-6020B	=
Manganese		1.38	mg/L	0.025	7/24/2023			SW846-6020B	=
Molybdenum	U	0.001	mg/L	0.001	7/24/2023			SW846-6020B	=
Nickel		0.00303	mg/L	0.002	7/24/2023			SW846-6020B	J
Potassium		2.78	mg/L	0.3	7/24/2023			SW846-6020B	=
Rhodium	U	0.005	mg/L	0.005	7/24/2023			SW846-6020B	=
Selenium	U	0.005	mg/L	0.005	7/24/2023			SW846-6020B	=
Silver	U	0.001	mg/L	0.001	7/24/2023			SW846-6020B	=
Sodium		15.5	mg/L	0.25	7/24/2023			SW846-6020B	=
Tantalum	U	0.005	mg/L	0.005	7/24/2023			SW846-6020B	=
Thallium	U	0.002	mg/L	0.002	7/24/2023			SW846-6020B	=
Uranium	U	0.0002	mg/L	0.0002	7/24/2023			SW846-6020B	=
Vanadium	BJ	0.00341	mg/L	0.02	7/24/2023			SW846-6020B	U
Zinc	J	0.0179	mg/L	0.02	7/24/2023			SW846-6020B	=
Mercury	U	0.0002	mg/L	0.0002	7/24/2023			SW846-7470A	=
Barium, Dissolved		0.127	mg/L	0.004	7/24/2023			SW846-6020B	=
Chromium, Dissolved	U	0.01	mg/L	0.01	7/24/2023			SW846-6020B	=
Uranium, Dissolved	U	0.0002	mg/L	0.0002	7/24/2023			SW846-6020B	=
PCB-1016	UY2	0.0997	ug/L	0.0997	7/24/2023			SW846-8082A	=
PCB-1221	U	0.0997	ug/L	0.0997	7/24/2023			SW846-8082A	=
PCB-1232	U	0.0997	ug/L	0.0997	7/24/2023			SW846-8082A	=

PCB-1242	U	0.0997	ug/L	0.0997	7/24/2023			SW846-8082A	=
PCB-1248	U	0.0997	ug/L	0.0997	7/24/2023			SW846-8082A	=
PCB-1254	U	0.0997	ug/L	0.0997	7/24/2023			SW846-8082A	=
PCB-1260	UY2	0.0997	ug/L	0.0997	7/24/2023			SW846-8082A	UJ
PCB-1268	U	0.0997	ug/L	0.0997	7/24/2023			SW846-8082A	=
Polychlorinated biphenyl	UY2	0.0997	ug/L	0.0997	7/24/2023			SW846-8082A	UJ
Radium-226	U	0.279	pCi/L	0.281	7/24/2023	0.284	0.284	AN-1418	=
Radium-228	U	0.0688	pCi/L	4.54	7/24/2023	2.38	2.38	EPA-904-M	=
Strontium-90	U	0.728	pCi/L	4.79	7/24/2023	2.59	2.59	EPA-905.0-M	=
Tritium	U	61.7	pCi/L	239	7/24/2023	137	138	EPA-906.0-M	=
Technetium-99	U	-3.27	pCi/L	18.7	7/24/2023	10.4	10.4	HASL 300, Tc-02-RC M	=
Thorium-230	U	2.29	pCi/L	2.7	7/24/2023	2.17	2.2	HASL 300, Th-01-RC M	=
Thorium-232	U	0.323	pCi/L	1.51	7/24/2023	1.03	1.03	HASL 300, Th-01-RC M	=
Alpha activity	U	1.07	pCi/L	6.35	7/24/2023	3.13	3.14	SW846-9310	=
Beta activity	U	1.14	pCi/L	9.89	7/24/2023	5.38	5.39	SW846-9310	=
1,2-Dibromo-3-chloropropane	U	0.019	ug/L	0.019	7/24/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	7/24/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	7/24/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	7/24/2023			SW846-8260D	=
Acetone	U	5	ug/L	5	7/24/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	7/24/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	7/24/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	7/24/2023			SW846-8260D	UJ
Bromomethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	7/24/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	7/24/2023			SW846-8260D	UJ
Chlorobenzene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Ethylbenzene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Iodomethane	U	5	ug/L	5	7/24/2023			SW846-8260D	=
Methylene chloride	U	5	ug/L	5	7/24/2023			SW846-8260D	=
Styrene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Tetrachloroethene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Toluene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Total Xylene	U	3	ug/L	3	7/24/2023			SW846-8260D	=

trans-1,2-Dichloroethene	U	1	ug/L	1	7/24/2023	SW846-8260D	=
trans-1,3-Dichloropropene	U	1	ug/L	1	7/24/2023	SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5	ug/L	5	7/24/2023	SW846-8260D	=
Trichloroethene	U	1	ug/L	1	7/24/2023	SW846-8260D	=
Trichlorofluoromethane	U	1	ug/L	1	7/24/2023	SW846-8260D	=
Vinyl acetate	U	5	ug/L	5	7/24/2023	SW846-8260D	=
Vinyl chloride	U	1	ug/L	1	7/24/2023	SW846-8260D	=
Dissolved Solids		96	mg/L	10	7/24/2023	EPA-160.1	=
Iodide	U	0.5	mg/L	0.5	7/24/2023	EPA-300.0	=
Chemical Oxygen Demand (COD)	U	20	mg/L	20	7/24/2023	EPA-410.4	=
Cyanide	UN	0.2	mg/L	0.2	7/24/2023	SW846-9012B	=
Total Organic Halides (TOX)	U	10	ug/L	10	7/24/2023	SW846-9020B	=
Total Organic Carbon (TOC)	J	0.481	mg/L	2	7/24/2023	SW846-9060A	=

Paducah OREIS
GROUNDWATER MONITORING REPORT

Facility: C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

Sampling Point: MW369 UP **RGA Type:** URGA **Period:** 3rd Quarter 2023

AKGWA Well Tag #: 8004-4820 **SAMPLE ID:** MW369UG4-23 Sample Type: REG

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Bromide	W	0.325	mg/L	0.2	7/25/2023			SW846-9056A	=
Chloride	JW	28.3	mg/L	250	7/25/2023			SW846-9056A	=
Fluoride	J	0.228	mg/L	4	7/25/2023			SW846-9056A	=
Nitrate as Nitrogen	J	0.933	mg/L	10	7/25/2023			SW846-9056A	=
Sulfate		7.91	mg/L	0.4	7/25/2023			SW846-9056A	=
Barometric Pressure Reading		30.09	Inches/Hg		7/25/2023				X
Conductivity		350	umho/cm		7/25/2023				X
Depth to Water		40.24	ft		7/25/2023				X
Dissolved Oxygen		2.85	mg/L		7/25/2023				X
Eh (approx)		406	mV		7/25/2023				X
pH		5.96	Std Unit		7/25/2023				X
Temperature		65.9	deg F		7/25/2023				X
Turbidity		6	NTU		7/25/2023				X
Aluminum		0.112	mg/L	0.05	7/25/2023			SW846-6020B	=
Antimony	U	0.003	mg/L	0.003	7/25/2023			SW846-6020B	=
Arsenic	U	0.005	mg/L	0.005	7/25/2023			SW846-6020B	=
Barium		0.363	mg/L	0.004	7/25/2023			SW846-6020B	=
Beryllium	U	0.0005	mg/L	0.0005	7/25/2023			SW846-6020B	=
Boron		0.0161	mg/L	0.015	7/25/2023			SW846-6020B	=
Cadmium	U	0.001	mg/L	0.001	7/25/2023			SW846-6020B	=
Calcium		15.7	mg/L	0.2	7/25/2023			SW846-6020B	J
Chromium	U	0.01	mg/L	0.01	7/25/2023			SW846-6020B	=
Cobalt		0.00583	mg/L	0.001	7/25/2023			SW846-6020B	J
Copper		0.00504	mg/L	0.002	7/25/2023			SW846-6020B	J
Iron		0.36	mg/L	0.1	7/25/2023			SW846-6020B	=
Lead	U	0.002	mg/L	0.002	7/25/2023			SW846-6020B	=
Magnesium		6.17	mg/L	0.03	7/25/2023			SW846-6020B	=
Manganese		0.0332	mg/L	0.005	7/25/2023			SW846-6020B	J
Molybdenum	U	0.001	mg/L	0.001	7/25/2023			SW846-6020B	=
Nickel		0.00462	mg/L	0.002	7/25/2023			SW846-6020B	J
Potassium		0.519	mg/L	0.3	7/25/2023			SW846-6020B	=
Rhodium	U	0.005	mg/L	0.005	7/25/2023			SW846-6020B	=
Selenium	J	0.00218	mg/L	0.005	7/25/2023			SW846-6020B	J
Silver	U	0.001	mg/L	0.001	7/25/2023			SW846-6020B	=
Sodium		47.6	mg/L	0.25	7/25/2023			SW846-6020B	=
Tantalum	U	0.005	mg/L	0.005	7/25/2023			SW846-6020B	=
Thallium	U	0.002	mg/L	0.002	7/25/2023			SW846-6020B	=
Uranium	U	0.0002	mg/L	0.0002	7/25/2023			SW846-6020B	=
Vanadium	U	0.02	mg/L	0.02	7/25/2023			SW846-6020B	=
Zinc	J	0.0123	mg/L	0.02	7/25/2023			SW846-6020B	J
Mercury	U	0.0002	mg/L	0.0002	7/25/2023			SW846-7470A	=
Barium, Dissolved		0.366	mg/L	0.004	7/25/2023			SW846-6020B	=
Chromium, Dissolved	U	0.01	mg/L	0.01	7/25/2023			SW846-6020B	=
Uranium, Dissolved	U	0.0002	mg/L	0.0002	7/25/2023			SW846-6020B	=
PCB-1016	U	0.0962	ug/L	0.0962	7/25/2023			SW846-8082A	UJ
PCB-1221	U	0.0962	ug/L	0.0962	7/25/2023			SW846-8082A	=
PCB-1232	U	0.0962	ug/L	0.0962	7/25/2023			SW846-8082A	=

PCB-1242	U	0.0962	ug/L	0.0962	7/25/2023			SW846-8082A	=
PCB-1248	U	0.0962	ug/L	0.0962	7/25/2023			SW846-8082A	=
PCB-1254	U	0.0962	ug/L	0.0962	7/25/2023			SW846-8082A	=
PCB-1260	U	0.0962	ug/L	0.0962	7/25/2023			SW846-8082A	UJ
PCB-1268	U	0.0962	ug/L	0.0962	7/25/2023			SW846-8082A	=
Polychlorinated biphenyl	U	0.0962	ug/L	0.0962	7/25/2023			SW846-8082A	UJ
Radium-226	U	0.427	pCi/L	0.561	7/25/2023	0.413	0.414	AN-1418	=
Radium-228	U	2.75	pCi/L	3.24	7/25/2023	2.09	2.21	EPA-904-M	=
Strontium-90	U	3.71	pCi/L	4.94	7/25/2023	3.13	3.19	EPA-905.0-M	=
Tritium	U	-0.366	pCi/L	214	7/25/2023	119	119	EPA-906.0-M	=
Technetium-99		56.1	pCi/L	21.2	7/25/2023	13.9	15.3	HASL 300, Tc-02-RC M	=
Thorium-230	U	0.529	pCi/L	3.17	7/25/2023	1.69	1.7	HASL 300, Th-01-RC M	=
Thorium-232	U	-0.145	pCi/L	2.16	7/25/2023	0.879	0.881	HASL 300, Th-01-RC M	=
Alpha activity	U	-0.652	pCi/L	4.94	7/25/2023	1.65	1.65	SW846-9310	=
Beta activity		42.3	pCi/L	7.46	7/25/2023	8	10.6	SW846-9310	=
1,2-Dibromo-3-chloropropane	U	0.0193	ug/L	0.0193	7/25/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	7/25/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	7/25/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Acetone	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	7/25/2023			SW846-8260D	UJ
Bromomethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	7/25/2023			SW846-8260D	UJ
Chlorobenzene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Ethylbenzene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Iodomethane	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Methylene chloride	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Styrene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Tetrachloroethene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Toluene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Total Xylene	U	3	ug/L	3	7/25/2023			SW846-8260D	=

trans-1,2-Dichloroethene	U	1	ug/L	1	7/25/2023	SW846-8260D	=
trans-1,3-Dichloropropene	U	1	ug/L	1	7/25/2023	SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5	ug/L	5	7/25/2023	SW846-8260D	=
Trichloroethene		2.27	ug/L	1	7/25/2023	SW846-8260D	=
Trichlorofluoromethane	U	1	ug/L	1	7/25/2023	SW846-8260D	=
Vinyl acetate	U	5	ug/L	5	7/25/2023	SW846-8260D	=
Vinyl chloride	U	1	ug/L	1	7/25/2023	SW846-8260D	=
Dissolved Solids		175	mg/L	10	7/25/2023	EPA-160.1	=
Iodide	U	0.5	mg/L	0.5	7/25/2023	EPA-300.0	=
Chemical Oxygen Demand (COD)	U	20	mg/L	20	7/25/2023	EPA-410.4	=
Cyanide	U	0.2	mg/L	0.2	7/25/2023	SW846-9012B	=
Total Organic Halides (TOX)	J	5.18	ug/L	10	7/25/2023	SW846-9020B	=
Total Organic Carbon (TOC)	J	0.817	mg/L	2	7/25/2023	SW846-9060A	=

Paducah OREIS
GROUNDWATER MONITORING REPORT

Facility: C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

Sampling Point: MW370 UP **RGA Type:** LRGA **Period:** 3rd Quarter 2023

AKGWA Well Tag #: 8004-4818 **SAMPLE ID:** MW370UG4-23 Sample Type: REG

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Bromide	W	0.675	mg/L	0.2	7/25/2023			SW846-9056A	J
Chloride	JW	44	mg/L	250	7/25/2023			SW846-9056A	J
Fluoride	J	0.17	mg/L	4	7/25/2023			SW846-9056A	=
Nitrate as Nitrogen	J	1.02	mg/L	10	7/25/2023			SW846-9056A	=
Sulfate		20.3	mg/L	2	7/25/2023			SW846-9056A	=
Barometric Pressure Reading		30.1	Inches/Hg		7/25/2023				X
Conductivity		468	umho/cm		7/25/2023				X
Depth to Water		41.12	ft		7/25/2023				X
Dissolved Oxygen		4.01	mg/L		7/25/2023				X
Eh (approx)		388	mV		7/25/2023				X
pH		6.12	Std Unit		7/25/2023				X
Temperature		72.6	deg F		7/25/2023				X
Turbidity		4.5	NTU		7/25/2023				X
Aluminum	U	0.05	mg/L	0.05	7/25/2023			SW846-6020B	=
Antimony	U	0.003	mg/L	0.003	7/25/2023			SW846-6020B	=
Arsenic	U	0.005	mg/L	0.005	7/25/2023			SW846-6020B	=
Barium		0.223	mg/L	0.004	7/25/2023			SW846-6020B	=
Beryllium	U	0.0005	mg/L	0.0005	7/25/2023			SW846-6020B	=
Boron		0.124	mg/L	0.015	7/25/2023			SW846-6020B	=
Cadmium	U	0.001	mg/L	0.001	7/25/2023			SW846-6020B	=
Calcium		29.3	mg/L	0.2	7/25/2023			SW846-6020B	J
Chromium	U	0.01	mg/L	0.01	7/25/2023			SW846-6020B	=
Cobalt	U	0.001	mg/L	0.001	7/25/2023			SW846-6020B	=
Copper	J	0.00196	mg/L	0.002	7/25/2023			SW846-6020B	J
Iron	U	0.1	mg/L	0.1	7/25/2023			SW846-6020B	=
Lead	U	0.002	mg/L	0.002	7/25/2023			SW846-6020B	=
Magnesium		12.1	mg/L	0.03	7/25/2023			SW846-6020B	=
Manganese	J	0.0014	mg/L	0.005	7/25/2023			SW846-6020B	J
Molybdenum	U	0.001	mg/L	0.001	7/25/2023			SW846-6020B	=
Nickel	J	0.000752	mg/L	0.002	7/25/2023			SW846-6020B	J
Potassium		2.49	mg/L	0.3	7/25/2023			SW846-6020B	=
Rhodium	U	0.005	mg/L	0.005	7/25/2023			SW846-6020B	=
Selenium	U	0.005	mg/L	0.005	7/25/2023			SW846-6020B	=
Silver	U	0.001	mg/L	0.001	7/25/2023			SW846-6020B	=
Sodium		42.8	mg/L	0.25	7/25/2023			SW846-6020B	=
Tantalum	U	0.005	mg/L	0.005	7/25/2023			SW846-6020B	=
Thallium	U	0.002	mg/L	0.002	7/25/2023			SW846-6020B	=
Uranium	U	0.0002	mg/L	0.0002	7/25/2023			SW846-6020B	=
Vanadium	U	0.02	mg/L	0.02	7/25/2023			SW846-6020B	=
Zinc	J	0.00572	mg/L	0.02	7/25/2023			SW846-6020B	J
Mercury	U	0.0002	mg/L	0.0002	7/25/2023			SW846-7470A	=
Barium, Dissolved		0.223	mg/L	0.004	7/25/2023			SW846-6020B	=
Chromium, Dissolved	U	0.01	mg/L	0.01	7/25/2023			SW846-6020B	=
Uranium, Dissolved	U	0.0002	mg/L	0.0002	7/25/2023			SW846-6020B	=
PCB-1016	U	0.1	ug/L	0.1	7/25/2023			SW846-8082A	UJ
PCB-1221	U	0.1	ug/L	0.1	7/25/2023			SW846-8082A	=
PCB-1232	U	0.1	ug/L	0.1	7/25/2023			SW846-8082A	=

PCB-1242	U	0.1	ug/L	0.1	7/25/2023			SW846-8082A	=
PCB-1248	U	0.1	ug/L	0.1	7/25/2023			SW846-8082A	=
PCB-1254	U	0.1	ug/L	0.1	7/25/2023			SW846-8082A	=
PCB-1260	U	0.1	ug/L	0.1	7/25/2023			SW846-8082A	UJ
PCB-1268	U	0.1	ug/L	0.1	7/25/2023			SW846-8082A	=
Polychlorinated biphenyl	U	0.1	ug/L	0.1	7/25/2023			SW846-8082A	UJ
Radium-226	U	0.42	pCi/L	0.433	7/25/2023	0.37	0.371	AN-1418	=
Radium-228	U	1.19	pCi/L	3.7	7/25/2023	2.1	2.12	EPA-904-M	=
Strontium-90	U	6.33	pCi/L	7.14	7/25/2023	4.52	4.63	EPA-905.0-M	=
Tritium	U	61.8	pCi/L	216	7/25/2023	125	125	EPA-906.0-M	=
Technetium-99	U	20.3	pCi/L	21.9	7/25/2023	13.3	13.5	HASL 300, Tc-02-RC M	=
Thorium-230	U	1.68	pCi/L	3.55	7/25/2023	2.32	2.35	HASL 300, Th-01-RC M	=
Thorium-232	U	-0.0431	pCi/L	1.77	7/25/2023	0.886	0.888	HASL 300, Th-01-RC M	=
Alpha activity	U	0.582	pCi/L	5.83	7/25/2023	2.76	2.76	SW846-9310	=
Beta activity		15.3	pCi/L	7.44	7/25/2023	5.73	6.28	SW846-9310	=
1,2-Dibromo-3-chloropropane	U	0.0187	ug/L	0.0187	7/25/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	7/25/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	7/25/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Acetone	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	7/25/2023			SW846-8260D	UJ
Bromomethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	7/25/2023			SW846-8260D	UJ
Chlorobenzene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Ethylbenzene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Iodomethane	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Methylene chloride	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Styrene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Tetrachloroethene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Toluene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Total Xylene	U	3	ug/L	3	7/25/2023			SW846-8260D	=

trans-1,2-Dichloroethene	U	1	ug/L	1	7/25/2023	SW846-8260D	=
trans-1,3-Dichloropropene	U	1	ug/L	1	7/25/2023	SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5	ug/L	5	7/25/2023	SW846-8260D	=
Trichloroethene		5.48	ug/L	1	7/25/2023	SW846-8260D	=
Trichlorofluoromethane	U	1	ug/L	1	7/25/2023	SW846-8260D	=
Vinyl acetate	U	5	ug/L	5	7/25/2023	SW846-8260D	=
Vinyl chloride	U	1	ug/L	1	7/25/2023	SW846-8260D	=
Dissolved Solids		211	mg/L	10	7/25/2023	EPA-160.1	=
Iodide	U	0.5	mg/L	0.5	7/25/2023	EPA-300.0	=
Chemical Oxygen Demand (COD)	U	20	mg/L	20	7/25/2023	EPA-410.4	=
Cyanide	U	0.2	mg/L	0.2	7/25/2023	SW846-9012B	=
Total Organic Halides (TOX)	JB	7.64	ug/L	10	7/25/2023	SW846-9020B	U
Total Organic Carbon (TOC)	J	0.765	mg/L	2	7/25/2023	SW846-9060A	=

Paducah OREIS
GROUNDWATER MONITORING REPORT

Facility: C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

Sampling Point: MW371 UP **RGA Type:** UCRS **Period:** 3rd Quarter 2023

AKGWA Well Tag #: 8004-4819 **SAMPLE ID:** MW371UG4-23 Sample Type: REG

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Bromide	UW	0.2	mg/L	0.2	7/25/2023			SW846-9056A	=
Chloride	JW	3.49	mg/L	250	7/25/2023			SW846-9056A	=
Fluoride	J	0.18	mg/L	4	7/25/2023			SW846-9056A	=
Nitrate as Nitrogen	J	0.166	mg/L	10	7/25/2023			SW846-9056A	=
Sulfate		28.6	mg/L	2	7/25/2023			SW846-9056A	=
Barometric Pressure Reading		30.11	Inches/Hg		7/25/2023				X
Conductivity		626	umho/cm		7/25/2023				X
Depth to Water		24.07	ft		7/25/2023				X
Dissolved Oxygen		3.3	mg/L		7/25/2023				X
Eh (approx)		372	mV		7/25/2023				X
pH		6.54	Std Unit		7/25/2023				X
Temperature		66.1	deg F		7/25/2023				X
Turbidity		6.95	NTU		7/25/2023				X
Aluminum		0.178	mg/L	0.05	7/25/2023			SW846-6020B	=
Antimony	U	0.003	mg/L	0.003	7/25/2023			SW846-6020B	=
Arsenic	U	0.005	mg/L	0.005	7/25/2023			SW846-6020B	=
Barium		0.115	mg/L	0.004	7/25/2023			SW846-6020B	=
Beryllium	U	0.0005	mg/L	0.0005	7/25/2023			SW846-6020B	=
Boron	J	0.00544	mg/L	0.015	7/25/2023			SW846-6020B	=
Cadmium	U	0.001	mg/L	0.001	7/25/2023			SW846-6020B	=
Calcium		60.9	mg/L	2	7/25/2023			SW846-6020B	J
Chromium	U	0.01	mg/L	0.01	7/25/2023			SW846-6020B	=
Cobalt	U	0.001	mg/L	0.001	7/25/2023			SW846-6020B	=
Copper	J	0.00141	mg/L	0.002	7/25/2023			SW846-6020B	J
Iron		0.143	mg/L	0.1	7/25/2023			SW846-6020B	=
Lead	U	0.002	mg/L	0.002	7/25/2023			SW846-6020B	=
Magnesium		14.5	mg/L	0.03	7/25/2023			SW846-6020B	=
Manganese	J	0.0023	mg/L	0.005	7/25/2023			SW846-6020B	J
Molybdenum	J	0.00044	mg/L	0.001	7/25/2023			SW846-6020B	=
Nickel	J	0.00163	mg/L	0.002	7/25/2023			SW846-6020B	J
Potassium		0.375	mg/L	0.3	7/25/2023			SW846-6020B	=
Rhodium	U	0.005	mg/L	0.005	7/25/2023			SW846-6020B	=
Selenium	U	0.005	mg/L	0.005	7/25/2023			SW846-6020B	=
Silver	U	0.001	mg/L	0.001	7/25/2023			SW846-6020B	=
Sodium		65.3	mg/L	2.5	7/25/2023			SW846-6020B	=
Tantalum	U	0.005	mg/L	0.005	7/25/2023			SW846-6020B	=
Thallium	U	0.002	mg/L	0.002	7/25/2023			SW846-6020B	=
Uranium		0.0012	mg/L	0.0002	7/25/2023			SW846-6020B	=
Vanadium	J	0.00428	mg/L	0.02	7/25/2023			SW846-6020B	=
Zinc	J	0.00463	mg/L	0.02	7/25/2023			SW846-6020B	J
Mercury	U	0.0002	mg/L	0.0002	7/25/2023			SW846-7470A	=
Barium, Dissolved		0.117	mg/L	0.004	7/25/2023			SW846-6020B	=
Chromium, Dissolved	U	0.01	mg/L	0.01	7/25/2023			SW846-6020B	=
Uranium, Dissolved		0.00118	mg/L	0.0002	7/25/2023			SW846-6020B	=
PCB-1016	U	0.0984	ug/L	0.0984	7/25/2023			SW846-8082A	UJ
PCB-1221	U	0.0984	ug/L	0.0984	7/25/2023			SW846-8082A	=
PCB-1232	U	0.0984	ug/L	0.0984	7/25/2023			SW846-8082A	=

PCB-1242	U	0.0984	ug/L	0.0984	7/25/2023			SW846-8082A	=
PCB-1248	U	0.0984	ug/L	0.0984	7/25/2023			SW846-8082A	=
PCB-1254	U	0.0984	ug/L	0.0984	7/25/2023			SW846-8082A	=
PCB-1260	U	0.0984	ug/L	0.0984	7/25/2023			SW846-8082A	UJ
PCB-1268	U	0.0984	ug/L	0.0984	7/25/2023			SW846-8082A	=
Polychlorinated biphenyl	U	0.0984	ug/L	0.0984	7/25/2023			SW846-8082A	UJ
Radium-226	U	0.322	pCi/L	0.389	7/25/2023	0.314	0.315	AN-1418	=
Radium-228	U	1.99	pCi/L	3.22	7/25/2023	1.97	2.04	EPA-904-M	=
Strontium-90	U	2.83	pCi/L	5.49	7/25/2023	3.27	3.3	EPA-905.0-M	=
Tritium	U	30	pCi/L	213	7/25/2023	121	121	EPA-906.0-M	=
Technetium-99	U	11.5	pCi/L	21.9	7/25/2023	13	13.1	HASL 300, Tc-02-RC M	=
Thorium-230	U	1.39	pCi/L	2.76	7/25/2023	1.85	1.87	HASL 300, Th-01-RC M	=
Thorium-232	U	-0.212	pCi/L	2.04	7/25/2023	0.749	0.75	HASL 300, Th-01-RC M	=
Alpha activity		6.67	pCi/L	5.31	7/25/2023	4.52	4.67	SW846-9310	=
Beta activity	U	5.72	pCi/L	7.45	7/25/2023	4.7	4.79	SW846-9310	=
1,2-Dibromo-3-chloropropane	U	0.019	ug/L	0.019	7/25/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	7/25/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	7/25/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Acetone	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	7/25/2023			SW846-8260D	UJ
Bromomethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	7/25/2023			SW846-8260D	UJ
Chlorobenzene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Ethylbenzene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Iodomethane	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Methylene chloride	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Styrene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Tetrachloroethene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Toluene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Total Xylene	U	3	ug/L	3	7/25/2023			SW846-8260D	=

trans-1,2-Dichloroethene	U	1	ug/L	1	7/25/2023	SW846-8260D	=
trans-1,3-Dichloropropene	U	1	ug/L	1	7/25/2023	SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5	ug/L	5	7/25/2023	SW846-8260D	=
Trichloroethene	U	1	ug/L	1	7/25/2023	SW846-8260D	=
Trichlorofluoromethane	U	1	ug/L	1	7/25/2023	SW846-8260D	=
Vinyl acetate	U	5	ug/L	5	7/25/2023	SW846-8260D	=
Vinyl chloride	U	1	ug/L	1	7/25/2023	SW846-8260D	=
Dissolved Solids		362	mg/L	10	7/25/2023	EPA-160.1	=
Iodide	U	0.5	mg/L	0.5	7/25/2023	EPA-300.0	=
Chemical Oxygen Demand (COD)	U	20	mg/L	20	7/25/2023	EPA-410.4	=
Cyanide	J	0.0168	mg/L	0.2	7/25/2023	SW846-9012B	=
Total Organic Halides (TOX)	J	5.3	ug/L	10	7/25/2023	SW846-9020B	=
Total Organic Carbon (TOC)	J	1.72	mg/L	2	7/25/2023	SW846-9060A	=

Paducah OREIS
GROUNDWATER MONITORING REPORT

Facility: C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

Sampling Point: MW372 UP **RGA Type:** URGA **Period:** 3rd Quarter 2023

AKGWA Well Tag #: 8004-4808 **SAMPLE ID:** MW372UG4-23 Sample Type: REG

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Bromide	W	0.595	mg/L	0.2	7/25/2023			SW846-9056A	=
Chloride	JW	38.7	mg/L	250	7/25/2023			SW846-9056A	=
Fluoride	J	0.175	mg/L	4	7/25/2023			SW846-9056A	=
Nitrate as Nitrogen	J	0.742	mg/L	10	7/25/2023			SW846-9056A	=
Sulfate		145	mg/L	10	7/25/2023			SW846-9056A	=
Barometric Pressure Reading		30.1	Inches/Hg		7/25/2023				X
Conductivity		759	umho/cm		7/25/2023				X
Depth to Water		35.38	ft		7/25/2023				X
Dissolved Oxygen		1.91	mg/L		7/25/2023				X
Eh (approx)		387	mV		7/25/2023				X
pH		6.05	Std Unit		7/25/2023				X
Temperature		69.4	deg F		7/25/2023				X
Turbidity		1.52	NTU		7/25/2023				X
Aluminum	U	0.05	mg/L	0.05	7/25/2023			SW846-6020B	=
Antimony	U	0.003	mg/L	0.003	7/25/2023			SW846-6020B	=
Arsenic	U	0.005	mg/L	0.005	7/25/2023			SW846-6020B	=
Barium		0.0596	mg/L	0.004	7/25/2023			SW846-6020B	=
Beryllium	U	0.0005	mg/L	0.0005	7/25/2023			SW846-6020B	=
Boron		1.29	mg/L	0.15	7/25/2023			SW846-6020B	=
Cadmium	U	0.001	mg/L	0.001	7/25/2023			SW846-6020B	=
Calcium		61	mg/L	2	7/25/2023			SW846-6020B	J
Chromium	U	0.01	mg/L	0.01	7/25/2023			SW846-6020B	=
Cobalt	J	0.000305	mg/L	0.001	7/25/2023			SW846-6020B	J
Copper	J	0.00127	mg/L	0.002	7/25/2023			SW846-6020B	J
Iron	J	0.033	mg/L	0.1	7/25/2023			SW846-6020B	=
Lead	U	0.002	mg/L	0.002	7/25/2023			SW846-6020B	=
Magnesium		21.1	mg/L	0.03	7/25/2023			SW846-6020B	=
Manganese	J	0.00157	mg/L	0.005	7/25/2023			SW846-6020B	J
Molybdenum	J	0.000202	mg/L	0.001	7/25/2023			SW846-6020B	=
Nickel	J	0.000929	mg/L	0.002	7/25/2023			SW846-6020B	J
Potassium		2.3	mg/L	0.3	7/25/2023			SW846-6020B	=
Rhodium	U	0.005	mg/L	0.005	7/25/2023			SW846-6020B	=
Selenium	U	0.005	mg/L	0.005	7/25/2023			SW846-6020B	=
Silver	U	0.001	mg/L	0.001	7/25/2023			SW846-6020B	=
Sodium		56.9	mg/L	2.5	7/25/2023			SW846-6020B	=
Tantalum	U	0.005	mg/L	0.005	7/25/2023			SW846-6020B	=
Thallium	U	0.002	mg/L	0.002	7/25/2023			SW846-6020B	=
Uranium	U	0.0002	mg/L	0.0002	7/25/2023			SW846-6020B	=
Vanadium	U	0.02	mg/L	0.02	7/25/2023			SW846-6020B	=
Zinc	J	0.00431	mg/L	0.02	7/25/2023			SW846-6020B	J
Mercury	U	0.0002	mg/L	0.0002	7/25/2023			SW846-7470A	=
Barium, Dissolved		0.063	mg/L	0.004	7/25/2023			SW846-6020B	=
Chromium, Dissolved	U	0.01	mg/L	0.01	7/25/2023			SW846-6020B	=
Uranium, Dissolved	U	0.0002	mg/L	0.0002	7/25/2023			SW846-6020B	=
PCB-1016	U	0.102	ug/L	0.102	7/25/2023			SW846-8082A	UJ
PCB-1221	U	0.102	ug/L	0.102	7/25/2023			SW846-8082A	=
PCB-1232	U	0.102	ug/L	0.102	7/25/2023			SW846-8082A	=

PCB-1242	U	0.102	ug/L	0.102	7/25/2023			SW846-8082A	=
PCB-1248	U	0.102	ug/L	0.102	7/25/2023			SW846-8082A	=
PCB-1254	U	0.102	ug/L	0.102	7/25/2023			SW846-8082A	=
PCB-1260	U	0.102	ug/L	0.102	7/25/2023			SW846-8082A	UJ
PCB-1268	U	0.102	ug/L	0.102	7/25/2023			SW846-8082A	=
Polychlorinated biphenyl	U	0.102	ug/L	0.102	7/25/2023			SW846-8082A	UJ
Radium-226	U	0.0809	pCi/L	0.386	7/25/2023	0.223	0.223	AN-1418	=
Radium-228	U	1.6	pCi/L	4.35	7/25/2023	2.49	2.53	EPA-904-M	=
Strontium-90	U	0.725	pCi/L	6.04	7/25/2023	3.29	3.29	EPA-905.0-M	=
Tritium	U	7.49	pCi/L	215	7/25/2023	121	121	EPA-906.0-M	=
Technetium-99	U	20	pCi/L	21.2	7/25/2023	12.9	13.1	HASL 300, Tc-02-RC M	=
Thorium-230	U	2.33	pCi/L	3.01	7/25/2023	2.25	2.28	HASL 300, Th-01-RC M	=
Thorium-232	U	0.859	pCi/L	2.07	7/25/2023	1.43	1.44	HASL 300, Th-01-RC M	=
Alpha activity	U	2.37	pCi/L	7.33	7/25/2023	4.08	4.1	SW846-9310	=
Beta activity		18.9	pCi/L	7.96	7/25/2023	6.36	7.08	SW846-9310	=
1,2-Dibromo-3-chloropropane	U	0.0189	ug/L	0.0189	7/25/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	7/25/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	7/25/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Acetone	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	7/25/2023			SW846-8260D	UJ
Bromomethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	7/25/2023			SW846-8260D	UJ
Chlorobenzene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Ethylbenzene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Iodomethane	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Methylene chloride	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Styrene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Tetrachloroethene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Toluene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Total Xylene	U	3	ug/L	3	7/25/2023			SW846-8260D	=

trans-1,2-Dichloroethene	U	1	ug/L	1	7/25/2023	SW846-8260D	=
trans-1,3-Dichloropropene	U	1	ug/L	1	7/25/2023	SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5	ug/L	5	7/25/2023	SW846-8260D	=
Trichloroethene		5.09	ug/L	1	7/25/2023	SW846-8260D	=
Trichlorofluoromethane	U	1	ug/L	1	7/25/2023	SW846-8260D	=
Vinyl acetate	U	5	ug/L	5	7/25/2023	SW846-8260D	=
Vinyl chloride	U	1	ug/L	1	7/25/2023	SW846-8260D	=
Dissolved Solids		423	mg/L	10	7/25/2023	EPA-160.1	=
Iodide	U	0.5	mg/L	0.5	7/25/2023	EPA-300.0	=
Chemical Oxygen Demand (COD)	U	20	mg/L	20	7/25/2023	EPA-410.4	=
Cyanide	J	0.00437	mg/L	0.2	7/25/2023	SW846-9012B	=
Total Organic Halides (TOX)	J	9.56	ug/L	10	7/25/2023	SW846-9020B	=
Total Organic Carbon (TOC)	J	0.881	mg/L	2	7/25/2023	SW846-9060A	=

Paducah OREIS
GROUNDWATER MONITORING REPORT

Facility: C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

Sampling Point: MW373 UP **RGA Type:** LRGA **Period:** 3rd Quarter 2023

AKGWA Well Tag #: 8004-4792 **SAMPLE ID:** MW373UG4-23 Sample Type: REG

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Bromide	JW	0.463	mg/L	1	7/25/2023			SW846-9056A	=
Chloride	JW	32.1	mg/L	5	7/25/2023			SW846-9056A	=
Fluoride	J	0.187	mg/L	4	7/25/2023			SW846-9056A	=
Nitrate as Nitrogen	J	0.658	mg/L	10	7/25/2023			SW846-9056A	=
Sulfate		180	mg/L	10	7/25/2023			SW846-9056A	=
Barometric Pressure Reading		30.1	Inches/Hg		7/25/2023				X
Conductivity		910	umho/cm		7/25/2023				X
Depth to Water		35.68	ft		7/25/2023				X
Dissolved Oxygen		1.69	mg/L		7/25/2023				X
Eh (approx)		384	mV		7/25/2023				X
pH		6.08	Std Unit		7/25/2023				X
Temperature		72	deg F		7/25/2023				X
Turbidity		1.6	NTU		7/25/2023				X
Aluminum	U	0.05	mg/L	0.05	7/25/2023			SW846-6020B	=
Antimony	U	0.003	mg/L	0.003	7/25/2023			SW846-6020B	=
Arsenic	U	0.005	mg/L	0.005	7/25/2023			SW846-6020B	=
Barium		0.0342	mg/L	0.004	7/25/2023			SW846-6020B	=
Beryllium	U	0.0005	mg/L	0.0005	7/25/2023			SW846-6020B	=
Boron		2.01	mg/L	0.3	7/25/2023			SW846-6020B	=
Cadmium	U	0.001	mg/L	0.001	7/25/2023			SW846-6020B	=
Calcium		78.7	mg/L	4	7/25/2023			SW846-6020B	J
Chromium	U	0.01	mg/L	0.01	7/25/2023			SW846-6020B	=
Cobalt	U	0.001	mg/L	0.001	7/25/2023			SW846-6020B	=
Copper	J	0.00112	mg/L	0.002	7/25/2023			SW846-6020B	J
Iron	J	0.0429	mg/L	0.1	7/25/2023			SW846-6020B	=
Lead	U	0.002	mg/L	0.002	7/25/2023			SW846-6020B	=
Magnesium		26.6	mg/L	0.03	7/25/2023			SW846-6020B	=
Manganese		0.0518	mg/L	0.005	7/25/2023			SW846-6020B	J
Molybdenum	U	0.001	mg/L	0.001	7/25/2023			SW846-6020B	=
Nickel	J	0.00168	mg/L	0.002	7/25/2023			SW846-6020B	J
Potassium		2.73	mg/L	0.3	7/25/2023			SW846-6020B	=
Rhodium	U	0.005	mg/L	0.005	7/25/2023			SW846-6020B	=
Selenium	U	0.005	mg/L	0.005	7/25/2023			SW846-6020B	=
Silver	U	0.001	mg/L	0.001	7/25/2023			SW846-6020B	=
Sodium		62.9	mg/L	5	7/25/2023			SW846-6020B	=
Tantalum	U	0.005	mg/L	0.005	7/25/2023			SW846-6020B	=
Thallium	U	0.002	mg/L	0.002	7/25/2023			SW846-6020B	=
Uranium	U	0.0002	mg/L	0.0002	7/25/2023			SW846-6020B	=
Vanadium	U	0.02	mg/L	0.02	7/25/2023			SW846-6020B	=
Zinc	J	0.00448	mg/L	0.02	7/25/2023			SW846-6020B	J
Mercury	U	0.0002	mg/L	0.0002	7/25/2023			SW846-7470A	=
Barium, Dissolved		0.0327	mg/L	0.004	7/25/2023			SW846-6020B	=
Chromium, Dissolved	U	0.01	mg/L	0.01	7/25/2023			SW846-6020B	=
Uranium, Dissolved	U	0.0002	mg/L	0.0002	7/25/2023			SW846-6020B	=
PCB-1016	U	0.102	ug/L	0.102	7/25/2023			SW846-8082A	UJ
PCB-1221	U	0.102	ug/L	0.102	7/25/2023			SW846-8082A	=
PCB-1232	U	0.102	ug/L	0.102	7/25/2023			SW846-8082A	=

PCB-1242	U	0.102	ug/L	0.102	7/25/2023			SW846-8082A	=
PCB-1248	U	0.102	ug/L	0.102	7/25/2023			SW846-8082A	=
PCB-1254	U	0.102	ug/L	0.102	7/25/2023			SW846-8082A	=
PCB-1260	U	0.102	ug/L	0.102	7/25/2023			SW846-8082A	UJ
PCB-1268	U	0.102	ug/L	0.102	7/25/2023			SW846-8082A	=
Polychlorinated biphenyl	U	0.102	ug/L	0.102	7/25/2023			SW846-8082A	UJ
Radium-226	U	0.0298	pCi/L	0.458	7/25/2023	0.221	0.221	AN-1418	=
Radium-228	U	0.476	pCi/L	3.95	7/25/2023	2.16	2.16	EPA-904-M	=
Strontium-90	U	2.72	pCi/L	6.17	7/25/2023	3.61	3.64	EPA-905.0-M	=
Tritium	U	40.1	pCi/L	215	7/25/2023	123	123	EPA-906.0-M	=
Technetium-99	U	13.3	pCi/L	21.2	7/25/2023	12.7	12.8	HASL 300, Tc-02-RC M	=
Thorium-230	U	2.12	pCi/L	3.47	7/25/2023	2.51	2.54	HASL 300, Th-01-RC M	=
Thorium-232	U	0.436	pCi/L	1.91	7/25/2023	1.35	1.35	HASL 300, Th-01-RC M	=
Alpha activity	U	2.01	pCi/L	6.04	7/25/2023	3.36	3.38	SW846-9310	=
Beta activity	U	5.93	pCi/L	7.79	7/25/2023	4.88	4.98	SW846-9310	=
1,2-Dibromo-3-chloropropane	U	0.0191	ug/L	0.0191	7/25/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	7/25/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	7/25/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Acetone	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	7/25/2023			SW846-8260D	UJ
Bromomethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	7/25/2023			SW846-8260D	UJ
Chlorobenzene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Ethylbenzene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Iodomethane	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Methylene chloride	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Styrene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Tetrachloroethene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Toluene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Total Xylene	U	3	ug/L	3	7/25/2023			SW846-8260D	=

trans-1,2-Dichloroethene	U	1	ug/L	1	7/25/2023	SW846-8260D	=
trans-1,3-Dichloropropene	U	1	ug/L	1	7/25/2023	SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5	ug/L	5	7/25/2023	SW846-8260D	=
Trichloroethene		3.53	ug/L	1	7/25/2023	SW846-8260D	=
Trichlorofluoromethane	U	1	ug/L	1	7/25/2023	SW846-8260D	=
Vinyl acetate	U	5	ug/L	5	7/25/2023	SW846-8260D	=
Vinyl chloride	U	1	ug/L	1	7/25/2023	SW846-8260D	=
Dissolved Solids		514	mg/L	10	7/25/2023	EPA-160.1	=
Iodide	U	0.5	mg/L	0.5	7/25/2023	EPA-300.0	=
Chemical Oxygen Demand (COD)	U	20	mg/L	20	7/25/2023	EPA-410.4	=
Cyanide	J	0.00361	mg/L	0.2	7/25/2023	SW846-9012B	=
Total Organic Halides (TOX)	J	9.2	ug/L	10	7/25/2023	SW846-9020B	=
Total Organic Carbon (TOC)	J	1.22	mg/L	2	7/25/2023	SW846-9060A	=

Paducah OREIS
GROUNDWATER MONITORING REPORT

Facility: C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

Sampling Point: MW374 UP **RGA Type:** UCRS **Period:** 3rd Quarter 2023

AKGWA Well Tag #: 8004-0990 **SAMPLE ID:** MW374UG4-23 Sample Type: REG

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Bromide	W	0.575	mg/L	0.2	7/25/2023			SW846-9056A	=
Chloride	JW	45	mg/L	250	7/25/2023			SW846-9056A	=
Fluoride	J	0.208	mg/L	4	7/25/2023			SW846-9056A	=
Nitrate as Nitrogen	J	0.415	mg/L	10	7/25/2023			SW846-9056A	=
Sulfate		15.6	mg/L	0.4	7/25/2023			SW846-9056A	=
Barometric Pressure Reading		30.09	Inches/Hg		7/25/2023				X
Conductivity		694	umho/cm		7/25/2023				X
Depth to Water		23.54	ft		7/25/2023				X
Dissolved Oxygen		1.01	mg/L		7/25/2023				X
Eh (approx)		351	mV		7/25/2023				X
pH		6.71	Std Unit		7/25/2023				X
Temperature		68.4	deg F		7/25/2023				X
Turbidity		4.36	NTU		7/25/2023				X
Aluminum	U	0.05	mg/L	0.05	7/25/2023			SW846-6020B	=
Antimony	U	0.003	mg/L	0.003	7/25/2023			SW846-6020B	=
Arsenic	U	0.005	mg/L	0.005	7/25/2023			SW846-6020B	=
Barium		0.141	mg/L	0.004	7/25/2023			SW846-6020B	=
Beryllium	U	0.0005	mg/L	0.0005	7/25/2023			SW846-6020B	=
Boron		0.0356	mg/L	0.015	7/25/2023			SW846-6020B	=
Cadmium	U	0.001	mg/L	0.001	7/25/2023			SW846-6020B	=
Calcium		23.8	mg/L	0.2	7/25/2023			SW846-6020B	J
Chromium	U	0.01	mg/L	0.01	7/25/2023			SW846-6020B	=
Cobalt	U	0.001	mg/L	0.001	7/25/2023			SW846-6020B	=
Copper	J	0.000689	mg/L	0.002	7/25/2023			SW846-6020B	J
Iron		0.184	mg/L	0.1	7/25/2023			SW846-6020B	=
Lead	U	0.002	mg/L	0.002	7/25/2023			SW846-6020B	=
Magnesium		5.79	mg/L	0.03	7/25/2023			SW846-6020B	=
Manganese		0.0852	mg/L	0.005	7/25/2023			SW846-6020B	J
Molybdenum	J	0.000252	mg/L	0.001	7/25/2023			SW846-6020B	=
Nickel	U	0.002	mg/L	0.002	7/25/2023			SW846-6020B	=
Potassium		0.393	mg/L	0.3	7/25/2023			SW846-6020B	=
Rhodium	U	0.005	mg/L	0.005	7/25/2023			SW846-6020B	=
Selenium		0.00737	mg/L	0.005	7/25/2023			SW846-6020B	J
Silver	U	0.001	mg/L	0.001	7/25/2023			SW846-6020B	=
Sodium		121	mg/L	2.5	7/25/2023			SW846-6020B	=
Tantalum	U	0.005	mg/L	0.005	7/25/2023			SW846-6020B	=
Thallium	U	0.002	mg/L	0.002	7/25/2023			SW846-6020B	=
Uranium		0.000366	mg/L	0.0002	7/25/2023			SW846-6020B	=
Vanadium	U	0.02	mg/L	0.02	7/25/2023			SW846-6020B	=
Zinc	U	0.02	mg/L	0.02	7/25/2023			SW846-6020B	=
Mercury	U	0.0002	mg/L	0.0002	7/25/2023			SW846-7470A	=
Barium, Dissolved		0.135	mg/L	0.004	7/25/2023			SW846-6020B	=
Chromium, Dissolved	U	0.01	mg/L	0.01	7/25/2023			SW846-6020B	=
Uranium, Dissolved		0.000358	mg/L	0.0002	7/25/2023			SW846-6020B	=
PCB-1016	U	0.0969	ug/L	0.0969	7/25/2023			SW846-8082A	UJ
PCB-1221	U	0.0969	ug/L	0.0969	7/25/2023			SW846-8082A	=
PCB-1232	U	0.0969	ug/L	0.0969	7/25/2023			SW846-8082A	=

PCB-1242	U	0.0969	ug/L	0.0969	7/25/2023			SW846-8082A	=
PCB-1248	U	0.0969	ug/L	0.0969	7/25/2023			SW846-8082A	=
PCB-1254	U	0.0969	ug/L	0.0969	7/25/2023			SW846-8082A	=
PCB-1260	U	0.0969	ug/L	0.0969	7/25/2023			SW846-8082A	UJ
PCB-1268	U	0.0969	ug/L	0.0969	7/25/2023			SW846-8082A	=
Polychlorinated biphenyl	U	0.0969	ug/L	0.0969	7/25/2023			SW846-8082A	UJ
Radium-226	U	0.264	pCi/L	0.574	7/25/2023	0.37	0.371	AN-1418	=
Radium-228	U	0.514	pCi/L	4.43	7/25/2023	2.42	2.42	EPA-904-M	=
Strontium-90	U	3.15	pCi/L	5.85	7/25/2023	3.49	3.53	EPA-905.0-M	=
Tritium	U	37.5	pCi/L	216	7/25/2023	123	123	EPA-906.0-M	=
Technetium-99	U	-0.154	pCi/L	20.7	7/25/2023	12	12	HASL 300, Tc-02-RC M	=
Thorium-230	U	0.916	pCi/L	2.59	7/25/2023	1.58	1.59	HASL 300, Th-01-RC M	=
Thorium-232	U	0.608	pCi/L	1.36	7/25/2023	1.12	1.12	HASL 300, Th-01-RC M	=
Alpha activity	U	2.92	pCi/L	7.7	7/25/2023	4.39	4.42	SW846-9310	=
Beta activity	U	1.75	pCi/L	7.67	7/25/2023	4.29	4.3	SW846-9310	=
1,2-Dibromo-3-chloropropane	U	0.0191	ug/L	0.0191	7/25/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	7/25/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	7/25/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Acetone	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	7/25/2023			SW846-8260D	UJ
Bromomethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	7/25/2023			SW846-8260D	UJ
Chlorobenzene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Ethylbenzene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Iodomethane	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Methylene chloride	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Styrene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Tetrachloroethene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Toluene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Total Xylene	U	3	ug/L	3	7/25/2023			SW846-8260D	=

trans-1,2-Dichloroethene	U	1	ug/L	1	7/25/2023	SW846-8260D	=
trans-1,3-Dichloropropene	U	1	ug/L	1	7/25/2023	SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5	ug/L	5	7/25/2023	SW846-8260D	=
Trichloroethene	J	0.34	ug/L	1	7/25/2023	SW846-8260D	=
Trichlorofluoromethane	U	1	ug/L	1	7/25/2023	SW846-8260D	=
Vinyl acetate	U	5	ug/L	5	7/25/2023	SW846-8260D	=
Vinyl chloride	U	1	ug/L	1	7/25/2023	SW846-8260D	=
Dissolved Solids		363	mg/L	10	7/25/2023	EPA-160.1	=
Iodide	U	0.5	mg/L	0.5	7/25/2023	EPA-300.0	=
Chemical Oxygen Demand (COD)	U	20	mg/L	20	7/25/2023	EPA-410.4	=
Cyanide	J	0.00181	mg/L	0.2	7/25/2023	SW846-9012B	=
Total Organic Halides (TOX)		14.7	ug/L	10	7/25/2023	SW846-9020B	=
Total Organic Carbon (TOC)		2.09	mg/L	2	7/25/2023	SW846-9060A	=

Paducah OREIS
GROUNDWATER MONITORING REPORT

Facility: C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

Sampling Point: MW375 SIDE **RGA Type:** UCRS **Period:** 3rd Quarter 2023

AKGWA Well Tag #: 8004-0985 **SAMPLE ID:** MW375UG4-23 Sample Type: REG

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Bromide	UW	0.2	mg/L	0.2	7/25/2023			SW846-9056A	=
Chloride	JW	3.27	mg/L	250	7/25/2023			SW846-9056A	=
Fluoride	J	0.3	mg/L	4	7/25/2023			SW846-9056A	=
Nitrate as Nitrogen	J	0.897	mg/L	10	7/25/2023			SW846-9056A	=
Sulfate		23.5	mg/L	0.8	7/25/2023			SW846-9056A	=
Barometric Pressure Reading		30.11	Inches/Hg		7/25/2023				X
Conductivity		329	umho/cm		7/25/2023				X
Depth to Water		35.45	ft		7/25/2023				X
Dissolved Oxygen		2.59	mg/L		7/25/2023				X
Eh (approx)		370	mV		7/25/2023				X
pH		6.39	Std Unit		7/25/2023				X
Temperature		68.7	deg F		7/25/2023				X
Turbidity		2.09	NTU		7/25/2023				X
Aluminum	J	0.0268	mg/L	0.05	7/25/2023			SW846-6020B	=
Antimony	U	0.003	mg/L	0.003	7/25/2023			SW846-6020B	=
Arsenic	U	0.005	mg/L	0.005	7/25/2023			SW846-6020B	=
Barium		0.174	mg/L	0.004	7/25/2023			SW846-6020B	=
Beryllium	U	0.0005	mg/L	0.0005	7/25/2023			SW846-6020B	=
Boron	J	0.0138	mg/L	0.015	7/25/2023			SW846-6020B	=
Cadmium	U	0.001	mg/L	0.001	7/25/2023			SW846-6020B	=
Calcium		13.2	mg/L	0.2	7/25/2023			SW846-6020B	J
Chromium	U	0.01	mg/L	0.01	7/25/2023			SW846-6020B	=
Cobalt	U	0.001	mg/L	0.001	7/25/2023			SW846-6020B	=
Copper	J	0.00112	mg/L	0.002	7/25/2023			SW846-6020B	J
Iron	J	0.0367	mg/L	0.1	7/25/2023			SW846-6020B	=
Lead	U	0.002	mg/L	0.002	7/25/2023			SW846-6020B	=
Magnesium		5.19	mg/L	0.03	7/25/2023			SW846-6020B	=
Manganese	J	0.00154	mg/L	0.005	7/25/2023			SW846-6020B	J
Molybdenum	U	0.001	mg/L	0.001	7/25/2023			SW846-6020B	=
Nickel	J	0.00133	mg/L	0.002	7/25/2023			SW846-6020B	J
Potassium	J	0.254	mg/L	0.3	7/25/2023			SW846-6020B	=
Rhodium	U	0.005	mg/L	0.005	7/25/2023			SW846-6020B	=
Selenium	J	0.00257	mg/L	0.005	7/25/2023			SW846-6020B	J
Silver	U	0.001	mg/L	0.001	7/25/2023			SW846-6020B	=
Sodium		52.7	mg/L	2.5	7/25/2023			SW846-6020B	=
Tantalum	U	0.005	mg/L	0.005	7/25/2023			SW846-6020B	=
Thallium	U	0.002	mg/L	0.002	7/25/2023			SW846-6020B	=
Uranium	U	0.0002	mg/L	0.0002	7/25/2023			SW846-6020B	=
Vanadium	U	0.02	mg/L	0.02	7/25/2023			SW846-6020B	=
Zinc	J	0.00595	mg/L	0.02	7/25/2023			SW846-6020B	J
Mercury	U	0.0002	mg/L	0.0002	7/25/2023			SW846-7470A	=
Barium, Dissolved		0.171	mg/L	0.004	7/25/2023			SW846-6020B	=
Chromium, Dissolved	U	0.01	mg/L	0.01	7/25/2023			SW846-6020B	=
Uranium, Dissolved	U	0.0002	mg/L	0.0002	7/25/2023			SW846-6020B	=
PCB-1016	U	0.0974	ug/L	0.0974	7/25/2023			SW846-8082A	UJ
PCB-1221	U	0.0974	ug/L	0.0974	7/25/2023			SW846-8082A	=
PCB-1232	U	0.0974	ug/L	0.0974	7/25/2023			SW846-8082A	=

PCB-1242	U	0.0974	ug/L	0.0974	7/25/2023			SW846-8082A	=
PCB-1248	U	0.0974	ug/L	0.0974	7/25/2023			SW846-8082A	=
PCB-1254	U	0.0974	ug/L	0.0974	7/25/2023			SW846-8082A	=
PCB-1260	U	0.0974	ug/L	0.0974	7/25/2023			SW846-8082A	UJ
PCB-1268	U	0.0974	ug/L	0.0974	7/25/2023			SW846-8082A	=
Polychlorinated biphenyl	U	0.0974	ug/L	0.0974	7/25/2023			SW846-8082A	UJ
Radium-226	U	0.196	pCi/L	0.455	7/25/2023	0.303	0.303	AN-1418	=
Radium-228		7.23	pCi/L	4.8	7/25/2023	3.33	3.8	EPA-904-M	=
Strontium-90	U	-3.61	pCi/L	7.17	7/25/2023	3.24	3.24	EPA-905.0-M	=
Tritium	U	-26.4	pCi/L	213	7/25/2023	117	117	EPA-906.0-M	=
Technetium-99	U	-4.5	pCi/L	21.2	7/25/2023	12.1	12.1	HASL 300, Tc-02-RC M	=
Thorium-230	U	1.58	pCi/L	3.17	7/25/2023	2.12	2.14	HASL 300, Th-01-RC M	=
Thorium-232	U	0.76	pCi/L	1.64	7/25/2023	1.38	1.38	HASL 300, Th-01-RC M	=
Alpha activity	U	-0.289	pCi/L	6.15	7/25/2023	2.58	2.59	SW846-9310	=
Beta activity	U	3.01	pCi/L	7.56	7/25/2023	4.39	4.42	SW846-9310	=
1,2-Dibromo-3-chloropropane	U	0.0188	ug/L	0.0188	7/25/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	7/25/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	7/25/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Acetone	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	7/25/2023			SW846-8260D	UJ
Bromomethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	7/25/2023			SW846-8260D	UJ
Chlorobenzene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Ethylbenzene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Iodomethane	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Methylene chloride	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Styrene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Tetrachloroethene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Toluene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Total Xylene	U	3	ug/L	3	7/25/2023			SW846-8260D	=

trans-1,2-Dichloroethene	U	1	ug/L	1	7/25/2023	SW846-8260D	=
trans-1,3-Dichloropropene	U	1	ug/L	1	7/25/2023	SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5	ug/L	5	7/25/2023	SW846-8260D	=
Trichloroethene	J	0.64	ug/L	1	7/25/2023	SW846-8260D	=
Trichlorofluoromethane	U	1	ug/L	1	7/25/2023	SW846-8260D	=
Vinyl acetate	U	5	ug/L	5	7/25/2023	SW846-8260D	=
Vinyl chloride	U	1	ug/L	1	7/25/2023	SW846-8260D	=
Dissolved Solids		171	mg/L	10	7/25/2023	EPA-160.1	=
Iodide	U	0.5	mg/L	0.5	7/25/2023	EPA-300.0	=
Chemical Oxygen Demand (COD)	U	20	mg/L	20	7/25/2023	EPA-410.4	=
Cyanide	J	0.00176	mg/L	0.2	7/25/2023	SW846-9012B	=
Total Organic Halides (TOX)	J	4.28	ug/L	10	7/25/2023	SW846-9020B	=
Total Organic Carbon (TOC)	J	0.743	mg/L	2	7/25/2023	SW846-9060A	=

Paducah OREIS
GROUNDWATER MONITORING REPORT

Facility: C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

Sampling Point: QC **Period:** 3rd Quarter 2023

AKGWA Well Tag #: N/A **SAMPLE ID:** FB1UG4-23 **Sample Type:** FB

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Aluminum	U	0.05	mg/L	0.05	7/18/2023			SW846-6020B	=
Antimony	U	0.003	mg/L	0.003	7/18/2023			SW846-6020B	=
Arsenic	U	0.005	mg/L	0.005	7/18/2023			SW846-6020B	=
Barium	J	0.000694	mg/L	0.004	7/18/2023			SW846-6020B	=
Beryllium	U	0.0005	mg/L	0.0005	7/18/2023			SW846-6020B	=
Boron	U	0.015	mg/L	0.015	7/18/2023			SW846-6020B	=
Cadmium	U	0.001	mg/L	0.001	7/18/2023			SW846-6020B	=
Calcium	U	0.2	mg/L	0.2	7/18/2023			SW846-6020B	=
Chromium	U	0.01	mg/L	0.01	7/18/2023			SW846-6020B	=
Cobalt	U	0.001	mg/L	0.001	7/18/2023			SW846-6020B	=
Copper	U	0.002	mg/L	0.002	7/18/2023			SW846-6020B	=
Iron	U	0.1	mg/L	0.1	7/18/2023			SW846-6020B	=
Lead	U	0.002	mg/L	0.002	7/18/2023			SW846-6020B	=
Magnesium	U	0.03	mg/L	0.03	7/18/2023			SW846-6020B	=
Manganese	U	0.005	mg/L	0.005	7/18/2023			SW846-6020B	=
Molybdenum	U	0.001	mg/L	0.001	7/18/2023			SW846-6020B	=
Nickel	U	0.002	mg/L	0.002	7/18/2023			SW846-6020B	=
Potassium	U	0.3	mg/L	0.3	7/18/2023			SW846-6020B	=
Rhodium	U	0.005	mg/L	0.005	7/18/2023			SW846-6020B	=
Selenium	U	0.005	mg/L	0.005	7/18/2023			SW846-6020B	=
Silver	U	0.001	mg/L	0.001	7/18/2023			SW846-6020B	=
Sodium	U	0.25	mg/L	0.25	7/18/2023			SW846-6020B	=
Tantalum	UN	0.005	mg/L	0.005	7/18/2023			SW846-6020B	=
Thallium	U	0.002	mg/L	0.002	7/18/2023			SW846-6020B	=
Uranium	U	0.0002	mg/L	0.0002	7/18/2023			SW846-6020B	=
Vanadium	U	0.02	mg/L	0.02	7/18/2023			SW846-6020B	=
Zinc	U	0.02	mg/L	0.02	7/18/2023			SW846-6020B	=
Mercury	U	0.0002	mg/L	0.0002	7/18/2023			SW846-7470A	=
PCB-1016	U	0.103	ug/L	0.103	7/18/2023			SW846-8082A	=
PCB-1221	U	0.103	ug/L	0.103	7/18/2023			SW846-8082A	=
PCB-1232	U	0.103	ug/L	0.103	7/18/2023			SW846-8082A	=
PCB-1242	U	0.103	ug/L	0.103	7/18/2023			SW846-8082A	=
PCB-1248	U	0.103	ug/L	0.103	7/18/2023			SW846-8082A	=
PCB-1254	U	0.103	ug/L	0.103	7/18/2023			SW846-8082A	=
PCB-1260	U	0.103	ug/L	0.103	7/18/2023			SW846-8082A	UJ
PCB-1268	U	0.103	ug/L	0.103	7/18/2023			SW846-8082A	=
Polychlorinated biphenyl	U	0.103	ug/L	0.103	7/18/2023			SW846-8082A	UJ
Radium-226	U	-0.0116	pCi/L	0.407	7/18/2023	0.174	0.174	AN-1418	=
Radium-228	U	-0.771	pCi/L	4.45	7/18/2023	2.35	2.35	EPA-904-M	=
Strontium-90	U	-1.07	pCi/L	7.96	7/18/2023	4.09	4.09	EPA-905.0-M	=
Tritium	U	-60.3	pCi/L	223	7/18/2023	121	121	EPA-906.0-M	=
Technetium-99	U	16	pCi/L	19.8	7/18/2023	11.9	12.1	HASL 300, Tc-02-RC M	=
Thorium-230	U	1.22	pCi/L	3.21	7/18/2023	2.06	2.08	HASL 300, Th-01-RC M	=
Thorium-232	U	-0.0431	pCi/L	1.86	7/18/2023	0.938	0.94	HASL 300, Th-01-RC M	=
Alpha activity	U	2.49	pCi/L	4.74	7/18/2023	2.95	2.97	SW846-9310	=
Beta activity	U	-1.53	pCi/L	7.32	7/18/2023	3.62	3.62	SW846-9310	=
1,2-Dibromo-3-chloropropane	U	0.0191	ug/L	0.0191	7/18/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=

1,1,2,2-Tetrachloroethane	U	1 ug/L	1	7/18/2023	SW846-8260D	=
1,1,2-Trichloroethane	U	1 ug/L	1	7/18/2023	SW846-8260D	=
1,1-Dichloroethane	U	1 ug/L	1	7/18/2023	SW846-8260D	=
1,1-Dichloroethene	U	1 ug/L	1	7/18/2023	SW846-8260D	=
1,2,3-Trichloropropane	U	1 ug/L	1	7/18/2023	SW846-8260D	=
1,2-Dibromoethane	U	1 ug/L	1	7/18/2023	SW846-8260D	=
1,2-Dichlorobenzene	U	1 ug/L	1	7/18/2023	SW846-8260D	=
1,2-Dichloroethane	U	1 ug/L	1	7/18/2023	SW846-8260D	=
1,2-Dichloropropane	U	1 ug/L	1	7/18/2023	SW846-8260D	=
1,4-Dichlorobenzene	U	1 ug/L	1	7/18/2023	SW846-8260D	=
2-Butanone	U	5 ug/L	5	7/18/2023	SW846-8260D	=
2-Hexanone	U	5 ug/L	5	7/18/2023	SW846-8260D	=
4-Methyl-2-pentanone	U	5 ug/L	5	7/18/2023	SW846-8260D	=
Acetone	J	2.35 ug/L	5	7/18/2023	SW846-8260D	=
Acrolein	U	5 ug/L	5	7/18/2023	SW846-8260D	=
Acrylonitrile	U	5 ug/L	5	7/18/2023	SW846-8260D	=
Benzene	U	1 ug/L	1	7/18/2023	SW846-8260D	=
Bromochloromethane	U	1 ug/L	1	7/18/2023	SW846-8260D	=
Bromodichloromethane	U	1 ug/L	1	7/18/2023	SW846-8260D	=
Bromoform	U	1 ug/L	1	7/18/2023	SW846-8260D	=
Bromomethane	U	1 ug/L	1	7/18/2023	SW846-8260D	=
Carbon disulfide	U	5 ug/L	5	7/18/2023	SW846-8260D	=
Carbon tetrachloride	U	1 ug/L	1	7/18/2023	SW846-8260D	=
Chlorobenzene	U	1 ug/L	1	7/18/2023	SW846-8260D	=
Chloroethane	U	1 ug/L	1	7/18/2023	SW846-8260D	=
Chloroform	U	1 ug/L	1	7/18/2023	SW846-8260D	=
Chloromethane	U	1 ug/L	1	7/18/2023	SW846-8260D	=
cis-1,2-Dichloroethene	U	1 ug/L	1	7/18/2023	SW846-8260D	=
cis-1,3-Dichloropropene	U	1 ug/L	1	7/18/2023	SW846-8260D	=
Dibromochloromethane	U	1 ug/L	1	7/18/2023	SW846-8260D	=
Dibromomethane	U	1 ug/L	1	7/18/2023	SW846-8260D	=
Ethylbenzene	U	1 ug/L	1	7/18/2023	SW846-8260D	=
Iodomethane	U	5 ug/L	5	7/18/2023	SW846-8260D	=
Methylene chloride	U	5 ug/L	5	7/18/2023	SW846-8260D	=
Styrene	U	1 ug/L	1	7/18/2023	SW846-8260D	=
Tetrachloroethene	U	1 ug/L	1	7/18/2023	SW846-8260D	=
Toluene	U	1 ug/L	1	7/18/2023	SW846-8260D	=
Total Xylene	U	3 ug/L	3	7/18/2023	SW846-8260D	=
trans-1,2-Dichloroethene	U	1 ug/L	1	7/18/2023	SW846-8260D	=
trans-1,3-Dichloropropene	U	1 ug/L	1	7/18/2023	SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5 ug/L	5	7/18/2023	SW846-8260D	=
Trichloroethene	U	1 ug/L	1	7/18/2023	SW846-8260D	=
Trichlorofluoromethane	U	1 ug/L	1	7/18/2023	SW846-8260D	=
Vinyl acetate	U	5 ug/L	5	7/18/2023	SW846-8260D	=
Vinyl chloride	U	1 ug/L	1	7/18/2023	SW846-8260D	=
Iodide	U	0.5 mg/L	0.5	7/18/2023	EPA-300.0	=

Paducah OREIS
GROUNDWATER MONITORING REPORT

Facility: C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

Sampling Point: QC **Period:** 3rd Quarter 2023

AKGWA Well Tag #: N/A **SAMPLE ID:** RI1UG4-23 **Sample Type:** RI

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Aluminum	U	0.05	mg/L	0.05	7/18/2023			SW846-6020B	=
Antimony	U	0.003	mg/L	0.003	7/18/2023			SW846-6020B	=
Arsenic	U	0.005	mg/L	0.005	7/18/2023			SW846-6020B	=
Barium	U	0.004	mg/L	0.004	7/18/2023			SW846-6020B	=
Beryllium	U	0.0005	mg/L	0.0005	7/18/2023			SW846-6020B	=
Boron	U	0.015	mg/L	0.015	7/18/2023			SW846-6020B	=
Cadmium	U	0.001	mg/L	0.001	7/18/2023			SW846-6020B	=
Calcium	U	0.2	mg/L	0.2	7/18/2023			SW846-6020B	=
Chromium	U	0.01	mg/L	0.01	7/18/2023			SW846-6020B	=
Cobalt	U	0.001	mg/L	0.001	7/18/2023			SW846-6020B	=
Copper		0.0028	mg/L	0.002	7/18/2023			SW846-6020B	J
Iron	U	0.1	mg/L	0.1	7/18/2023			SW846-6020B	=
Lead	U	0.002	mg/L	0.002	7/18/2023			SW846-6020B	=
Magnesium	U	0.03	mg/L	0.03	7/18/2023			SW846-6020B	=
Manganese	U	0.005	mg/L	0.005	7/18/2023			SW846-6020B	=
Molybdenum	U	0.001	mg/L	0.001	7/18/2023			SW846-6020B	=
Nickel		0.00295	mg/L	0.002	7/18/2023			SW846-6020B	J
Potassium	U	0.3	mg/L	0.3	7/18/2023			SW846-6020B	=
Rhodium	U	0.005	mg/L	0.005	7/18/2023			SW846-6020B	=
Selenium	U	0.005	mg/L	0.005	7/18/2023			SW846-6020B	=
Silver	U	0.001	mg/L	0.001	7/18/2023			SW846-6020B	=
Sodium	U	0.25	mg/L	0.25	7/18/2023			SW846-6020B	=
Tantalum	UN	0.005	mg/L	0.005	7/18/2023			SW846-6020B	=
Thallium	U	0.002	mg/L	0.002	7/18/2023			SW846-6020B	=
Uranium	U	0.0002	mg/L	0.0002	7/18/2023			SW846-6020B	=
Vanadium	U	0.02	mg/L	0.02	7/18/2023			SW846-6020B	=
Zinc	J	0.00957	mg/L	0.02	7/18/2023			SW846-6020B	=
Mercury	U	0.0002	mg/L	0.0002	7/18/2023			SW846-7470A	=
PCB-1016	U	0.0969	ug/L	0.0969	7/18/2023			SW846-8082A	=
PCB-1221	U	0.0969	ug/L	0.0969	7/18/2023			SW846-8082A	=
PCB-1232	U	0.0969	ug/L	0.0969	7/18/2023			SW846-8082A	=
PCB-1242	U	0.0969	ug/L	0.0969	7/18/2023			SW846-8082A	=
PCB-1248	U	0.0969	ug/L	0.0969	7/18/2023			SW846-8082A	=
PCB-1254	U	0.0969	ug/L	0.0969	7/18/2023			SW846-8082A	=
PCB-1260	U	0.0969	ug/L	0.0969	7/18/2023			SW846-8082A	UJ
PCB-1268	U	0.0969	ug/L	0.0969	7/18/2023			SW846-8082A	=
Polychlorinated biphenyl	U	0.0969	ug/L	0.0969	7/18/2023			SW846-8082A	UJ
Radium-226	U	-0.108	pCi/L	0.552	7/18/2023	0.173	0.173	AN-1418	=
Radium-228	U	-0.829	pCi/L	4.24	7/18/2023	2.15	2.15	EPA-904-M	=
Strontium-90	U	3.11	pCi/L	5.89	7/18/2023	3.53	3.56	EPA-905.0-M	=
Tritium	U	8.1	pCi/L	229	7/18/2023	129	129	EPA-906.0-M	=
Technetium-99	U	11	pCi/L	18.3	7/18/2023	10.9	11	HASL 300, Tc-02-RC M	=
Thorium-230	U	0.602	pCi/L	3.22	7/18/2023	1.76	1.77	HASL 300, Th-01-RC M	=
Thorium-232	U	0.4	pCi/L	1.77	7/18/2023	1.24	1.24	HASL 300, Th-01-RC M	=
Alpha activity	U	0.769	pCi/L	6.37	7/18/2023	3.12	3.12	SW846-9310	=
Beta activity	U	2.63	pCi/L	7.27	7/18/2023	4.21	4.23	SW846-9310	=
1,2-Dibromo-3-chloropropane	U	0.0189	ug/L	0.0189	7/18/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=

1,1,2,2-Tetrachloroethane	U	1 ug/L	1	7/18/2023	SW846-8260D	=
1,1,2-Trichloroethane	U	1 ug/L	1	7/18/2023	SW846-8260D	=
1,1-Dichloroethane	U	1 ug/L	1	7/18/2023	SW846-8260D	=
1,1-Dichloroethene	U	1 ug/L	1	7/18/2023	SW846-8260D	=
1,2,3-Trichloropropane	U	1 ug/L	1	7/18/2023	SW846-8260D	=
1,2-Dibromoethane	U	1 ug/L	1	7/18/2023	SW846-8260D	=
1,2-Dichlorobenzene	U	1 ug/L	1	7/18/2023	SW846-8260D	=
1,2-Dichloroethane	U	1 ug/L	1	7/18/2023	SW846-8260D	=
1,2-Dichloropropane	U	1 ug/L	1	7/18/2023	SW846-8260D	=
1,4-Dichlorobenzene	U	1 ug/L	1	7/18/2023	SW846-8260D	=
2-Butanone	U	5 ug/L	5	7/18/2023	SW846-8260D	=
2-Hexanone	U	5 ug/L	5	7/18/2023	SW846-8260D	=
4-Methyl-2-pentanone	U	5 ug/L	5	7/18/2023	SW846-8260D	=
Acetone	J	4.93 ug/L	5	7/18/2023	SW846-8260D	=
Acrolein	U	5 ug/L	5	7/18/2023	SW846-8260D	=
Acrylonitrile	U	5 ug/L	5	7/18/2023	SW846-8260D	=
Benzene	U	1 ug/L	1	7/18/2023	SW846-8260D	=
Bromochloromethane	U	1 ug/L	1	7/18/2023	SW846-8260D	=
Bromodichloromethane	U	1 ug/L	1	7/18/2023	SW846-8260D	=
Bromoform	U	1 ug/L	1	7/18/2023	SW846-8260D	=
Bromomethane	U	1 ug/L	1	7/18/2023	SW846-8260D	=
Carbon disulfide	U	5 ug/L	5	7/18/2023	SW846-8260D	=
Carbon tetrachloride	U	1 ug/L	1	7/18/2023	SW846-8260D	=
Chlorobenzene	U	1 ug/L	1	7/18/2023	SW846-8260D	=
Chloroethane	U	1 ug/L	1	7/18/2023	SW846-8260D	=
Chloroform	U	1 ug/L	1	7/18/2023	SW846-8260D	=
Chloromethane	U	1 ug/L	1	7/18/2023	SW846-8260D	=
cis-1,2-Dichloroethene	U	1 ug/L	1	7/18/2023	SW846-8260D	=
cis-1,3-Dichloropropene	U	1 ug/L	1	7/18/2023	SW846-8260D	=
Dibromochloromethane	U	1 ug/L	1	7/18/2023	SW846-8260D	=
Dibromomethane	U	1 ug/L	1	7/18/2023	SW846-8260D	=
Ethylbenzene	U	1 ug/L	1	7/18/2023	SW846-8260D	=
Iodomethane	U	5 ug/L	5	7/18/2023	SW846-8260D	=
Methylene chloride	U	5 ug/L	5	7/18/2023	SW846-8260D	=
Styrene	U	1 ug/L	1	7/18/2023	SW846-8260D	=
Tetrachloroethene	U	1 ug/L	1	7/18/2023	SW846-8260D	=
Toluene	U	1 ug/L	1	7/18/2023	SW846-8260D	=
Total Xylene	U	3 ug/L	3	7/18/2023	SW846-8260D	=
trans-1,2-Dichloroethene	U	1 ug/L	1	7/18/2023	SW846-8260D	=
trans-1,3-Dichloropropene	U	1 ug/L	1	7/18/2023	SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5 ug/L	5	7/18/2023	SW846-8260D	=
Trichloroethene	U	1 ug/L	1	7/18/2023	SW846-8260D	=
Trichlorofluoromethane	U	1 ug/L	1	7/18/2023	SW846-8260D	=
Vinyl acetate	U	5 ug/L	5	7/18/2023	SW846-8260D	=
Vinyl chloride	U	1 ug/L	1	7/18/2023	SW846-8260D	=
Iodide	U	0.5 mg/L	0.5	7/18/2023	EPA-300.0	=

Paducah OREIS
GROUNDWATER MONITORING REPORT

Facility: C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

Sampling Point: QC **Period:** 3rd Quarter 2023

AKGWA Well Tag #: N/A **SAMPLE ID:** TB1UG4-23 **Sample Type:** TB

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
1,2-Dibromo-3-chloropropane	U	0.019	ug/L	0.019	7/18/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	7/18/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	7/18/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Acetone	J	2.51	ug/L	5	7/18/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Bromomethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Chlorobenzene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Ethylbenzene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Iodomethane	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Methylene chloride	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Styrene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Tetrachloroethene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Toluene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Total Xylene	U	3	ug/L	3	7/18/2023			SW846-8260D	=
trans-1,2-Dichloroethene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
trans-1,3-Dichloropropene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Trichloroethene	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Trichlorofluoromethane	U	1	ug/L	1	7/18/2023			SW846-8260D	=
Vinyl acetate	U	5	ug/L	5	7/18/2023			SW846-8260D	=
Vinyl chloride	U	1	ug/L	1	7/18/2023			SW846-8260D	=

Paducah OREIS
GROUNDWATER MONITORING REPORT

Facility: C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

Sampling Point: QC **Period:** 3rd Quarter 2023

AKGWA Well Tag #: N/A **SAMPLE ID:** TB2UG4-23 **Sample Type:** TB

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
1,2-Dibromo-3-chloropropane	U	0.0192	ug/L	0.0192	7/20/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	7/20/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	7/20/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	7/20/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	7/20/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	7/20/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	7/20/2023			SW846-8260D	=
Acetone	JB	4.46	ug/L	5	7/20/2023			SW846-8260D	U
Acrolein	U	5	ug/L	5	7/20/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	7/20/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Bromomethane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	7/20/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Chlorobenzene	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	7/20/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Ethylbenzene	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Iodomethane	U	5	ug/L	5	7/20/2023			SW846-8260D	=
Methylene chloride	U	5	ug/L	5	7/20/2023			SW846-8260D	=
Styrene	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Tetrachloroethene	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Toluene	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Total Xylene	U	3	ug/L	3	7/20/2023			SW846-8260D	=
trans-1,2-Dichloroethene	U	1	ug/L	1	7/20/2023			SW846-8260D	=
trans-1,3-Dichloropropene	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5	ug/L	5	7/20/2023			SW846-8260D	=
Trichloroethene	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Trichlorofluoromethane	U	1	ug/L	1	7/20/2023			SW846-8260D	=
Vinyl acetate	U	5	ug/L	5	7/20/2023			SW846-8260D	=
Vinyl chloride	U	1	ug/L	1	7/20/2023			SW846-8260D	=

Paducah OREIS
GROUNDWATER MONITORING REPORT

Facility: C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

Sampling Point: QC **Period:** 3rd Quarter 2023

AKGWA Well Tag #: N/A **SAMPLE ID:** TB3UG4-23 **Sample Type:** TB

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
1,2-Dibromo-3-chloropropane	U	0.0189	ug/L	0.0189	7/24/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
2-Butanone	U	5	ug/L	5	7/24/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	7/24/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	7/24/2023			SW846-8260D	=
Acetone	J	2.96	ug/L	5	7/24/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	7/24/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	7/24/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	7/24/2023			SW846-8260D	UJ
Bromomethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	7/24/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	7/24/2023			SW846-8260D	UJ
Chlorobenzene		6.9	ug/L	1	7/24/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Ethylbenzene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Iodomethane	U	5	ug/L	5	7/24/2023			SW846-8260D	=
Methylene chloride	U	5	ug/L	5	7/24/2023			SW846-8260D	=
Styrene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Tetrachloroethene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Toluene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Total Xylene	U	3	ug/L	3	7/24/2023			SW846-8260D	=
trans-1,2-Dichloroethene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
trans-1,3-Dichloropropene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5	ug/L	5	7/24/2023			SW846-8260D	=
Trichloroethene	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Trichlorofluoromethane	U	1	ug/L	1	7/24/2023			SW846-8260D	=
Vinyl acetate	U	5	ug/L	5	7/24/2023			SW846-8260D	=
Vinyl chloride	U	1	ug/L	1	7/24/2023			SW846-8260D	=

Paducah OREIS
GROUNDWATER MONITORING REPORT

Facility: C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

Sampling Point: QC **Period:** 3rd Quarter 2023

AKGWA Well Tag #: N/A **SAMPLE ID:** TB4UG4-23 **Sample Type:** TB

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
1,2-Dibromo-3-chloropropane	U	0.0189	ug/L	0.0189	7/25/2023			SW846-8011	=
1,1,1,2-Tetrachloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,1,1-Trichloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,1,2,2-Tetrachloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,1,2-Trichloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,1-Dichloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,1-Dichloroethene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,2,3-Trichloropropane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,2-Dibromoethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,2-Dichlorobenzene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,2-Dichloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,2-Dichloropropane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
1,4-Dichlorobenzene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
2-Butanone	J	2.3	ug/L	5	7/25/2023			SW846-8260D	=
2-Hexanone	U	5	ug/L	5	7/25/2023			SW846-8260D	=
4-Methyl-2-pentanone	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Acetone	J	4.88	ug/L	5	7/25/2023			SW846-8260D	=
Acrolein	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Acrylonitrile	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Benzene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Bromochloromethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Bromodichloromethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Bromoform	U	1	ug/L	1	7/25/2023			SW846-8260D	UJ
Bromomethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Carbon disulfide	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Carbon tetrachloride	U	1	ug/L	1	7/25/2023			SW846-8260D	UJ
Chlorobenzene		5.39	ug/L	1	7/25/2023			SW846-8260D	=
Chloroethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Chloroform	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Chloromethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
cis-1,2-Dichloroethene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
cis-1,3-Dichloropropene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Dibromochloromethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Dibromomethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Ethylbenzene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Iodomethane	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Methylene chloride	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Styrene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Tetrachloroethene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Toluene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Total Xylene	U	3	ug/L	3	7/25/2023			SW846-8260D	=
trans-1,2-Dichloroethene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
trans-1,3-Dichloropropene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Trans-1,4-Dichloro-2-butene	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Trichloroethene	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Trichlorofluoromethane	U	1	ug/L	1	7/25/2023			SW846-8260D	=
Vinyl acetate	U	5	ug/L	5	7/25/2023			SW846-8260D	=
Vinyl chloride	U	1	ug/L	1	7/25/2023			SW846-8260D	=

Qualifier Code Definitions	
B	Analyte found in the associated blank
H	Analysis performed outside holding time requirement
J	Estimated value
L	LCS or LCSD recovery outside of control limits
L1	LCS/LCSD RPD outside acceptance criteria
N	Sample spike (MS/MSD) recovery not within control limits
N1	MS/MSD RPD outside acceptance criteria
P	Difference between results from two GC columns outside control limits
S	Sample surrogate recovery outside acceptance criteria
T	Tracer recovery outside control limits of 30-110%
U	Analyte analyzed for but not detected at or below the lowest concentration reported.
W	Post-digestion spike recovery out of control limits
W1	Post-digestion spike and post-digestion spike duplicate RPD out of control limits
X	Other specific flags and footnotes may be required to properly define the results.
Y1	MS/MSD recovery outside acceptance criteria
Y2	MS/MSD RPD outside acceptance criteria

RGA Type Code Definitions	
LRGA	Lower Regional Gravel Aquifer
UCRS	Upper Continental Recharge System
URGA	Upper Regional Gravel Aquifer
NA	

Sample Type Code Definitions	
REG	Regular
FR	Field Replicate (code used for Field Duplicate)
RI	Equipment Rinsate Blank
FB	Field Blank
TB	Trip Blank

Validation Code Definitions	
=	Validated result, no additional qualifier necessary
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
UJ	Analyte not detected above the reported detection limit, and the reported detection limit is approximated due to quality deficiency.
X	Not validated

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ATTACHMENT C1

GEL LABORATORIES CERTIFICATE OF ANALYSIS

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GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW357UG4-23	Project:	FRNP00507
Sample ID:	629613001	Client ID:	FRNP005
Matrix:	WG		
Collect Date:	18-JUL-23 10:03		
Receive Date:	19-JUL-23		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	U	0.0192	0.00865	0.0192	ug/L	0.961	1	LOF	07/20/23	1658	2461592	1
Carbon Analysis												
9060A, Total Organic Carbon "As Received"												
Total Organic Carbon Average	U	2.00	0.330	2.00	mg/L		1	RM3	07/21/23	1718	2462371	2
Flow Injection Analysis												
9012B, Cyanide, Total "As Received"												
Cyanide, Total	U	0.200	0.00167	0.200	mg/L	1.00	1	AXH3	07/20/23	1228	2461621	3
Halogen Analysis												
9020B, TOX (Organic Halogen) "As Received"												
Total Organic Halogens	J	3.56	3.33	10.0	ug/L		1	RM3	08/04/23	1411	2471469	4
Ion Chromatography												
300.0, Iodide in Liquid "As Received"												
Iodide	U	0.500	0.167	0.500	mg/L		1	LXA2	07/19/23	1704	2461882	5
SW846 9056A Anions (5 elements) "As Received"												
Bromide		0.336	0.0670	0.200	mg/L		1	JLD1	07/19/23	1221	2461498	6
Fluoride	J	0.156	0.0330	4.00	mg/L		1					
Nitrate-N	J	1.11	0.0330	10.0	mg/L		1					
Chloride	JW	30.7	0.335	250	mg/L		5	JLD1	07/19/23	1843	2461498	7
Sulfate		39.3	0.665	2.00	mg/L		5					
Mercury Analysis-CVAA												
7470, Mercury Liquid "As Received"												
Mercury	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	JP2	07/21/23	1128	2461907	8
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Boron		0.370	0.0520	0.150	mg/L	1.00	10	PRB	08/13/23	1904	2461874	9
Antimony	U	0.00300	0.00100	0.00300	mg/L	1.00	1	PRB	08/12/23	2104	2461874	10
Rhodium	U	0.00500	0.00160	0.00500	mg/L	1.00	1	PRB	08/13/23	1316	2461874	11
Tantalum	UN	0.00500	0.00100	0.00500	mg/L	1.00	1					
Sodium		42.2	0.0800	0.250	mg/L	1.00	1	BCD1	08/15/23	0739	2475831	12
Aluminum	U	0.0500	0.0193	0.0500	mg/L	1.00	1	PRB	08/13/23	0255	2461874	13
Arsenic	U	0.00500	0.00200	0.00500	mg/L	1.00	1					
Barium		0.0713	0.000670	0.00400	mg/L	1.00	1					
Beryllium	U	0.000500	0.000200	0.000500	mg/L	1.00	1					

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Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW357UG4-23 Project: FRNP00507
Sample ID: 629613001 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Cadmium	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Calcium		25.8	0.0800	0.200	mg/L	1.00	1					
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Cobalt	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Copper		0.00309	0.000300	0.00200	mg/L	1.00	1					
Iron	J	0.0420	0.0330	0.100	mg/L	1.00	1					
Lead	U	0.00200	0.000500	0.00200	mg/L	1.00	1					
Magnesium		11.1	0.0100	0.0300	mg/L	1.00	1					
Manganese		0.00759	0.00100	0.00500	mg/L	1.00	1					
Molybdenum	U	0.00100	0.000200	0.00100	mg/L	1.00	1					
Nickel		0.00210	0.000600	0.00200	mg/L	1.00	1					
Potassium		1.69	0.0800	0.300	mg/L	1.00	1					
Selenium	U	0.00500	0.00150	0.00500	mg/L	1.00	1					
Silver	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Thallium	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					
Vanadium	U	0.0200	0.00330	0.0200	mg/L	1.00	1					
Zinc	J	0.0148	0.00330	0.0200	mg/L	1.00	1					
Semi-Volatiles-PCB												
8082A, PCB Liquids "As Received"												
Aroclor-1016	U	0.101	0.0335	0.101	ug/L	0.00101	1	YS1	08/15/23	1653	2476203	14
Aroclor-1221	U	0.101	0.0335	0.101	ug/L	0.00101	1					
Aroclor-1232	U	0.101	0.0335	0.101	ug/L	0.00101	1					
Aroclor-1242	U	0.101	0.0335	0.101	ug/L	0.00101	1					
Aroclor-1248	U	0.101	0.0335	0.101	ug/L	0.00101	1					
Aroclor-1254	U	0.101	0.0335	0.101	ug/L	0.00101	1					
Aroclor-1260	U	0.101	0.0335	0.101	ug/L	0.00101	1					
Aroclor-1268	U	0.101	0.0335	0.101	ug/L	0.00101	1					
Aroclor-Total	U	0.101	0.0335	0.101	ug/L	0.00101	1					
Solids Analysis												
160.1, Dissolved Solids "As Received"												
Total Dissolved Solids		198	2.38	10.0	mg/L			CH6	07/20/23	1020	2462095	15
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												

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Report Date: November 2, 2023

Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW357UG4-23 Project: FRNP00507
Sample ID: 629613001 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												
COD	U	20.0	8.95	20.0	mg/L		1	JW2	07/19/23	1704	2461639	16
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	PXY1	07/20/23	1407	2462233	17
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	U	5.00	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					

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	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW357UG4-23	Project:	FRNP00507
Sample ID:	629613001	Client ID:	FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene		5.30	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3535A	SW3535A PCB SPE Extraction	LW1	08/15/23	0520	2476202
SW846 8011 PREP	8011 Prep	LOF	07/20/23	1251	2461591
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	EXF1	07/20/23	1210	2461903
SW846 3005A	ICP-MS 3005A PREP	PRB	08/14/23	1525	2475830
SW846 3005A	ICP-MS 3005A PREP	EXF1	07/25/23	1510	2461873
SW846 9010C Distillation	SW846 9010C Prep	ES2	07/20/23	1038	2461620

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Certificate of Analysis

Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW357UG4-23	Project:	FRNP00507
Sample ID:	629613001	Client ID:	FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8011	
2	SW846 9060A	
3	SW846 9012B	
4	SW846 9020B	
5	EPA 300.0	
6	SW846 9056A	
7	SW846 9056A	
8	SW846 7470A	
9	SW846 3005A/6020B	
10	SW846 3005A/6020B	
11	SW846 3005A/6020B	
12	SW846 3005A/6020B	
13	SW846 3005A/6020B	
14	SW846 3535A/8082A	
15	EPA 160.1	
16	EPA 410.4	
17	SW846 8260D	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	7.89 ug/L	6.86	115	(46%-159%)
Decachlorobiphenyl	8082A, PCB Liquids "As Received"	0.185 ug/L	0.201	92	(32%-135%)
4cmx	8082A, PCB Liquids "As Received"	0.136 ug/L	0.201	68	(26%-108%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	46.6 ug/L	50.0	93	(72%-125%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	50.3 ug/L	50.0	101	(73%-129%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	48.4 ug/L	50.0	97	(75%-123%)

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW357UG4-23	Project:	FRNP00507
Sample ID:	629613002	Client ID:	FRNP005
Matrix:	WG		
Collect Date:	18-JUL-23 10:03		
Receive Date:	19-JUL-23		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Dissolved Metals (3 Elements) "As Received"												
Barium		0.0722	0.000670	0.00400	mg/L	1.00	1	PRB	08/13/23	0259	2461874	1
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 160	Laboratory Filtration	RXB5	07/19/23	1435	2461675
SW846 3005A	ICP-MS 3005A PREP	EXF1	07/25/23	1510	2461873

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3005A/6020B	

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: November 2, 2023

Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW358DUG4-23
Sample ID: 629613003
Matrix: WG
Collect Date: 18-JUL-23 10:50
Receive Date: 19-JUL-23
Collector: Client

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	U	0.0191	0.00861	0.0191	ug/L	0.957	1	LOF	07/20/23	1723	2461592	1
Carbon Analysis												
9060A, Total Organic Carbon "As Received"												
Total Organic Carbon Average		2.16	0.330	2.00	mg/L		1	RM3	07/21/23	1756	2462371	2
Flow Injection Analysis												
9012B, Cyanide, Total "As Received"												
Cyanide, Total	U	0.200	0.00167	0.200	mg/L	1.00	1	AXH3	07/20/23	1229	2461621	3
Halogen Analysis												
9020B, TOX (Organic Halogen) "As Received"												
Total Organic Halogens	U	10.0	3.33	10.0	ug/L		1	RM3	08/04/23	1508	2471469	4
Ion Chromatography												
300.0, Iodide in Liquid "As Received"												
Iodide	U	0.500	0.167	0.500	mg/L		1	LXA2	07/19/23	1717	2461882	5
SW846 9056A Anions (5 elements) "As Received"												
Bromide		0.391	0.0670	0.200	mg/L		1	JLD1	07/19/23	1252	2461498	6
Fluoride	J	0.163	0.0330	4.00	mg/L		1					
Nitrate-N	J	0.671	0.0330	10.0	mg/L		1					
Chloride	JW	31.3	0.335	250	mg/L		5	JLD1	07/19/23	1915	2461498	7
Sulfate		52.5	0.665	2.00	mg/L		5					
Mercury Analysis-CVAA												
7470, Mercury Liquid "As Received"												
Mercury	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	JP2	07/21/23	1130	2461907	8
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Rhodium	U	0.00500	0.00160	0.00500	mg/L	1.00	1	PRB	08/13/23	1318	2461874	9
Tantalum	UN	0.00500	0.00100	0.00500	mg/L	1.00	1					
Aluminum	J	0.0378	0.0193	0.0500	mg/L	1.00	1	PRB	08/13/23	0303	2461874	10
Arsenic		0.00511	0.00200	0.00500	mg/L	1.00	1					
Barium		0.0798	0.000670	0.00400	mg/L	1.00	1					
Beryllium	U	0.000500	0.000200	0.000500	mg/L	1.00	1					
Cadmium	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Calcium		33.2	0.0800	0.200	mg/L	1.00	1					
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					

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Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW358DUG4-23 Project: FRNP00507
Sample ID: 629613003 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Cobalt		0.0410	0.000300	0.00100	mg/L	1.00	1					
Copper	J	0.000794	0.000300	0.00200	mg/L	1.00	1					
Iron		12.9	0.0330	0.100	mg/L	1.00	1					
Lead	U	0.00200	0.000500	0.00200	mg/L	1.00	1					
Magnesium		16.2	0.0100	0.0300	mg/L	1.00	1					
Molybdenum	J	0.000559	0.000200	0.00100	mg/L	1.00	1					
Nickel		0.0546	0.000600	0.00200	mg/L	1.00	1					
Potassium		3.14	0.0800	0.300	mg/L	1.00	1					
Selenium	U	0.00500	0.00150	0.00500	mg/L	1.00	1					
Silver	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Thallium	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					
Vanadium	U	0.0200	0.00330	0.0200	mg/L	1.00	1					
Zinc	J	0.00976	0.00330	0.0200	mg/L	1.00	1					
Antimony	U	0.00300	0.00100	0.00300	mg/L	1.00	1	PRB	08/12/23	2111	2461874	11
Boron		0.241	0.0520	0.150	mg/L	1.00	10	PRB	08/13/23	1906	2461874	12
Manganese		2.01	0.0100	0.0500	mg/L	1.00	10					
Sodium		35.5	0.0800	0.250	mg/L	1.00	1	BCD1	08/15/23	0741	2475831	13
Semi-Volatiles-PCB												
8082A, PCB Liquids "As Received"												
Aroclor-1016	U	0.105	0.0349	0.105	ug/L	0.00105	1	YS1	08/15/23	1705	2476203	14
Aroclor-1221	U	0.105	0.0349	0.105	ug/L	0.00105	1					
Aroclor-1232	U	0.105	0.0349	0.105	ug/L	0.00105	1					
Aroclor-1242	U	0.105	0.0349	0.105	ug/L	0.00105	1					
Aroclor-1248	U	0.105	0.0349	0.105	ug/L	0.00105	1					
Aroclor-1254	U	0.105	0.0349	0.105	ug/L	0.00105	1					
Aroclor-1260	U	0.105	0.0349	0.105	ug/L	0.00105	1					
Aroclor-1268	U	0.105	0.0349	0.105	ug/L	0.00105	1					
Aroclor-Total	U	0.105	0.0349	0.105	ug/L	0.00105	1					
Solids Analysis												
160.1, Dissolved Solids "As Received"												
Total Dissolved Solids		237	2.38	10.0	mg/L			CH6	07/20/23	1020	2462095	15
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												

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Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW358DUG4-23 Project: FRNP00507
Sample ID: 629613003 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												
COD	U	20.0	8.95	20.0	mg/L		1	JW2	07/19/23	1704	2461639	16
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	PXY1	07/20/23	1435	2462233	17
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	J	1.81	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					

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Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW358DUG4-23 Project: FRNP00507
Sample ID: 629613003 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene		1.62	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	EXF1	07/25/23	1510	2461873
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	EXF1	07/20/23	1210	2461903
SW846 3005A	ICP-MS 3005A PREP	PRB	08/14/23	1525	2475830
SW846 9010C Distillation	SW846 9010C Prep	ES2	07/20/23	1038	2461620
SW846 8011 PREP	8011 Prep	LOF	07/20/23	1251	2461591
SW846 3535A	SW3535A PCB SPE Extraction	LW1	08/15/23	0520	2476202

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Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW358DUG4-23	Project:	FRNP00507
Sample ID:	629613003	Client ID:	FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8011	
2	SW846 9060A	
3	SW846 9012B	
4	SW846 9020B	
5	EPA 300.0	
6	SW846 9056A	
7	SW846 9056A	
8	SW846 7470A	
9	SW846 3005A/6020B	
10	SW846 3005A/6020B	
11	SW846 3005A/6020B	
12	SW846 3005A/6020B	
13	SW846 3005A/6020B	
14	SW846 3535A/8082A	
15	EPA 160.1	
16	EPA 410.4	
17	SW846 8260D	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	7.44 ug/L	6.84	109	(46%-159%)
Decachlorobiphenyl	8082A, PCB Liquids "As Received"	0.178 ug/L	0.209	85	(32%-135%)
4cmx	8082A, PCB Liquids "As Received"	0.134 ug/L	0.209	64	(26%-108%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	45.2 ug/L	50.0	90	(72%-125%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	49.4 ug/L	50.0	99	(73%-129%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	48.5 ug/L	50.0	97	(75%-123%)

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW358DUG4-23	Project:	FRNP00507
Sample ID:	629613004	Client ID:	FRNP005
Matrix:	WG		
Collect Date:	18-JUL-23 10:50		
Receive Date:	19-JUL-23		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Dissolved Metals (3 Elements) "As Received"												
Barium		0.0661	0.000670	0.00400	mg/L	1.00	1	PRB	08/13/23	0306	2461874	1
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 160	Laboratory Filtration	RXB5	07/19/23	1435	2461675
SW846 3005A	ICP-MS 3005A PREP	EXF1	07/25/23	1510	2461873

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3005A/6020B	

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Report Date: November 2, 2023

Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW358UG4-23
Sample ID: 629613005
Matrix: WG
Collect Date: 18-JUL-23 10:50
Receive Date: 19-JUL-23
Collector: Client

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	U	0.0189	0.00850	0.0189	ug/L	0.944	1	LOF	07/20/23	1747	2461592	1
Carbon Analysis												
9060A, Total Organic Carbon "As Received"												
Total Organic Carbon Average		4.20	0.330	2.00	mg/L		1	RM3	07/21/23	1834	2462371	2
Flow Injection Analysis												
9012B, Cyanide, Total "As Received"												
Cyanide, Total	U	0.200	0.00167	0.200	mg/L	1.00	1	AXH3	07/20/23	1230	2461621	3
Halogen Analysis												
9020B, TOX (Organic Halogen) "As Received"												
Total Organic Halogens	U	10.0	3.33	10.0	ug/L		1	RM3	08/04/23	1544	2471469	4
Ion Chromatography												
300.0, Iodide in Liquid "As Received"												
Iodide	U	0.500	0.167	0.500	mg/L		1	LXA2	07/19/23	1730	2461882	5
SW846 9056A Anions (5 elements) "As Received"												
Chloride	JW	29.6	0.335	250	mg/L		5	JLD1	07/19/23	1946	2461498	6
Sulfate		50.9	0.665	2.00	mg/L		5					
Bromide		0.379	0.0670	0.200	mg/L		1	JLD1	07/19/23	1324	2461498	7
Fluoride	J	0.178	0.0330	4.00	mg/L		1					
Nitrate-N	J	0.582	0.0330	10.0	mg/L		1					
Mercury Analysis-CVAA												
7470, Mercury Liquid "As Received"												
Mercury	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	JP2	07/21/23	1132	2461907	8
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Boron		0.258	0.0520	0.150	mg/L	1.00	10	PRB	08/13/23	1908	2461874	9
Manganese		1.98	0.0100	0.0500	mg/L	1.00	10					
Sodium		36.0	0.0800	0.250	mg/L	1.00	1	BCD1	08/15/23	0743	2475831	10
Rhodium	U	0.00500	0.00160	0.00500	mg/L	1.00	1	PRB	08/13/23	1320	2461874	11
Tantalum	UN	0.00500	0.00100	0.00500	mg/L	1.00	1					
Antimony	U	0.00300	0.00100	0.00300	mg/L	1.00	1	PRB	08/12/23	2118	2461874	12
Aluminum	J	0.0357	0.0193	0.0500	mg/L	1.00	1	PRB	08/13/23	0310	2461874	13
Arsenic	J	0.00453	0.00200	0.00500	mg/L	1.00	1					
Barium		0.0800	0.000670	0.00400	mg/L	1.00	1					

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Certificate of Analysis

Report Date: November 2, 2023

Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW358UG4-23 Project: FRNP00507
Sample ID: 629613005 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Beryllium	U	0.000500	0.000200	0.000500	mg/L	1.00	1					
Cadmium	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Calcium		33.6	0.0800	0.200	mg/L	1.00	1					
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Cobalt		0.0442	0.000300	0.00100	mg/L	1.00	1					
Copper	J	0.000747	0.000300	0.00200	mg/L	1.00	1					
Iron		12.0	0.0330	0.100	mg/L	1.00	1					
Lead	U	0.00200	0.000500	0.00200	mg/L	1.00	1					
Magnesium		16.5	0.0100	0.0300	mg/L	1.00	1					
Molybdenum	J	0.000549	0.000200	0.00100	mg/L	1.00	1					
Nickel		0.0536	0.000600	0.00200	mg/L	1.00	1					
Potassium		3.20	0.0800	0.300	mg/L	1.00	1					
Selenium	U	0.00500	0.00150	0.00500	mg/L	1.00	1					
Silver	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Thallium	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					
Vanadium	U	0.0200	0.00330	0.0200	mg/L	1.00	1					
Zinc	J	0.0103	0.00330	0.0200	mg/L	1.00	1					
Semi-Volatiles-PCB												
8082A, PCB Liquids "As Received"												
Aroclor-1016	U	0.0988	0.0329	0.0988	ug/L	0.000988	1	YS1	08/15/23	1717	2476203	14
Aroclor-1221	U	0.0988	0.0329	0.0988	ug/L	0.000988	1					
Aroclor-1232	U	0.0988	0.0329	0.0988	ug/L	0.000988	1					
Aroclor-1242	U	0.0988	0.0329	0.0988	ug/L	0.000988	1					
Aroclor-1248	U	0.0988	0.0329	0.0988	ug/L	0.000988	1					
Aroclor-1254	U	0.0988	0.0329	0.0988	ug/L	0.000988	1					
Aroclor-1260	U	0.0988	0.0329	0.0988	ug/L	0.000988	1					
Aroclor-1268	U	0.0988	0.0329	0.0988	ug/L	0.000988	1					
Aroclor-Total	U	0.0988	0.0329	0.0988	ug/L	0.000988	1					
Solids Analysis												
160.1, Dissolved Solids "As Received"												
Total Dissolved Solids		241	2.38	10.0	mg/L			CH6	07/20/23	1020	2462095	15
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												

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Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW358UG4-23 Project: FRNP00507
Sample ID: 629613005 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												
COD	U	20.0	8.95	20.0	mg/L		1	JW2	07/19/23	1704	2461639	16
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	PXY1	07/20/23	1503	2462233	17
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	U	5.00	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					

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Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW358UG4-23 Project: FRNP00507
Sample ID: 629613005 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene		1.63	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9010C Distillation	SW846 9010C Prep	ES2	07/20/23	1038	2461620
SW846 3005A	ICP-MS 3005A PREP	PRB	08/14/23	1525	2475830
SW846 3535A	SW3535A PCB SPE Extraction	LW1	08/15/23	0520	2476202
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	EXF1	07/20/23	1210	2461903
SW846 8011 PREP	8011 Prep	LOF	07/20/23	1251	2461591
SW846 3005A	ICP-MS 3005A PREP	EXF1	07/25/23	1510	2461873

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Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW358UG4-23	Project:	FRNP00507
Sample ID:	629613005	Client ID:	FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8011	
2	SW846 9060A	
3	SW846 9012B	
4	SW846 9020B	
5	EPA 300.0	
6	SW846 9056A	
7	SW846 9056A	
8	SW846 7470A	
9	SW846 3005A/6020B	
10	SW846 3005A/6020B	
11	SW846 3005A/6020B	
12	SW846 3005A/6020B	
13	SW846 3005A/6020B	
14	SW846 3535A/8082A	
15	EPA 160.1	
16	EPA 410.4	
17	SW846 8260D	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	6.75 ug/L	6.74	100	(46%-159%)
Decachlorobiphenyl	8082A, PCB Liquids "As Received"	0.177 ug/L	0.198	90	(32%-135%)
4cmx	8082A, PCB Liquids "As Received"	0.122 ug/L	0.198	62	(26%-108%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	46.6 ug/L	50.0	93	(72%-125%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	49.9 ug/L	50.0	100	(73%-129%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	48.0 ug/L	50.0	96	(75%-123%)

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW358UG4-23	Project:	FRNP00507
Sample ID:	629613006	Client ID:	FRNP005
Matrix:	WG		
Collect Date:	18-JUL-23 10:50		
Receive Date:	19-JUL-23		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Dissolved Metals (3 Elements) "As Received"												
Barium		0.0726	0.000670	0.00400	mg/L	1.00	1	PRB	08/13/23	0313	2461874	1
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	EXF1	07/25/23	1510	2461873
EPA 160	Laboratory Filtration	RXB5	07/19/23	1435	2461675

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3005A/6020B	

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Report Date: November 2, 2023

Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW360UG4-23
Sample ID: 629613007
Matrix: WG
Collect Date: 18-JUL-23 07:33
Receive Date: 19-JUL-23
Collector: Client

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	U	0.0188	0.00844	0.0188	ug/L	0.938	1	LOF	07/20/23	1812	2461592	1
Carbon Analysis												
9060A, Total Organic Carbon "As Received"												
Total Organic Carbon Average	J	0.502	0.330	2.00	mg/L		1	RM3	07/21/23	1912	2462371	2
Flow Injection Analysis												
9012B, Cyanide, Total "As Received"												
Cyanide, Total	U	0.200	0.00167	0.200	mg/L	1.00	1	AXH3	07/20/23	1231	2461621	3
Halogen Analysis												
9020B, TOX (Organic Halogen) "As Received"												
Total Organic Halogens	J	7.88	3.33	10.0	ug/L		1	RM3	08/04/23	1233	2471469	4
Ion Chromatography												
300.0, Iodide in Liquid "As Received"												
Iodide	U	0.500	0.167	0.500	mg/L		1	LXA2	07/19/23	1743	2461882	5
SW846 9056A Anions (5 elements) "As Received"												
Bromide	J	0.140	0.0670	0.200	mg/L		1	JLD1	07/19/23	1356	2461498	6
Chloride	JW	7.73	0.0670	250	mg/L		1					
Fluoride	J	0.199	0.0330	4.00	mg/L		1					
Sulfate		13.1	0.133	0.400	mg/L		1					
Nitrate-N	J	0.622	0.0660	10.0	mg/L		2	JLD1	07/19/23	2018	2461498	7
Mercury Analysis-CVAA												
7470, Mercury Liquid "As Received"												
Mercury	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	JP2	07/21/23	1133	2461907	8
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Rhodium	U	0.00500	0.00160	0.00500	mg/L	1.00	1	PRB	08/13/23	1326	2461874	9
Tantalum	UN	0.00500	0.00100	0.00500	mg/L	1.00	1					
Sodium		59.6	0.800	2.50	mg/L	1.00	10	BCD1	08/15/23	0745	2475831	10
Antimony	U	0.00300	0.00100	0.00300	mg/L	1.00	1	PRB	08/12/23	2132	2461874	11
Aluminum	J	0.0402	0.0193	0.0500	mg/L	1.00	1	PRB	08/13/23	0324	2461874	12
Arsenic	U	0.00500	0.00200	0.00500	mg/L	1.00	1					
Barium		0.196	0.000670	0.00400	mg/L	1.00	1					
Beryllium	U	0.000500	0.000200	0.000500	mg/L	1.00	1					
Boron		0.0284	0.00520	0.0150	mg/L	1.00	1					

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Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW360UG4-23 Project: FRNP00507
Sample ID: 629613007 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Cadmium	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Calcium		18.9	0.0800	0.200	mg/L	1.00	1					
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Cobalt		0.00147	0.000300	0.00100	mg/L	1.00	1					
Copper		0.00230	0.000300	0.00200	mg/L	1.00	1					
Iron		0.176	0.0330	0.100	mg/L	1.00	1					
Lead	U	0.00200	0.000500	0.00200	mg/L	1.00	1					
Magnesium		7.97	0.0100	0.0300	mg/L	1.00	1					
Manganese		0.0188	0.00100	0.00500	mg/L	1.00	1					
Molybdenum	U	0.00100	0.000200	0.00100	mg/L	1.00	1					
Nickel	J	0.00171	0.000600	0.00200	mg/L	1.00	1					
Potassium		0.697	0.0800	0.300	mg/L	1.00	1					
Selenium	J	0.00217	0.00150	0.00500	mg/L	1.00	1					
Silver	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Thallium	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Uranium	J	0.0000700	0.0000670	0.000200	mg/L	1.00	1					
Vanadium	U	0.0200	0.00330	0.0200	mg/L	1.00	1					
Zinc	J	0.00469	0.00330	0.0200	mg/L	1.00	1					
Semi-Volatiles-PCB												
8082A, PCB Liquids "As Received"												
Aroclor-1016	U	0.100	0.0333	0.100	ug/L	0.00100	1	YS1	08/15/23	1729	2476203	13
Aroclor-1221	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Aroclor-1232	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Aroclor-1242	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Aroclor-1248	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Aroclor-1254	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Aroclor-1260	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Aroclor-1268	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Aroclor-Total	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Solids Analysis												
160.1, Dissolved Solids "As Received"												
Total Dissolved Solids		216	2.38	10.0	mg/L			CH6	07/20/23	1020	2462095	14
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												

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Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW360UG4-23 Project: FRNP00507
Sample ID: 629613007 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												
COD	U	20.0	8.95	20.0	mg/L		1	JW2	07/19/23	1704	2461639	15
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	PXY1	07/20/23	1531	2462233	16
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	U	5.00	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					

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Certificate of Analysis

Report Date: November 2, 2023

Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW360UG4-23 Project: FRNP00507
Sample ID: 629613007 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene		7.54	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8011 PREP	8011 Prep	LOF	07/20/23	1251	2461591
SW846 9010C Distillation	SW846 9010C Prep	ES2	07/20/23	1038	2461620
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	EXF1	07/20/23	1210	2461903
SW846 3005A	ICP-MS 3005A PREP	PRB	08/14/23	1525	2475830
SW846 3535A	SW3535A PCB SPE Extraction	LW1	08/15/23	0520	2476202
SW846 3005A	ICP-MS 3005A PREP	EXF1	07/25/23	1510	2461873

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Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW360UG4-23	Project:	FRNP00507
Sample ID:	629613007	Client ID:	FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8011	
2	SW846 9060A	
3	SW846 9012B	
4	SW846 9020B	
5	EPA 300.0	
6	SW846 9056A	
7	SW846 9056A	
8	SW846 7470A	
9	SW846 3005A/6020B	
10	SW846 3005A/6020B	
11	SW846 3005A/6020B	
12	SW846 3005A/6020B	
13	SW846 3535A/8082A	
14	EPA 160.1	
15	EPA 410.4	
16	SW846 8260D	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	7.21 ug/L	6.70	108	(46%-159%)
Decachlorobiphenyl	8082A, PCB Liquids "As Received"	0.194 ug/L	0.200	97	(32%-135%)
4cmx	8082A, PCB Liquids "As Received"	0.132 ug/L	0.200	66	(26%-108%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	47.8 ug/L	50.0	96	(72%-125%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	50.2 ug/L	50.0	100	(73%-129%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	49.2 ug/L	50.0	98	(75%-123%)

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW360UG4-23	Project:	FRNP00507
Sample ID:	629613008	Client ID:	FRNP005
Matrix:	WG		
Collect Date:	18-JUL-23 07:33		
Receive Date:	19-JUL-23		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Dissolved Metals (3 Elements) "As Received"												
Barium		0.192	0.000670	0.00400	mg/L	1.00	1	PRB	08/13/23	0342	2461874	1
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	EXF1	07/25/23	1510	2461873
EPA 160	Laboratory Filtration	RXB5	07/19/23	1435	2461675

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3005A/6020B	

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW362UG4-23	Project:	FRNP00507
Sample ID:	629613009	Client ID:	FRNP005
Matrix:	WG		
Collect Date:	18-JUL-23 09:16		
Receive Date:	19-JUL-23		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	U	0.0188	0.00846	0.0188	ug/L	0.940	1	LOF	07/20/23	1926	2461592	1
Carbon Analysis												
9060A, Total Organic Carbon "As Received"												
Total Organic Carbon Average	J	1.49	0.330	2.00	mg/L		1	RM3	07/21/23	2128	2462371	2
Flow Injection Analysis												
9012B, Cyanide, Total "As Received"												
Cyanide, Total	U	0.200	0.00167	0.200	mg/L	1.00	1	AXH3	07/20/23	1237	2461621	3
Halogen Analysis												
9020B, TOX (Organic Halogen) "As Received"												
Total Organic Halogens		15.1	3.33	10.0	ug/L		1	RM3	08/04/23	1648	2471469	4
Ion Chromatography												
300.0, Iodide in Liquid "As Received"												
Iodide	U	0.500	0.167	0.500	mg/L		1	LXA2	07/19/23	1821	2461882	5
SW846 9056A Anions (5 elements) "As Received"												
Sulfate		28.5	0.665	2.00	mg/L		5	JLD1	07/19/23	2154	2461498	6
Bromide	U	0.200	0.0670	0.200	mg/L		1	JLD1	07/19/23	1428	2461498	7
Chloride	JW	2.36	0.0670	250	mg/L		1					
Fluoride	J	0.491	0.0330	4.00	mg/L		1					
Nitrate-N	J	0.407	0.0330	10.0	mg/L		1					
Semi-Volatiles-PCB												
8082A, PCB Liquids "As Received"												
Aroclor-1016	U	0.102	0.0338	0.102	ug/L	0.00102	1	YS1	08/15/23	1804	2476203	8
Aroclor-1221	U	0.102	0.0338	0.102	ug/L	0.00102	1					
Aroclor-1232	U	0.102	0.0338	0.102	ug/L	0.00102	1					
Aroclor-1242	U	0.102	0.0338	0.102	ug/L	0.00102	1					
Aroclor-1248	U	0.102	0.0338	0.102	ug/L	0.00102	1					
Aroclor-1254	U	0.102	0.0338	0.102	ug/L	0.00102	1					
Aroclor-1260	U	0.102	0.0338	0.102	ug/L	0.00102	1					
Aroclor-1268	U	0.102	0.0338	0.102	ug/L	0.00102	1					
Aroclor-Total	U	0.102	0.0338	0.102	ug/L	0.00102	1					
Solids Analysis												
160.1, Dissolved Solids "As Received"												
Total Dissolved Solids		354	2.38	10.0	mg/L			CH6	07/20/23	1020	2462095	9

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Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW362UG4-23 Project: FRNP00507
Sample ID: 629613009 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												
COD	U	20.0	8.95	20.0	mg/L		1	JW2	07/19/23	1705	2461639	10
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	PXY1	07/20/23	1559	2462233	11
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	U	5.00	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					

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Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW362UG4-23 Project: FRNP00507
Sample ID: 629613009 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene		4.59	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9010C Distillation	SW846 9010C Prep	ES2	07/20/23	1038	2461620
SW846 8011 PREP	8011 Prep	LOF	07/20/23	1251	2461591
SW846 3535A	SW3535A PCB SPE Extraction	LW1	08/15/23	0520	2476202

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8011	
2	SW846 9060A	
3	SW846 9012B	
4	SW846 9020B	
5	EPA 300.0	
6	SW846 9056A	
7	SW846 9056A	
8	SW846 3535A/8082A	
9	EPA 160.1	
10	EPA 410.4	
11	SW846 8260D	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits

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Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW362UG4-23	Project:	FRNP00507
Sample ID:	629613009	Client ID:	FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	7.37 ug/L	6.72	110	(46%-159%)
Decachlorobiphenyl	8082A, PCB Liquids "As Received"	0.168 ug/L	0.203	83	(32%-135%)
4cmx	8082A, PCB Liquids "As Received"	0.125 ug/L	0.203	61	(26%-108%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	47.5 ug/L	50.0	95	(72%-125%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	51.3 ug/L	50.0	103	(73%-129%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	48.9 ug/L	50.0	98	(75%-123%)

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW361UG4-23	Project:	FRNP00507
Sample ID:	629613010	Client ID:	FRNP005
Matrix:	WG		
Collect Date:	18-JUL-23 08:35		
Receive Date:	19-JUL-23		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Dissolved Metals (3 Elements) "As Received"												
Barium		0.0846	0.000670	0.00400	mg/L	1.00	1	PRB	08/13/23	0411	2461874	1
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Uranium		0.00358	0.0000670	0.000200	mg/L	1.00	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	EXF1	07/25/23	1510	2461873
EPA 160	Laboratory Filtration	RXB5	07/19/23	1435	2461675

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3005A/6020B	

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW361UG4-23	Project:	FRNP00507
Sample ID:	629613011	Client ID:	FRNP005
Matrix:	WG		
Collect Date:	18-JUL-23 08:35		
Receive Date:	19-JUL-23		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	U	0.0191	0.00860	0.0191	ug/L	0.955	1	LOF	07/20/23	1951	2461592	1
Carbon Analysis												
9060A, Total Organic Carbon "As Received"												
Total Organic Carbon Average	U	2.00	0.330	2.00	mg/L		1	RM3	07/21/23	2206	2462371	2
Flow Injection Analysis												
9012B, Cyanide, Total "As Received"												
Cyanide, Total	U	0.200	0.00167	0.200	mg/L	1.00	1	AXH3	07/20/23	1238	2461621	3
Halogen Analysis												
9020B, TOX (Organic Halogen) "As Received"												
Total Organic Halogens	J	3.60	3.33	10.0	ug/L		1	RM3	08/04/23	1725	2471469	4
Ion Chromatography												
300.0, Iodide in Liquid "As Received"												
Iodide	U	0.500	0.167	0.500	mg/L		1	LXA2	07/19/23	1834	2461882	5
SW846 9056A Anions (5 elements) "As Received"												
Chloride	JW	37.3	0.335	250	mg/L		5	JLD1	07/19/23	2330	2461498	6
Nitrate-N	J	1.13	0.165	10.0	mg/L		5					
Sulfate		80.6	0.665	2.00	mg/L		5					
Bromide		0.542	0.0670	0.200	mg/L		1	JLD1	07/19/23	1500	2461498	7
Fluoride	J	0.145	0.0330	4.00	mg/L		1					
Semi-Volatiles-PCB												
8082A, PCB Liquids "As Received"												
Aroclor-1016	U	0.0987	0.0329	0.0987	ug/L	0.000987	1	YS1	08/15/23	1816	2476203	8
Aroclor-1221	U	0.0987	0.0329	0.0987	ug/L	0.000987	1					
Aroclor-1232	U	0.0987	0.0329	0.0987	ug/L	0.000987	1					
Aroclor-1242	U	0.0987	0.0329	0.0987	ug/L	0.000987	1					
Aroclor-1248	U	0.0987	0.0329	0.0987	ug/L	0.000987	1					
Aroclor-1254	U	0.0987	0.0329	0.0987	ug/L	0.000987	1					
Aroclor-1260	U	0.0987	0.0329	0.0987	ug/L	0.000987	1					
Aroclor-1268	U	0.0987	0.0329	0.0987	ug/L	0.000987	1					
Aroclor-Total	U	0.0987	0.0329	0.0987	ug/L	0.000987	1					
Solids Analysis												
160.1, Dissolved Solids "As Received"												
Total Dissolved Solids		272	2.38	10.0	mg/L			CH6	07/20/23	1020	2462095	9

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Certificate of Analysis

Report Date: November 2, 2023

Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW361UG4-23 Project: FRNP00507
Sample ID: 629613011 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												
COD	U	20.0	8.95	20.0	mg/L		1	JW2	07/19/23	1705	2461639	10
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	PXY1	07/20/23	1627	2462233	11
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	U	5.00	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					

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Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW361UG4-23 Project: FRNP00507
Sample ID: 629613011 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene		1.78	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3535A	SW3535A PCB SPE Extraction	LW1	08/15/23	0520	2476202
SW846 9010C Distillation	SW846 9010C Prep	ES2	07/20/23	1038	2461620
SW846 8011 PREP	8011 Prep	LOF	07/20/23	1251	2461591

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8011	
2	SW846 9060A	
3	SW846 9012B	
4	SW846 9020B	
5	EPA 300.0	
6	SW846 9056A	
7	SW846 9056A	
8	SW846 3535A/8082A	
9	EPA 160.1	
10	EPA 410.4	
11	SW846 8260D	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits

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Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW361UG4-23	Project:	FRNP00507
Sample ID:	629613011	Client ID:	FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	7.52 ug/L	6.82	110	(46%-159%)
Decachlorobiphenyl	8082A, PCB Liquids "As Received"	0.186 ug/L	0.197	94	(32%-135%)
4cmx	8082A, PCB Liquids "As Received"	0.129 ug/L	0.197	65	(26%-108%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	47.1 ug/L	50.0	94	(72%-125%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	49.3 ug/L	50.0	99	(73%-129%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	49.3 ug/L	50.0	99	(75%-123%)

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW362UG4-23	Project:	FRNP00507
Sample ID:	629613012	Client ID:	FRNP005
Matrix:	WG		
Collect Date:	18-JUL-23 09:16		
Receive Date:	19-JUL-23		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Dissolved Metals (3 Elements) "As Received"												
Barium		0.0637	0.000670	0.00400	mg/L	1.00	1	PRB	08/13/23	0418	2461874	1
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	EXF1	07/25/23	1510	2461873
EPA 160	Laboratory Filtration	RXB5	07/19/23	1435	2461675

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3005A/6020B	

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	FB1UG4-23	Project:	FRNP00507
Sample ID:	629613013	Client ID:	FRNP005
Matrix:	WATER		
Collect Date:	18-JUL-23 10:55		
Receive Date:	19-JUL-23		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	U	0.0191	0.00859	0.0191	ug/L	0.955	1	LOF	07/20/23	2154	2461592	1
Ion Chromatography												
300.0, Iodide in Liquid "As Received"												
Iodide	U	0.500	0.167	0.500	mg/L		1	LXA2	07/19/23	1921	2461882	2
Mercury Analysis-CVAA												
7470, Mercury Liquid "As Received"												
Mercury	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	JP2	07/21/23	1148	2461907	3
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Sodium	U	0.250	0.0800	0.250	mg/L	1.00	1	BCD1	08/15/23	0802	2475831	4
Antimony	U	0.00300	0.00100	0.00300	mg/L	1.00	1	PRB	08/12/23	2230	2461874	5
Rhodium	U	0.00500	0.00160	0.00500	mg/L	1.00	1	PRB	08/13/23	1339	2461874	6
Tantalum	UN	0.00500	0.00100	0.00500	mg/L	1.00	1					
Aluminum	U	0.0500	0.0193	0.0500	mg/L	1.00	1	PRB	08/13/23	0422	2461874	7
Arsenic	U	0.00500	0.00200	0.00500	mg/L	1.00	1					
Barium	J	0.000694	0.000670	0.00400	mg/L	1.00	1					
Beryllium	U	0.000500	0.000200	0.000500	mg/L	1.00	1					
Boron	U	0.0150	0.00520	0.0150	mg/L	1.00	1					
Cadmium	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Calcium	U	0.200	0.0800	0.200	mg/L	1.00	1					
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Cobalt	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Copper	U	0.00200	0.000300	0.00200	mg/L	1.00	1					
Iron	U	0.100	0.0330	0.100	mg/L	1.00	1					
Lead	U	0.00200	0.000500	0.00200	mg/L	1.00	1					
Magnesium	U	0.0300	0.0100	0.0300	mg/L	1.00	1					
Manganese	U	0.00500	0.00100	0.00500	mg/L	1.00	1					
Molybdenum	U	0.00100	0.000200	0.00100	mg/L	1.00	1					
Nickel	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Potassium	U	0.300	0.0800	0.300	mg/L	1.00	1					
Selenium	U	0.00500	0.00150	0.00500	mg/L	1.00	1					
Silver	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Thallium	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					

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Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: FB1UG4-23 Project: FRNP00507
Sample ID: 629613013 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Vanadium	U	0.0200	0.00330	0.0200	mg/L	1.00	1					
Zinc	U	0.0200	0.00330	0.0200	mg/L	1.00	1					
Semi-Volatiles-PCB												
8082A, PCB Liquids "As Received"												
Aroclor-1016	U	0.103	0.0344	0.103	ug/L	0.00103	1	YS1	08/15/23	1828	2476203	8
Aroclor-1221	U	0.103	0.0344	0.103	ug/L	0.00103	1					
Aroclor-1232	U	0.103	0.0344	0.103	ug/L	0.00103	1					
Aroclor-1242	U	0.103	0.0344	0.103	ug/L	0.00103	1					
Aroclor-1248	U	0.103	0.0344	0.103	ug/L	0.00103	1					
Aroclor-1254	U	0.103	0.0344	0.103	ug/L	0.00103	1					
Aroclor-1260	U	0.103	0.0344	0.103	ug/L	0.00103	1					
Aroclor-1268	U	0.103	0.0344	0.103	ug/L	0.00103	1					
Aroclor-Total	U	0.103	0.0344	0.103	ug/L	0.00103	1					
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	PXY1	07/20/23	1655	2462233	9
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	J	2.35	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					

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Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	FB1UG4-23	Project:	FRNP00507
Sample ID:	629613013	Client ID:	FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene	U	1.00	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	PRB	08/14/23	1525	2475830
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	EXF1	07/20/23	1210	2461903
SW846 3005A	ICP-MS 3005A PREP	EXF1	07/25/23	1510	2461873
SW846 3535A	SW3535A PCB SPE Extraction	LW1	08/15/23	0520	2476202
SW846 8011 PREP	8011 Prep	LOF	07/20/23	1251	2461591

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Certificate of Analysis

Report Date: November 2, 2023

Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: FB1UG4-23 Project: FRNP00507
Sample ID: 629613013 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8011	
2	EPA 300.0	
3	SW846 7470A	
4	SW846 3005A/6020B	
5	SW846 3005A/6020B	
6	SW846 3005A/6020B	
7	SW846 3005A/6020B	
8	SW846 3535A/8082A	
9	SW846 8260D	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	7.28 ug/L	6.82	107	(46%-159%)
Decachlorobiphenyl	8082A, PCB Liquids "As Received"	0.163 ug/L	0.206	79	(32%-135%)
4cmx	8082A, PCB Liquids "As Received"	0.135 ug/L	0.206	65	(26%-108%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	47.6 ug/L	50.0	95	(72%-125%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	50.1 ug/L	50.0	100	(73%-129%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	49.4 ug/L	50.0	99	(75%-123%)

Notes:

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Lc/LC: Critical Level
PF: Prep Factor
RL: Reporting Limit
SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	RI1UG4-23	Project:	FRNP00507
Sample ID:	629613014	Client ID:	FRNP005
Matrix:	WATER		
Collect Date:	18-JUL-23 06:50		
Receive Date:	19-JUL-23		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	U	0.0189	0.00851	0.0189	ug/L	0.946	1	LOF	07/20/23	2219	2461592	1
Ion Chromatography												
300.0, Iodide in Liquid "As Received"												
Iodide	U	0.500	0.167	0.500	mg/L		1	LXA2	07/19/23	1934	2461882	2
Mercury Analysis-CVAA												
7470, Mercury Liquid "As Received"												
Mercury	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	JP2	07/21/23	1150	2461907	3
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Aluminum	U	0.0500	0.0193	0.0500	mg/L	1.00	1	PRB	08/13/23	0426	2461874	4
Arsenic	U	0.00500	0.00200	0.00500	mg/L	1.00	1					
Barium	U	0.00400	0.000670	0.00400	mg/L	1.00	1					
Beryllium	U	0.000500	0.000200	0.000500	mg/L	1.00	1					
Boron	U	0.0150	0.00520	0.0150	mg/L	1.00	1					
Cadmium	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Calcium	U	0.200	0.0800	0.200	mg/L	1.00	1					
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Cobalt	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Copper		0.00280	0.000300	0.00200	mg/L	1.00	1					
Iron	U	0.100	0.0330	0.100	mg/L	1.00	1					
Lead	U	0.00200	0.000500	0.00200	mg/L	1.00	1					
Magnesium	U	0.0300	0.0100	0.0300	mg/L	1.00	1					
Manganese	U	0.00500	0.00100	0.00500	mg/L	1.00	1					
Molybdenum	U	0.00100	0.000200	0.00100	mg/L	1.00	1					
Nickel		0.00295	0.000600	0.00200	mg/L	1.00	1					
Potassium	U	0.300	0.0800	0.300	mg/L	1.00	1					
Selenium	U	0.00500	0.00150	0.00500	mg/L	1.00	1					
Silver	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Thallium	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					
Vanadium	U	0.0200	0.00330	0.0200	mg/L	1.00	1					
Zinc	J	0.00957	0.00330	0.0200	mg/L	1.00	1					
Sodium	U	0.250	0.0800	0.250	mg/L	1.00	1	BCD1	08/15/23	0804	2475831	5
Rhodium	U	0.00500	0.00160	0.00500	mg/L	1.00	1	PRB	08/13/23	1341	2461874	6

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Certificate of Analysis

Report Date: November 2, 2023

Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: RI1UG4-23 Project: FRNP00507
Sample ID: 629613014 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Tantalum	UN	0.00500	0.00100	0.00500	mg/L	1.00	1					
Antimony	U	0.00300	0.00100	0.00300	mg/L	1.00	1	PRB	08/12/23	2234	2461874	7
Semi-Volatiles-PCB												
8082A, PCB Liquids "As Received"												
Aroclor-1016	U	0.0969	0.0323	0.0969	ug/L	0.000969	1	YS1	08/15/23	1841	2476203	8
Aroclor-1221	U	0.0969	0.0323	0.0969	ug/L	0.000969	1					
Aroclor-1232	U	0.0969	0.0323	0.0969	ug/L	0.000969	1					
Aroclor-1242	U	0.0969	0.0323	0.0969	ug/L	0.000969	1					
Aroclor-1248	U	0.0969	0.0323	0.0969	ug/L	0.000969	1					
Aroclor-1254	U	0.0969	0.0323	0.0969	ug/L	0.000969	1					
Aroclor-1260	U	0.0969	0.0323	0.0969	ug/L	0.000969	1					
Aroclor-1268	U	0.0969	0.0323	0.0969	ug/L	0.000969	1					
Aroclor-Total	U	0.0969	0.0323	0.0969	ug/L	0.000969	1					
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	PXY1	07/20/23	1723	2462233	9
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	J	4.93	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					

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Report Date: November 2, 2023

Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: RI1UG4-23 Project: FRNP00507
Sample ID: 629613014 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene	U	1.00	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	EXF1	07/25/23	1510	2461873
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	EXF1	07/20/23	1210	2461903
SW846 3005A	ICP-MS 3005A PREP	PRB	08/14/23	1525	2475830
SW846 3535A	SW3535A PCB SPE Extraction	LW1	08/15/23	0520	2476202
SW846 8011 PREP	8011 Prep	LOF	07/20/23	1251	2461591

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Certificate of Analysis

Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	RI1UG4-23	Project:	FRNP00507
Sample ID:	629613014	Client ID:	FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8011	
2	EPA 300.0	
3	SW846 7470A	
4	SW846 3005A/6020B	
5	SW846 3005A/6020B	
6	SW846 3005A/6020B	
7	SW846 3005A/6020B	
8	SW846 3535A/8082A	
9	SW846 8260D	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	7.07 ug/L	6.75	105	(46%-159%)
Decachlorobiphenyl	8082A, PCB Liquids "As Received"	0.175 ug/L	0.194	90	(32%-135%)
4cmx	8082A, PCB Liquids "As Received"	0.130 ug/L	0.194	67	(26%-108%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	47.8 ug/L	50.0	96	(72%-125%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	50.8 ug/L	50.0	102	(73%-129%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	48.6 ug/L	50.0	97	(75%-123%)

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	TB1UG4-23	Project:	FRNP00507
Sample ID:	629613015	Client ID:	FRNP005
Matrix:	WATER		
Collect Date:	18-JUL-23 06:45		
Receive Date:	19-JUL-23		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	U	0.0190	0.00856	0.0190	ug/L	0.951	1	LOF	07/20/23	2243	2461592	1
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	PXY1	07/20/23	1751	2462233	3
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	J	2.51	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					

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Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: TB1UG4-23 Project: FRNP00507
Sample ID: 629613015 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene	U	1.00	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8011 PREP	8011 Prep	LOF	07/20/23	1251	2461591

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8011	
2	SW846 8011	
3	SW846 8260D	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	7.52 ug/L	6.80	111	(46%-159%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	46.4 ug/L	50.0	93	(72%-125%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	50.4 ug/L	50.0	101	(73%-129%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	48.3 ug/L	50.0	97	(75%-123%)

Notes:

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Certificate of Analysis

Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	TB1UG4-23	Project:	FRNP00507
Sample ID:	629613015	Client ID:	FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW361UG4-23	Project:	FRNP00507
Sample ID:	629613016	Client ID:	FRNP005
Matrix:	WG		
Collect Date:	18-JUL-23 08:35		
Receive Date:	19-JUL-23		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Mercury Analysis-CVAA												
7470, Mercury Liquid "As Received"												
Mercury	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	JP2	07/21/23	1145	2461907	1
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Sodium		45.7	0.0800	0.250	mg/L	1.00	1	BCD1	08/15/23	0758	2475831	2
Aluminum	U	0.0500	0.0193	0.0500	mg/L	1.00	1	PRB	08/13/23	0408	2461874	3
Arsenic	U	0.00500	0.00200	0.00500	mg/L	1.00	1					
Barium		0.0647	0.000670	0.00400	mg/L	1.00	1					
Beryllium	U	0.000500	0.000200	0.000500	mg/L	1.00	1					
Boron		0.184	0.00520	0.0150	mg/L	1.00	1					
Cadmium	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Calcium		34.4	0.0800	0.200	mg/L	1.00	1					
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Cobalt	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Copper		0.00206	0.000300	0.00200	mg/L	1.00	1					
Iron	U	0.100	0.0330	0.100	mg/L	1.00	1					
Lead	U	0.00200	0.000500	0.00200	mg/L	1.00	1					
Magnesium		15.0	0.0100	0.0300	mg/L	1.00	1					
Manganese		0.00657	0.00100	0.00500	mg/L	1.00	1					
Molybdenum	U	0.00100	0.000200	0.00100	mg/L	1.00	1					
Nickel	J	0.00144	0.000600	0.00200	mg/L	1.00	1					
Potassium		2.39	0.0800	0.300	mg/L	1.00	1					
Selenium	J	0.00161	0.00150	0.00500	mg/L	1.00	1					
Silver	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Thallium	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					
Vanadium	U	0.0200	0.00330	0.0200	mg/L	1.00	1					
Zinc	J	0.00711	0.00330	0.0200	mg/L	1.00	1					
Rhodium	U	0.00500	0.00160	0.00500	mg/L	1.00	1	PRB	08/13/23	1335	2461874	4
Tantalum	UN	0.00500	0.00100	0.00500	mg/L	1.00	1					
Antimony	U	0.00300	0.00100	0.00300	mg/L	1.00	1	PRB	08/12/23	2216	2461874	5

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	EXF1	07/25/23	1510	2461873
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	EXF1	07/20/23	1210	2461903
SW846 3005A	ICP-MS 3005A PREP	PRB	08/14/23	1525	2475830

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Certificate of Analysis

Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW361UG4-23	Project:	FRNP00507
Sample ID:	629613016	Client ID:	FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7470A	
2	SW846 3005A/6020B	
3	SW846 3005A/6020B	
4	SW846 3005A/6020B	
5	SW846 3005A/6020B	

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW362UG4-23	Project:	FRNP00507
Sample ID:	629613017	Client ID:	FRNP005
Matrix:	WG		
Collect Date:	18-JUL-23 09:16		
Receive Date:	19-JUL-23		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Mercury Analysis-CVAA												
7470, Mercury Liquid "As Received"												
Mercury	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	JP2	07/21/23	1146	2461907	1
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Aluminum		0.235	0.0193	0.0500	mg/L	1.00	1	PRB	08/13/23	0415	2461874	2
Arsenic	U	0.00500	0.00200	0.00500	mg/L	1.00	1					
Barium		0.0848	0.000670	0.00400	mg/L	1.00	1					
Beryllium	U	0.000500	0.000200	0.000500	mg/L	1.00	1					
Boron		0.0198	0.00520	0.0150	mg/L	1.00	1					
Cadmium	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Calcium		18.2	0.0800	0.200	mg/L	1.00	1					
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Cobalt	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Copper	J	0.00195	0.000300	0.00200	mg/L	1.00	1					
Iron		0.183	0.0330	0.100	mg/L	1.00	1					
Lead	U	0.00200	0.000500	0.00200	mg/L	1.00	1					
Magnesium		8.03	0.0100	0.0300	mg/L	1.00	1					
Manganese	J	0.00286	0.00100	0.00500	mg/L	1.00	1					
Molybdenum		0.00124	0.000200	0.00100	mg/L	1.00	1					
Nickel	J	0.00177	0.000600	0.00200	mg/L	1.00	1					
Potassium		0.337	0.0800	0.300	mg/L	1.00	1					
Selenium	U	0.00500	0.00150	0.00500	mg/L	1.00	1					
Silver	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Thallium	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Uranium		0.00350	0.0000670	0.000200	mg/L	1.00	1					
Vanadium	U	0.0200	0.00330	0.0200	mg/L	1.00	1					
Zinc	U	0.0200	0.00330	0.0200	mg/L	1.00	1					
Antimony	U	0.00300	0.00100	0.00300	mg/L	1.00	1	PRB	08/12/23	2223	2461874	3
Rhodium	U	0.00500	0.00160	0.00500	mg/L	1.00	1	PRB	08/13/23	1337	2461874	4
Tantalum	UN	0.00500	0.00100	0.00500	mg/L	1.00	1					
Sodium		127	0.800	2.50	mg/L	1.00	10	BCD1	08/15/23	0800	2475831	5

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	PRB	08/14/23	1525	2475830
SW846 3005A	ICP-MS 3005A PREP	EXF1	07/25/23	1510	2461873
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	EXF1	07/20/23	1210	2461903

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Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW362UG4-23	Project:	FRNP00507
Sample ID:	629613017	Client ID:	FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7470A	
2	SW846 3005A/6020B	
3	SW846 3005A/6020B	
4	SW846 3005A/6020B	
5	SW846 3005A/6020B	

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road
Kevil, Kentucky 42053
Report Date: November 2, 2023
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW357UG4-23
Sample ID: 629613001
Matrix: WG
Collect Date: 18-JUL-23
Receive Date: 19-JUL-23
Collector: Client
Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Alpha Spec Analysis														
AN-1418 AlphaSpec Ra226, Liquid "As Received"														
Radium-226	U	-0.0491	+/-0.166	0.431	+/-0.166	5.00	pCi/L			CM4	07/28/23	0850	2462144	1
Th-01-RC M, Th Isotopes, Liquid "As Received"														
Thorium-230	U	1.09	+/-1.64	2.61	+/-1.66	50.0	pCi/L			CM4	07/25/23	1121	2462143	2
Thorium-232	U	-0.0425	+/-0.628	1.31	+/-0.630		pCi/L							
Rad Gas Flow Proportional Counting														
904.0Mod, Ra228, Liquid "As Received"														
Radium-228	U	1.89	+/-2.70	4.64	+/-2.74	4.99	pCi/L			JE1	08/07/23	1254	2463317	3
905.0Mod, Sr90, liquid "As Received"														
Strontium-90	U	0.0214	+/-2.14	4.31	+/-2.14	8.00	pCi/L			ST2	07/24/23	1442	2462305	4
9310, Alpha/Beta Activity, liquid "As Received"														
Alpha	U	2.93	+/-4.49	7.89	+/-4.52	15.0	pCi/L			KP1	07/22/23	1325	2462455	5
Beta		17.0	+/-5.62	6.64	+/-6.33	50.0	pCi/L							
Rad Liquid Scintillation Analysis														
906.0M, Tritium Dist, Liquid "As Received"														
Tritium	U	-57.5	+/-126	233	+/-126	300	pCi/L			GS3	07/27/23	1912	2463722	6
Tc-02-RC-MOD, Tc99, Liquid "As Received"														
Technetium-99		46.1	+/-12.1	18.6	+/-13.1	25.0	pCi/L			AG2	07/30/23	1603	2462082	7

The following Analytical Methods were performed

Method	Description
1	Eichrom Industries, AN-1418
2	DOE EML HASL-300, Th-01-RC Modified
3	EPA 904.0/SW846 9320 Modified
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
5	EPA 900.0/SW846 9310
6	EPA 906.0 Modified
7	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Barium-133 Tracer	AN-1418 AlphaSpec Ra226, Liquid "As Received"	2462144	92.7	(30%-110%)
Thorium-229 Tracer	Th-01-RC M, Th Isotopes, Liquid "As Received"	2462143	84.8	(30%-110%)
Barium-133 Tracer	904.0Mod, Ra228, Liquid "As Received"	2463317	81.4	(30%-110%)
Strontium Carrier	905.0Mod, Sr90, liquid "As Received"	2462305	82.4	(30%-110%)
Technetium-99m Tracer	Tc-02-RC-MOD, Tc99, Liquid "As Received"	2462082	93.3	(30%-110%)

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Company : Four Rivers Nuclear Partnership, LLC
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Report Date: November 2, 2023

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW357UG4-23
Sample ID: 629613001

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	**Test**							**Batch ID**		**Recovery%**	**Acceptable Limits**			

Notes:

The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

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Company : Four Rivers Nuclear Partnership, LLC
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Kevil, Kentucky 42053

Report Date: November 2, 2023

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW358DUG4-23
Sample ID: 629613003
Matrix: WG
Collect Date: 18-JUL-23
Receive Date: 19-JUL-23
Collector: Client

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Alpha Spec Analysis														
AN-1418 AlphaSpec Ra226, Liquid "As Received"														
Radium-226	U	0.161	+/-0.238	0.348	+/-0.239	5.00	pCi/L			CM4	07/28/23	0850	2462144	1
Th-01-RC M, Th Isotopes, Liquid "As Received"														
Thorium-230	U	1.73	+/-1.89	2.80	+/-1.91	50.0	pCi/L			CM4	07/25/23	1121	2462143	2
Thorium-232	U	-0.0427	+/-0.572	1.21	+/-0.573		pCi/L							
Rad Gas Flow Proportional Counting														
904.0Mod, Ra228, Liquid "As Received"														
Radium-228	U	3.86	+/-2.98	4.77	+/-3.13	4.99	pCi/L			JE1	08/07/23	1254	2463317	3
905.0Mod, Sr90, liquid "As Received"														
Strontium-90	U	0.101	+/-3.31	6.37	+/-3.31	8.00	pCi/L			ST2	07/24/23	1443	2462305	4
9310, Alpha/Beta Activity, liquid "As Received"														
Alpha	U	0.828	+/-3.94	8.14	+/-3.94	15.0	pCi/L			KP1	07/22/23	1325	2462455	5
Beta		27.3	+/-6.93	7.47	+/-8.23	50.0	pCi/L							
Rad Liquid Scintillation Analysis														
906.0M, Tritium Dist, Liquid "As Received"														
Tritium	U	-129	+/-119	229	+/-119	300	pCi/L			GS3	07/27/23	1949	2463722	6
Tc-02-RC-MOD, Tc99, Liquid "As Received"														
Technetium-99		35.9	+/-11.7	18.4	+/-12.4	25.0	pCi/L			AG2	07/30/23	1639	2462082	7

The following Analytical Methods were performed

Method	Description
1	Eichrom Industries, AN-1418
2	DOE EML HASL-300, Th-01-RC Modified
3	EPA 904.0/SW846 9320 Modified
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
5	EPA 900.0/SW846 9310
6	EPA 906.0 Modified
7	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Barium-133 Tracer	AN-1418 AlphaSpec Ra226, Liquid "As Received"	2462144	92.6	(30%-110%)
Thorium-229 Tracer	Th-01-RC M, Th Isotopes, Liquid "As Received"	2462143	91.9	(30%-110%)
Barium-133 Tracer	904.0Mod, Ra228, Liquid "As Received"	2463317	82.1	(30%-110%)
Strontium Carrier	905.0Mod, Sr90, liquid "As Received"	2462305	70.6	(30%-110%)
Technetium-99m Tracer	Tc-02-RC-MOD, Tc99, Liquid "As Received"	2462082	94.8	(30%-110%)

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Report Date: November 2, 2023

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW358DUG4-23
Sample ID: 629613003

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	**Test**							**Batch ID**		**Recovery%**	**Acceptable Limits**			

Notes:

The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

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Report Date: November 2, 2023

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW358UG4-23
Sample ID: 629613005
Matrix: WG
Collect Date: 18-JUL-23
Receive Date: 19-JUL-23
Collector: Client

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Alpha Spec Analysis														
AN-1418 AlphaSpec Ra226, Liquid "As Received"														
Radium-226	U	0.118	+/-0.234	0.380	+/-0.234	5.00	pCi/L			CM4	07/28/23	0850	2462144	1
Th-01-RC M, Th Isotopes, Liquid "As Received"														
Thorium-230	U	1.47	+/-1.73	2.56	+/-1.75	50.0	pCi/L			CM4	07/25/23	1121	2462143	2
Thorium-232	U	0.189	+/-1.04	2.09	+/-1.04		pCi/L							
Rad Gas Flow Proportional Counting														
904.0Mod, Ra228, Liquid "As Received"														
Radium-228		4.93	+/-2.94	4.22	+/-3.20	4.99	pCi/L			JE1	08/09/23	1330	2463317	3
905.0Mod, Sr90, liquid "As Received"														
Strontium-90	U	-0.847	+/-3.92	7.32	+/-3.92	8.00	pCi/L			ST2	07/24/23	1443	2462305	4
9310, Alpha/Beta Activity, liquid "As Received"														
Alpha	U	4.81	+/-4.84	7.52	+/-4.92	15.0	pCi/L			KP1	07/22/23	1325	2462455	5
Beta		14.1	+/-4.94	5.74	+/-5.48	50.0	pCi/L							
Rad Liquid Scintillation Analysis														
906.0M, Tritium Dist, Liquid "As Received"														
Tritium	U	20.8	+/-131	232	+/-131	300	pCi/L			GS3	07/27/23	2025	2463722	6
Tc-02-RC-MOD, Tc99, Liquid "As Received"														
Technetium-99		47.0	+/-12.2	18.7	+/-13.3	25.0	pCi/L			AG2	07/30/23	1716	2462082	7

The following Analytical Methods were performed

Method	Description
1	Eichrom Industries, AN-1418
2	DOE EML HASL-300, Th-01-RC Modified
3	EPA 904.0/SW846 9320 Modified
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
5	EPA 900.0/SW846 9310
6	EPA 906.0 Modified
7	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Barium-133 Tracer	AN-1418 AlphaSpec Ra226, Liquid "As Received"	2462144	95.3	(30%-110%)
Thorium-229 Tracer	Th-01-RC M, Th Isotopes, Liquid "As Received"	2462143	97.4	(30%-110%)
Barium-133 Tracer	904.0Mod, Ra228, Liquid "As Received"	2463317	69.2	(30%-110%)
Strontium Carrier	905.0Mod, Sr90, liquid "As Received"	2462305	80	(30%-110%)
Technetium-99m Tracer	Tc-02-RC-MOD, Tc99, Liquid "As Received"	2462082	95.9	(30%-110%)

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Report Date: November 2, 2023

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW358UG4-23
Sample ID: 629613005

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	**Test**							**Batch ID**		**Recovery%**	**Acceptable Limits**			

Notes:

The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

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Address : 5600 Hobbs Road

Kevil, Kentucky 42053

Report Date: November 2, 2023

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW360UG4-23
Sample ID: 629613007
Matrix: WG
Collect Date: 18-JUL-23
Receive Date: 19-JUL-23
Collector: Client

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Alpha Spec Analysis														
AN-1418 AlphaSpec Ra226, Liquid "As Received"														
Radium-226	U	0.0840	+/-0.193	0.306	+/-0.193	5.00	pCi/L			CM4	07/28/23	0850	2462144	1
Th-01-RC M, Th Isotopes, Liquid "As Received"														
Thorium-230	U	0.719	+/-2.66	5.02	+/-2.67	50.0	pCi/L			CM4	07/27/23	0852	2462143	2
Thorium-232	U	0.639	+/-2.17	3.44	+/-2.17		pCi/L							
Rad Gas Flow Proportional Counting														
904.0Mod, Ra228, Liquid "As Received"														
Radium-228	U	1.66	+/-2.71	4.70	+/-2.74	4.99	pCi/L			JE1	08/07/23	1255	2463317	3
905.0Mod, Sr90, liquid "As Received"														
Strontium-90	U	-1.01	+/-2.52	5.06	+/-2.52	8.00	pCi/L			ST2	07/24/23	1443	2462305	4
9310, Alpha/Beta Activity, liquid "As Received"														
Alpha	U	1.55	+/-3.40	6.64	+/-3.41	15.0	pCi/L			KP1	07/22/23	1325	2462455	5
Beta	U	2.40	+/-4.12	7.18	+/-4.14	50.0	pCi/L							
Rad Liquid Scintillation Analysis														
906.0M, Tritium Dist, Liquid "As Received"														
Tritium	U	23.1	+/-132	234	+/-133	300	pCi/L			GS3	07/27/23	2102	2463722	6
Tc-02-RC-MOD, Tc99, Liquid "As Received"														
Technetium-99	U	8.03	+/-10.9	18.5	+/-11.0	25.0	pCi/L			AG2	07/30/23	1752	2462082	7

The following Analytical Methods were performed

Method	Description
1	Eichrom Industries, AN-1418
2	DOE EML HASL-300, Th-01-RC Modified
3	EPA 904.0/SW846 9320 Modified
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
5	EPA 900.0/SW846 9310
6	EPA 906.0 Modified
7	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Barium-133 Tracer	AN-1418 AlphaSpec Ra226, Liquid "As Received"	2462144	94.9	(30%-110%)
Thorium-229 Tracer	Th-01-RC M, Th Isotopes, Liquid "As Received"	2462143	93.3	(30%-110%)
Barium-133 Tracer	904.0Mod, Ra228, Liquid "As Received"	2463317	79.5	(30%-110%)
Strontium Carrier	905.0Mod, Sr90, liquid "As Received"	2462305	101	(30%-110%)
Technetium-99m Tracer	Tc-02-RC-MOD, Tc99, Liquid "As Received"	2462082	96.6	(30%-110%)

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Certificate of Analysis

Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053

Report Date: November 2, 2023

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW360UG4-23
Sample ID: 629613007

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	**Test**							**Batch ID**		**Recovery%**	**Acceptable Limits**			

Notes:

The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

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Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road
Kevil, Kentucky 42053

Report Date: November 2, 2023

Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW362UG4-23
Sample ID: 629613009
Matrix: WG
Collect Date: 18-JUL-23
Receive Date: 19-JUL-23
Collector: Client

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Liquid Scintillation Analysis														
906.0M, Tritium Dist, Liquid "As Received"														
Tritium	U	-22.0	+/-128	232	+/-128	300	pCi/L			GS3	07/27/23	2139	2463722	1
Tc-02-RC-MOD, Tc99, Liquid "As Received"														

The following Analytical Methods were performed

Method	Description
1	EPA 906.0 Modified
2	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

Notes:

The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

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Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road
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Report Date: November 2, 2023

Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW361UG4-23
Sample ID: 629613011
Matrix: WG
Collect Date: 18-JUL-23
Receive Date: 19-JUL-23
Collector: Client

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Liquid Scintillation Analysis														
906.0M, Tritium Dist, Liquid "As Received"														
Tritium	U	-118	+/-122	234	+/-122	300	pCi/L			GS3	07/27/23	2216	2463722	1
Tc-02-RC-MOD, Tc99, Liquid "As Received"														

The following Analytical Methods were performed

Method	Description
1	EPA 906.0 Modified
2	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

Notes:

The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

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Report Date: November 2, 2023

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: FB1UG4-23
Sample ID: 629613013
Matrix: WATER
Collect Date: 18-JUL-23
Receive Date: 19-JUL-23
Collector: Client

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Alpha Spec Analysis														
AN-1418 AlphaSpec Ra226, Liquid "As Received"														
Radium-226	U	-0.0116	+/-0.174	0.407	+/-0.174	5.00	pCi/L			CM4	07/28/23	0850	2462696	1
Th-01-RC M, Th Isotopes, Liquid "As Received"														
Thorium-230	U	1.22	+/-2.06	3.21	+/-2.08	50.0	pCi/L			CM4	07/26/23	0855	2462143	2
Thorium-232	U	-0.0431	+/-0.938	1.86	+/-0.940		pCi/L							
Rad Gas Flow Proportional Counting														
904.0Mod, Ra228, Liquid "As Received"														
Radium-228	U	-0.771	+/-2.35	4.45	+/-2.35	4.99	pCi/L			JE1	08/07/23	1255	2463317	3
905.0Mod, Sr90, liquid "As Received"														
Strontium-90	U	-1.07	+/-4.09	7.96	+/-4.09	8.00	pCi/L			ST2	07/31/23	1419	2466689	4
9310, Alpha/Beta Activity, liquid "As Received"														
Alpha	U	2.49	+/-2.95	4.74	+/-2.97	15.0	pCi/L			KP1	07/25/23	1208	2462455	5
Beta	U	-1.53	+/-3.62	7.32	+/-3.62	50.0	pCi/L							
Rad Liquid Scintillation Analysis														
906.0M, Tritium Dist, Liquid "As Received"														
Tritium	U	-60.3	+/-121	223	+/-121	300	pCi/L			GS3	07/27/23	2253	2463722	6
Tc-02-RC-MOD, Tc99, Liquid "As Received"														
Technetium-99	U	16.0	+/-11.9	19.8	+/-12.1	25.0	pCi/L			AG2	07/30/23	1941	2462082	7

The following Analytical Methods were performed

Method	Description
1	Eichrom Industries, AN-1418
2	DOE EML HASL-300, Th-01-RC Modified
3	EPA 904.0/SW846 9320 Modified
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
5	EPA 900.0/SW846 9310
6	EPA 906.0 Modified
7	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Barium-133 Tracer	AN-1418 AlphaSpec Ra226, Liquid "As Received"	2462696	96.9	(30%-110%)
Thorium-229 Tracer	Th-01-RC M, Th Isotopes, Liquid "As Received"	2462143	75.5	(30%-110%)
Barium-133 Tracer	904.0Mod, Ra228, Liquid "As Received"	2463317	82.4	(30%-110%)
Strontium Carrier	905.0Mod, Sr90, liquid "As Received"	2466689	68.2	(30%-110%)
Technetium-99m Tracer	Tc-02-RC-MOD, Tc99, Liquid "As Received"	2462082	90.5	(30%-110%)

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Report Date: November 2, 2023

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: FB1UG4-23
Sample ID: 629613013

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	**Test**							**Batch ID**		**Recovery%**	**Acceptable Limits**			

Notes:

The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

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Address : 5600 Hobbs Road

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Report Date: November 2, 2023

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: RI1UG4-23
Sample ID: 629613014
Matrix: WATER
Collect Date: 18-JUL-23
Receive Date: 19-JUL-23
Collector: Client

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Alpha Spec Analysis														
AN-1418 AlphaSpec Ra226, Liquid "As Received"														
Radium-226	U	-0.108	+/-0.173	0.552	+/-0.173	5.00	pCi/L			CM4	07/28/23	0904	2462696	1
Th-01-RC M, Th Isotopes, Liquid "As Received"														
Thorium-230	U	0.602	+/-1.76	3.22	+/-1.77	50.0	pCi/L			CM4	07/26/23	0855	2462143	2
Thorium-232	U	0.400	+/-1.24	1.77	+/-1.24		pCi/L							
Rad Gas Flow Proportional Counting														
904.0Mod, Ra228, Liquid "As Received"														
Radium-228	U	-0.829	+/-2.15	4.24	+/-2.15	4.99	pCi/L			JE1	08/07/23	1550	2463317	3
905.0Mod, Sr90, liquid "As Received"														
Strontium-90	U	3.11	+/-3.53	5.89	+/-3.56	8.00	pCi/L			ST2	07/24/23	1443	2462305	4
9310, Alpha/Beta Activity, liquid "As Received"														
Alpha	U	0.769	+/-3.12	6.37	+/-3.12	15.0	pCi/L			KP1	07/22/23	1325	2462455	5
Beta	U	2.63	+/-4.21	7.27	+/-4.23	50.0	pCi/L							
Rad Liquid Scintillation Analysis														
906.0M, Tritium Dist, Liquid "As Received"														
Tritium	U	8.10	+/-129	229	+/-129	300	pCi/L			GS3	07/27/23	2329	2463722	6
Tc-02-RC-MOD, Tc99, Liquid "As Received"														
Technetium-99	U	11.0	+/-10.9	18.3	+/-11.0	25.0	pCi/L			AG2	07/30/23	2018	2462082	7

The following Analytical Methods were performed

Method	Description
1	Eichrom Industries, AN-1418
2	DOE EML HASL-300, Th-01-RC Modified
3	EPA 904.0/SW846 9320 Modified
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
5	EPA 900.0/SW846 9310
6	EPA 906.0 Modified
7	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Barium-133 Tracer	AN-1418 AlphaSpec Ra226, Liquid "As Received"	2462696	95.8	(30%-110%)
Thorium-229 Tracer	Th-01-RC M, Th Isotopes, Liquid "As Received"	2462143	77.1	(30%-110%)
Barium-133 Tracer	904.0Mod, Ra228, Liquid "As Received"	2463317	79.3	(30%-110%)
Strontium Carrier	905.0Mod, Sr90, liquid "As Received"	2462305	61.2	(30%-110%)
Technetium-99m Tracer	Tc-02-RC-MOD, Tc99, Liquid "As Received"	2462082	94.7	(30%-110%)

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Report Date: November 2, 2023

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: RI1UG4-23
Sample ID: 629613014

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	**Test**							**Batch ID**		**Recovery%**	**Acceptable Limits**			

Notes:

The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

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Certificate of Analysis

Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road
Kevil, Kentucky 42053

Report Date: November 2, 2023

Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW361UG4-23
Sample ID: 629613016
Matrix: WG
Collect Date: 18-JUL-23
Receive Date: 19-JUL-23
Collector: Client

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Alpha Spec Analysis														
AN-1418 AlphaSpec Ra226, Liquid "As Received"														
Radium-226	U	0.0321	+/-0.207	0.424	+/-0.207	5.00	pCi/L			CM4	07/28/23	0850	2462144	1
Th-01-RC M, Th Isotopes, Liquid "As Received"														
Thorium-230	U	0.423	+/-1.71	3.33	+/-1.72	50.0	pCi/L			CM4	07/25/23	1121	2462143	2
Thorium-232	U	0.706	+/-1.47	2.16	+/-1.48		pCi/L							
Rad Gas Flow Proportional Counting														
904.0Mod, Ra228, Liquid "As Received"														
Radium-228	U	3.40	+/-2.70	4.32	+/-2.84	4.99	pCi/L			JE1	08/07/23	1550	2463317	3
905.0Mod, Sr90, liquid "As Received"														
Strontium-90	U	-0.788	+/-2.39	5.00	+/-2.39	8.00	pCi/L			ST2	07/24/23	1443	2462305	4
9310, Alpha/Beta Activity, liquid "As Received"														
Alpha	U	1.20	+/-3.40	6.90	+/-3.41	15.0	pCi/L			KP1	07/22/23	1325	2462455	5
Beta		30.8	+/-7.98	9.43	+/-9.48	50.0	pCi/L							
Rad Liquid Scintillation Analysis														
Tc-02-RC-MOD, Tc99, Liquid "As Received"														
Technetium-99		50.9	+/-13.4	19.3	+/-14.6	25.0	pCi/L			AG2	08/13/23	1433	2470468	6

The following Analytical Methods were performed

Method	Description
1	Eichrom Industries, AN-1418
2	DOE EML HASL-300, Th-01-RC Modified
3	EPA 904.0/SW846 9320 Modified
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
5	EPA 900.0/SW846 9310
6	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Barium-133 Tracer	AN-1418 AlphaSpec Ra226, Liquid "As Received"	2462144	93.1	(30%-110%)
Thorium-229 Tracer	Th-01-RC M, Th Isotopes, Liquid "As Received"	2462143	69.2	(30%-110%)
Barium-133 Tracer	904.0Mod, Ra228, Liquid "As Received"	2463317	80.5	(30%-110%)
Strontium Carrier	905.0Mod, Sr90, liquid "As Received"	2462305	80	(30%-110%)
Technetium-99m Tracer	Tc-02-RC-MOD, Tc99, Liquid "As Received"	2470468	95.7	(30%-110%)

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Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053

Report Date: November 2, 2023

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW361UG4-23
Sample ID: 629613016

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	**Test**							**Batch ID**		**Recovery%**	**Acceptable Limits**			

Notes:

The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

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Address : 5600 Hobbs Road

Kevil, Kentucky 42053

Report Date: November 2, 2023

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW362UG4-23
Sample ID: 629613017
Matrix: WG
Collect Date: 18-JUL-23
Receive Date: 19-JUL-23
Collector: Client

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Alpha Spec Analysis														
AN-1418 AlphaSpec Ra226, Liquid "As Received"														
Radium-226	U	0.230	+/-0.280	0.375	+/-0.280	5.00	pCi/L			CM4	07/28/23	0850	2462144	1
Th-01-RC M, Th Isotopes, Liquid "As Received"														
Thorium-230	U	1.16	+/-1.48	2.23	+/-1.50	50.0	pCi/L			CM4	07/25/23	1121	2462143	2
Thorium-232	U	1.02	+/-1.17	1.14	+/-1.17		pCi/L							
Rad Gas Flow Proportional Counting														
904.0Mod, Ra228, Liquid "As Received"														
Radium-228	U	2.59	+/-2.63	4.32	+/-2.71	4.99	pCi/L			JE1	08/07/23	1255	2463317	3
905.0Mod, Sr90, liquid "As Received"														
Strontium-90	U	0.185	+/-2.84	5.57	+/-2.84	8.00	pCi/L			ST2	07/24/23	1443	2462305	4
9310, Alpha/Beta Activity, liquid "As Received"														
Alpha	U	-0.654	+/-3.97	9.64	+/-3.97	15.0	pCi/L			KP1	07/22/23	1325	2462455	5
Beta	U	1.47	+/-3.58	6.47	+/-3.59	50.0	pCi/L							
Rad Liquid Scintillation Analysis														
Tc-02-RC-MOD, Tc99, Liquid "As Received"														
Technetium-99	U	10.9	+/-10.7	17.9	+/-10.8	25.0	pCi/L			AG2	07/30/23	1905	2462082	6

The following Analytical Methods were performed

Method	Description
1	Eichrom Industries, AN-1418
2	DOE EML HASL-300, Th-01-RC Modified
3	EPA 904.0/SW846 9320 Modified
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
5	EPA 900.0/SW846 9310
6	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Barium-133 Tracer	AN-1418 AlphaSpec Ra226, Liquid "As Received"	2462144	91	(30%-110%)
Thorium-229 Tracer	Th-01-RC M, Th Isotopes, Liquid "As Received"	2462143	96.6	(30%-110%)
Barium-133 Tracer	904.0Mod, Ra228, Liquid "As Received"	2463317	77.2	(30%-110%)
Strontium Carrier	905.0Mod, Sr90, liquid "As Received"	2462305	70.6	(30%-110%)
Technetium-99m Tracer	Tc-02-RC-MOD, Tc99, Liquid "As Received"	2462082	93.7	(30%-110%)

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Company : Four Rivers Nuclear Partnership,
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Report Date: November 2, 2023

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW362UG4-23
Sample ID: 629613017

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	**Test**							**Batch ID**		**Recovery%**	**Acceptable Limits**			

Notes:

The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

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ATTACHMENT C2

GEL LABORATORIES CERTIFICATE OF ANALYSIS

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Certificate of Analysis

Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW363UG4-23	Project:	FRNP00507
Sample ID:	630015001	Client ID:	FRNP005
Matrix:	WG		
Collect Date:	20-JUL-23 12:49		
Receive Date:	21-JUL-23		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	U	0.0195	0.00878	0.0195	ug/L	0.975	1	LOF	07/31/23	1645	2468076	1
Carbon Analysis												
9060A, Total Organic Carbon "As Received"												
Total Organic Carbon Average	J	1.31	0.330	2.00	mg/L		1	RM3	07/28/23	1836	2466615	2
Flow Injection Analysis												
9012B, Cyanide, Total "As Received"												
Cyanide, Total	U	0.200	0.00167	0.200	mg/L	1.00	1	KLP1	07/24/23	1626	2463970	3
Halogen Analysis												
9020B, TOX (Organic Halogen) "As Received"												
Total Organic Halogens	J	5.08	3.33	10.0	ug/L		1	RM3	08/04/23	1825	2471469	4
Ion Chromatography												
300.0, Iodide in Liquid "As Received"												
Iodide	U	0.500	0.167	0.500	mg/L		1	LXA2	07/21/23	1635	2463583	5
SW846 9056A Anions (5 elements) "As Received"												
Chloride	JW	20.1	0.335	250	mg/L		5	LXA2	07/21/23	1658	2463587	6
Nitrate-N	J	4.41	0.165	10.0	mg/L		5					
Sulfate		29.9	0.665	2.00	mg/L		5					
Bromide	U	0.200	0.0670	0.200	mg/L		1	LXA2	07/21/23	1455	2463587	7
Fluoride	J	0.130	0.0330	4.00	mg/L		1					
Mercury Analysis-CVAA												
7470, Mercury Liquid "As Received"												
Mercury	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	JP2	07/27/23	0954	2465613	8
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Aluminum	U	0.0500	0.0193	0.0500	mg/L	1.00	1	PRB	08/14/23	2043	2463840	9
Antimony	U	0.00300	0.00100	0.00300	mg/L	1.00	1					
Arsenic	U	0.00500	0.00200	0.00500	mg/L	1.00	1					
Barium		0.126	0.000670	0.00400	mg/L	1.00	1					
Beryllium	U	0.000500	0.000200	0.000500	mg/L	1.00	1					
Boron		0.0213	0.00520	0.0150	mg/L	1.00	1					
Cadmium	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Calcium		22.4	0.0800	0.200	mg/L	1.00	1					
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					

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Certificate of Analysis

Report Date: November 2, 2023

Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW363UG4-23 Project: FRNP00507
Sample ID: 630015001 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Cobalt		0.00172	0.000300	0.00100	mg/L	1.00	1					
Copper	J	0.000440	0.000300	0.00200	mg/L	1.00	1					
Iron		0.133	0.0330	0.100	mg/L	1.00	1					
Lead	U	0.00200	0.000500	0.00200	mg/L	1.00	1					
Magnesium		8.89	0.0100	0.0300	mg/L	1.00	1					
Manganese		0.204	0.00100	0.00500	mg/L	1.00	1					
Molybdenum	U	0.00100	0.000200	0.00100	mg/L	1.00	1					
Nickel		0.0441	0.000600	0.00200	mg/L	1.00	1					
Potassium		1.98	0.0800	0.300	mg/L	1.00	1					
Selenium	U	0.00500	0.00150	0.00500	mg/L	1.00	1					
Silver	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Sodium		38.8	0.0800	0.250	mg/L	1.00	1					
Thallium	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					
Vanadium	U	0.0200	0.00330	0.0200	mg/L	1.00	1					
Zinc	U	0.0200	0.00330	0.0200	mg/L	1.00	1					
Rhodium	U	0.00500	0.00160	0.00500	mg/L	1.00	1	PRB	08/15/23	0153	2463840	10
Tantalum	U	0.00500	0.00100	0.00500	mg/L	1.00	1					
Semi-Volatiles-PCB												
8082A, PCB Liquids "As Received"												
Aroclor-1016	U	0.0966	0.0322	0.0966	ug/L	0.000966	1	NS2	08/17/23	1310	2477372	11
Aroclor-1221	U	0.0966	0.0322	0.0966	ug/L	0.000966	1					
Aroclor-1232	U	0.0966	0.0322	0.0966	ug/L	0.000966	1					
Aroclor-1242	U	0.0966	0.0322	0.0966	ug/L	0.000966	1					
Aroclor-1248	U	0.0966	0.0322	0.0966	ug/L	0.000966	1					
Aroclor-1254	U	0.0966	0.0322	0.0966	ug/L	0.000966	1					
Aroclor-1260	U	0.0966	0.0322	0.0966	ug/L	0.000966	1					
Aroclor-1268	U	0.0966	0.0322	0.0966	ug/L	0.000966	1					
Aroclor-Total	U	0.0966	0.0322	0.0966	ug/L	0.000966	1					
Solids Analysis												
160.1, Dissolved Solids "As Received"												
Total Dissolved Solids		195	2.38	10.0	mg/L			CH6	07/24/23	1334	2464011	12
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												

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Certificate of Analysis

Report Date: November 2, 2023

Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW363UG4-23 Project: FRNP00507
Sample ID: 630015001 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												
COD	U	20.0	8.95	20.0	mg/L		1	JW2	07/21/23	1745	2463705	13
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	PXY1	07/24/23	1704	2464173	14
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	U	5.00	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					

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Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW363UG4-23 Project: FRNP00507
Sample ID: 630015001 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene	U	1.00	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	CD3	07/26/23	1530	2463839
SW846 3535A	SW3535A PCB SPE Extraction	LW1	08/17/23	0552	2477369
SW846 8011 PREP	8011 Prep	LOF	07/31/23	1408	2468075
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	EK1	07/26/23	1200	2465611
SW846 9010C Distillation	SW846 9010C Prep	ES2	07/24/23	1103	2463969

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Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW363UG4-23	Project:	FRNP00507
Sample ID:	630015001	Client ID:	FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8011	
2	SW846 9060A	
3	SW846 9012B	
4	SW846 9020B	
5	EPA 300.0	
6	SW846 9056A	
7	SW846 9056A	
8	SW846 7470A	
9	SW846 3005A/6020B	
10	SW846 3005A/6020B	
11	SW846 3535A/8082A	
12	EPA 160.1	
13	EPA 410.4	
14	SW846 8260D	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	7.18 ug/L	6.97	103	(46%-159%)
Decachlorobiphenyl	8082A, PCB Liquids "As Received"	0.146 ug/L	0.193	76	(32%-135%)
4cmx	8082A, PCB Liquids "As Received"	0.137 ug/L	0.193	71	(26%-108%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	48.4 ug/L	50.0	97	(72%-125%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	56.8 ug/L	50.0	114	(73%-129%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	46.5 ug/L	50.0	93	(75%-123%)

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW363UG4-23	Project:	FRNP00507
Sample ID:	630015002	Client ID:	FRNP005
Matrix:	WG		
Collect Date:	20-JUL-23 12:49		
Receive Date:	21-JUL-23		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Dissolved Metals (3 Elements) "As Received"												
Barium		0.123	0.000670	0.00400	mg/L	1.00	1	PRB	08/14/23	2046	2463840	1
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	CD3	07/26/23	1530	2463839
EPA 160	Laboratory Filtration	RXB5	07/21/23	1555	2463675

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3005A/6020B	

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: November 2, 2023

Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW364UG4-23
Sample ID: 630015003
Matrix: WG
Collect Date: 20-JUL-23 13:35
Receive Date: 21-JUL-23
Collector: Client

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	U	0.0191	0.00861	0.0191	ug/L	0.957	1	LOF	07/31/23	1709	2468076	1
Carbon Analysis												
9060A, Total Organic Carbon "As Received"												
Total Organic Carbon Average	J	0.802	0.330	2.00	mg/L		1	RM3	07/28/23	1917	2466615	2
Flow Injection Analysis												
9012B, Cyanide, Total "As Received"												
Cyanide, Total	U	0.200	0.00167	0.200	mg/L	1.00	1	KLP1	07/24/23	1627	2463970	3
Halogen Analysis												
9020B, TOX (Organic Halogen) "As Received"												
Total Organic Halogens	U	10.0	3.33	10.0	ug/L		1	RM3	08/07/23	1530	2472135	4
Ion Chromatography												
300.0, Iodide in Liquid "As Received"												
Iodide	U	0.500	0.167	0.500	mg/L		1	LXA2	07/21/23	1647	2463583	5
SW846 9056A Anions (5 elements) "As Received"												
Chloride	JW	37.9	0.335	250	mg/L		5	LXA2	07/21/23	1729	2463587	6
Nitrate-N	J	1.19	0.165	10.0	mg/L		5					
Sulfate		71.9	0.665	2.00	mg/L		5					
Bromide		0.458	0.0670	0.200	mg/L		1	LXA2	07/21/23	1525	2463587	7
Fluoride	J	0.126	0.0330	4.00	mg/L		1					
Mercury Analysis-CVAA												
7470, Mercury Liquid "As Received"												
Mercury	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	JP2	07/27/23	0956	2465613	8
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Rhodium	U	0.00500	0.00160	0.00500	mg/L	1.00	1	PRB	08/15/23	0155	2463840	9
Tantalum	U	0.00500	0.00100	0.00500	mg/L	1.00	1					
Aluminum	U	0.0500	0.0193	0.0500	mg/L	1.00	1	PRB	08/14/23	2050	2463840	10
Antimony	U	0.00300	0.00100	0.00300	mg/L	1.00	1					
Arsenic	U	0.00500	0.00200	0.00500	mg/L	1.00	1					
Barium		0.0581	0.000670	0.00400	mg/L	1.00	1					
Beryllium	U	0.000500	0.000200	0.000500	mg/L	1.00	1					
Boron		0.145	0.00520	0.0150	mg/L	1.00	1					
Cadmium	U	0.00100	0.000300	0.00100	mg/L	1.00	1					

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Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW364UG4-23 Project: FRNP00507
Sample ID: 630015003 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Calcium		31.1	0.0800	0.200	mg/L	1.00	1					
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Cobalt	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Copper	J	0.00128	0.000300	0.00200	mg/L	1.00	1					
Iron	U	0.100	0.0330	0.100	mg/L	1.00	1					
Lead	U	0.00200	0.000500	0.00200	mg/L	1.00	1					
Magnesium		13.2	0.0100	0.0300	mg/L	1.00	1					
Manganese	J	0.00352	0.00100	0.00500	mg/L	1.00	1					
Molybdenum	U	0.00100	0.000200	0.00100	mg/L	1.00	1					
Nickel	J	0.00119	0.000600	0.00200	mg/L	1.00	1					
Potassium		1.96	0.0800	0.300	mg/L	1.00	1					
Selenium	U	0.00500	0.00150	0.00500	mg/L	1.00	1					
Silver	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Sodium		41.2	0.0800	0.250	mg/L	1.00	1					
Thallium	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					
Vanadium	U	0.0200	0.00330	0.0200	mg/L	1.00	1					
Zinc		0.0215	0.00330	0.0200	mg/L	1.00	1					
Semi-Volatiles-PCB												
8082A, PCB Liquids "As Received"												
Aroclor-1016	U	0.100	0.0333	0.100	ug/L	0.00100	1	NS2	08/17/23	1322	2477372	11
Aroclor-1221	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Aroclor-1232	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Aroclor-1242	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Aroclor-1248	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Aroclor-1254	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Aroclor-1260	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Aroclor-1268	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Aroclor-Total	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Solids Analysis												
160.1, Dissolved Solids "As Received"												
Total Dissolved Solids		251	2.38	10.0	mg/L			CH6	07/24/23	1334	2464011	12
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												

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Certificate of Analysis

Report Date: November 2, 2023

Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW364UG4-23 Project: FRNP00507
Sample ID: 630015003 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												
COD	U	20.0	8.95	20.0	mg/L		1	JW2	07/21/23	1745	2463705	13
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	PXY1	07/24/23	1733	2464173	14
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	U	5.00	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					

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Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW364UG4-23 Project: FRNP00507
Sample ID: 630015003 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene	J	0.390	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	EK1	07/26/23	1200	2465611
SW846 9010C Distillation	SW846 9010C Prep	ES2	07/24/23	1103	2463969
SW846 3005A	ICP-MS 3005A PREP	CD3	07/26/23	1530	2463839
SW846 3535A	SW3535A PCB SPE Extraction	LW1	08/17/23	0552	2477369
SW846 8011 PREP	8011 Prep	LOF	07/31/23	1408	2468075

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Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW364UG4-23	Project:	FRNP00507
Sample ID:	630015003	Client ID:	FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8011	
2	SW846 9060A	
3	SW846 9012B	
4	SW846 9020B	
5	EPA 300.0	
6	SW846 9056A	
7	SW846 9056A	
8	SW846 7470A	
9	SW846 3005A/6020B	
10	SW846 3005A/6020B	
11	SW846 3535A/8082A	
12	EPA 160.1	
13	EPA 410.4	
14	SW846 8260D	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	6.97 ug/L	6.83	102	(46%-159%)
Decachlorobiphenyl	8082A, PCB Liquids "As Received"	0.158 ug/L	0.200	79	(32%-135%)
4cmx	8082A, PCB Liquids "As Received"	0.150 ug/L	0.200	75	(26%-108%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	49.5 ug/L	50.0	99	(72%-125%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	57.1 ug/L	50.0	114	(73%-129%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	47.1 ug/L	50.0	94	(75%-123%)

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW364UG4-23	Project:	FRNP00507
Sample ID:	630015004	Client ID:	FRNP005
Matrix:	WG		
Collect Date:	20-JUL-23 13:35		
Receive Date:	21-JUL-23		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Dissolved Metals (3 Elements) "As Received"												
Barium		0.0567	0.000670	0.00400	mg/L	1.00	1	PRB	08/14/23	2115	2463840	1
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 160	Laboratory Filtration	RXB5	07/21/23	1555	2463675
SW846 3005A	ICP-MS 3005A PREP	CD3	07/26/23	1530	2463839

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3005A/6020B	

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	TB2UG4-23	Project:	FRNP00507
Sample ID:	630015005	Client ID:	FRNP005
Matrix:	WATER		
Collect Date:	20-JUL-23 07:30		
Receive Date:	21-JUL-23		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	U	0.0192	0.00865	0.0192	ug/L	0.961	1	LOF	07/31/23	1823	2468076	1
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	PXY1	07/24/23	1803	2464173	2
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	BJ	4.46	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					

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Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: TB2UG4-23 Project: FRNP00507
Sample ID: 630015005 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene	U	1.00	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8011 PREP	8011 Prep	LOF	07/31/23	1408	2468075

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8011	
2	SW846 8260D	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	6.84 ug/L	6.86	100	(46%-159%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	50.4 ug/L	50.0	101	(72%-125%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	57.1 ug/L	50.0	114	(73%-129%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	49.4 ug/L	50.0	99	(75%-123%)

Notes:

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Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	TB2UG4-23	Project:	FRNP00507
Sample ID:	630015005	Client ID:	FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Lc/LC: Critical Level
PF: Prep Factor
RL: Reporting Limit
SQL: Sample Quantitation Limit

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Address : 5600 Hobbs Road
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Report Date: November 2, 2023
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW363UG4-23
Sample ID: 630015001
Matrix: WG
Collect Date: 20-JUL-23
Receive Date: 21-JUL-23
Collector: Client
Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Alpha Spec Analysis														
AN-1418 AlphaSpec Ra226, Liquid "As Received"														
Radium-226	U	0.134	+/-0.264	0.446	+/-0.264	5.00	pCi/L			EJ1	07/30/23	1035	2463597	1
Th-01-RC M, Th Isotopes, Liquid "As Received"														
Thorium-230	U	-0.455	+/-1.03	2.88	+/-1.03	50.0	pCi/L			EJ1	07/26/23	0855	2463595	2
Thorium-232	U	-0.0427	+/-0.716	1.47	+/-0.718		pCi/L							
Rad Gas Flow Proportional Counting														
904.0Mod, Ra228, Liquid "As Received"														
Radium-228	U	0.0523	+/-1.45	2.70	+/-1.45	4.99	pCi/L			JE1	08/10/23	1340	2464358	3
905.0Mod, Sr90, liquid "As Received"														
Strontium-90	U	4.57	+/-4.40	7.24	+/-4.47	8.00	pCi/L			ST2	07/26/23	1353	2463726	4
9310, Alpha/Beta Activity, liquid "As Received"														
Alpha	U	5.24	+/-5.37	8.48	+/-5.44	15.0	pCi/L			JB6	07/31/23	1002	2464211	5
Beta		11.0	+/-6.49	9.65	+/-6.74	50.0	pCi/L							
Rad Liquid Scintillation Analysis														
906.0M, Tritium Dist, Liquid "As Received"														
Tritium	U	7.84	+/-129	230	+/-129	300	pCi/L			GS3	07/28/23	0006	2463722	6
Tc-02-RC-MOD, Tc99, Liquid "As Received"														
Technetium-99	U	-2.22	+/-11.1	19.8	+/-11.1	25.0	pCi/L			AG2	08/13/23	1450	2470468	7

The following Analytical Methods were performed

Method	Description
1	Eichrom Industries, AN-1418
2	DOE EML HASL-300, Th-01-RC Modified
3	EPA 904.0/SW846 9320 Modified
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
5	EPA 900.0/SW846 9310
6	EPA 906.0 Modified
7	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Barium-133 Tracer	AN-1418 AlphaSpec Ra226, Liquid "As Received"	2463597	92.4	(30%-110%)
Thorium-229 Tracer	Th-01-RC M, Th Isotopes, Liquid "As Received"	2463595	98.3	(30%-110%)
Barium-133 Tracer	904.0Mod, Ra228, Liquid "As Received"	2464358	80.9	(30%-110%)
Strontium Carrier	905.0Mod, Sr90, liquid "As Received"	2463726	80	(30%-110%)
Technetium-99m Tracer	Tc-02-RC-MOD, Tc99, Liquid "As Received"	2470468	92.4	(30%-110%)

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Report Date: November 2, 2023

Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW363UG4-23
Sample ID: 630015001

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	**Test**							**Batch ID**		**Recovery%**	**Acceptable Limits**			

Notes:

The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

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Kevil, Kentucky 42053

Report Date: November 2, 2023

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW364UG4-23
Sample ID: 630015003
Matrix: WG
Collect Date: 20-JUL-23
Receive Date: 21-JUL-23
Collector: Client

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Alpha Spec Analysis														
AN-1418 AlphaSpec Ra226, Liquid "As Received"														
Radium-226	U	0.226	+/-0.340	0.544	+/-0.340	5.00	pCi/L			EJ1	07/30/23	1035	2463597	1
Th-01-RC M, Th Isotopes, Liquid "As Received"														
Thorium-230	U	-0.170	+/-1.33	3.24	+/-1.33	50.0	pCi/L			EJ1	07/26/23	0855	2463595	2
Thorium-232	U	0.902	+/-1.62	1.89	+/-1.62		pCi/L							
Rad Gas Flow Proportional Counting														
904.0Mod, Ra228, Liquid "As Received"														
Radium-228	U	1.77	+/-1.53	2.47	+/-1.59	4.99	pCi/L			JE1	08/10/23	1340	2464358	3
905.0Mod, Sr90, liquid "As Received"														
Strontium-90	U	1.06	+/-3.40	6.18	+/-3.40	8.00	pCi/L			ST2	07/26/23	1353	2463726	4
9310, Alpha/Beta Activity, liquid "As Received"														
Alpha	U	-0.844	+/-1.01	3.00	+/-1.01	15.0	pCi/L			JB6	07/31/23	1002	2464211	5
Beta		32.0	+/-4.27	3.12	+/-6.72	50.0	pCi/L							
Rad Liquid Scintillation Analysis														
906.0M, Tritium Dist, Liquid "As Received"														
Tritium	U	63.4	+/-134	233	+/-135	300	pCi/L			GS3	07/28/23	0043	2463722	6
Tc-02-RC-MOD, Tc99, Liquid "As Received"														
Technetium-99		51.3	+/-12.7	19.4	+/-13.9	25.0	pCi/L			AG2	07/30/23	0809	2463996	7

The following Analytical Methods were performed

Method	Description
1	Eichrom Industries, AN-1418
2	DOE EML HASL-300, Th-01-RC Modified
3	EPA 904.0/SW846 9320 Modified
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
5	EPA 900.0/SW846 9310
6	EPA 906.0 Modified
7	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Barium-133 Tracer	AN-1418 AlphaSpec Ra226, Liquid "As Received"	2463597	96.7	(30%-110%)
Thorium-229 Tracer	Th-01-RC M, Th Isotopes, Liquid "As Received"	2463595	73.6	(30%-110%)
Barium-133 Tracer	904.0Mod, Ra228, Liquid "As Received"	2464358	84.5	(30%-110%)
Strontium Carrier	905.0Mod, Sr90, liquid "As Received"	2463726	80	(30%-110%)
Technetium-99m Tracer	Tc-02-RC-MOD, Tc99, Liquid "As Received"	2463996	94.3	(30%-110%)

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Certificate of Analysis

Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road
Kevil, Kentucky 42053

Report Date: November 2, 2023

Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW364UG4-23
Sample ID: 630015003

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	**Test**							**Batch ID**		**Recovery%**	**Acceptable Limits**			

Notes:

The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

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ATTACHMENT C3

GEL LABORATORIES CERTIFICATE OF ANALYSIS

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Certificate of Analysis

Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW365UG4-23	Project:	FRNP00507
Sample ID:	630312001	Client ID:	FRNP005
Matrix:	WG		
Collect Date:	24-JUL-23 08:28		
Receive Date:	25-JUL-23		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	U	0.0193	0.00866	0.0193	ug/L	0.963	1	LOF	07/31/23	1848	2468076	1
Carbon Analysis												
9060A, Total Organic Carbon "As Received"												
Total Organic Carbon Average	J	1.44	0.330	2.00	mg/L		1	LXA2	07/26/23	0558	2465158	2
Flow Injection Analysis												
9012B, Cyanide, Total "As Received"												
Cyanide, Total	UN	0.200	0.00167	0.200	mg/L	1.00	1	KLP1	07/27/23	1139	2465021	3
Halogen Analysis												
9020B, TOX (Organic Halogen) "As Received"												
Total Organic Halogens	J	4.56	3.33	10.0	ug/L		1	RM3	08/10/23	1216	2472705	4
Ion Chromatography												
300.0, Iodide in Liquid "As Received"												
Iodide	U	0.500	0.167	0.500	mg/L		1	LXA2	07/25/23	1808	2465371	5
SW846 9056A Anions (5 elements) "As Received"												
Bromide	U	0.200	0.0670	0.200	mg/L		1	JLD1	07/25/23	1223	2464781	6
Chloride	J	2.34	0.0670	250	mg/L		1					
Fluoride	J	0.265	0.0330	4.00	mg/L		1					
Nitrate-N	J	0.725	0.0330	10.0	mg/L		1					
Sulfate		54.0	1.33	4.00	mg/L		10	JLD1	07/25/23	2053	2464781	7
Mercury Analysis-CVAA												
7470, Mercury Liquid "As Received"												
Mercury	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	JP2	07/28/23	1011	2466244	8
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Aluminum	J	0.0310	0.0193	0.0500	mg/L	1.00	1	RM4	08/05/23	1536	2464905	9
Antimony	U	0.00300	0.00100	0.00300	mg/L	1.00	1					
Barium		0.0933	0.000670	0.00400	mg/L	1.00	1					
Boron	J	0.00763	0.00520	0.0150	mg/L	1.00	1					
Cadmium	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Cobalt		0.00115	0.000300	0.00100	mg/L	1.00	1					
Copper		0.00406	0.000300	0.00200	mg/L	1.00	1					
Iron	J	0.0373	0.0330	0.100	mg/L	1.00	1					

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Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW365UG4-23 Project: FRNP00507
Sample ID: 630312001 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Lead	U	0.00200	0.000500	0.00200	mg/L	1.00	1					
Magnesium		9.45	0.0100	0.0300	mg/L	1.00	1					
Molybdenum	U	0.00100	0.000200	0.00100	mg/L	1.00	1					
Nickel		0.00533	0.000600	0.00200	mg/L	1.00	1					
Potassium	J	0.214	0.0800	0.300	mg/L	1.00	1					
Selenium	U	0.00500	0.00150	0.00500	mg/L	1.00	1					
Silver	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Sodium		48.9	0.0800	0.250	mg/L	1.00	1					
Thallium	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Uranium	J	0.000120	0.0000670	0.000200	mg/L	1.00	1					
Vanadium	BJ	0.0134	0.00330	0.0200	mg/L	1.00	1					
Zinc	J	0.00796	0.00330	0.0200	mg/L	1.00	1					
Rhodium	U	0.00500	0.00160	0.00500	mg/L	1.00	1	PRB	08/08/23	0333	2464905	10
Tantalum	U	0.00500	0.00100	0.00500	mg/L	1.00	1					
Arsenic	U	0.00500	0.00200	0.00500	mg/L	1.00	1	PRB	08/08/23	0154	2464905	11
Beryllium	U	0.000500	0.000200	0.000500	mg/L	1.00	1					
Calcium		17.4	0.0800	0.200	mg/L	1.00	1					
Manganese		0.0174	0.00100	0.00500	mg/L	1.00	1					
Semi-Volatiles-PCB												
8082A, PCB Liquids "As Received"												
Aroclor-1016	Y2U	0.0951	0.0317	0.0951	ug/L	0.000951	1	NS2	08/11/23	2120	2474305	12
Aroclor-1221	U	0.0951	0.0317	0.0951	ug/L	0.000951	1					
Aroclor-1232	U	0.0951	0.0317	0.0951	ug/L	0.000951	1					
Aroclor-1242	U	0.0951	0.0317	0.0951	ug/L	0.000951	1					
Aroclor-1248	U	0.0951	0.0317	0.0951	ug/L	0.000951	1					
Aroclor-1254	U	0.0951	0.0317	0.0951	ug/L	0.000951	1					
Aroclor-1260	Y2U	0.0951	0.0317	0.0951	ug/L	0.000951	1					
Aroclor-1268	U	0.0951	0.0317	0.0951	ug/L	0.000951	1					
Aroclor-Total	UY2	0.0951	0.0317	0.0951	ug/L	0.000951	1					
Solids Analysis												
160.1, Dissolved Solids "As Received"												
Total Dissolved Solids		211	2.38	10.0	mg/L			CH6	07/27/23	1301	2466402	13
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												

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Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW365UG4-23 Project: FRNP00507
Sample ID: 630312001 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												
COD	U	20.0	8.95	20.0	mg/L		1	HH2	07/26/23	1510	2464912	14
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	JM6	07/26/23	1346	2465652	15
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	U	5.00	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					

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Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW365UG4-23 Project: FRNP00507
Sample ID: 630312001 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene	U	1.00	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	JD2	08/03/23	0750	2464904
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	EK1	07/27/23	1130	2466243
SW846 3535A	SW3535A PCB SPE Extraction	DG3	08/11/23	0911	2474300
SW846 8011 PREP	8011 Prep	LOF	07/31/23	1408	2468075
SW846 9010C Distillation	SW846 9010C Prep	ES2	07/26/23	1406	2465020

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Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW365UG4-23	Project:	FRNP00507
Sample ID:	630312001	Client ID:	FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8011	
2	SW846 9060A	
3	SW846 9012B	
4	SW846 9020B	
5	EPA 300.0	
6	SW846 9056A	
7	SW846 9056A	
8	SW846 7470A	
9	SW846 3005A/6020B	
10	SW846 3005A/6020B	
11	SW846 3005A/6020B	
12	SW846 3535A/8082A	
13	EPA 160.1	
14	EPA 410.4	
15	SW846 8260D	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	7.29 ug/L	6.88	106	(46%-159%)
Decachlorobiphenyl	8082A, PCB Liquids "As Received"	0.181 ug/L	0.190	95	(32%-135%)
4cmx	8082A, PCB Liquids "As Received"	0.142 ug/L	0.190	75	(26%-108%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	53.3 ug/L	50.0	107	(72%-125%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	49.5 ug/L	50.0	99	(73%-129%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	51.5 ug/L	50.0	103	(75%-123%)

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW365UG4-23	Project:	FRNP00507
Sample ID:	630312002	Client ID:	FRNP005
Matrix:	WG		
Collect Date:	24-JUL-23 08:28		
Receive Date:	25-JUL-23		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Dissolved Metals (3 Elements) "As Received"												
Barium		0.0964	0.000670	0.00400	mg/L	1.00	1	RM4	08/05/23	1603	2464905	1
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Uranium	J	0.000103	0.0000670	0.000200	mg/L	1.00	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 160	Laboratory Filtration	RXB5	07/25/23	1145	2464824
SW846 3005A	ICP-MS 3005A PREP	JD2	08/03/23	0750	2464904

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3005A/6020B	

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
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Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW366UG4-23	Project:	FRNP00507
Sample ID:	630312003	Client ID:	FRNP005
Matrix:	WG		
Collect Date:	24-JUL-23 13:23		
Receive Date:	25-JUL-23		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	U	0.0188	0.00847	0.0188	ug/L	0.941	1	LOF	07/31/23	2051	2468076	1
Carbon Analysis												
9060A, Total Organic Carbon "As Received"												
Total Organic Carbon Average	J	0.751	0.330	2.00	mg/L		1	LXA2	07/26/23	0756	2465158	2
Flow Injection Analysis												
9012B, Cyanide, Total "As Received"												
Cyanide, Total	UN	0.200	0.00167	0.200	mg/L	1.00	1	KLP1	07/27/23	1142	2465021	3
Halogen Analysis												
9020B, TOX (Organic Halogen) "As Received"												
Total Organic Halogens		24.5	3.33	10.0	ug/L		1	RM3	08/04/23	1906	2471469	4
Ion Chromatography												
300.0, Iodide in Liquid "As Received"												
Iodide	U	0.500	0.167	0.500	mg/L		1	LXA2	07/25/23	1846	2465371	5
SW846 9056A Anions (5 elements) "As Received"												
Chloride	J	39.9	0.670	250	mg/L		10	JLD1	07/25/23	1949	2464781	6
Sulfate		49.6	1.33	4.00	mg/L		10					
Bromide		0.529	0.0670	0.200	mg/L		1	JLD1	07/25/23	1120	2464781	7
Fluoride	J	0.170	0.0330	4.00	mg/L		1					
Nitrate-N	J	0.895	0.0330	10.0	mg/L		1					
Mercury Analysis-CVAA												
7470, Mercury Liquid "As Received"												
Mercury	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	JP2	08/01/23	1313	2468385	8
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Arsenic	U	0.00500	0.00200	0.00500	mg/L	1.00	1	PRB	08/08/23	0238	2464905	9
Beryllium	U	0.000500	0.000200	0.000500	mg/L	1.00	1					
Calcium		31.4	0.0800	0.200	mg/L	1.00	1					
Manganese	J	0.00266	0.00100	0.00500	mg/L	1.00	1					
Rhodium	U	0.00500	0.00160	0.00500	mg/L	1.00	1	PRB	08/08/23	0343	2464905	10
Tantalum	U	0.00500	0.00100	0.00500	mg/L	1.00	1					
Aluminum	J	0.0238	0.0193	0.0500	mg/L	1.00	1	RM4	08/05/23	1622	2464905	11
Antimony	U	0.00300	0.00100	0.00300	mg/L	1.00	1					
Barium		0.107	0.000670	0.00400	mg/L	1.00	1					

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Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
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Client Sample ID: MW366UG4-23 Project: FRNP00507
Sample ID: 630312003 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Boron		0.0785	0.00520	0.0150	mg/L	1.00	1					
Cadmium	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Cobalt	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Copper	J	0.00144	0.000300	0.00200	mg/L	1.00	1					
Iron	U	0.100	0.0330	0.100	mg/L	1.00	1					
Lead	U	0.00200	0.000500	0.00200	mg/L	1.00	1					
Magnesium		14.8	0.0100	0.0300	mg/L	1.00	1					
Molybdenum	U	0.00100	0.000200	0.00100	mg/L	1.00	1					
Nickel	J	0.000938	0.000600	0.00200	mg/L	1.00	1					
Potassium		1.95	0.0800	0.300	mg/L	1.00	1					
Selenium	J	0.00267	0.00150	0.00500	mg/L	1.00	1					
Silver	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Sodium		48.0	0.0800	0.250	mg/L	1.00	1					
Thallium	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					
Vanadium	BJ	0.00775	0.00330	0.0200	mg/L	1.00	1					
Zinc	J	0.00779	0.00330	0.0200	mg/L	1.00	1					
Semi-Volatiles-PCB												
8082A, PCB Liquids "As Received"												
Aroclor-1016	Y2U	0.0995	0.0331	0.0995	ug/L	0.000995	1	NS2	08/11/23	2156	2474305	12
Aroclor-1221	U	0.0995	0.0331	0.0995	ug/L	0.000995	1					
Aroclor-1232	U	0.0995	0.0331	0.0995	ug/L	0.000995	1					
Aroclor-1242	U	0.0995	0.0331	0.0995	ug/L	0.000995	1					
Aroclor-1248	U	0.0995	0.0331	0.0995	ug/L	0.000995	1					
Aroclor-1254	U	0.0995	0.0331	0.0995	ug/L	0.000995	1					
Aroclor-1260	Y2U	0.0995	0.0331	0.0995	ug/L	0.000995	1					
Aroclor-1268	U	0.0995	0.0331	0.0995	ug/L	0.000995	1					
Aroclor-Total	UY2	0.0995	0.0331	0.0995	ug/L	0.000995	1					
Solids Analysis												
160.1, Dissolved Solids "As Received"												
Total Dissolved Solids		256	2.38	10.0	mg/L			CH6	07/27/23	1301	2466402	13
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												

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Certificate of Analysis

Report Date: November 2, 2023

Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW366UG4-23 Project: FRNP00507
Sample ID: 630312003 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												
COD	U	20.0	8.95	20.0	mg/L		1	HH2	07/26/23	1511	2464912	14
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	JM6	07/26/23	1318	2465652	15
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	U	5.00	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					

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Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW366UG4-23	Project:	FRNP00507
Sample ID:	630312003	Client ID:	FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene		2.17	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	AXS5	07/31/23	1226	2468384
SW846 3535A	SW3535A PCB SPE Extraction	DG3	08/11/23	0911	2474300
SW846 3005A	ICP-MS 3005A PREP	JD2	08/03/23	0750	2464904
SW846 8011 PREP	8011 Prep	LOF	07/31/23	1408	2468075
SW846 9010C Distillation	SW846 9010C Prep	ES2	07/26/23	1406	2465020

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	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW366UG4-23	Project:	FRNP00507
Sample ID:	630312003	Client ID:	FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8011	
2	SW846 9060A	
3	SW846 9012B	
4	SW846 9020B	
5	EPA 300.0	
6	SW846 9056A	
7	SW846 9056A	
8	SW846 7470A	
9	SW846 3005A/6020B	
10	SW846 3005A/6020B	
11	SW846 3005A/6020B	
12	SW846 3535A/8082A	
13	EPA 160.1	
14	EPA 410.4	
15	SW846 8260D	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	6.89 ug/L	6.72	102	(46%-159%)
Decachlorobiphenyl	8082A, PCB Liquids "As Received"	0.124 ug/L	0.199	62	(32%-135%)
4cmx	8082A, PCB Liquids "As Received"	0.0898 ug/L	0.199	45	(26%-108%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	53.3 ug/L	50.0	107	(72%-125%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	50.2 ug/L	50.0	100	(73%-129%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	49.8 ug/L	50.0	100	(75%-123%)

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW366UG4-23	Project:	FRNP00507
Sample ID:	630312004	Client ID:	FRNP005
Matrix:	WG		
Collect Date:	24-JUL-23 13:23		
Receive Date:	25-JUL-23		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Dissolved Metals (3 Elements) "As Received"												
Barium		0.106	0.000670	0.00400	mg/L	1.00	1	RM4	08/05/23	1625	2464905	1
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 160	Laboratory Filtration	RXB5	07/25/23	1145	2464824
SW846 3005A	ICP-MS 3005A PREP	JD2	08/03/23	0750	2464904

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3005A/6020B	

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Report Date: November 2, 2023

Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW367UG4-23
Sample ID: 630312005
Matrix: WG
Collect Date: 24-JUL-23 09:49
Receive Date: 25-JUL-23
Collector: Client

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	U	0.0190	0.00853	0.0190	ug/L	0.948	1	LOF	07/31/23	2116	2468076	1
Carbon Analysis												
9060A, Total Organic Carbon "As Received"												
Total Organic Carbon Average	J	0.481	0.330	2.00	mg/L		1	LXA2	07/26/23	0835	2465158	2
Flow Injection Analysis												
9012B, Cyanide, Total "As Received"												
Cyanide, Total	UN	0.200	0.00167	0.200	mg/L	1.00	1	KLP1	07/27/23	1143	2465021	3
Halogen Analysis												
9020B, TOX (Organic Halogen) "As Received"												
Total Organic Halogens	U	10.0	3.33	10.0	ug/L		1	RM3	08/04/23	2007	2471469	4
Ion Chromatography												
300.0, Iodide in Liquid "As Received"												
Iodide	U	0.500	0.167	0.500	mg/L		1	LXA2	07/25/23	1859	2465371	5
SW846 9056A Anions (5 elements) "As Received"												
Bromide	J	0.0996	0.0670	0.200	mg/L		1	JLD1	07/25/23	1151	2464781	6
Chloride	J	7.48	0.0670	250	mg/L		1					
Fluoride	J	0.221	0.0330	4.00	mg/L		1					
Nitrate-N	U	10.0	0.0330	10.0	mg/L		1					
Sulfate		21.6	0.266	0.800	mg/L		2	JLD1	07/25/23	2021	2464781	7
Mercury Analysis-CVAA												
7470, Mercury Liquid "As Received"												
Mercury	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	JP2	07/28/23	1020	2466244	8
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Arsenic	J	0.00271	0.00200	0.00500	mg/L	1.00	1	PRB	08/08/23	0245	2464905	9
Beryllium	U	0.000500	0.000200	0.000500	mg/L	1.00	1					
Calcium		12.6	0.0800	0.200	mg/L	1.00	1					
Manganese		1.38	0.00500	0.0250	mg/L	1.00	5	PRB	08/08/23	0248	2464905	10
Rhodium	U	0.00500	0.00160	0.00500	mg/L	1.00	1	PRB	08/08/23	0345	2464905	11
Tantalum	U	0.00500	0.00100	0.00500	mg/L	1.00	1					
Aluminum	U	0.0500	0.0193	0.0500	mg/L	1.00	1	RM4	08/05/23	1629	2464905	12
Antimony	U	0.00300	0.00100	0.00300	mg/L	1.00	1					
Barium		0.128	0.000670	0.00400	mg/L	1.00	1					

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Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW367UG4-23 Project: FRNP00507
Sample ID: 630312005 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Boron		0.0184	0.00520	0.0150	mg/L	1.00	1					
Cadmium	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Cobalt		0.00598	0.000300	0.00100	mg/L	1.00	1					
Copper		0.00273	0.000300	0.00200	mg/L	1.00	1					
Iron		7.11	0.0330	0.100	mg/L	1.00	1					
Lead	J	0.000552	0.000500	0.00200	mg/L	1.00	1					
Magnesium		7.31	0.0100	0.0300	mg/L	1.00	1					
Molybdenum	U	0.00100	0.000200	0.00100	mg/L	1.00	1					
Nickel		0.00303	0.000600	0.00200	mg/L	1.00	1					
Potassium		2.78	0.0800	0.300	mg/L	1.00	1					
Selenium	U	0.00500	0.00150	0.00500	mg/L	1.00	1					
Silver	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Sodium		15.5	0.0800	0.250	mg/L	1.00	1					
Thallium	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					
Vanadium	BJ	0.00341	0.00330	0.0200	mg/L	1.00	1					
Zinc	J	0.0179	0.00330	0.0200	mg/L	1.00	1					
Semi-Volatiles-PCB												
8082A, PCB Liquids "As Received"												
Aroclor-1016	Y2U	0.0997	0.0332	0.0997	ug/L	0.000997	1	NS2	08/11/23	2208	2474305	13
Aroclor-1221	U	0.0997	0.0332	0.0997	ug/L	0.000997	1					
Aroclor-1232	U	0.0997	0.0332	0.0997	ug/L	0.000997	1					
Aroclor-1242	U	0.0997	0.0332	0.0997	ug/L	0.000997	1					
Aroclor-1248	U	0.0997	0.0332	0.0997	ug/L	0.000997	1					
Aroclor-1254	U	0.0997	0.0332	0.0997	ug/L	0.000997	1					
Aroclor-1260	Y2U	0.0997	0.0332	0.0997	ug/L	0.000997	1					
Aroclor-1268	U	0.0997	0.0332	0.0997	ug/L	0.000997	1					
Aroclor-Total	UY2	0.0997	0.0332	0.0997	ug/L	0.000997	1					
Solids Analysis												
160.1, Dissolved Solids "As Received"												
Total Dissolved Solids		96.0	2.38	10.0	mg/L			CH6	07/27/23	1301	2466402	14
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												

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Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW367UG4-23 Project: FRNP00507
Sample ID: 630312005 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												
COD	U	20.0	8.95	20.0	mg/L		1	HH2	07/26/23	1511	2464912	15
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	JM6	07/26/23	1249	2465652	16
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	U	5.00	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					

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Certificate of Analysis

Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW367UG4-23	Project:	FRNP00507
Sample ID:	630312005	Client ID:	FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene	U	1.00	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	EK1	07/27/23	1130	2466243
SW846 3535A	SW3535A PCB SPE Extraction	DG3	08/11/23	0911	2474300
SW846 9010C Distillation	SW846 9010C Prep	ES2	07/26/23	1406	2465020
SW846 3005A	ICP-MS 3005A PREP	JD2	08/03/23	0750	2464904
SW846 8011 PREP	8011 Prep	LOF	07/31/23	1408	2468075

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Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW367UG4-23	Project:	FRNP00507
Sample ID:	630312005	Client ID:	FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8011	
2	SW846 9060A	
3	SW846 9012B	
4	SW846 9020B	
5	EPA 300.0	
6	SW846 9056A	
7	SW846 9056A	
8	SW846 7470A	
9	SW846 3005A/6020B	
10	SW846 3005A/6020B	
11	SW846 3005A/6020B	
12	SW846 3005A/6020B	
13	SW846 3535A/8082A	
14	EPA 160.1	
15	EPA 410.4	
16	SW846 8260D	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	6.72 ug/L	6.77	99	(46%-159%)
Decachlorobiphenyl	8082A, PCB Liquids "As Received"	0.181 ug/L	0.199	91	(32%-135%)
4cmx	8082A, PCB Liquids "As Received"	0.149 ug/L	0.199	75	(26%-108%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	53.6 ug/L	50.0	107	(72%-125%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	50.1 ug/L	50.0	100	(73%-129%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	50.8 ug/L	50.0	102	(75%-123%)

Notes:

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Lc/LC: Critical Level
PF: Prep Factor
RL: Reporting Limit
SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW367UG4-23	Project:	FRNP00507
Sample ID:	630312006	Client ID:	FRNP005
Matrix:	WG		
Collect Date:	24-JUL-23 09:49		
Receive Date:	25-JUL-23		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Dissolved Metals (3 Elements) "As Received"												
Barium		0.127	0.000670	0.00400	mg/L	1.00	1	RM4	08/05/23	1633	2464905	1
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 160	Laboratory Filtration	RXB5	07/25/23	1145	2464824
SW846 3005A	ICP-MS 3005A PREP	JD2	08/03/23	0750	2464904

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3005A/6020B	

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: November 2, 2023

Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: TB3UG4-23
Sample ID: 630312007
Matrix: WATER
Collect Date: 24-JUL-23 07:30
Receive Date: 25-JUL-23
Collector: Client

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	U	0.0189	0.00850	0.0189	ug/L	0.945	1	LOF	07/31/23	2140	2468076	1
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	JM6	07/26/23	0933	2465652	2
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	J	2.96	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene		6.90	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					

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Certificate of Analysis

Report Date: November 2, 2023

Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: TB3UG4-23 Project: FRNP00507
Sample ID: 630312007 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene	U	1.00	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8011 PREP	8011 Prep	LOF	07/31/23	1408	2468075

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8011	
2	SW846 8260D	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	7.22 ug/L	6.75	107	(46%-159%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	52.3 ug/L	50.0	105	(72%-125%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	49.8 ug/L	50.0	100	(73%-129%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	52.1 ug/L	50.0	104	(75%-123%)

Notes:

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Certificate of Analysis

Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	TB3UG4-23	Project:	FRNP00507
Sample ID:	630312007	Client ID:	FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Certificate of Analysis

Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road
Kevil, Kentucky 42053
Report Date: November 2, 2023
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW365UG4-23
Sample ID: 630312001
Matrix: WG
Collect Date: 24-JUL-23
Receive Date: 25-JUL-23
Collector: Client
Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Alpha Spec Analysis														
AN-1418 AlphaSpec Ra226, Liquid "As Received"														
Radium-226	U	0.399	+/-0.597	0.770	+/-0.598	5.00	pCi/L			MR2	07/31/23	1107	2464779	1
Th-01-RC M, Th Isotopes, Liquid "As Received"														
Thorium-230	U	1.32	+/-1.99	3.07	+/-2.01	50.0	pCi/L			CM4	07/27/23	0852	2464782	2
Thorium-232	U	-0.0425	+/-0.827	1.66	+/-0.829		pCi/L							
Rad Gas Flow Proportional Counting														
904.0Mod, Ra228, Liquid "As Received"														
Radium-228	U	1.13	+/-2.14	3.82	+/-2.16	4.99	pCi/L			JE1	08/10/23	1144	2472073	3
905.0Mod, Sr90, liquid "As Received"														
Strontium-90	U	-6.35	+/-1.96	5.78	+/-1.96	8.00	pCi/L			ST2	07/27/23	1624	2465357	4
9310, Alpha/Beta Activity, liquid "As Received"														
Alpha	U	2.75	+/-4.07	7.14	+/-4.10	15.0	pCi/L			CT3	07/27/23	1212	2464892	5
Beta	U	6.25	+/-6.06	9.92	+/-6.15	50.0	pCi/L							
Rad Liquid Scintillation Analysis														
906.0M, Tritium Dist, Liquid "As Received"														
Tritium	U	-31.4	+/-132	243	+/-132	300	pCi/L			GS3	07/28/23	2032	2465086	6
Tc-02-RC-MOD, Tc99, Liquid "As Received"														
Technetium-99	U	2.67	+/-10.9	18.9	+/-10.9	25.0	pCi/L			AG2	08/01/23	0553	2464799	7

The following Analytical Methods were performed

Method	Description
1	Eichrom Industries, AN-1418
2	DOE EML HASL-300, Th-01-RC Modified
3	EPA 904.0/SW846 9320 Modified
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
5	EPA 900.0/SW846 9310
6	EPA 906.0 Modified
7	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Barium-133 Tracer	AN-1418 AlphaSpec Ra226, Liquid "As Received"	2464779	96.7	(30%-110%)
Thorium-229 Tracer	Th-01-RC M, Th Isotopes, Liquid "As Received"	2464782	83.4	(30%-110%)
Barium-133 Tracer	904.0Mod, Ra228, Liquid "As Received"	2472073	65	(30%-110%)
Strontium Carrier	905.0Mod, Sr90, liquid "As Received"	2465357	87.1	(30%-110%)
Technetium-99m Tracer	Tc-02-RC-MOD, Tc99, Liquid "As Received"	2464799	97.4	(30%-110%)

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Report Date: November 2, 2023

Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW365UG4-23
Sample ID: 630312001

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	**Test**							**Batch ID**		**Recovery%**	**Acceptable Limits**			

Notes:

The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

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Certificate of Analysis

Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road
Kevil, Kentucky 42053

Report Date: November 2, 2023

Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW366UG4-23
Sample ID: 630312003
Matrix: WG
Collect Date: 24-JUL-23
Receive Date: 25-JUL-23
Collector: Client

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Alpha Spec Analysis														
AN-1418 AlphaSpec Ra226, Liquid "As Received"														
Radium-226	U	0.0739	+/-0.232	0.434	+/-0.232	5.00	pCi/L			MR2	07/30/23	1035	2464779	1
Th-01-RC M, Th Isotopes, Liquid "As Received"														
Thorium-230	U	0.713	+/-1.72	3.07	+/-1.73	50.0	pCi/L			CM4	07/27/23	0852	2464782	2
Thorium-232	U	1.11	+/-1.52	1.58	+/-1.53		pCi/L							
Rad Gas Flow Proportional Counting														
904.0Mod, Ra228, Liquid "As Received"														
Radium-228	U	4.67	+/-3.11	4.81	+/-3.33	4.99	pCi/L			JE1	08/10/23	1144	2472073	3
905.0Mod, Sr90, liquid "As Received"														
Strontium-90	U	-1.32	+/-2.18	4.89	+/-2.19	8.00	pCi/L			ST2	07/27/23	1624	2465357	4
9310, Alpha/Beta Activity, liquid "As Received"														
Alpha	U	0.502	+/-3.28	6.94	+/-3.28	15.0	pCi/L			CT3	07/27/23	1212	2464892	5
Beta		45.7	+/-10.2	11.6	+/-12.8	50.0	pCi/L							
Rad Liquid Scintillation Analysis														
906.0M, Tritium Dist, Liquid "As Received"														
Tritium	U	28.7	+/-136	241	+/-136	300	pCi/L			GS3	07/28/23	2104	2465086	6
Tc-02-RC-MOD, Tc99, Liquid "As Received"														
Technetium-99		57.7	+/-14.0	19.8	+/-15.4	25.0	pCi/L			AG2	08/01/23	0610	2464799	7

The following Analytical Methods were performed

Method	Description
1	Eichrom Industries, AN-1418
2	DOE EML HASL-300, Th-01-RC Modified
3	EPA 904.0/SW846 9320 Modified
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
5	EPA 900.0/SW846 9310
6	EPA 906.0 Modified
7	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Barium-133 Tracer	AN-1418 AlphaSpec Ra226, Liquid "As Received"	2464779	98.6	(30%-110%)
Thorium-229 Tracer	Th-01-RC M, Th Isotopes, Liquid "As Received"	2464782	92.2	(30%-110%)
Barium-133 Tracer	904.0Mod, Ra228, Liquid "As Received"	2472073	71.2	(30%-110%)
Strontium Carrier	905.0Mod, Sr90, liquid "As Received"	2465357	77.6	(30%-110%)
Technetium-99m Tracer	Tc-02-RC-MOD, Tc99, Liquid "As Received"	2464799	93.4	(30%-110%)

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Kevil, Kentucky 42053

Report Date: November 2, 2023

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW366UG4-23
Sample ID: 630312003

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	**Test**							**Batch ID**		**Recovery%**	**Acceptable Limits**			

Notes:

The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

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Certificate of Analysis

Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053

Report Date: November 2, 2023

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW367UG4-23
Sample ID: 630312005
Matrix: WG
Collect Date: 24-JUL-23
Receive Date: 25-JUL-23
Collector: Client

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Alpha Spec Analysis														
AN-1418 AlphaSpec Ra226, Liquid "As Received"														
Radium-226	U	0.279	+/-0.284	0.281	+/-0.284	5.00	pCi/L			MR2	07/30/23	1035	2464779	1
Th-01-RC M, Th Isotopes, Liquid "As Received"														
Thorium-230	U	2.29	+/-2.17	2.70	+/-2.20	50.0	pCi/L			CM4	07/27/23	0852	2464782	2
Thorium-232	U	0.323	+/-1.03	1.51	+/-1.03		pCi/L							
Rad Gas Flow Proportional Counting														
904.0Mod, Ra228, Liquid "As Received"														
Radium-228	U	0.0688	+/-2.38	4.54	+/-2.38	4.99	pCi/L			JE1	08/10/23	1144	2472073	3
905.0Mod, Sr90, liquid "As Received"														
Strontium-90	U	0.728	+/-2.59	4.79	+/-2.59	8.00	pCi/L			ST2	07/27/23	1624	2465357	4
9310, Alpha/Beta Activity, liquid "As Received"														
Alpha	U	1.07	+/-3.13	6.35	+/-3.14	15.0	pCi/L			CT3	07/27/23	1212	2464892	5
Beta	U	1.14	+/-5.38	9.89	+/-5.39	50.0	pCi/L							
Rad Liquid Scintillation Analysis														
906.0M, Tritium Dist, Liquid "As Received"														
Tritium	U	61.7	+/-137	239	+/-138	300	pCi/L			GS3	07/28/23	2135	2465086	6
Tc-02-RC-MOD, Tc99, Liquid "As Received"														
Technetium-99	U	-3.27	+/-10.4	18.7	+/-10.4	25.0	pCi/L			AG2	08/01/23	0626	2464799	7

The following Analytical Methods were performed

Method	Description
1	Eichrom Industries, AN-1418
2	DOE EML HASL-300, Th-01-RC Modified
3	EPA 904.0/SW846 9320 Modified
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
5	EPA 900.0/SW846 9310
6	EPA 906.0 Modified
7	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Barium-133 Tracer	AN-1418 AlphaSpec Ra226, Liquid "As Received"	2464779	96.3	(30%-110%)
Thorium-229 Tracer	Th-01-RC M, Th Isotopes, Liquid "As Received"	2464782	95.5	(30%-110%)
Barium-133 Tracer	904.0Mod, Ra228, Liquid "As Received"	2472073	66.5	(30%-110%)
Strontium Carrier	905.0Mod, Sr90, liquid "As Received"	2465357	87.1	(30%-110%)
Technetium-99m Tracer	Tc-02-RC-MOD, Tc99, Liquid "As Received"	2464799	98.5	(30%-110%)

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Certificate of Analysis

Company : Four Rivers Nuclear Partnership,
Address : LLC
5600 Hobbs Road

Kevil, Kentucky 42053

Report Date: November 2, 2023

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW367UG4-23
Sample ID: 630312005

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	**Test**							**Batch ID**		**Recovery%**	**Acceptable Limits**			

Notes:

The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

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ATTACHMENT C4

GEL LABORATORIES CERTIFICATE OF ANALYSIS

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Certificate of Analysis

Report Date: November 2, 2023

Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW369UG4-23
Sample ID: 630713001
Matrix: WG
Collect Date: 25-JUL-23 07:39
Receive Date: 26-JUL-23
Collector: Client

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	U	0.0193	0.00867	0.0193	ug/L	0.963	1	LOF	08/02/23	1713	2468087	1
Carbon Analysis												
9060A, Total Organic Carbon "As Received"												
Total Organic Carbon Average	J	0.817	0.330	2.00	mg/L		1	RM3	07/29/23	0255	2466615	2
Flow Injection Analysis												
9012B, Cyanide, Total "As Received"												
Cyanide, Total	U	0.200	0.00167	0.200	mg/L	1.00	1	KLP1	07/27/23	1440	2465823	3
Halogen Analysis												
9020B, TOX (Organic Halogen) "As Received"												
Total Organic Halogens	J	5.18	3.33	10.0	ug/L		1	RM3	08/04/23	2044	2471469	4
Ion Chromatography												
300.0, Iodide in Liquid "As Received"												
Iodide	U	0.500	0.167	0.500	mg/L		1	LXA2	07/26/23	1851	2466163	5
SW846 9056A Anions (5 elements) "As Received"												
Bromide	W	0.325	0.0670	0.200	mg/L		1	JLD1	07/26/23	1236	2465609	6
Fluoride	J	0.228	0.0330	4.00	mg/L		1					
Sulfate		7.91	0.133	0.400	mg/L		1					
Chloride	JW	28.3	0.335	250	mg/L		5	JLD1	07/26/23	2034	2465609	7
Nitrate-N	J	0.933	0.165	10.0	mg/L		5					
Mercury Analysis-CVAA												
7470, Mercury Liquid "As Received"												
Mercury	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	JP2	07/28/23	1044	2466244	8
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Rhodium	U	0.00500	0.00160	0.00500	mg/L	1.00	1	PRB	08/11/23	0048	2466146	9
Tantalum	U	0.00500	0.00100	0.00500	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	PRB	08/10/23	2002	2466146	10
Boron		0.0161	0.00520	0.0150	mg/L	1.00	1	PRB	08/11/23	1206	2466146	11
Aluminum		0.112	0.0193	0.0500	mg/L	1.00	1	PRB	08/11/23	0531	2466146	12
Antimony	U	0.00300	0.00100	0.00300	mg/L	1.00	1					
Arsenic	U	0.00500	0.00200	0.00500	mg/L	1.00	1					
Barium		0.363	0.000670	0.00400	mg/L	1.00	1					
Beryllium	U	0.000500	0.000200	0.000500	mg/L	1.00	1					

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Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW369UG4-23 Project: FRNP00507
Sample ID: 630713001 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Cadmium	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Calcium		15.7	0.0800	0.200	mg/L	1.00	1					
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Cobalt		0.00583	0.000300	0.00100	mg/L	1.00	1					
Copper		0.00504	0.000300	0.00200	mg/L	1.00	1					
Iron		0.360	0.0330	0.100	mg/L	1.00	1					
Lead	U	0.00200	0.000500	0.00200	mg/L	1.00	1					
Magnesium		6.17	0.0100	0.0300	mg/L	1.00	1					
Manganese		0.0332	0.00100	0.00500	mg/L	1.00	1					
Molybdenum	U	0.00100	0.000200	0.00100	mg/L	1.00	1					
Nickel		0.00462	0.000600	0.00200	mg/L	1.00	1					
Potassium		0.519	0.0800	0.300	mg/L	1.00	1					
Selenium	J	0.00218	0.00150	0.00500	mg/L	1.00	1					
Silver	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Sodium		47.6	0.0800	0.250	mg/L	1.00	1					
Thallium	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Vanadium	U	0.0200	0.00330	0.0200	mg/L	1.00	1					
Zinc	J	0.0123	0.00330	0.0200	mg/L	1.00	1					
Semi-Volatiles-PCB												
8082A, PCB Liquids "As Received"												
Aroclor-1016	U	0.0962	0.0320	0.0962	ug/L	0.000962	1	JXM	08/16/23	1049	2476246	13
Aroclor-1221	U	0.0962	0.0320	0.0962	ug/L	0.000962	1					
Aroclor-1232	U	0.0962	0.0320	0.0962	ug/L	0.000962	1					
Aroclor-1242	U	0.0962	0.0320	0.0962	ug/L	0.000962	1					
Aroclor-1248	U	0.0962	0.0320	0.0962	ug/L	0.000962	1					
Aroclor-1254	U	0.0962	0.0320	0.0962	ug/L	0.000962	1					
Aroclor-1260	U	0.0962	0.0320	0.0962	ug/L	0.000962	1					
Aroclor-1268	U	0.0962	0.0320	0.0962	ug/L	0.000962	1					
Aroclor-Total	U	0.0962	0.0320	0.0962	ug/L	0.000962	1					
Solids Analysis												
160.1, Dissolved Solids "As Received"												
Total Dissolved Solids		175	2.38	10.0	mg/L			CH6	07/28/23	0944	2467003	14
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												

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Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW369UG4-23 Project: FRNP00507
Sample ID: 630713001 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												
COD	U	20.0	8.95	20.0	mg/L		1	JW2	07/27/23	1453	2465849	15
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	JM6	07/27/23	0948	2465652	16
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	U	5.00	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					

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Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW369UG4-23 Project: FRNP00507
Sample ID: 630713001 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene		2.27	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 9010C Distillation	SW846 9010C Prep	ES2	07/27/23	1111	2466361
SW846 8011 PREP	8011 Prep	LOF	08/02/23	1201	2468080
SW846 3005A	ICP-MS 3005A PREP	CD3	07/28/23	1430	2466144
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	EK1	07/27/23	1130	2466243
SW846 3535A	SW3535A PCB SPE Extraction	LW1	08/16/23	0520	2476245

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	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW369UG4-23	Project:	FRNP00507
Sample ID:	630713001	Client ID:	FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8011	
2	SW846 9060A	
3	SW846 9012B	
4	SW846 9020B	
5	EPA 300.0	
6	SW846 9056A	
7	SW846 9056A	
8	SW846 7470A	
9	SW846 3005A/6020B	
10	SW846 3005A/6020B	
11	SW846 3005A/6020B	
12	SW846 3005A/6020B	
13	SW846 3535A/8082A	
14	EPA 160.1	
15	EPA 410.4	
16	SW846 8260D	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	9.08 ug/L	6.88	132	(46%-159%)
Decachlorobiphenyl	8082A, PCB Liquids "As Received"	0.196 ug/L	0.192	102	(32%-135%)
4cmx	8082A, PCB Liquids "As Received"	0.127 ug/L	0.192	66	(26%-108%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	52.3 ug/L	50.0	105	(72%-125%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	47.3 ug/L	50.0	95	(73%-129%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	50.2 ug/L	50.0	100	(75%-123%)

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW369UG4-23	Project:	FRNP00507
Sample ID:	630713002	Client ID:	FRNP005
Matrix:	WG		
Collect Date:	25-JUL-23 07:39		
Receive Date:	26-JUL-23		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Dissolved Metals (3 Elements) "As Received"												
Barium		0.366	0.000670	0.00400	mg/L	1.00	1	PRB	08/11/23	0534	2466146	1
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	PRB	08/10/23	2006	2466146	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	CD3	07/28/23	1430	2466144
EPA 160	Laboratory Filtration	AXS5	07/26/23	1420	2465786

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3005A/6020B	
2	SW846 3005A/6020B	

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW370UG4-23	Project:	FRNP00507
Sample ID:	630713003	Client ID:	FRNP005
Matrix:	WG		
Collect Date:	25-JUL-23 08:25		
Receive Date:	26-JUL-23		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	U	0.0187	0.00841	0.0187	ug/L	0.935	1	LOF	08/02/23	1738	2468087	1
Carbon Analysis												
9060A, Total Organic Carbon "As Received"												
Total Organic Carbon Average	J	0.765	0.330	2.00	mg/L		1	RM3	07/29/23	0356	2466615	2
Flow Injection Analysis												
9012B, Cyanide, Total "As Received"												
Cyanide, Total	U	0.200	0.00167	0.200	mg/L	1.00	1	KLP1	07/27/23	1441	2465823	3
Halogen Analysis												
9020B, TOX (Organic Halogen) "As Received"												
Total Organic Halogens	BJ	7.64	3.33	10.0	ug/L		1	RM3	08/10/23	1320	2474234	4
Ion Chromatography												
300.0, Iodide in Liquid "As Received"												
Iodide	U	0.500	0.167	0.500	mg/L		1	LXA2	07/26/23	1903	2466163	5
SW846 9056A Anions (5 elements) "As Received"												
Bromide	W	0.675	0.0670	0.200	mg/L		1	JLD1	07/26/23	1308	2465609	6
Fluoride	J	0.170	0.0330	4.00	mg/L		1					
Chloride	JW	44.0	0.335	250	mg/L		5	JLD1	07/26/23	2210	2465609	7
Nitrate-N	J	1.02	0.165	10.0	mg/L		5					
Sulfate		20.3	0.665	2.00	mg/L		5					
Mercury Analysis-CVAA												
7470, Mercury Liquid "As Received"												
Mercury	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	JP2	07/28/23	1049	2466244	8
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	PRB	08/10/23	2009	2466146	9
Rhodium	U	0.00500	0.00160	0.00500	mg/L	1.00	1	PRB	08/11/23	0050	2466146	10
Tantalum	U	0.00500	0.00100	0.00500	mg/L	1.00	1					
Boron		0.124	0.00520	0.0150	mg/L	1.00	1	PRB	08/11/23	1208	2466146	11
Aluminum	U	0.0500	0.0193	0.0500	mg/L	1.00	1	PRB	08/11/23	0538	2466146	12
Antimony	U	0.00300	0.00100	0.00300	mg/L	1.00	1					
Arsenic	U	0.00500	0.00200	0.00500	mg/L	1.00	1					
Barium		0.223	0.000670	0.00400	mg/L	1.00	1					
Beryllium	U	0.000500	0.000200	0.000500	mg/L	1.00	1					

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Certificate of Analysis

Report Date: November 2, 2023

Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW370UG4-23 Project: FRNP00507
Sample ID: 630713003 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Cadmium	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Calcium		29.3	0.0800	0.200	mg/L	1.00	1					
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Cobalt	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Copper	J	0.00196	0.000300	0.00200	mg/L	1.00	1					
Iron	U	0.100	0.0330	0.100	mg/L	1.00	1					
Lead	U	0.00200	0.000500	0.00200	mg/L	1.00	1					
Magnesium		12.1	0.0100	0.0300	mg/L	1.00	1					
Manganese	J	0.00140	0.00100	0.00500	mg/L	1.00	1					
Molybdenum	U	0.00100	0.000200	0.00100	mg/L	1.00	1					
Nickel	J	0.000752	0.000600	0.00200	mg/L	1.00	1					
Potassium		2.49	0.0800	0.300	mg/L	1.00	1					
Selenium	U	0.00500	0.00150	0.00500	mg/L	1.00	1					
Silver	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Sodium		42.8	0.0800	0.250	mg/L	1.00	1					
Thallium	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Vanadium	U	0.0200	0.00330	0.0200	mg/L	1.00	1					
Zinc	J	0.00572	0.00330	0.0200	mg/L	1.00	1					
Semi-Volatiles-PCB												
8082A, PCB Liquids "As Received"												
Aroclor-1016	U	0.100	0.0333	0.100	ug/L	0.00100	1	JXM	08/16/23	1104	2476246	13
Aroclor-1221	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Aroclor-1232	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Aroclor-1242	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Aroclor-1248	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Aroclor-1254	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Aroclor-1260	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Aroclor-1268	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Aroclor-Total	U	0.100	0.0333	0.100	ug/L	0.00100	1					
Solids Analysis												
160.1, Dissolved Solids "As Received"												
Total Dissolved Solids		211	2.38	10.0	mg/L			CH6	07/28/23	0944	2467003	14
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												

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Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW370UG4-23 Project: FRNP00507
Sample ID: 630713003 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												
COD	U	20.0	8.95	20.0	mg/L		1	JW2	07/27/23	1453	2465849	15
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	JM6	07/27/23	1016	2465652	16
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	U	5.00	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					

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Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW370UG4-23	Project:	FRNP00507
Sample ID:	630713003	Client ID:	FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene		5.48	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8011 PREP	8011 Prep	LOF	08/02/23	1201	2468080
SW846 3005A	ICP-MS 3005A PREP	CD3	07/28/23	1430	2466144
SW846 9010C Distillation	SW846 9010C Prep	ES2	07/27/23	1111	2466361
SW846 3535A	SW3535A PCB SPE Extraction	LW1	08/16/23	0520	2476245
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	EK1	07/27/23	1130	2466243

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Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW370UG4-23	Project:	FRNP00507
Sample ID:	630713003	Client ID:	FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8011	
2	SW846 9060A	
3	SW846 9012B	
4	SW846 9020B	
5	EPA 300.0	
6	SW846 9056A	
7	SW846 9056A	
8	SW846 7470A	
9	SW846 3005A/6020B	
10	SW846 3005A/6020B	
11	SW846 3005A/6020B	
12	SW846 3005A/6020B	
13	SW846 3535A/8082A	
14	EPA 160.1	
15	EPA 410.4	
16	SW846 8260D	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	6.06 ug/L	6.68	91	(46%-159%)
Decachlorobiphenyl	8082A, PCB Liquids "As Received"	0.170 ug/L	0.200	85	(32%-135%)
4cmx	8082A, PCB Liquids "As Received"	0.113 ug/L	0.200	57	(26%-108%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	54.6 ug/L	50.0	109	(72%-125%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	47.9 ug/L	50.0	96	(73%-129%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	50.8 ug/L	50.0	102	(75%-123%)

Notes:

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Lc/LC: Critical Level
PF: Prep Factor
RL: Reporting Limit
SQL: Sample Quantitation Limit

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Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW370UG4-23	Project:	FRNP00507
Sample ID:	630713004	Client ID:	FRNP005
Matrix:	WG		
Collect Date:	25-JUL-23 08:25		
Receive Date:	26-JUL-23		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Dissolved Metals (3 Elements) "As Received"												
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	PRB	08/10/23	2034	2466146	1
Barium		0.223	0.000670	0.00400	mg/L	1.00	1	PRB	08/11/23	0603	2466146	2
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 160	Laboratory Filtration	AXS5	07/26/23	1420	2465786
SW846 3005A	ICP-MS 3005A PREP	CD3	07/28/23	1430	2466144

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3005A/6020B	
2	SW846 3005A/6020B	

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW371UG4-23	Project:	FRNP00507
Sample ID:	630713005	Client ID:	FRNP005
Matrix:	WG		
Collect Date:	25-JUL-23 09:26		
Receive Date:	26-JUL-23		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	U	0.0190	0.00854	0.0190	ug/L	0.949	1	LOF	08/02/23	1852	2468087	1
Carbon Analysis												
9060A, Total Organic Carbon "As Received"												
Total Organic Carbon Average	J	1.72	0.330	2.00	mg/L		1	RM3	07/29/23	0554	2466615	2
Flow Injection Analysis												
9012B, Cyanide, Total "As Received"												
Cyanide, Total	J	0.0168	0.00167	0.200	mg/L	1.00	1	KLP1	07/27/23	1445	2465823	3
Halogen Analysis												
9020B, TOX (Organic Halogen) "As Received"												
Total Organic Halogens	J	5.30	3.33	10.0	ug/L		1	RM3	08/07/23	1429	2472135	4
Ion Chromatography												
300.0, Iodide in Liquid "As Received"												
Iodide	U	0.500	0.167	0.500	mg/L		1	LXA2	07/26/23	1942	2466163	5
SW846 9056A Anions (5 elements) "As Received"												
Nitrate-N	J	0.166	0.165	10.0	mg/L		5	JLD1	07/26/23	2345	2465609	6
Sulfate		28.6	0.665	2.00	mg/L		5					
Bromide	UW	0.200	0.0670	0.200	mg/L		1	JLD1	07/26/23	1340	2465609	7
Chloride	JW	3.49	0.0670	250	mg/L		1					
Fluoride	J	0.180	0.0330	4.00	mg/L		1					
Mercury Analysis-CVAA												
7470, Mercury Liquid "As Received"												
Mercury	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	JP2	07/28/23	1057	2466244	8
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Boron	J	0.00544	0.00520	0.0150	mg/L	1.00	1	PRB	08/11/23	1222	2466146	9
Aluminum		0.178	0.0193	0.0500	mg/L	1.00	1	PRB	08/11/23	0621	2466146	10
Antimony	U	0.00300	0.00100	0.00300	mg/L	1.00	1					
Arsenic	U	0.00500	0.00200	0.00500	mg/L	1.00	1					
Barium		0.115	0.000670	0.00400	mg/L	1.00	1					
Beryllium	U	0.000500	0.000200	0.000500	mg/L	1.00	1					
Cadmium	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Cobalt	U	0.00100	0.000300	0.00100	mg/L	1.00	1					

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Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW371UG4-23 Project: FRNP00507
Sample ID: 630713005 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Copper	J	0.00141	0.000300	0.00200	mg/L	1.00	1					
Iron		0.143	0.0330	0.100	mg/L	1.00	1					
Lead	U	0.00200	0.000500	0.00200	mg/L	1.00	1					
Magnesium		14.5	0.0100	0.0300	mg/L	1.00	1					
Manganese	J	0.00230	0.00100	0.00500	mg/L	1.00	1					
Molybdenum	J	0.000440	0.000200	0.00100	mg/L	1.00	1					
Nickel	J	0.00163	0.000600	0.00200	mg/L	1.00	1					
Potassium		0.375	0.0800	0.300	mg/L	1.00	1					
Selenium	U	0.00500	0.00150	0.00500	mg/L	1.00	1					
Silver	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Thallium	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Vanadium	J	0.00428	0.00330	0.0200	mg/L	1.00	1					
Zinc	J	0.00463	0.00330	0.0200	mg/L	1.00	1					
Uranium		0.00120	0.0000670	0.000200	mg/L	1.00	1	PRB	08/10/23	2052	2466146	11
Calcium		60.9	0.800	2.00	mg/L	1.00	10	PRB	08/11/23	1231	2466146	12
Sodium		65.3	0.800	2.50	mg/L	1.00	10					
Rhodium	U	0.00500	0.00160	0.00500	mg/L	1.00	1	PRB	08/11/23	0104	2466146	13
Tantalum	U	0.00500	0.00100	0.00500	mg/L	1.00	1					
Semi-Volatiles-PCB												
8082A, PCB Liquids "As Received"												
Aroclor-1016	U	0.0984	0.0328	0.0984	ug/L	0.000984	1	JXM	08/16/23	1147	2476246	14
Aroclor-1221	U	0.0984	0.0328	0.0984	ug/L	0.000984	1					
Aroclor-1232	U	0.0984	0.0328	0.0984	ug/L	0.000984	1					
Aroclor-1242	U	0.0984	0.0328	0.0984	ug/L	0.000984	1					
Aroclor-1248	U	0.0984	0.0328	0.0984	ug/L	0.000984	1					
Aroclor-1254	U	0.0984	0.0328	0.0984	ug/L	0.000984	1					
Aroclor-1260	U	0.0984	0.0328	0.0984	ug/L	0.000984	1					
Aroclor-1268	U	0.0984	0.0328	0.0984	ug/L	0.000984	1					
Aroclor-Total	U	0.0984	0.0328	0.0984	ug/L	0.000984	1					
Solids Analysis												
160.1, Dissolved Solids "As Received"												
Total Dissolved Solids		362	2.38	10.0	mg/L			CH6	07/28/23	0944	2467003	15
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												

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Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW371UG4-23 Project: FRNP00507
Sample ID: 630713005 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												
COD	U	20.0	8.95	20.0	mg/L		1	JW2	07/27/23	1454	2465849	16
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	JM6	07/27/23	1044	2465652	17
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	U	5.00	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					

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Certificate of Analysis

Report Date: November 2, 2023

Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW371UG4-23 Project: FRNP00507
Sample ID: 630713005 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene	U	1.00	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	CD3	07/28/23	1430	2466144
SW846 8011 PREP	8011 Prep	LOF	08/02/23	1201	2468080
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	EK1	07/27/23	1130	2466243
SW846 9010C Distillation	SW846 9010C Prep	ES2	07/27/23	1111	2466361
SW846 3535A	SW3535A PCB SPE Extraction	LW1	08/16/23	0520	2476245

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Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW371UG4-23	Project:	FRNP00507
Sample ID:	630713005	Client ID:	FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8011	
2	SW846 9060A	
3	SW846 9012B	
4	SW846 9020B	
5	EPA 300.0	
6	SW846 9056A	
7	SW846 9056A	
8	SW846 7470A	
9	SW846 3005A/6020B	
10	SW846 3005A/6020B	
11	SW846 3005A/6020B	
12	SW846 3005A/6020B	
13	SW846 3005A/6020B	
14	SW846 3535A/8082A	
15	EPA 160.1	
16	EPA 410.4	
17	SW846 8260D	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	7.25 ug/L	6.78	107	(46%-159%)
Decachlorobiphenyl	8082A, PCB Liquids "As Received"	0.174 ug/L	0.197	88	(32%-135%)
4cmx	8082A, PCB Liquids "As Received"	0.116 ug/L	0.197	59	(26%-108%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	54.7 ug/L	50.0	109	(72%-125%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	48.3 ug/L	50.0	97	(73%-129%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	49.4 ug/L	50.0	99	(75%-123%)

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW371UG4-23	Project:	FRNP00507
Sample ID:	630713006	Client ID:	FRNP005
Matrix:	WG		
Collect Date:	25-JUL-23 09:26		
Receive Date:	26-JUL-23		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Dissolved Metals (3 Elements) "As Received"												
Barium		0.117	0.000670	0.00400	mg/L	1.00	1	PRB	08/11/23	0625	2466146	1
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Uranium		0.00118	0.0000670	0.000200	mg/L	1.00	1	PRB	08/10/23	2056	2466146	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	CD3	07/28/23	1430	2466144
EPA 160	Laboratory Filtration	AXS5	07/26/23	1420	2465786

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3005A/6020B	
2	SW846 3005A/6020B	

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW372UG4-23	Project:	FRNP00507
Sample ID:	630713007	Client ID:	FRNP005
Matrix:	WG		
Collect Date:	25-JUL-23 10:55		
Receive Date:	26-JUL-23		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	U	0.0189	0.00849	0.0189	ug/L	0.943	1	LOF	08/02/23	1917	2468087	1
Carbon Analysis												
9060A, Total Organic Carbon "As Received"												
Total Organic Carbon Average	J	0.881	0.330	2.00	mg/L		1	RM3	07/29/23	0633	2466615	2
Flow Injection Analysis												
9012B, Cyanide, Total "As Received"												
Cyanide, Total	J	0.00437	0.00167	0.200	mg/L	1.00	1	KLP1	07/27/23	1449	2465823	3
Halogen Analysis												
9020B, TOX (Organic Halogen) "As Received"												
Total Organic Halogens	J	9.56	3.33	10.0	ug/L		1	RM3	08/07/23	1549	2472135	4
Ion Chromatography												
300.0, Iodide in Liquid "As Received"												
Iodide	U	0.500	0.167	0.500	mg/L		1	LXA2	07/26/23	1955	2466163	5
SW846 9056A Anions (5 elements) "As Received"												
Chloride	JW	38.7	0.335	250	mg/L		5	JLD1	07/27/23	0017	2465609	6
Nitrate-N	J	0.742	0.165	10.0	mg/L		5					
Bromide	W	0.595	0.0670	0.200	mg/L		1	JLD1	07/26/23	1412	2465609	7
Fluoride	J	0.175	0.0330	4.00	mg/L		1					
Sulfate		145	3.33	10.0	mg/L		25	JLD1	07/27/23	0049	2465609	8
Mercury Analysis-CVAA												
7470, Mercury Liquid "As Received"												
Mercury	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	JP2	07/28/23	1059	2466244	9
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Rhodium	U	0.00500	0.00160	0.00500	mg/L	1.00	1	PRB	08/11/23	0106	2466146	10
Tantalum	U	0.00500	0.00100	0.00500	mg/L	1.00	1					
Boron		1.29	0.0520	0.150	mg/L	1.00	10	PRB	08/11/23	1233	2466146	11
Calcium		61.0	0.800	2.00	mg/L	1.00	10					
Sodium		56.9	0.800	2.50	mg/L	1.00	10					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	PRB	08/10/23	2100	2466146	12
Aluminum	U	0.0500	0.0193	0.0500	mg/L	1.00	1	PRB	08/11/23	0628	2466146	13
Antimony	U	0.00300	0.00100	0.00300	mg/L	1.00	1					
Arsenic	U	0.00500	0.00200	0.00500	mg/L	1.00	1					

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Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW372UG4-23 Project: FRNP00507
Sample ID: 630713007 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Barium		0.0596	0.000670	0.00400	mg/L	1.00	1					
Beryllium	U	0.000500	0.000200	0.000500	mg/L	1.00	1					
Cadmium	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Cobalt	J	0.000305	0.000300	0.00100	mg/L	1.00	1					
Copper	J	0.00127	0.000300	0.00200	mg/L	1.00	1					
Iron	U	0.100	0.0330	0.100	mg/L	1.00	1					
Lead	U	0.00200	0.000500	0.00200	mg/L	1.00	1					
Magnesium		21.1	0.0100	0.0300	mg/L	1.00	1					
Manganese	J	0.00157	0.00100	0.00500	mg/L	1.00	1					
Molybdenum	J	0.000202	0.000200	0.00100	mg/L	1.00	1					
Nickel	J	0.000929	0.000600	0.00200	mg/L	1.00	1					
Potassium		2.30	0.0800	0.300	mg/L	1.00	1					
Selenium	U	0.00500	0.00150	0.00500	mg/L	1.00	1					
Silver	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Thallium	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Vanadium	U	0.0200	0.00330	0.0200	mg/L	1.00	1					
Zinc	J	0.00431	0.00330	0.0200	mg/L	1.00	1					
Semi-Volatiles-PCB												
8082A, PCB Liquids "As Received"												
Aroclor-1016	U	0.102	0.0338	0.102	ug/L	0.00102	1	JXM	08/16/23	1201	2476246	14
Aroclor-1221	U	0.102	0.0338	0.102	ug/L	0.00102	1					
Aroclor-1232	U	0.102	0.0338	0.102	ug/L	0.00102	1					
Aroclor-1242	U	0.102	0.0338	0.102	ug/L	0.00102	1					
Aroclor-1248	U	0.102	0.0338	0.102	ug/L	0.00102	1					
Aroclor-1254	U	0.102	0.0338	0.102	ug/L	0.00102	1					
Aroclor-1260	U	0.102	0.0338	0.102	ug/L	0.00102	1					
Aroclor-1268	U	0.102	0.0338	0.102	ug/L	0.00102	1					
Aroclor-Total	U	0.102	0.0338	0.102	ug/L	0.00102	1					
Solids Analysis												
160.1, Dissolved Solids "As Received"												
Total Dissolved Solids		423	2.38	10.0	mg/L			CH6	07/28/23	0944	2467003	15
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												

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Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW372UG4-23 Project: FRNP00507
Sample ID: 630713007 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												
COD	U	20.0	8.95	20.0	mg/L		1	JW2	07/27/23	1454	2465849	16
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	JM6	07/27/23	1304	2465652	17
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	U	5.00	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					

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Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW372UG4-23 Project: FRNP00507
Sample ID: 630713007 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene		5.09	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	EK1	07/27/23	1130	2466243
SW846 3005A	ICP-MS 3005A PREP	CD3	07/28/23	1430	2466144
SW846 9010C Distillation	SW846 9010C Prep	ES2	07/27/23	1111	2466361
SW846 3535A	SW3535A PCB SPE Extraction	LW1	08/16/23	0520	2476245
SW846 8011 PREP	8011 Prep	LOF	08/02/23	1201	2468080

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Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW372UG4-23	Project:	FRNP00507
Sample ID:	630713007	Client ID:	FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8011	
2	SW846 9060A	
3	SW846 9012B	
4	SW846 9020B	
5	EPA 300.0	
6	SW846 9056A	
7	SW846 9056A	
8	SW846 9056A	
9	SW846 7470A	
10	SW846 3005A/6020B	
11	SW846 3005A/6020B	
12	SW846 3005A/6020B	
13	SW846 3005A/6020B	
14	SW846 3535A/8082A	
15	EPA 160.1	
16	EPA 410.4	
17	SW846 8260D	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	5.96 ug/L	6.74	88	(46%-159%)
Decachlorobiphenyl	8082A, PCB Liquids "As Received"	0.228 ug/L	0.203	112	(32%-135%)
4cmx	8082A, PCB Liquids "As Received"	0.139 ug/L	0.203	69	(26%-108%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	54.8 ug/L	50.0	110	(72%-125%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	49.4 ug/L	50.0	99	(73%-129%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	49.7 ug/L	50.0	99	(75%-123%)

Notes:

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Lc/LC: Critical Level
PF: Prep Factor
RL: Reporting Limit
SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW372UG4-23	Project:	FRNP00507
Sample ID:	630713008	Client ID:	FRNP005
Matrix:	WG		
Collect Date:	25-JUL-23 10:55		
Receive Date:	26-JUL-23		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Dissolved Metals (3 Elements) "As Received"												
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	PRB	08/10/23	2111	2466146	1
Barium		0.0630	0.000670	0.00400	mg/L	1.00	1	PRB	08/11/23	0639	2466146	2
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	CD3	07/28/23	1430	2466144
EPA 160	Laboratory Filtration	AXS5	07/26/23	1420	2465786

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3005A/6020B	
2	SW846 3005A/6020B	

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW373UG4-23	Project:	FRNP00507
Sample ID:	630713009	Client ID:	FRNP005
Matrix:	WG		
Collect Date:	25-JUL-23 11:39		
Receive Date:	26-JUL-23		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	U	0.0191	0.00858	0.0191	ug/L	0.954	1	LOF	08/02/23	1941	2468087	1
Carbon Analysis												
9060A, Total Organic Carbon "As Received"												
Total Organic Carbon Average	J	1.22	0.330	2.00	mg/L		1	RM3	07/29/23	0712	2466615	2
Flow Injection Analysis												
9012B, Cyanide, Total "As Received"												
Cyanide, Total	J	0.00361	0.00167	0.200	mg/L	1.00	1	KLP1	07/27/23	1450	2465823	3
Halogen Analysis												
9020B, TOX (Organic Halogen) "As Received"												
Total Organic Halogens	J	9.20	3.33	10.0	ug/L		1	RM3	08/07/23	1627	2472135	4
Ion Chromatography												
300.0, Iodide in Liquid "As Received"												
Iodide	U	0.500	0.167	0.500	mg/L		1	LXA2	07/26/23	2008	2466163	5
SW846 9056A Anions (5 elements) "As Received"												
Bromide	JW	0.463	0.335	1.00	mg/L		5	JLD1	07/27/23	0121	2465609	6
Nitrate-N	J	0.658	0.165	10.0	mg/L		5					
Fluoride	J	0.187	0.0330	4.00	mg/L		1	JLD1	07/26/23	1547	2465609	7
Chloride	JW	32.1	1.68	250	mg/L		25	JLD1	07/27/23	0153	2465609	8
Sulfate		180	3.33	10.0	mg/L		25					
Mercury Analysis-CVAA												
7470, Mercury Liquid "As Received"												
Mercury	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	JP2	07/28/23	1101	2466244	9
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Aluminum	U	0.0500	0.0193	0.0500	mg/L	1.00	1	PRB	08/11/23	0643	2466146	10
Antimony	U	0.00300	0.00100	0.00300	mg/L	1.00	1					
Arsenic	U	0.00500	0.00200	0.00500	mg/L	1.00	1					
Barium		0.0342	0.000670	0.00400	mg/L	1.00	1					
Beryllium	U	0.000500	0.000200	0.000500	mg/L	1.00	1					
Cadmium	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Cobalt	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Copper	J	0.00112	0.000300	0.00200	mg/L	1.00	1					

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Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW373UG4-23 Project: FRNP00507
Sample ID: 630713009 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Iron	J	0.0429	0.0330	0.100	mg/L	1.00	1					
Lead	U	0.00200	0.000500	0.00200	mg/L	1.00	1					
Magnesium		26.6	0.0100	0.0300	mg/L	1.00	1					
Manganese		0.0518	0.00100	0.00500	mg/L	1.00	1					
Molybdenum	U	0.00100	0.000200	0.00100	mg/L	1.00	1					
Nickel	J	0.00168	0.000600	0.00200	mg/L	1.00	1					
Potassium		2.73	0.0800	0.300	mg/L	1.00	1					
Selenium	U	0.00500	0.00150	0.00500	mg/L	1.00	1					
Silver	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Thallium	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Vanadium	U	0.0200	0.00330	0.0200	mg/L	1.00	1					
Zinc	J	0.00448	0.00330	0.0200	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	PRB	08/10/23	2114	2466146	11
Rhodium	U	0.00500	0.00160	0.00500	mg/L	1.00	1	PRB	08/11/23	0108	2466146	12
Tantalum	U	0.00500	0.00100	0.00500	mg/L	1.00	1					
Boron		2.01	0.104	0.300	mg/L	1.00	20	PRB	08/11/23	1250	2466146	13
Calcium		78.7	1.60	4.00	mg/L	1.00	20					
Sodium		62.9	1.60	5.00	mg/L	1.00	20					
Semi-Volatiles-PCB												
8082A, PCB Liquids "As Received"												
Aroclor-1016	U	0.102	0.0341	0.102	ug/L	0.00102	1	JXM	08/16/23	1216	2476246	14
Aroclor-1221	U	0.102	0.0341	0.102	ug/L	0.00102	1					
Aroclor-1232	U	0.102	0.0341	0.102	ug/L	0.00102	1					
Aroclor-1242	U	0.102	0.0341	0.102	ug/L	0.00102	1					
Aroclor-1248	U	0.102	0.0341	0.102	ug/L	0.00102	1					
Aroclor-1254	U	0.102	0.0341	0.102	ug/L	0.00102	1					
Aroclor-1260	U	0.102	0.0341	0.102	ug/L	0.00102	1					
Aroclor-1268	U	0.102	0.0341	0.102	ug/L	0.00102	1					
Aroclor-Total	U	0.102	0.0341	0.102	ug/L	0.00102	1					
Solids Analysis												
160.1, Dissolved Solids "As Received"												
Total Dissolved Solids		514	2.38	10.0	mg/L			CH6	07/28/23	0944	2467003	15
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												

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Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW373UG4-23 Project: FRNP00507
Sample ID: 630713009 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												
COD	U	20.0	8.95	20.0	mg/L		1	JW2	07/27/23	1454	2465849	16
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	JM6	07/27/23	1332	2465652	17
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	U	5.00	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					

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Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW373UG4-23	Project:	FRNP00507
Sample ID:	630713009	Client ID:	FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene		3.53	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	EK1	07/27/23	1130	2466243
SW846 8011 PREP	8011 Prep	LOF	08/02/23	1201	2468080
SW846 3005A	ICP-MS 3005A PREP	CD3	07/28/23	1430	2466144
SW846 3535A	SW3535A PCB SPE Extraction	LW1	08/16/23	0520	2476245
SW846 9010C Distillation	SW846 9010C Prep	ES2	07/27/23	1111	2466361

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Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW373UG4-23	Project:	FRNP00507
Sample ID:	630713009	Client ID:	FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8011	
2	SW846 9060A	
3	SW846 9012B	
4	SW846 9020B	
5	EPA 300.0	
6	SW846 9056A	
7	SW846 9056A	
8	SW846 9056A	
9	SW846 7470A	
10	SW846 3005A/6020B	
11	SW846 3005A/6020B	
12	SW846 3005A/6020B	
13	SW846 3005A/6020B	
14	SW846 3535A/8082A	
15	EPA 160.1	
16	EPA 410.4	
17	SW846 8260D	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	7.69 ug/L	6.81	113	(46%-159%)
Decachlorobiphenyl	8082A, PCB Liquids "As Received"	0.204 ug/L	0.205	100	(32%-135%)
4cmx	8082A, PCB Liquids "As Received"	0.124 ug/L	0.205	61	(26%-108%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	53.2 ug/L	50.0	106	(72%-125%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	49.6 ug/L	50.0	99	(73%-129%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	51.0 ug/L	50.0	102	(75%-123%)

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
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Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW373UG4-23	Project:	FRNP00507
Sample ID:	630713010	Client ID:	FRNP005
Matrix:	WG		
Collect Date:	25-JUL-23 11:39		
Receive Date:	26-JUL-23		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Dissolved Metals (3 Elements) "As Received"												
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	PRB	08/10/23	2118	2466146	1
Barium		0.0327	0.000670	0.00400	mg/L	1.00	1	PRB	08/11/23	0646	2466146	2
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	CD3	07/28/23	1430	2466144
EPA 160	Laboratory Filtration	AXS5	07/26/23	1420	2465786

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3005A/6020B	
2	SW846 3005A/6020B	

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
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Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW374UG4-23	Project:	FRNP00507
Sample ID:	630713011	Client ID:	FRNP005
Matrix:	WG		
Collect Date:	25-JUL-23 12:23		
Receive Date:	26-JUL-23		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	U	0.0191	0.00859	0.0191	ug/L	0.954	1	LOF	08/02/23	2006	2468087	1
Carbon Analysis												
9060A, Total Organic Carbon "As Received"												
Total Organic Carbon Average		2.09	0.330	2.00	mg/L		1	RM3	07/29/23	0751	2466615	2
Flow Injection Analysis												
9012B, Cyanide, Total "As Received"												
Cyanide, Total	J	0.00181	0.00167	0.200	mg/L	1.00	1	KLP1	07/27/23	1451	2465823	3
Halogen Analysis												
9020B, TOX (Organic Halogen) "As Received"												
Total Organic Halogens		14.7	3.33	10.0	ug/L		1	RM3	08/07/23	1731	2472135	4
Ion Chromatography												
300.0, Iodide in Liquid "As Received"												
Iodide	U	0.500	0.167	0.500	mg/L		1	LXA2	07/26/23	2021	2466163	5
SW846 9056A Anions (5 elements) "As Received"												
Chloride	JW	45.0	0.670	250	mg/L		10	JLD1	07/27/23	0225	2465609	6
Bromide	W	0.575	0.0670	0.200	mg/L		1	JLD1	07/26/23	1619	2465609	7
Fluoride	J	0.208	0.0330	4.00	mg/L		1					
Nitrate-N	J	0.415	0.0330	10.0	mg/L		1					
Sulfate		15.6	0.133	0.400	mg/L		1					
Mercury Analysis-CVAA												
7470, Mercury Liquid "As Received"												
Mercury	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	JP2	07/28/23	1102	2466244	8
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Boron		0.0356	0.00520	0.0150	mg/L	1.00	1	PRB	08/11/23	1228	2466146	9
Rhodium	U	0.00500	0.00160	0.00500	mg/L	1.00	1	PRB	08/11/23	0110	2466146	10
Tantalum	U	0.00500	0.00100	0.00500	mg/L	1.00	1					
Sodium		121	0.800	2.50	mg/L	1.00	10	PRB	08/11/23	1237	2466146	11
Uranium		0.000366	0.0000670	0.000200	mg/L	1.00	1	PRB	08/10/23	2121	2466146	12
Aluminum	U	0.0500	0.0193	0.0500	mg/L	1.00	1	PRB	08/11/23	0650	2466146	13
Antimony	U	0.00300	0.00100	0.00300	mg/L	1.00	1					
Arsenic	U	0.00500	0.00200	0.00500	mg/L	1.00	1					
Barium		0.141	0.000670	0.00400	mg/L	1.00	1					

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Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW374UG4-23 Project: FRNP00507
Sample ID: 630713011 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Beryllium	U	0.000500	0.000200	0.000500	mg/L	1.00	1					
Cadmium	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Calcium		23.8	0.0800	0.200	mg/L	1.00	1					
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Cobalt	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Copper	J	0.000689	0.000300	0.00200	mg/L	1.00	1					
Iron		0.184	0.0330	0.100	mg/L	1.00	1					
Lead	U	0.00200	0.000500	0.00200	mg/L	1.00	1					
Magnesium		5.79	0.0100	0.0300	mg/L	1.00	1					
Manganese		0.0852	0.00100	0.00500	mg/L	1.00	1					
Molybdenum	J	0.000252	0.000200	0.00100	mg/L	1.00	1					
Nickel	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Potassium		0.393	0.0800	0.300	mg/L	1.00	1					
Selenium		0.00737	0.00150	0.00500	mg/L	1.00	1					
Silver	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Thallium	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Vanadium	U	0.0200	0.00330	0.0200	mg/L	1.00	1					
Zinc	U	0.0200	0.00330	0.0200	mg/L	1.00	1					
Semi-Volatiles-PCB												
8082A, PCB Liquids "As Received"												
Aroclor-1016	U	0.0969	0.0323	0.0969	ug/L	0.000969	1	JXM	08/16/23	1230	2476246	14
Aroclor-1221	U	0.0969	0.0323	0.0969	ug/L	0.000969	1					
Aroclor-1232	U	0.0969	0.0323	0.0969	ug/L	0.000969	1					
Aroclor-1242	U	0.0969	0.0323	0.0969	ug/L	0.000969	1					
Aroclor-1248	U	0.0969	0.0323	0.0969	ug/L	0.000969	1					
Aroclor-1254	U	0.0969	0.0323	0.0969	ug/L	0.000969	1					
Aroclor-1260	U	0.0969	0.0323	0.0969	ug/L	0.000969	1					
Aroclor-1268	U	0.0969	0.0323	0.0969	ug/L	0.000969	1					
Aroclor-Total	U	0.0969	0.0323	0.0969	ug/L	0.000969	1					
Solids Analysis												
160.1, Dissolved Solids "As Received"												
Total Dissolved Solids		363	2.38	10.0	mg/L			CH6	07/28/23	0944	2467003	15
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												

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Certificate of Analysis

Report Date: November 2, 2023

Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW374UG4-23 Project: FRNP00507
Sample ID: 630713011 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												
COD	U	20.0	8.95	20.0	mg/L		1	JW2	07/27/23	1455	2465849	16
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	JM6	07/27/23	1400	2465652	17
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	U	5.00	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					

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Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW374UG4-23	Project:	FRNP00507
Sample ID:	630713011	Client ID:	FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene	J	0.340	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8011 PREP	8011 Prep	LOF	08/02/23	1201	2468080
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	EK1	07/27/23	1130	2466243
SW846 3005A	ICP-MS 3005A PREP	CD3	07/28/23	1430	2466144
SW846 3535A	SW3535A PCB SPE Extraction	LW1	08/16/23	0520	2476245
SW846 9010C Distillation	SW846 9010C Prep	ES2	07/27/23	1111	2466361

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	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW374UG4-23	Project:	FRNP00507
Sample ID:	630713011	Client ID:	FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8011	
2	SW846 9060A	
3	SW846 9012B	
4	SW846 9020B	
5	EPA 300.0	
6	SW846 9056A	
7	SW846 9056A	
8	SW846 7470A	
9	SW846 3005A/6020B	
10	SW846 3005A/6020B	
11	SW846 3005A/6020B	
12	SW846 3005A/6020B	
13	SW846 3005A/6020B	
14	SW846 3535A/8082A	
15	EPA 160.1	
16	EPA 410.4	
17	SW846 8260D	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	7.12 ug/L	6.82	104	(46%-159%)
Decachlorobiphenyl	8082A, PCB Liquids "As Received"	0.174 ug/L	0.194	90	(32%-135%)
4cmx	8082A, PCB Liquids "As Received"	0.115 ug/L	0.194	60	(26%-108%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	53.1 ug/L	50.0	106	(72%-125%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	49.0 ug/L	50.0	98	(73%-129%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	50.5 ug/L	50.0	101	(75%-123%)

Notes:

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Lc/LC: Critical Level
PF: Prep Factor
RL: Reporting Limit
SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW374UG4-23	Project:	FRNP00507
Sample ID:	630713012	Client ID:	FRNP005
Matrix:	WG		
Collect Date:	25-JUL-23 12:23		
Receive Date:	26-JUL-23		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Dissolved Metals (3 Elements) "As Received"												
Barium		0.135	0.000670	0.00400	mg/L	1.00	1	PRB	08/11/23	0654	2466146	1
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Uranium		0.000358	0.0000670	0.000200	mg/L	1.00	1	PRB	08/10/23	2125	2466146	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	CD3	07/28/23	1430	2466144
EPA 160	Laboratory Filtration	AXS5	07/26/23	1420	2465786

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3005A/6020B	
2	SW846 3005A/6020B	

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Report Date: November 2, 2023

Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW375UG4-23
Sample ID: 630713013
Matrix: WG
Collect Date: 25-JUL-23 10:17
Receive Date: 26-JUL-23
Collector: Client

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	U	0.0188	0.00847	0.0188	ug/L	0.941	1	LOF	08/02/23	2030	2468087	1
Carbon Analysis												
9060A, Total Organic Carbon "As Received"												
Total Organic Carbon Average	J	0.743	0.330	2.00	mg/L		1	RM3	07/29/23	0830	2466615	2
Flow Injection Analysis												
9012B, Cyanide, Total "As Received"												
Cyanide, Total	J	0.00176	0.00167	0.200	mg/L	1.00	1	KLP1	07/27/23	1452	2465823	3
Halogen Analysis												
9020B, TOX (Organic Halogen) "As Received"												
Total Organic Halogens	J	4.28	3.33	10.0	ug/L		1	RM3	08/07/23	1808	2472135	4
Ion Chromatography												
300.0, Iodide in Liquid "As Received"												
Iodide	U	0.500	0.167	0.500	mg/L		1	LXA2	07/26/23	2059	2466163	5
SW846 9056A Anions (5 elements) "As Received"												
Bromide	UW	0.200	0.0670	0.200	mg/L		1	JLD1	07/26/23	1651	2465609	6
Chloride	JW	3.27	0.0670	250	mg/L		1					
Fluoride	J	0.300	0.0330	4.00	mg/L		1					
Nitrate-N	J	0.897	0.0330	10.0	mg/L		1					
Sulfate		23.5	0.266	0.800	mg/L		2	JLD1	07/27/23	0257	2465609	7
Mercury Analysis-CVAA												
7470, Mercury Liquid "As Received"												
Mercury	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	JP2	07/28/23	1104	2466244	8
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Aluminum	J	0.0268	0.0193	0.0500	mg/L	1.00	1	PRB	08/11/23	0657	2466146	9
Antimony	U	0.00300	0.00100	0.00300	mg/L	1.00	1					
Arsenic	U	0.00500	0.00200	0.00500	mg/L	1.00	1					
Barium		0.174	0.000670	0.00400	mg/L	1.00	1					
Beryllium	U	0.000500	0.000200	0.000500	mg/L	1.00	1					
Cadmium	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Calcium		13.2	0.0800	0.200	mg/L	1.00	1					
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					
Cobalt	U	0.00100	0.000300	0.00100	mg/L	1.00	1					

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Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW375UG4-23 Project: FRNP00507
Sample ID: 630713013 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Metals (15+ elements) "As Received"												
Copper	J	0.00112	0.000300	0.00200	mg/L	1.00	1					
Iron	J	0.0367	0.0330	0.100	mg/L	1.00	1					
Lead	U	0.00200	0.000500	0.00200	mg/L	1.00	1					
Magnesium		5.19	0.0100	0.0300	mg/L	1.00	1					
Manganese	J	0.00154	0.00100	0.00500	mg/L	1.00	1					
Molybdenum	U	0.00100	0.000200	0.00100	mg/L	1.00	1					
Nickel	J	0.00133	0.000600	0.00200	mg/L	1.00	1					
Potassium	J	0.254	0.0800	0.300	mg/L	1.00	1					
Selenium	J	0.00257	0.00150	0.00500	mg/L	1.00	1					
Silver	U	0.00100	0.000300	0.00100	mg/L	1.00	1					
Thallium	U	0.00200	0.000600	0.00200	mg/L	1.00	1					
Vanadium	U	0.0200	0.00330	0.0200	mg/L	1.00	1					
Zinc	J	0.00595	0.00330	0.0200	mg/L	1.00	1					
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	PRB	08/10/23	2129	2466146	10
Sodium		52.7	0.800	2.50	mg/L	1.00	10	PRB	08/11/23	1239	2466146	11
Rhodium	U	0.00500	0.00160	0.00500	mg/L	1.00	1	PRB	08/11/23	0112	2466146	12
Tantalum	U	0.00500	0.00100	0.00500	mg/L	1.00	1					
Boron	J	0.0138	0.00520	0.0150	mg/L	1.00	1	PRB	08/11/23	1230	2466146	13
Semi-Volatiles-PCB												
8082A, PCB Liquids "As Received"												
Aroclor-1016	U	0.0974	0.0324	0.0974	ug/L	0.000974	1	JXM	08/16/23	1309	2476246	14
Aroclor-1221	U	0.0974	0.0324	0.0974	ug/L	0.000974	1					
Aroclor-1232	U	0.0974	0.0324	0.0974	ug/L	0.000974	1					
Aroclor-1242	U	0.0974	0.0324	0.0974	ug/L	0.000974	1					
Aroclor-1248	U	0.0974	0.0324	0.0974	ug/L	0.000974	1					
Aroclor-1254	U	0.0974	0.0324	0.0974	ug/L	0.000974	1					
Aroclor-1260	U	0.0974	0.0324	0.0974	ug/L	0.000974	1					
Aroclor-1268	U	0.0974	0.0324	0.0974	ug/L	0.000974	1					
Aroclor-Total	U	0.0974	0.0324	0.0974	ug/L	0.000974	1					
Solids Analysis												
160.1, Dissolved Solids "As Received"												
Total Dissolved Solids		171	2.38	10.0	mg/L			CH6	07/28/23	0944	2467003	15
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												

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Certificate of Analysis

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Company : Four Rivers Nuclear Partnership, LLC
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Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW375UG4-23 Project: FRNP00507
Sample ID: 630713013 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis												
410.4, Chem. Oxygen Demand "As Received"												
COD	U	20.0	8.95	20.0	mg/L		1	JW2	07/27/23	1455	2465849	16
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	JM6	07/27/23	1429	2465652	17
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	U	5.00	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	U	5.00	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene	U	1.00	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					

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Certificate of Analysis

Report Date: November 2, 2023

Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW375UG4-23 Project: FRNP00507
Sample ID: 630713013 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene	J	0.640	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	CD3	07/28/23	1430	2466144
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	EK1	07/27/23	1130	2466243
SW846 3535A	SW3535A PCB SPE Extraction	LW1	08/16/23	0520	2476245
SW846 9010C Distillation	SW846 9010C Prep	ES2	07/27/23	1111	2466361
SW846 8011 PREP	8011 Prep	LOF	08/02/23	1201	2468080

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Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW375UG4-23	Project:	FRNP00507
Sample ID:	630713013	Client ID:	FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8011	
2	SW846 9060A	
3	SW846 9012B	
4	SW846 9020B	
5	EPA 300.0	
6	SW846 9056A	
7	SW846 9056A	
8	SW846 7470A	
9	SW846 3005A/6020B	
10	SW846 3005A/6020B	
11	SW846 3005A/6020B	
12	SW846 3005A/6020B	
13	SW846 3005A/6020B	
14	SW846 3535A/8082A	
15	EPA 160.1	
16	EPA 410.4	
17	SW846 8260D	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	7.57 ug/L	6.72	113	(46%-159%)
Decachlorobiphenyl	8082A, PCB Liquids "As Received"	0.201 ug/L	0.195	103	(32%-135%)
4cmx	8082A, PCB Liquids "As Received"	0.131 ug/L	0.195	67	(26%-108%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	53.6 ug/L	50.0	107	(72%-125%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	50.1 ug/L	50.0	100	(73%-129%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	52.6 ug/L	50.0	105	(75%-123%)

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	MW375UG4-23	Project:	FRNP00507
Sample ID:	630713014	Client ID:	FRNP005
Matrix:	WG		
Collect Date:	25-JUL-23 10:17		
Receive Date:	26-JUL-23		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS												
6020, Dissolved Metals (3 Elements) "As Received"												
Uranium	U	0.000200	0.0000670	0.000200	mg/L	1.00	1	PRB	08/10/23	2132	2466146	1
Barium		0.171	0.000670	0.00400	mg/L	1.00	1	PRB	08/11/23	0701	2466146	2
Chromium	U	0.0100	0.00300	0.0100	mg/L	1.00	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 160	Laboratory Filtration	AXS5	07/26/23	1420	2465786
SW846 3005A	ICP-MS 3005A PREP	CD3	07/28/23	1430	2466144

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3005A/6020B	
2	SW846 3005A/6020B	

Notes:

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Lc/LC: Critical Level
PF: Prep Factor
RL: Reporting Limit
SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	TB4UG4-23	Project:	FRNP00507
Sample ID:	630713015	Client ID:	FRNP005
Matrix:	WATER		
Collect Date:	25-JUL-23 06:25		
Receive Date:	26-JUL-23		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
504.1/8011 Analysis of EDB/DBCP												
8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"												
1,2-Dibromo-3-chloropropane	U	0.0189	0.00849	0.0189	ug/L	0.943	1	LOF	08/02/23	2055	2468087	1
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
1,1,1,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1	JM6	07/27/23	1236	2465652	2
1,1,1-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2,2-Tetrachloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
1,2,3-Trichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	1.00	0.333	1.00	ug/L		1					
1,2-Dichloropropane	U	1.00	0.333	1.00	ug/L		1					
1,4-Dichlorobenzene	U	1.00	0.333	1.00	ug/L		1					
2-Butanone	J	2.30	1.67	5.00	ug/L		1					
2-Hexanone	U	5.00	1.67	5.00	ug/L		1					
4-Methyl-2-pentanone	U	5.00	1.67	5.00	ug/L		1					
Acetone	J	4.88	1.74	5.00	ug/L		1					
Acrolein	U	5.00	1.67	5.00	ug/L		1					
Acrylonitrile	U	5.00	1.67	5.00	ug/L		1					
Benzene	U	1.00	0.333	1.00	ug/L		1					
Bromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromodichloromethane	U	1.00	0.333	1.00	ug/L		1					
Bromoform	U	1.00	0.333	1.00	ug/L		1					
Bromomethane	U	1.00	0.337	1.00	ug/L		1					
Carbon disulfide	U	5.00	1.67	5.00	ug/L		1					
Carbon tetrachloride	U	1.00	0.333	1.00	ug/L		1					
Chlorobenzene		5.39	0.333	1.00	ug/L		1					
Chloroethane	U	1.00	0.333	1.00	ug/L		1					
Chloroform	U	1.00	0.333	1.00	ug/L		1					
Chloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromochloromethane	U	1.00	0.333	1.00	ug/L		1					
Dibromomethane	U	1.00	0.333	1.00	ug/L		1					
Ethylbenzene	U	1.00	0.333	1.00	ug/L		1					
Iodomethane	U	5.00	1.67	5.00	ug/L		1					

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Certificate of Analysis

Report Date: November 2, 2023

Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: TB4UG4-23 Project: FRNP00507
Sample ID: 630713015 Client ID: FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
8260D, Volatiles- full suite "As Received"												
Methylene chloride	U	5.00	0.500	5.00	ug/L		1					
Styrene	U	1.00	0.333	1.00	ug/L		1					
Tetrachloroethylene	U	1.00	0.333	1.00	ug/L		1					
Toluene	U	1.00	0.333	1.00	ug/L		1					
Trichloroethylene	U	1.00	0.333	1.00	ug/L		1					
Trichlorofluoromethane	U	1.00	0.333	1.00	ug/L		1					
Vinyl acetate	U	5.00	1.67	5.00	ug/L		1					
Vinyl chloride	U	1.00	0.333	1.00	ug/L		1					
Xylenes (total)	U	3.00	1.00	3.00	ug/L		1					
cis-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
cis-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,2-Dichloroethylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,3-Dichloropropylene	U	1.00	0.333	1.00	ug/L		1					
trans-1,4-Dichloro-2-butene	U	5.00	1.67	5.00	ug/L		1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8011 PREP	8011 Prep	LOF	08/02/23	1201	2468080

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8011	
2	SW846 8260D	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chloro-2-fluorobenzene	8011 VOA- 1,2-Dibromo-3-chloropropane "As Received"	7.16 ug/L	6.73	106	(46%-159%)
Bromofluorobenzene	8260D, Volatiles- full suite "As Received"	52.5 ug/L	50.0	105	(72%-125%)
1,2-Dichloroethane-d4	8260D, Volatiles- full suite "As Received"	48.2 ug/L	50.0	96	(73%-129%)
Toluene-d8	8260D, Volatiles- full suite "As Received"	50.9 ug/L	50.0	102	(75%-123%)

Notes:

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Certificate of Analysis

Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Quarterly(UG23-04)

Client Sample ID:	TB4UG4-23	Project:	FRNP00507
Sample ID:	630713015	Client ID:	FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Lc/LC: Critical Level
PF: Prep Factor
RL: Reporting Limit
SQL: Sample Quantitation Limit

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Certificate of Analysis

Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road
Kevil, Kentucky 42053
Report Date: November 2, 2023
Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW369UG4-23
Sample ID: 630713001
Matrix: WG
Collect Date: 25-JUL-23
Receive Date: 26-JUL-23
Collector: Client
Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Alpha Spec Analysis														
AN-1418 AlphaSpec Ra226, Liquid "As Received"														
Radium-226	U	0.427	+/-0.413	0.561	+/-0.414	5.00	pCi/L			CM4	08/03/23	0813	2465813	1
Th-01-RC M, Th Isotopes, Liquid "As Received"														
Thorium-230	U	0.529	+/-1.69	3.17	+/-1.70	50.0	pCi/L			CM4	07/28/23	0903	2465845	2
Thorium-232	U	-0.145	+/-0.879	2.16	+/-0.881		pCi/L							
Rad Gas Flow Proportional Counting														
904.0Mod, Ra228, Liquid "As Received"														
Radium-228	U	2.75	+/-2.09	3.24	+/-2.21	4.99	pCi/L			JE1	08/10/23	1144	2472073	3
905.0Mod, Sr90, liquid "As Received"														
Strontium-90	U	3.71	+/-3.13	4.94	+/-3.19	8.00	pCi/L			ST2	07/31/23	1419	2466689	4
9310, Alpha/Beta Activity, liquid "As Received"														
Alpha	U	-0.652	+/-1.65	4.94	+/-1.65	15.0	pCi/L			JXK3	07/31/23	1522	2466763	5
Beta		42.3	+/-8.00	7.46	+/-10.6	50.0	pCi/L							
Rad Liquid Scintillation Analysis														
906.0M, Tritium Dist, Liquid "As Received"														
Tritium	U	-0.366	+/-119	214	+/-119	300	pCi/L			GS3	07/29/23	0746	2466390	6
Tc-02-RC-MOD, Tc99, Liquid "As Received"														
Technetium-99		56.1	+/-13.9	21.2	+/-15.3	25.0	pCi/L			AG2	08/08/23	0343	2465820	7

The following Analytical Methods were performed

Method	Description
1	Eichrom Industries, AN-1418
2	DOE EML HASL-300, Th-01-RC Modified
3	EPA 904.0/SW846 9320 Modified
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
5	EPA 900.0/SW846 9310
6	EPA 906.0 Modified
7	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Barium-133 Tracer	AN-1418 AlphaSpec Ra226, Liquid "As Received"	2465813	95.8	(30%-110%)
Thorium-229 Tracer	Th-01-RC M, Th Isotopes, Liquid "As Received"	2465845	84.1	(30%-110%)
Barium-133 Tracer	904.0Mod, Ra228, Liquid "As Received"	2472073	79.8	(30%-110%)
Strontium Carrier	905.0Mod, Sr90, liquid "As Received"	2466689	80	(30%-110%)
Technetium-99m Tracer	Tc-02-RC-MOD, Tc99, Liquid "As Received"	2465820	93.6	(30%-110%)

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Kevil, Kentucky 42053

Report Date: November 2, 2023

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW369UG4-23
Sample ID: 630713001

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	**Test**							**Batch ID**		**Recovery%**	**Acceptable Limits**			

Notes:

The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

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Certificate of Analysis

Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053

Report Date: November 2, 2023

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW370UG4-23
Sample ID: 630713003
Matrix: WG
Collect Date: 25-JUL-23
Receive Date: 26-JUL-23
Collector: Client

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Alpha Spec Analysis														
AN-1418 AlphaSpec Ra226, Liquid "As Received"														
Radium-226	U	0.420	+/-0.370	0.433	+/-0.371	5.00	pCi/L			CM4	08/03/23	0813	2465813	1
Th-01-RC M, Th Isotopes, Liquid "As Received"														
Thorium-230	U	1.68	+/-2.32	3.55	+/-2.35	50.0	pCi/L			CM4	07/28/23	0904	2465845	2
Thorium-232	U	-0.0431	+/-0.886	1.77	+/-0.888		pCi/L							
Rad Gas Flow Proportional Counting														
904.0Mod, Ra228, Liquid "As Received"														
Radium-228	U	1.19	+/-2.10	3.70	+/-2.12	4.99	pCi/L			JE1	08/10/23	1144	2472073	3
905.0Mod, Sr90, liquid "As Received"														
Strontium-90	U	6.33	+/-4.52	7.14	+/-4.63	8.00	pCi/L			ST2	07/31/23	1418	2466689	4
9310, Alpha/Beta Activity, liquid "As Received"														
Alpha	U	0.582	+/-2.76	5.83	+/-2.76	15.0	pCi/L			JXK3	07/31/23	1522	2466763	5
Beta		15.3	+/-5.73	7.44	+/-6.28	50.0	pCi/L							
Rad Liquid Scintillation Analysis														
906.0M, Tritium Dist, Liquid "As Received"														
Tritium	U	61.8	+/-125	216	+/-125	300	pCi/L			GS3	07/29/23	0822	2466390	6
Tc-02-RC-MOD, Tc99, Liquid "As Received"														
Technetium-99	U	20.3	+/-13.3	21.9	+/-13.5	25.0	pCi/L			AG2	08/08/23	0415	2465820	7

The following Analytical Methods were performed

Method	Description
1	Eichrom Industries, AN-1418
2	DOE EML HASL-300, Th-01-RC Modified
3	EPA 904.0/SW846 9320 Modified
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
5	EPA 900.0/SW846 9310
6	EPA 906.0 Modified
7	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Barium-133 Tracer	AN-1418 AlphaSpec Ra226, Liquid "As Received"	2465813	94	(30%-110%)
Thorium-229 Tracer	Th-01-RC M, Th Isotopes, Liquid "As Received"	2465845	93.6	(30%-110%)
Barium-133 Tracer	904.0Mod, Ra228, Liquid "As Received"	2472073	72.6	(30%-110%)
Strontium Carrier	905.0Mod, Sr90, liquid "As Received"	2466689	87.1	(30%-110%)
Technetium-99m Tracer	Tc-02-RC-MOD, Tc99, Liquid "As Received"	2465820	95	(30%-110%)

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Certificate of Analysis

Company : Four Rivers Nuclear Partnership,
Address : LLC
5600 Hobbs Road

Kevil, Kentucky 42053

Report Date: November 2, 2023

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW370UG4-23
Sample ID: 630713003

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	**Test**							**Batch ID**		**Recovery%**	**Acceptable Limits**			

Notes:

The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

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Certificate of Analysis

Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road

Kevil, Kentucky 42053

Report Date: November 2, 2023

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW371UG4-23
Sample ID: 630713005
Matrix: WG
Collect Date: 25-JUL-23
Receive Date: 26-JUL-23
Collector: Client

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Alpha Spec Analysis														
AN-1418 AlphaSpec Ra226, Liquid "As Received"														
Radium-226	U	0.322	+/-0.314	0.389	+/-0.315	5.00	pCi/L			CM4	08/03/23	0813	2465813	1
Th-01-RC M, Th Isotopes, Liquid "As Received"														
Thorium-230	U	1.39	+/-1.85	2.76	+/-1.87	50.0	pCi/L			CM4	07/28/23	0904	2465845	2
Thorium-232	U	-0.212	+/-0.749	2.04	+/-0.750		pCi/L							
Rad Gas Flow Proportional Counting														
904.0Mod, Ra228, Liquid "As Received"														
Radium-228	U	1.99	+/-1.97	3.22	+/-2.04	4.99	pCi/L			JE1	08/10/23	1144	2472073	3
905.0Mod, Sr90, liquid "As Received"														
Strontium-90	U	2.83	+/-3.27	5.49	+/-3.30	8.00	pCi/L			ST2	07/31/23	1418	2466689	4
9310, Alpha/Beta Activity, liquid "As Received"														
Alpha		6.67	+/-4.52	5.31	+/-4.67	15.0	pCi/L			JXK3	07/31/23	1522	2466763	5
Beta	U	5.72	+/-4.70	7.45	+/-4.79	50.0	pCi/L							
Rad Liquid Scintillation Analysis														
906.0M, Tritium Dist, Liquid "As Received"														
Tritium	U	30.0	+/-121	213	+/-121	300	pCi/L			GS3	07/29/23	0859	2466390	6
Tc-02-RC-MOD, Tc99, Liquid "As Received"														
Technetium-99	U	11.5	+/-13.0	21.9	+/-13.1	25.0	pCi/L			AG2	08/08/23	0446	2465820	7

The following Analytical Methods were performed

Method	Description
1	Eichrom Industries, AN-1418
2	DOE EML HASL-300, Th-01-RC Modified
3	EPA 904.0/SW846 9320 Modified
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
5	EPA 900.0/SW846 9310
6	EPA 906.0 Modified
7	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Barium-133 Tracer	AN-1418 AlphaSpec Ra226, Liquid "As Received"	2465813	97.4	(30%-110%)
Thorium-229 Tracer	Th-01-RC M, Th Isotopes, Liquid "As Received"	2465845	101	(30%-110%)
Barium-133 Tracer	904.0Mod, Ra228, Liquid "As Received"	2472073	79.9	(30%-110%)
Strontium Carrier	905.0Mod, Sr90, liquid "As Received"	2466689	84.7	(30%-110%)
Technetium-99m Tracer	Tc-02-RC-MOD, Tc99, Liquid "As Received"	2465820	90.5	(30%-110%)

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Report Date: November 2, 2023

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW371UG4-23
Sample ID: 630713005

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	**Test**							**Batch ID**		**Recovery%**	**Acceptable Limits**			

Notes:

The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

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Report Date: November 2, 2023

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW372UG4-23
Sample ID: 630713007
Matrix: WG
Collect Date: 25-JUL-23
Receive Date: 26-JUL-23
Collector: Client

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Alpha Spec Analysis														
AN-1418 AlphaSpec Ra226, Liquid "As Received"														
Radium-226	U	0.0809	+/-0.223	0.386	+/-0.223	5.00	pCi/L			CM4	08/03/23	0813	2465813	1
Th-01-RC M, Th Isotopes, Liquid "As Received"														
Thorium-230	U	2.33	+/-2.25	3.01	+/-2.28	50.0	pCi/L			CM4	07/28/23	0904	2465845	2
Thorium-232	U	0.859	+/-1.43	2.07	+/-1.44		pCi/L							
Rad Gas Flow Proportional Counting														
904.0Mod, Ra228, Liquid "As Received"														
Radium-228	U	1.60	+/-2.49	4.35	+/-2.53	4.99	pCi/L			JE1	08/10/23	1418	2472073	3
905.0Mod, Sr90, liquid "As Received"														
Strontium-90	U	0.725	+/-3.29	6.04	+/-3.29	8.00	pCi/L			ST2	07/31/23	1418	2466689	4
9310, Alpha/Beta Activity, liquid "As Received"														
Alpha	U	2.37	+/-4.08	7.33	+/-4.10	15.0	pCi/L			JXK3	07/31/23	1522	2466763	5
Beta		18.9	+/-6.36	7.96	+/-7.08	50.0	pCi/L							
Rad Liquid Scintillation Analysis														
906.0M, Tritium Dist, Liquid "As Received"														
Tritium	U	7.49	+/-121	215	+/-121	300	pCi/L			GS3	07/29/23	0936	2466390	6
Tc-02-RC-MOD, Tc99, Liquid "As Received"														
Technetium-99	U	20.0	+/-12.9	21.2	+/-13.1	25.0	pCi/L			AG2	08/08/23	0518	2465820	7

The following Analytical Methods were performed

Method	Description
1	Eichrom Industries, AN-1418
2	DOE EML HASL-300, Th-01-RC Modified
3	EPA 904.0/SW846 9320 Modified
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
5	EPA 900.0/SW846 9310
6	EPA 906.0 Modified
7	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Barium-133 Tracer	AN-1418 AlphaSpec Ra226, Liquid "As Received"	2465813	95.8	(30%-110%)
Thorium-229 Tracer	Th-01-RC M, Th Isotopes, Liquid "As Received"	2465845	96.8	(30%-110%)
Barium-133 Tracer	904.0Mod, Ra228, Liquid "As Received"	2472073	76.4	(30%-110%)
Strontium Carrier	905.0Mod, Sr90, liquid "As Received"	2466689	84.7	(30%-110%)
Technetium-99m Tracer	Tc-02-RC-MOD, Tc99, Liquid "As Received"	2465820	93	(30%-110%)

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Report Date: November 2, 2023

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW372UG4-23
Sample ID: 630713007

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	**Test**							**Batch ID**		**Recovery%**	**Acceptable Limits**			

Notes:

The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

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Report Date: November 2, 2023

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW373UG4-23
Sample ID: 630713009
Matrix: WG
Collect Date: 25-JUL-23
Receive Date: 26-JUL-23
Collector: Client

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Alpha Spec Analysis														
AN-1418 AlphaSpec Ra226, Liquid "As Received"														
Radium-226	U	0.0298	+/-0.221	0.458	+/-0.221	5.00	pCi/L			CM4	08/04/23	0822	2465813	1
Th-01-RC M, Th Isotopes, Liquid "As Received"														
Thorium-230	U	2.12	+/-2.51	3.47	+/-2.54	50.0	pCi/L			CM4	07/28/23	0904	2465845	2
Thorium-232	U	0.436	+/-1.35	1.91	+/-1.35		pCi/L							
Rad Gas Flow Proportional Counting														
904.0Mod, Ra228, Liquid "As Received"														
Radium-228	U	0.476	+/-2.16	3.95	+/-2.16	4.99	pCi/L			JE1	08/10/23	1144	2472073	3
905.0Mod, Sr90, liquid "As Received"														
Strontium-90	U	2.72	+/-3.61	6.17	+/-3.64	8.00	pCi/L			ST2	07/31/23	1418	2466689	4
9310, Alpha/Beta Activity, liquid "As Received"														
Alpha	U	2.01	+/-3.36	6.04	+/-3.38	15.0	pCi/L			JXK3	07/31/23	1522	2466763	5
Beta	U	5.93	+/-4.88	7.79	+/-4.98	50.0	pCi/L							
Rad Liquid Scintillation Analysis														
906.0M, Tritium Dist, Liquid "As Received"														
Tritium	U	40.1	+/-123	215	+/-123	300	pCi/L			GS3	07/29/23	1013	2466390	6
Tc-02-RC-MOD, Tc99, Liquid "As Received"														
Technetium-99	U	13.3	+/-12.7	21.2	+/-12.8	25.0	pCi/L			AG2	08/08/23	0549	2465820	7

The following Analytical Methods were performed

Method	Description
1	Eichrom Industries, AN-1418
2	DOE EML HASL-300, Th-01-RC Modified
3	EPA 904.0/SW846 9320 Modified
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
5	EPA 900.0/SW846 9310
6	EPA 906.0 Modified
7	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Barium-133 Tracer	AN-1418 AlphaSpec Ra226, Liquid "As Received"	2465813	97	(30%-110%)
Thorium-229 Tracer	Th-01-RC M, Th Isotopes, Liquid "As Received"	2465845	72	(30%-110%)
Barium-133 Tracer	904.0Mod, Ra228, Liquid "As Received"	2472073	82.3	(30%-110%)
Strontium Carrier	905.0Mod, Sr90, liquid "As Received"	2466689	80	(30%-110%)
Technetium-99m Tracer	Tc-02-RC-MOD, Tc99, Liquid "As Received"	2465820	94	(30%-110%)

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Report Date: November 2, 2023

Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW373UG4-23
Sample ID: 630713009

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	**Test**							**Batch ID**		**Recovery%**	**Acceptable Limits**			

Notes:

The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

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Report Date: November 2, 2023

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW374UG4-23
Sample ID: 630713011
Matrix: WG
Collect Date: 25-JUL-23
Receive Date: 26-JUL-23
Collector: Client

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Alpha Spec Analysis														
AN-1418 AlphaSpec Ra226, Liquid "As Received"														
Radium-226	U	0.264	+/-0.370	0.574	+/-0.371	5.00	pCi/L			CM4	08/04/23	0822	2465813	1
Th-01-RC M, Th Isotopes, Liquid "As Received"														
Thorium-230	U	0.916	+/-1.58	2.59	+/-1.59	50.0	pCi/L			CM4	07/28/23	0904	2465845	2
Thorium-232	U	0.608	+/-1.12	1.36	+/-1.12		pCi/L							
Rad Gas Flow Proportional Counting														
904.0Mod, Ra228, Liquid "As Received"														
Radium-228	U	0.514	+/-2.42	4.43	+/-2.42	4.99	pCi/L			JE1	08/10/23	1144	2472073	3
905.0Mod, Sr90, liquid "As Received"														
Strontium-90	U	3.15	+/-3.49	5.85	+/-3.53	8.00	pCi/L			ST2	08/01/23	1113	2466689	4
9310, Alpha/Beta Activity, liquid "As Received"														
Alpha	U	2.92	+/-4.39	7.70	+/-4.42	15.0	pCi/L			JXK3	07/31/23	1522	2466763	5
Beta	U	1.75	+/-4.29	7.67	+/-4.30	50.0	pCi/L							
Rad Liquid Scintillation Analysis														
906.0M, Tritium Dist, Liquid "As Received"														
Tritium	U	37.5	+/-123	216	+/-123	300	pCi/L			GS3	07/29/23	1050	2466390	6
Tc-02-RC-MOD, Tc99, Liquid "As Received"														
Technetium-99	U	-0.154	+/-12.0	20.7	+/-12.0	25.0	pCi/L			AG2	08/08/23	0620	2465820	7

The following Analytical Methods were performed

Method	Description
1	Eichrom Industries, AN-1418
2	DOE EML HASL-300, Th-01-RC Modified
3	EPA 904.0/SW846 9320 Modified
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
5	EPA 900.0/SW846 9310
6	EPA 906.0 Modified
7	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Barium-133 Tracer	AN-1418 AlphaSpec Ra226, Liquid "As Received"	2465813	99.5	(30%-110%)
Thorium-229 Tracer	Th-01-RC M, Th Isotopes, Liquid "As Received"	2465845	105	(30%-110%)
Barium-133 Tracer	904.0Mod, Ra228, Liquid "As Received"	2472073	75.6	(30%-110%)
Strontium Carrier	905.0Mod, Sr90, liquid "As Received"	2466689	84.7	(30%-110%)
Technetium-99m Tracer	Tc-02-RC-MOD, Tc99, Liquid "As Received"	2465820	96.2	(30%-110%)

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Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW374UG4-23
Sample ID: 630713011

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	**Test**							**Batch ID**		**Recovery%**	**Acceptable Limits**			

Notes:

The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

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Report Date: November 2, 2023

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW375UG4-23
Sample ID: 630713013
Matrix: WG
Collect Date: 25-JUL-23
Receive Date: 26-JUL-23
Collector: Client

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Alpha Spec Analysis														
AN-1418 AlphaSpec Ra226, Liquid "As Received"														
Radium-226	U	0.196	+/-0.303	0.455	+/-0.303	5.00	pCi/L			CM4	08/04/23	0822	2465813	1
Th-01-RC M, Th Isotopes, Liquid "As Received"														
Thorium-230	U	1.58	+/-2.12	3.17	+/-2.14	50.0	pCi/L			CM4	07/28/23	0904	2465845	2
Thorium-232	U	0.760	+/-1.38	1.64	+/-1.38		pCi/L							
Rad Gas Flow Proportional Counting														
904.0Mod, Ra228, Liquid "As Received"														
Radium-228		7.23	+/-3.33	4.80	+/-3.80	4.99	pCi/L			JE1	08/14/23	0840	2472073	3
905.0Mod, Sr90, liquid "As Received"														
Strontium-90	U	-3.61	+/-3.24	7.17	+/-3.24	8.00	pCi/L			ST2	07/31/23	1418	2466689	4
9310, Alpha/Beta Activity, liquid "As Received"														
Alpha	U	-0.289	+/-2.58	6.15	+/-2.59	15.0	pCi/L			JXK3	07/31/23	1522	2466763	5
Beta	U	3.01	+/-4.39	7.56	+/-4.42	50.0	pCi/L							
Rad Liquid Scintillation Analysis														
906.0M, Tritium Dist, Liquid "As Received"														
Tritium	U	-26.4	+/-117	213	+/-117	300	pCi/L			GS3	07/29/23	1127	2466390	6
Tc-02-RC-MOD, Tc99, Liquid "As Received"														
Technetium-99	U	-4.50	+/-12.1	21.2	+/-12.1	25.0	pCi/L			AG2	08/08/23	0652	2465820	7

The following Analytical Methods were performed

Method	Description
1	Eichrom Industries, AN-1418
2	DOE EML HASL-300, Th-01-RC Modified
3	EPA 904.0/SW846 9320 Modified
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
5	EPA 900.0/SW846 9310
6	EPA 906.0 Modified
7	DOE EML HASL-300, Tc-02-RC Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Barium-133 Tracer	AN-1418 AlphaSpec Ra226, Liquid "As Received"	2465813	96	(30%-110%)
Thorium-229 Tracer	Th-01-RC M, Th Isotopes, Liquid "As Received"	2465845	88.2	(30%-110%)
Barium-133 Tracer	904.0Mod, Ra228, Liquid "As Received"	2472073	76.7	(30%-110%)
Strontium Carrier	905.0Mod, Sr90, liquid "As Received"	2466689	75.3	(30%-110%)
Technetium-99m Tracer	Tc-02-RC-MOD, Tc99, Liquid "As Received"	2465820	93.8	(30%-110%)

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Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Quarterly(UG23-04)

Client Sample ID: MW375UG4-23
Sample ID: 630713013

Project: FRNP00507
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	**Test**							**Batch ID**		**Recovery%**	**Acceptable Limits**			

Notes:

The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

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APPENDIX D

STATISTICAL ANALYSES AND QUALIFICATION STATEMENT

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GROUNDWATER STATISTICAL COMMENTS

Introduction

The statistical analyses conducted on the third quarter 2023 groundwater data collected from the C-746-U Landfill monitoring wells (MWs) were performed in accordance with Permit GSTR0001, Standard Requirement 3, using the U.S. Environmental Protection Agency (EPA) guidance document, *EPA Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Interim Final Guidance* (1989). A statistician qualification statement has been provided for this analysis.

The statistical evaluation was conducted separately for the three groundwater systems: the Upper Continental Recharge System (UCRS), the Upper Regional Gravel Aquifer (URGA), and the Lower Regional Gravel Aquifer (LRGA). For each groundwater system, data from wells considered to represent background conditions were compared with test wells (downgradient or sidegradient wells) (Exhibit D.1). The third quarter 2023 data used to conduct the statistical analyses were collected in July 2023. The statistical analyses for this report first used data from the first eight quarters that had been sampled for each parameter to develop the historical background value, beginning with the first two baseline sampling events in 2002, when available. Then a second set of statistical analyses, using the last eight quarters, was run on analytes that had at least one downgradient well that had exceeded the historical background. The sampling dates associated with both the historical and the current background data are listed next to the result in the statistical analysis sheets of this appendix.

Statistical Analysis Process

Constituents of concern that have Kentucky maximum contaminant levels (MCLs) and results that do not exceed their respective MCL are not included in the statistical evaluation. Parameters that have MCLs can be found in 401 *KAR* 47:030 § 6. For parameters with no established MCL and those parameters that exceed their MCLs, the most recent results are compared to historical background concentrations, as follows: the data are divided into censored and uncensored observations. The one-sided tolerance interval statistical test is conducted only on parameters that have at least one uncensored (detected) observation. The current result is compared to the results of the one-sided tolerance interval statistical test to determine if the current data exceed the historical background concentration calculated using the first eight quarters of data. The tolerance interval statistical analysis is conducted separately for each parameter in each well (no pooling of downgradient data).

For the statistical analysis of pH, a two-sided tolerance interval statistical test is conducted. The test well results are compared to both an upper and lower tolerance limit (TL) to determine if statistically significant deviations in concentrations exist with respect to upgradient (background) well data from the first eight quarters.

Statistical analyses are performed on the first eight quarters of historical background data, not on the data for the current quarter. Once a statistical result is obtained using the background data, the result for the current quarter is compared to that value. If the value is exceeded, the well is considered to have an exceedance of the statistically derived historical background concentration.

Exhibit D.1. Station Identification for Monitoring Wells Analyzed

Station	Type	Groundwater Unit
MW357	TW	URGA
MW358	TW	LRGA
MW359[a,b]	TW	UCRS
MW360	TW	URGA
MW361	TW	LRGA
MW362[a]	TW	UCRS
MW363	TW	URGA
MW364	TW	LRGA
MW365[a]	TW	UCRS
MW366	TW	URGA
MW367	TW	LRGA
MW368[a,b]	TW	UCRS
MW369	BG	URGA
MW370	BG	LRGA
MW371[a]	BG	UCRS
MW372	BG	URGA
MW373	BG	LRGA
MW374[a]	BG	UCRS
MW375[a]	SG	UCRS
MW376[a,b]	SG	UCRS
MW377[a,b]	SG	UCRS

[a] The gradients in UCRS wells are downward and, hydrogeologically, UCRS wells are not considered upgradient, downgradient, or sidegradient from the C-746-U Landfill. The UCRS wells identified as upgradient, sidegradient, or downgradient are those wells located in the same general direction as the RGA wells considered to be upgradient, sidegradient, or downgradient.
[b] Well was dry this quarter, and a groundwater sample could not be collected.
BG: upgradient or background wells
TW: downgradient or test wells
SG: sidegradient wells

For those parameters that are determined to exceed the historical background concentration, a second one-sided tolerance interval statistical test, or a two-sided tolerance interval statistical test in the case of pH, is conducted. The second one-sided tolerance interval statistical test is conducted to determine whether the current concentration in downgradient wells exceeds the current background, as determined by a comparison against the statistically derived upper TL using the most recent eight quarters of data for the relevant background wells. For the statistical analysis of pH, a two-sided tolerance interval statistical test is conducted, if required. The test well pH results are compared to both an upper and lower TL to determine if the current pH is different from the current background level to a statistically significant level. The tolerance interval statistical analysis is conducted separately for each parameter in each well (no pooling of downgradient data).

Statistical analyses are performed on the last eight quarters of current background data, not on the data for the current quarter. Once a statistical result is obtained using the background data, the result for the current quarter is compared to that value. If the value is exceeded, the well has an exceedance of the statistically derived current background concentration.

A stepwise list of the one-sided tolerance interval statistical procedure applied to the data is summarized below.[1]

1. The TL is calculated for the background data (first using the first eight quarters, then using the last eight quarters, if required).

    - For each parameter, the background data are used to establish a baseline. On this data set, the mean (X) and the standard deviation (S) are computed.

    - The data set is checked for normality using coefficient of variation (CV). If CV ≤ 1.0, then the data are assumed to be normally distributed. Data sets with CV > 1.0 are assumed to be log-normally distributed; for data sets with CV > 1.0, the data are log-transformed and analyzed.

    - The factor (K) for one-sided upper TL with 95% minimum coverage is determined (Table 5, Appendix B, *EPA Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Interim Final Guidance*, 1989) based on the number of background data points.

    - The one-sided upper TL is calculated using the following equation:

      $TL = X + (K \times S)$

2. Each observation from downgradient wells is compared to the calculated one-sided upper TL in Step 1. If an observation value exceeds the TL, then there is statistically significant evidence that the well concentration exceeds the historical background.

Type of Data Used

Exhibit D.1 presents the upgradient or background wells (identified as "BG"), the downgradient or test wells (identified as "TW"), and the sidegradient wells (identified as "SG") for the C-746-U Contained Landfill. Exhibit D.2 presents the parameters from the available data set for which a statistical test was performed using the one-sided tolerance interval.

Exhibits D.3, D.4, and D.5 list the number of analyses (observations), nondetects (censored observations), and detects (uncensored observations), by parameter in the UCRS, the URGA, and the LRGA, respectively. Those parameters displayed with bold-face type indicate the one-sided tolerance interval statistical test was performed. The data presented in Exhibits D.3, D.4, and D.5 were collected during the current quarter, third quarter 2023. The observations are representative of the current quarter data. Background data are presented in Attachments D1 and D2. The sampling dates associated with background data are listed next to the result in Attachments D1 and D2. When field duplicate data are available, the higher of the two readings is retained for further evaluation. When a data point has been rejected following data validation or data assessment, this result is not used, and the next available data point is used for the background or current quarter data.

[1] For pH, two-sided TLs (upper and lower) were calculated with an adjusted K factor using the following equations:
upper $TL = X + (K \times S)$
lower $TL = X - (K \times S)$

Exhibit D.2. List of Parameters Tested Using the One-Sided Upper Tolerance Level Test with Historical Background

Parameters
Acetone
Aluminum
Boron
Bromide
Calcium
Chloride
Cobalt
Conductivity
Copper
Cyanide
Dissolved Oxygen
Dissolved Solids
Iron
Magnesium
Manganese
Molybdenum
Nickel
Oxidation-Reduction Potential[a]
pH[b]
Potassium
Sodium
Sulfate
Technetium-99
Total Organic Carbon (TOC)
Total Organic Halides (TOX)
Trichloroethene
Vanadium
Zinc

[a] Oxidation-Reduction Potential calibrated as Eh.

[b] For pH, the test well results were compared to both an upper and lower TL to determine if the current result differs to a statistically significant degree from the historical background values.

Exhibit D.3. Summary of Censored, and Uncensored Data—UCRS

Parameters	Observations	Censored Observation	Uncensored Observation	Statistical Analysis?
1,1,1,2-Tetrachloroethane	5	5	0	No
1,1,2,2-Tetrachloroethane	5	5	0	No
1,1,2-Trichloroethane	5	5	0	No
1,1-Dichloroethane	5	5	0	No
1,2,3-Trichloropropane	5	5	0	No
1,2-Dibromo-3-chloropropane	5	5	0	No
1,2-Dibromoethane	5	5	0	No
1,2-Dichlorobenzene	5	5	0	No
1,2-Dichloropropane	5	5	0	No
2-Butanone	5	5	0	No
2-Hexanone	5	5	0	No
4-Methyl-2-pentanone	5	5	0	No
Acetone	5	5	0	No
Acrolein	5	5	0	No
Acrylonitrile	5	5	0	No
Aluminum	**5**	**1**	**4**	**Yes**
Antimony	5	5	0	No
Beryllium	5	5	0	No
Boron	**5**	**0**	**5**	**Yes**
Bromide	**5**	**4**	**1**	**Yes**
Bromochloromethane	5	5	0	No
Bromodichloromethane	5	5	0	No
Bromoform	5	5	0	No
Bromomethane	5	5	0	No
Calcium	**5**	**0**	**5**	**Yes**
Carbon disulfide	5	5	0	No
Chemical Oxygen Demand (COD)	5	5	0	No
Chloride	**5**	**0**	**5**	**Yes**
Chlorobenzene	5	5	0	No
Chloroethane	5	5	0	No
Chloroform	5	5	0	No
Chloromethane	5	5	0	No
cis-1,2-Dichloroethene	5	5	0	No
cis-1,3-Dichloropropene	5	5	0	No
Cobalt	**5**	**4**	**1**	**Yes**
Conductivity	**5**	**0**	**5**	**Yes**
Copper	**5**	**0**	**5**	**Yes**
Cyanide	**5**	**2**	**3**	**Yes**
Dibromochloromethane	5	5	0	No
Dibromomethane	5	5	0	No
Dimethylbenzene, Total	5	5	0	No
Dissolved Oxygen	**5**	**0**	**5**	**Yes**
Dissolved Solids	**5**	**0**	**5**	**Yes**
Ethylbenzene	5	5	0	No
Iodide	5	5	0	No
Iodomethane	5	5	0	No
Iron	**5**	**0**	**5**	**Yes**
Magnesium	**5**	**0**	**5**	**Yes**
Manganese	**5**	**0**	**5**	**Yes**
Methylene chloride	5	5	0	No
Molybdenum	**5**	**2**	**3**	**Yes**

Exhibit D.3. Summary of Censored, and Uncensored Data—UCRS (Continued)

Parameters	Observations	Censored Observation	Uncensored Observation	Statistical Analysis?
Nickel	**5**	**1**	**4**	**Yes**
Oxidation-Reduction Potential	**5**	**0**	**5**	**Yes**
PCB, Total	5	5	0	No
PCB-1016	5	5	0	No
PCB-1221	5	5	0	No
PCB-1232	5	5	0	No
PCB-1242	5	5	0	No
PCB-1248	5	5	0	No
PCB-1254	5	5	0	No
PCB-1260	5	5	0	No
PCB-1268	5	5	0	No
pH	**5**	**0**	**5**	**Yes**
Potassium	**5**	**0**	**5**	**Yes**
Radium-226	5	5	0	No
Rhodium	5	5	0	No
Sodium	**5**	**0**	**5**	**Yes**
Styrene	5	5	0	No
Sulfate	**5**	**0**	**5**	**Yes**
Tantalum	5	5	0	No
Technetium-99	5	5	0	No
Tetrachloroethene	5	5	0	No
Thallium	5	5	0	No
Thorium-230	5	5	0	No
Toluene	5	5	0	No
Total Organic Carbon (TOC)	**5**	**0**	**5**	**Yes**
Total Organic Halides (TOX)	**5**	**0**	**5**	**Yes**
trans-1,2-Dichloroethene	5	5	0	No
trans-1,3-Dichloropropene	5	5	0	No
trans-1,4-Dichloro-2-Butene	5	5	0	No
Trichlorofluoromethane	5	5	0	No
Vanadium	**5**	**4**	**1**	**Yes**
Vinyl Acetate	5	5	0	No
Zinc	**5**	**2**	**3**	**Yes**

Bold denotes parameters with at least one uncensored observation.

Exhibit D.4. Summary of Censored, and Uncensored Data—URGA

Parameters	Observations	Censored Observation	Uncensored Observation	Statistical Analysis?
1,1,1,2-Tetrachloroethane	6	6	0	No
1,1,2,2-Tetrachloroethane	6	6	0	No
1,1,2-Trichloroethane	6	6	0	No
1,1-Dichloroethane	6	6	0	No
1,2,3-Trichloropropane	6	6	0	No
1,2-Dibromo-3-chloropropane	6	6	0	No
1,2-Dibromoethane	6	6	0	No
1,2-Dichlorobenzene	6	6	0	No
1,2-Dichloropropane	6	6	0	No
2-Butanone	6	6	0	No
2-Hexanone	6	6	0	No
4-Methyl-2-pentanone	6	6	0	No
Acetone	6	6	0	No
Acrolein	6	6	0	No
Acrylonitrile	6	6	0	No
Aluminum	**6**	**3**	**3**	**Yes**
Antimony	6	6	0	No
Beryllium	6	6	0	No
Boron	**6**	**0**	**6**	**Yes**
Bromide	**6**	**1**	**5**	**Yes**
Bromochloromethane	6	6	0	No
Bromodichloromethane	6	6	0	No
Bromoform	6	6	0	No
Bromomethane	6	6	0	No
Calcium	**6**	**0**	**6**	**Yes**
Carbon disulfide	6	6	0	No
Chemical Oxygen Demand (COD)	6	6	0	No
Chloride	**6**	**0**	**6**	**Yes**
Chlorobenzene	6	6	0	No
Chloroethane	6	6	0	No
Chloroform	6	6	0	No
Chloromethane	6	6	0	No
cis-1,2-Dichloroethene	6	6	0	No
cis-1,3-Dichloropropene	6	6	0	No
Cobalt	**6**	**2**	**4**	**Yes**
Conductivity	**6**	**0**	**6**	**Yes**
Copper	**6**	**0**	**6**	**Yes**
Cyanide	**6**	**5**	**1**	**Yes**
Dibromochloromethane	6	6	0	No
Dibromomethane	6	6	0	No
Dimethylbenzene, Total	6	6	0	No
Dissolved Oxygen	**6**	**0**	**6**	**Yes**
Dissolved Solids	**6**	**0**	**6**	**Yes**
Ethylbenzene	6	6	0	No
Iodide	6	6	0	No
Iodomethane	6	6	0	No
Iron	**6**	**1**	**5**	**Yes**
Magnesium	**6**	**0**	**6**	**Yes**
Manganese	**6**	**0**	**6**	**Yes**
Methylene chloride	6	6	0	No
Molybdenum	**6**	**5**	**1**	**Yes**

Exhibit D.4. Summary of Censored, and Uncensored Data—URGA (Continued)

Parameters	Observations	Censored Observation	Uncensored Observation	Statistical Analysis?
Nickel	**6**	**0**	**6**	**Yes**
Oxidation-Reduction Potential	**6**	**0**	**6**	**Yes**
PCB, Total	6	6	0	No
PCB-1016	6	6	0	No
PCB-1221	6	6	0	No
PCB-1232	6	6	0	No
PCB-1242	6	6	0	No
PCB-1248	6	6	0	No
PCB-1254	6	6	0	No
PCB-1260	6	6	0	No
PCB-1268	6	6	0	No
pH	**6**	**0**	**6**	**Yes**
Potassium	**6**	**0**	**6**	**Yes**
Radium-226	6	6	0	No
Rhodium	6	6	0	No
Sodium	**6**	**0**	**6**	**Yes**
Styrene	6	6	0	No
Sulfate	**6**	**0**	**6**	**Yes**
Tantalum	6	6	0	No
Technetium-99	**6**	**3**	**3**	**Yes**
Tetrachloroethene	6	6	0	No
Thallium	6	6	0	No
Thorium-230	6	6	0	No
Toluene	6	6	0	No
Total Organic Carbon (TOC)	**6**	**1**	**5**	**Yes**
Total Organic Halides (TOX)	**6**	**0**	**6**	**Yes**
trans-1,2-Dichloroethene	6	6	0	No
trans-1,3-Dichloropropene	6	6	0	No
trans-1,4-Dichloro-2-Butene	6	6	0	No
Trichloroethene	**6**	**1**	**5**	**Yes**
Trichlorofluoromethane	6	6	0	No
Vanadium	6	6	0	No
Vinyl Acetate	6	6	0	No
Zinc	**6**	**1**	**5**	**Yes**

Bold denotes parameters with at least one uncensored observation.

Exhibit D.5. Summary of Censored, and Uncensored Data—LRGA

Parameters	Observations	Censored Observation	Uncensored Observation	Statistical Analysis?
1,1,1,2-Tetrachloroethane	6	6	0	No
1,1,2,2-Tetrachloroethane	6	6	0	No
1,1,2-Trichloroethane	6	6	0	No
1,1-Dichloroethane	6	6	0	No
1,2,3-Trichloropropane	6	6	0	No
1,2-Dibromo-3-chloropropane	6	6	0	No
1,2-Dibromoethane	6	6	0	No
1,2-Dichlorobenzene	6	6	0	No
1,2-Dichloropropane	6	6	0	No
2-Butanone	6	6	0	No
2-Hexanone	6	6	0	No
4-Methyl-2-pentanone	6	6	0	No
Acetone	**6**	**5**	**1**	**Yes**
Acrolein	6	6	0	No
Acrylonitrile	6	6	0	No
Aluminum	**6**	**5**	**1**	**Yes**
Antimony	6	6	0	No
Beryllium	6	6	0	No
Boron	**6**	**0**	**6**	**Yes**
Bromide	**6**	**0**	**6**	**Yes**
Bromochloromethane	6	6	0	No
Bromodichloromethane	6	6	0	No
Bromoform	6	6	0	No
Bromomethane	6	6	0	No
Calcium	**6**	**0**	**6**	**Yes**
Carbon disulfide	6	6	0	No
Chemical Oxygen Demand (COD)	6	6	0	No
Chloride	**6**	**0**	**6**	**Yes**
Chlorobenzene	6	6	0	No
Chloroethane	6	6	0	No
Chloroform	6	6	0	No
Chloromethane	6	6	0	No
cis-1,2-Dichloroethene	6	6	0	No
cis-1,3-Dichloropropene	6	6	0	No
Cobalt	**6**	**4**	**2**	**Yes**
Conductivity	**6**	**0**	**6**	**Yes**
Copper	**6**	**0**	**6**	**Yes**
Cyanide	**6**	**5**	**1**	**Yes**
Dibromochloromethane	6	6	0	No
Dibromomethane	6	6	0	No
Dimethylbenzene, Total	6	6	0	No
Dissolved Oxygen	**6**	**0**	**6**	**Yes**
Dissolved Solids	**6**	**0**	**6**	**Yes**
Ethylbenzene	6	6	0	No
Iodide	6	6	0	No
Iodomethane	6	6	0	No
Iron	**6**	**3**	**3**	**Yes**
Magnesium	**6**	**0**	**6**	**Yes**
Manganese	**6**	**0**	**6**	**Yes**
Methylene chloride	6	6	0	No
Molybdenum	**6**	**5**	**1**	**Yes**

Exhibit D.5. Summary of Censored, and Uncensored Data—LRGA (Continued)

Parameters	Observations	Censored Observation	Uncensored Observation	Statistical Analysis?
Nickel	**6**	**0**	**6**	**Yes**
Oxidation-Reduction Potential	**6**	**0**	**6**	**Yes**
PCB, Total	6	6	0	No
PCB-1016	6	6	0	No
PCB-1221	6	6	0	No
PCB-1232	6	6	0	No
PCB-1242	6	6	0	No
PCB-1248	6	6	0	No
PCB-1254	6	6	0	No
PCB-1260	6	6	0	No
PCB-1268	6	6	0	No
pH	**6**	**0**	**6**	**Yes**
Potassium	**6**	**0**	**6**	**Yes**
Radium-226	6	6	0	No
Rhodium	6	6	0	No
Sodium	**6**	**0**	**6**	**Yes**
Styrene	6	6	0	No
Sulfate	**6**	**0**	**6**	**Yes**
Tantalum	6	6	0	No
Technetium-99	**6**	**3**	**3**	**Yes**
Tetrachloroethene	6	6	0	No
Thallium	6	6	0	No
Thorium-230	6	6	0	No
Toluene	6	6	0	No
Total Organic Carbon (TOC)	**6**	**1**	**5**	**Yes**
Total Organic Halides (TOX)	**6**	**4**	**2**	**Yes**
trans-1,2-Dichloroethene	6	6	0	No
trans-1,3-Dichloropropene	6	6	0	No
trans-1,4-Dichloro-2-Butene	6	6	0	No
Trichloroethene	**6**	**1**	**5**	**Yes**
Trichlorofluoromethane	6	6	0	No
Vanadium	6	6	0	No
Vinyl Acetate	6	6	0	No
Zinc	**6**	**0**	**6**	**Yes**

Bold denotes parameters with at least one uncensored observation.

Discussion of Results from Historical Background Comparison

For the UCRS, URGA, and LRGA, the concentrations of this quarter were compared to the results of the one-sided tolerance interval test calculated using historical background and are presented in Attachment D1. The statistician qualification statement is presented in Attachment D3. For the UCRS, URGA, and LRGA, the test was applied to 25, 26, and 27 parameters, respectively, including those listed in bold print in Exhibits D.3, D.4, and D.5, which includes those constituents that exceeded their MCL. A summary of exceedances when compared to statistically derived historical upgradient background by well number is shown in Exhibit D.6.

UCRS

This quarter's results identified historical background exceedances for dissolved oxygen, oxidation-reduction potential, and sulfate.

URGA

This quarter's results identified historical background exceedances for calcium, conductivity, dissolved solids, oxidation-reduction potential, and sulfate.

LRGA

This quarter's results identified historical background exceedances for calcium, oxidation-reduction potential, and technetium-99.

Statistical Summary

Summaries of the results of the statistical tests conducted on data obtained from wells in the UCRS, the URGA, and in the LRGA in comparison to historical data are presented in Exhibit D.7, Exhibit D.8, and Exhibit D.9, respectively.

Exhibit D.6. Summary of Exceedances of Statistically Derived Historical Background Concentrations

UCRS	URGA	LRGA
MW362: Dissolved Oxygen, Oxidation-Reduction Potential,* and Sulfate	**MW357:** Oxidation-Reduction Potential*	**MW358:** Technetium-99
MW365: Dissolved Oxygen, Oxidation-Reduction Potential,* and Sulfate	**MW360:** Oxidation-Reduction Potential*	**MW361:** Oxidation-Reduction Potential* and Technetium-99
MW371: Dissolved Oxygen, Oxidation-Reduction Potential,* and Sulfate	**MW363:** Oxidation-Reduction Potential*	**MW364:** Oxidation-Reduction Potential* and Technetium-99
MW374: Oxidation-Reduction Potential* and Sulfate	**MW366:** Oxidation-Reduction Potential* and Technetium-99	**MW367:** Oxidation-Reduction Potential*
MW375: Oxidation-Reduction Potential* and Sulfate	**MW369:** Oxidation-Reduction Potential*	**MW370:** Oxidation-Reduction Potential*
	MW372: Calcium, Conductivity, Dissolved Solids, Oxidation-Reduction Potential,* and Sulfate	**MW373:** Calcium and Oxidation-Reduction Potential*

*Oxidation-Reduction Potential calibrated as Eh.

Exhibit D.7. Test Summaries for Qualified Parameters for Historical Background—UCRS

Parameter	Performed Test	CV Normality Test[a]	Results of Tolerance Interval Test Conducted
Aluminum	Tolerance Interval	2.08	No exceedance of statistically derived historical background concentration.
Boron	Tolerance Interval	1.24	No exceedance of statistically derived historical background concentration.
Bromide	Tolerance Interval	0.34	No exceedance of statistically derived historical background concentration.
Calcium	Tolerance Interval	0.40	No exceedance of statistically derived historical background concentration.
Chloride	Tolerance Interval	0.95	No exceedance of statistically derived historical background concentration.
Cobalt	Tolerance Interval	1.31	No exceedance of statistically derived historical background concentration.
Conductivity	Tolerance Interval	0.45	No exceedance of statistically derived historical background concentration.
Copper	Tolerance Interval	1.27	No exceedance of statistically derived historical background concentration.
Cyanide	Tolerance Interval	0.47	No exceedance of statistically derived historical background concentration.
Dissolved Oxygen	Tolerance Interval	0.55	Current results exceed statistically derived historical background concentration in MW362, MW365, and MW371.
Dissolved Solids	Tolerance Interval	0.42	No exceedance of statistically derived historical background concentration.
Iron	Tolerance Interval	0.98	No exceedance of statistically derived historical background concentration.
Magnesium	Tolerance Interval	0.27	No exceedance of statistically derived historical background concentration.
Manganese	Tolerance Interval	0.89	No exceedance of statistically derived historical background concentration.
Molybdenum	Tolerance Interval	1.65	No exceedance of statistically derived historical background concentration.
Nickel	Tolerance Interval	0.98	No exceedance of statistically derived historical background concentration.
Oxidation-Reduction Potential[b]	Tolerance Interval	3.54	Current results exceed statistically derived historical background concentration in MW362, MW365, MW371, MW374, and MW375.
pH	Tolerance Interval	0.04	No exceedance of statistically derived historical background concentration.
Potassium	Tolerance Interval	0.72	No exceedance of statistically derived historical background concentration.
Sodium	Tolerance Interval	0.40	No exceedance of statistically derived historical background concentration.
Sulfate	Tolerance Interval	0.49	Current results exceed statistically derived historical background concentration in MW362, MW365, MW371, MW374, and MW375.
TOC	Tolerance Interval	1.38	No exceedance of statistically derived historical background concentration.
TOX	Tolerance Interval	1.08	No exceedance of statistically derived historical background concentration.

Exhibit D.7. Test Summaries for Qualified Parameters for Historical Background—UCRS (Continued)

Parameter	Performed Test	CV Normality Test[a]	Results of Tolerance Interval Test Conducted
Vanadium	Tolerance Interval	1.32	No exceedance of statistically derived historical background concentration.
Zinc	Tolerance Interval	1.38	No exceedance of statistically derived historical background concentration.

CV: coefficient of variation
[a] If CV > 1.0, used log-transformed data.
[b] Oxidation-Reduction Potential calibrated as Eh.

Exhibit D.8. Test Summaries for Qualified Parameters for Historical Background—URGA

Parameter	Performed Test	CV Normality Test[a]	Results of Tolerance Interval Test Conducted
Aluminum	Tolerance Interval	1.24	No exceedance of statistically derived historical background concentration.
Boron	Tolerance Interval	0.84	No exceedance of statistically derived historical background concentration.
Bromide	Tolerance Interval	0.00	No exceedance of statistically derived historical background concentration.
Calcium	Tolerance Interval	0.29	Current results exceed statistically derived historical background concentration in MW372.
Chloride	Tolerance Interval	0.10	No exceedance of statistically derived historical background concentration.
Cobalt	Tolerance Interval	0.84	No exceedance of statistically derived historical background concentration.
Conductivity	Tolerance Interval	0.12	Current results exceed statistically derived historical background concentration in MW372.
Copper	Tolerance Interval	0.40	No exceedance of statistically derived historical background concentration.
Cyanide	Tolerance Interval	0.00	No exceedance of statistically derived historical background concentration.
Dissolved Oxygen	Tolerance Interval	0.76	No exceedance of statistically derived historical background concentration.
Dissolved Solids	Tolerance Interval	0.16	Current results exceed statistically derived historical background concentration in MW372.
Iron	Tolerance Interval	0.95	No exceedance of statistically derived historical background concentration.
Magnesium	Tolerance Interval	0.27	No exceedance of statistically derived historical background concentration.
Manganese	Tolerance Interval	0.66	No exceedance of statistically derived historical background concentration.
Molybdenum	Tolerance Interval	1.20	No exceedance of statistically derived historical background concentration.
Nickel	Tolerance Interval	0.91	No exceedance of statistically derived historical background concentration.
Oxidation-Reduction Potential[b]	Tolerance Interval	1.26	Current results exceed statistically derived historical background concentration in MW357, MW360, MW363, MW366, MW369, and MW372.

Exhibit D.8. Test Summaries for Qualified Parameters for Historical Background—URGA (Continued)

Parameter	Performed Test	CV Normality Test[a]	Results of Tolerance Interval Test Conducted
pH	Tolerance Interval	0.03	No exceedance of statistically derived historical background concentration.
Potassium	Tolerance Interval	0.29	No exceedance of statistically derived historical background concentration.
Sodium	Tolerance Interval	0.26	No exceedance of statistically derived historical background concentration.
Sulfate	Tolerance Interval	0.75	Current results exceed statistically derived historical background concentration in MW372.
Technetium-99	Tolerance Interval	0.87	No exceedance of statistically derived historical background concentration.
TOC	Tolerance Interval	1.23	No exceedance of statistically derived historical background concentration.
TOX	Tolerance Interval	0.95	No exceedance of statistically derived historical background concentration.
Trichloroethene	Tolerance Interval	0.64	No exceedance of statistically derived historical background concentration.
Zinc	Tolerance Interval	1.49	No exceedance of statistically derived historical background concentration.

CV: coefficient of variation
[a] If CV > 1.0, used log-transformed data.
[b] Oxidation-Reduction Potential calibrated as Eh.

Exhibit D.9. Test Summaries for Qualified Parameters for Historical Background—LRGA

Parameter	Performed Test	CV Normality Test[a]	Results of Tolerance Interval Test Conducted
Acetone	Tolerance Interval	2.67	No exceedance of statistically derived historical background concentration.
Aluminum	Tolerance Interval	2.78	No exceedance of statistically derived historical background concentration.
Boron	Tolerance Interval	0.68	No exceedance of statistically derived historical background concentration.
Bromide	Tolerance Interval	0.00	No exceedance of statistically derived historical background concentration.
Calcium	Tolerance Interval	0.31	Current results exceed statistically derived historical background concentration in MW373.
Chloride	Tolerance Interval	0.16	No exceedance of statistically derived historical background concentration.
Cobalt	Tolerance Interval	1.16	No exceedance of statistically derived historical background concentration.
Conductivity	Tolerance Interval	0.26	No exceedance of statistically derived historical background concentration.
Copper	Tolerance Interval	0.40	No exceedance of statistically derived historical background concentration.
Cyanide	Tolerance Interval	0.00	No exceedance of statistically derived historical background concentration.
Dissolved Oxygen	Tolerance Interval	0.83	No exceedance of statistically derived historical background concentration.
Dissolved Solids	Tolerance Interval	0.30	No exceedance of statistically derived historical background concentration.
Iron	Tolerance Interval	0.96	No exceedance of statistically derived historical background concentration.
Magnesium	Tolerance Interval	0.34	No exceedance of statistically derived historical background concentration.
Manganese	Tolerance Interval	0.62	No exceedance of statistically derived historical background concentration.
Molybdenum	Tolerance Interval	1.20	No exceedance of statistically derived historical background concentration.
Nickel	Tolerance Interval	0.90	No exceedance of statistically derived historical background concentration.
Oxidation-Reduction Potential[b]	Tolerance Interval	1.31	Current results exceed statistically derived historical background concentration in MW361, MW364, MW367, MW370, and MW373.
pH	Tolerance Interval	0.03	No exceedance of statistically derived historical background concentration.
Potassium	Tolerance Interval	0.18	No exceedance of statistically derived historical background concentration.
Sodium	Tolerance Interval	0.30	No exceedance of statistically derived historical background concentration.
Sulfate	Tolerance Interval	1.59	No exceedance of statistically derived historical background concentration.
Technetium-99	Tolerance Interval	1.73	Current results exceed statistically derived historical background concentration in MW358, MW361, and MW364.
TOC	Tolerance Interval	1.96	No exceedance of statistically derived historical background concentration.
TOX	Tolerance Interval	0.98	No exceedance of statistically derived historical background concentration.
Trichloroethene	Tolerance Interval	0.57	No exceedance of statistically derived historical background concentration.
Zinc	Tolerance Interval	0.67	No exceedance of statistically derived historical background concentration.

CV: coefficient of variation
[a] If CV > 1.0, used log-transformed data.
[b] Oxidation-Reduction Potential calibrated as Eh.

Discussion of Results from Current Background Comparison

For concentrations in wells in the UCRS, URGA, and LRGA that exceeded the TL test using historical background, the concentrations were compared to the results of the one-sided tolerance interval test compared to current background, and are presented in Attachment D2. The statistician qualification statement is presented in Attachment D3. For the UCRS, URGA, and LRGA, the test was applied to 3, 5, and 3 parameters, respectively, because these parameter concentrations exceeded the historical background TL.

UCRS

Because gradients in the UCRS are downward (vertical), there are no hydrogeologically downgradient UCRS wells. It should be noted; however, that none of the UCRS wells exceeded the current TL this quarter.

URGA

This quarter's results showed that none of the downgradient URGA wells exceeded the current TL.

LRGA

This quarter's results showed statistically significant exceedances of current background TL for technetium-99 in downgradient LRGA wells MW361 and MW364.

Statistical Summary

Summaries of the statistical tests conducted on data obtained from wells in the UCRS, the URGA, and the LRGA are presented in Exhibit D.10, Exhibit D.11, and Exhibit D.12, respectively.

Exhibit D.10. Test Summaries for Qualified Parameters for Current Background—UCRS

Parameter	Performed Test	CV Normality Test	Results of Tolerance Interval Test Conducted
Dissolved Oxygen	Tolerance Interval	0.72	None of the test wells exceeded the upper TL, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically significant level.
Oxidation-Reduction Potential*	Tolerance Interval	0.24	None of the test wells exceeded the upper TL, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically significant level.
Sulfate	Tolerance Interval	0.82	None of the test wells exceeded the upper TL, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically significant level.

CV: coefficient of variation
*Oxidation-Reduction Potential calibrated as Eh.

Exhibit D.11. Test Summaries for Qualified Parameters for Current Background—URGA

Parameter	Performed Test	CV Normality Test	Results of Tolerance Interval Test Conducted
Calcium	Tolerance Interval	0.62	None of the test wells exceeded the upper TL, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically significant level.
Conductivity	Tolerance Interval	0.37	None of the test wells exceeded the upper TL, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically significant level.
Dissolved Solids	Tolerance Interval	0.41	None of the test wells exceeded the upper TL, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically significant level.
Oxidation-Reduction Potential*	Tolerance Interval	0.09	None of the test wells exceeded the upper TL, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically significant level.
Sulfate	Tolerance Interval	0.92	None of the test wells exceeded the upper TL, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically significant level.

CV: coefficient of variation
*Oxidation-Reduction Potential calibrated as Eh.

Exhibit D.12. Test Summaries for Qualified Parameters for Current Background—LRGA

Parameter	Performed Test	CV Normality Test	Results of Tolerance Interval Test Conducted
Calcium	Tolerance Interval	0.40	None of the test wells exceeded the upper TL, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically significant level.
Oxidation-Reduction Potential*	Tolerance Interval	0.08	None of the test wells exceeded the upper TL, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically significant level.
Technetium-99	Tolerance Interval	0.57	MW361 and MW364 exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to current background data.

CV: coefficient of variation
*Oxidation-Reduction Potential calibrated as Eh.

ATTACHMENT D1

COMPARISON OF CURRENT DATA TO ONE-SIDED UPPER TOLERANCE INTERVAL TEST CALCULATED USING HISTORICAL BACKGROUND DATA

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C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Aluminum UNITS: mg/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 3.300 **S=** 6.859 **CV(1)=** 2.078 **K factor**=** 2.523 **TL(1)=** 2.06E+01 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** -0.371 **S=** 1.678 **CV(2)=** -4.521 **K factor**=** 2.523 **TL(2)=** 3.86E+00 **LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	2.24E+00	8.06E-01
4/22/2002	2.00E-01	-1.61E+00
7/15/2002	2.00E-01	-1.61E+00
10/8/2002	2.00E-01	-1.61E+00
1/8/2003	2.00E-01	-1.61E+00
4/3/2003	2.00E-01	-1.61E+00
7/9/2003	2.00E-01	-1.61E+00
10/6/2003	2.00E-01	-1.61E+00

Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	2.13E+01	3.06E+00
1/7/2003	2.00E+01	3.00E+00
4/2/2003	4.11E+00	1.41E+00
7/9/2003	1.41E+00	3.44E-01
10/7/2003	1.09E+00	8.62E-02
1/6/2004	8.54E-01	-1.58E-01
4/7/2004	2.00E-01	-1.61E+00
7/14/2004	2.00E-01	-1.61E+00

Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW362	Downgradient	Yes	2.35E-01	N/A	-1.45E+00	NO
MW365	Downgradient	Yes	3.10E-02	N/A	-3.47E+00	NO
MW371	Upgradient	Yes	1.78E-01	N/A	-1.73E+00	NO
MW374	Upgradient	No	5.00E-02	N/A	-3.00E+00	N/A
MW375	Sidegradient	Yes	2.68E-02	N/A	-3.62E+00	NO

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Boron UNITS: mg/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 0.650 **S=** 0.805 **CV(1)=** 1.238 **K factor**=** 2.523 **TL(1)=** 2.68E+00 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** -1.034 **S=** 1.030 **CV(2)=** -0.996 **K factor**=** 2.523 **TL(2)=** 1.56E+00 **LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	2.00E+00	6.93E-01
4/22/2002	2.00E+00	6.93E-01
7/15/2002	2.00E+00	6.93E-01
10/8/2002	2.00E-01	-1.61E+00
1/8/2003	2.00E-01	-1.61E+00
4/3/2003	2.00E-01	-1.61E+00
7/9/2003	2.00E-01	-1.61E+00
10/6/2003	2.00E-01	-1.61E+00

Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	2.00E+00	6.93E-01
1/7/2003	2.00E-01	-1.61E+00
4/2/2003	2.00E-01	-1.61E+00
7/9/2003	2.00E-01	-1.61E+00
10/7/2003	2.00E-01	-1.61E+00
1/6/2004	2.00E-01	-1.61E+00
4/7/2004	2.00E-01	-1.61E+00
7/14/2004	2.00E-01	-1.61E+00

Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW362	Downgradient	Yes	1.98E-02	N/A	-3.92E+00	NO
MW365	Downgradient	Yes	7.63E-03	N/A	-4.88E+00	NO
MW371	Upgradient	Yes	5.44E-03	N/A	-5.21E+00	NO
MW374	Upgradient	Yes	3.56E-02	N/A	-3.34E+00	NO
MW375	Sidegradient	Yes	1.38E-02	N/A	-4.28E+00	NO

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Bromide UNITS: mg/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 1.394 **S=** 0.474 **CV(1)=** 0.340 **K factor**=** 2.523 **TL(1)=** 2.59E+00 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 0.279 **S=** 0.332 **CV(2)=** 1.190 **K factor**=** 2.523 **TL(2)=** 1.12E+00 **LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	1.00E+00	0.00E+00
4/22/2002	1.00E+00	0.00E+00
7/15/2002	1.00E+00	0.00E+00
10/8/2002	1.00E+00	0.00E+00
1/8/2003	1.00E+00	0.00E+00
4/3/2003	1.00E+00	0.00E+00
7/9/2003	1.00E+00	0.00E+00
10/6/2003	1.00E+00	0.00E+00

Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	2.10E+00	7.42E-01
1/7/2003	2.10E+00	7.42E-01
4/2/2003	1.90E+00	6.42E-01
7/9/2003	1.00E+00	0.00E+00
10/7/2003	1.90E+00	6.42E-01
1/6/2004	1.90E+00	6.42E-01
4/7/2004	1.80E+00	5.88E-01
7/14/2004	1.60E+00	4.70E-01

Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW362	Downgradient	No	2.00E-01	N/A	-1.61E+00	N/A
MW365	Downgradient	No	2.00E-01	N/A	-1.61E+00	N/A
MW371	Upgradient	No	2.00E-01	N/A	-1.61E+00	N/A
MW374	Upgradient	Yes	5.75E-01	NO	-5.53E-01	N/A
MW375	Sidegradient	No	2.00E-01	N/A	-1.61E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Calcium UNITS: mg/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 34.100 **S=** 13.637 **CV(1)=** 0.400 **K factor**=** 2.523 **TL(1)=** 6.85E+01 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 3.466 **S=** 0.356 **CV(2)=** 0.103 **K factor**=** 2.523 **TL(2)=** 4.36E+00 **LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	1.72E+01	2.84E+00
4/22/2002	2.24E+01	3.11E+00
7/15/2002	2.55E+01	3.24E+00
10/8/2002	2.64E+01	3.27E+00
1/8/2003	2.72E+01	3.30E+00
4/3/2003	3.03E+01	3.41E+00
7/9/2003	2.59E+01	3.25E+00
10/6/2003	2.70E+01	3.30E+00

Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	6.73E+01	4.21E+00
1/7/2003	6.06E+01	4.10E+00
4/2/2003	4.72E+01	3.85E+00
7/9/2003	3.47E+01	3.55E+00
10/7/2003	3.71E+01	3.61E+00
1/6/2004	3.77E+01	3.63E+00
4/7/2004	3.22E+01	3.47E+00
7/14/2004	2.69E+01	3.29E+00

Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW362	Downgradient	Yes	1.82E+01	NO	2.90E+00	N/A
MW365	Downgradient	Yes	1.74E+01	NO	2.86E+00	N/A
MW371	Upgradient	Yes	6.09E+01	NO	4.11E+00	N/A
MW374	Upgradient	Yes	2.38E+01	NO	3.17E+00	N/A
MW375	Sidegradient	Yes	1.32E+01	NO	2.58E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Chloride UNITS: mg/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 91.300 **S=** 86.959 **CV(1)=** 0.952 **K factor**=** 2.523 **TL(1)=** 3.11E+02 **LL(1)=** N/A

Statistics-Transformed Background Data **X=** 3.620 **S=** 1.590 **CV(2)=** 0.439 **K factor**=** 2.523 **TL(2)=** 7.63E+00 **LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
7/15/2002	8.30E+00	2.12E+00
10/8/2002	7.60E+00	2.03E+00
1/8/2003	7.70E+00	2.04E+00
4/3/2003	8.80E+00	2.17E+00
7/9/2003	8.10E+00	2.09E+00
10/6/2003	8.60E+00	2.15E+00
1/7/2004	7.60E+00	2.03E+00
4/6/2004	7.60E+00	2.03E+00

Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	1.99E+02	5.29E+00
1/7/2003	2.00E+02	5.30E+00
4/2/2003	1.72E+02	5.15E+00
7/9/2003	1.79E+02	5.19E+00
10/7/2003	1.76E+02	5.17E+00
1/6/2004	1.70E+02	5.14E+00
4/7/2004	1.56E+02	5.05E+00
7/14/2004	1.45E+02	4.97E+00

Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW362	Downgradient	Yes	2.36E+00	NO	8.59E-01	N/A
MW365	Downgradient	Yes	2.34E+00	NO	8.50E-01	N/A
MW371	Upgradient	Yes	3.49E+00	NO	1.25E+00	N/A
MW374	Upgradient	Yes	4.50E+01	NO	3.81E+00	N/A
MW375	Sidegradient	Yes	3.27E+00	NO	1.18E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Cobalt UNITS: mg/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 0.007	**S=** 0.009	**CV(1)=** 1.314	**K factor**=** 2.523	**TL(1)=** 3.12E-02	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -5.843	**S=** 1.392	**CV(2)=** -0.238	**K factor**=** 2.523	**TL(2)=** -2.33E+00	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	2.50E-02	-3.69E+00
4/22/2002	2.50E-02	-3.69E+00
7/15/2002	2.50E-02	-3.69E+00
10/8/2002	1.00E-03	-6.91E+00
1/8/2003	1.00E-03	-6.91E+00
4/3/2003	1.00E-03	-6.91E+00
7/9/2003	1.00E-03	-6.91E+00
10/6/2003	1.00E-03	-6.91E+00

Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	1.00E-02	-4.61E+00
1/7/2003	1.00E-02	-4.61E+00
4/2/2003	1.00E-02	-4.61E+00
7/9/2003	1.61E-03	-6.43E+00
10/7/2003	1.00E-03	-6.91E+00
1/6/2004	1.00E-03	-6.91E+00
4/7/2004	1.00E-03	-6.91E+00
7/14/2004	1.00E-03	-6.91E+00

Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW362	Downgradient	No	1.00E-03	N/A	-6.91E+00	N/A
MW365	Downgradient	Yes	1.15E-03	N/A	-6.77E+00	NO
MW371	Upgradient	No	1.00E-03	N/A	-6.91E+00	N/A
MW374	Upgradient	No	1.00E-03	N/A	-6.91E+00	N/A
MW375	Sidegradient	No	1.00E-03	N/A	-6.91E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Conductivity UNITS: umho/cm UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 918.744 **S=** 417.257 **CV(1)=** 0.454 **K factor**=** 2.523 **TL(1)=** 1.97E+03 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 6.705 **S=** 0.550 **CV(2)=** 0.082 **K factor**=** 2.523 **TL(2)=** 8.09E+00 **LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	5.41E+02	6.29E+00
4/22/2002	6.43E+02	6.47E+00
7/15/2002	6.32E+02	6.45E+00
10/8/2002	6.31E+02	6.45E+00
1/8/2003	6.80E+02	6.52E+00
4/3/2003	7.49E+02	6.62E+00
7/9/2003	7.34E+02	6.60E+00
10/6/2003	7.53E+02	6.62E+00

Well Number:	MW374	
Date Collected	Result	LN(Result)
3/18/2002	1.01E+03	6.91E+00
10/8/2002	1.68E+03	7.43E+00
1/7/2003	1.72E+03	7.45E+00
4/2/2003	1.72E+02	5.15E+00
7/9/2003	1.23E+03	7.12E+00
10/7/2003	1.21E+03	7.10E+00
1/6/2004	1.17E+03	7.07E+00
4/7/2004	1.15E+03	7.04E+00

Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW362	Downgradient	Yes	6.32E+02	NO	6.45E+00	N/A
MW365	Downgradient	Yes	3.62E+02	NO	5.89E+00	N/A
MW371	Upgradient	Yes	6.26E+02	NO	6.44E+00	N/A
MW374	Upgradient	Yes	6.94E+02	NO	6.54E+00	N/A
MW375	Sidegradient	Yes	3.29E+02	NO	5.80E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Copper UNITS: mg/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 0.056 **S=** 0.072 **CV(1)=** 1.275 **K factor**=** 2.523 **TL(1)=** 2.37E-01 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** -3.395 **S=** 0.915 **CV(2)=** -0.270 **K factor**=** 2.523 **TL(2)=** -1.09E+00 **LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	2.50E-02	-3.69E+00
4/22/2002	2.50E-02	-3.69E+00
7/15/2002	5.00E-02	-3.00E+00
10/8/2002	2.00E-02	-3.91E+00
1/8/2003	2.00E-02	-3.91E+00
4/3/2003	2.00E-02	-3.91E+00
7/9/2003	2.00E-02	-3.91E+00
10/6/2003	2.00E-02	-3.91E+00

Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	2.00E-01	-1.61E+00
1/7/2003	2.00E-01	-1.61E+00
4/2/2003	2.00E-01	-1.61E+00
7/9/2003	2.00E-02	-3.91E+00
10/7/2003	2.00E-02	-3.91E+00
1/6/2004	2.00E-02	-3.91E+00
4/7/2004	2.00E-02	-3.91E+00
7/14/2004	2.00E-02	-3.91E+00

Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW362	Downgradient	Yes	1.95E-03	N/A	-6.24E+00	NO
MW365	Downgradient	Yes	4.06E-03	N/A	-5.51E+00	NO
MW371	Upgradient	Yes	1.41E-03	N/A	-6.56E+00	NO
MW374	Upgradient	Yes	6.89E-04	N/A	-7.28E+00	NO
MW375	Sidegradient	Yes	1.12E-03	N/A	-6.79E+00	NO

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Cyanide UNITS: mg/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 0.026 **S=** 0.012 **CV(1)=** 0.472 **K factor**=** 2.523 **TL(1)=** 5.61E-02 **LL(1)=** N/A

Statistics-Transformed Background Data **X=** -3.740 **S=** 0.369 **CV(2)=** -0.099 **K factor**=** 2.523 **TL(2)=** -2.81E+00 **LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	2.00E-02	-3.91E+00
4/22/2002	2.00E-02	-3.91E+00
7/15/2002	2.00E-02	-3.91E+00
10/8/2002	2.00E-02	-3.91E+00
4/3/2003	2.00E-02	-3.91E+00
7/9/2003	2.00E-02	-3.91E+00
10/6/2003	2.00E-02	-3.91E+00
1/7/2004	2.00E-02	-3.91E+00

Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	2.00E-02	-3.91E+00
4/2/2003	2.00E-02	-3.91E+00
7/9/2003	2.00E-02	-3.91E+00
10/7/2003	2.00E-02	-3.91E+00
1/6/2004	2.00E-02	-3.91E+00
4/7/2004	5.00E-02	-3.00E+00
7/14/2004	5.00E-02	-3.00E+00
10/7/2004	5.00E-02	-3.00E+00

Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW362	Downgradient	No	2.00E-01	N/A	-1.61E+00	N/A
MW365	Downgradient	No	2.00E-01	N/A	-1.61E+00	N/A
MW371	Upgradient	Yes	1.68E-02	NO	-4.09E+00	N/A
MW374	Upgradient	Yes	1.81E-03	NO	-6.31E+00	N/A
MW375	Sidegradient	Yes	1.76E-03	NO	-6.34E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Dissolved Oxygen UNITS: mg/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 1.138 **S=** 0.621 **CV(1)=** 0.546 **K factor**=** 2.523 **TL(1)=** 2.70E+00 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** -0.013 **S=** 0.577 **CV(2)=** -43.069 **K factor**=** 2.523 **TL(2)=** 1.44E+00 **LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	2.26E+00	8.15E-01
4/22/2002	1.15E+00	1.40E-01
7/15/2002	9.40E-01	-6.19E-02
10/8/2002	7.40E-01	-3.01E-01
1/8/2003	2.62E+00	9.63E-01
4/3/2003	1.50E+00	4.05E-01
7/9/2003	1.66E+00	5.07E-01
10/6/2003	1.28E+00	2.47E-01

Well Number:	MW374	
Date Collected	Result	LN(Result)
3/18/2002	6.00E-01	-5.11E-01
10/8/2002	6.70E-01	-4.00E-01
1/7/2003	2.30E-01	-1.47E+00
4/2/2003	6.50E-01	-4.31E-01
7/9/2003	9.20E-01	-8.34E-02
10/7/2003	9.90E-01	-1.01E-02
1/6/2004	1.11E+00	1.04E-01
4/7/2004	8.80E-01	-1.28E-01

Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW362	Downgradient	Yes	6.96E+00	YES	1.94E+00	N/A
MW365	Downgradient	Yes	6.32E+00	YES	1.84E+00	N/A
MW371	Upgradient	Yes	3.30E+00	YES	1.19E+00	N/A
MW374	Upgradient	Yes	1.01E+00	NO	9.95E-03	N/A
MW375	Sidegradient	Yes	2.59E+00	NO	9.52E-01	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data.

Wells with Exceedances

MW362
MW365
MW371

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Dissolved Solids UNITS: mg/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 590.000 **S=** 248.068 **CV(1)=** 0.420 **K factor**=** 2.523 **TL(1)=** 1.22E+03 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 6.308 **S=** 0.383 **CV(2)=** 0.061 **K factor**=** 2.523 **TL(2)=** 7.27E+00 **LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	2.74E+02	5.61E+00
4/22/2002	4.09E+02	6.01E+00
7/15/2002	4.18E+02	6.04E+00
10/8/2002	4.24E+02	6.05E+00
1/8/2003	4.31E+02	6.07E+00
4/3/2003	4.44E+02	6.10E+00
7/9/2003	4.45E+02	6.10E+00
10/6/2003	4.38E+02	6.08E+00

Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	1.14E+03	7.04E+00
1/7/2003	1.10E+03	7.00E+00
4/2/2003	8.63E+02	6.76E+00
7/9/2003	6.82E+02	6.53E+00
10/7/2003	5.89E+02	6.38E+00
1/6/2004	6.03E+02	6.40E+00
4/7/2004	6.01E+02	6.40E+00
7/14/2004	5.82E+02	6.37E+00

Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW362	Downgradient	Yes	3.54E+02	NO	5.87E+00	N/A
MW365	Downgradient	Yes	2.11E+02	NO	5.35E+00	N/A
MW371	Upgradient	Yes	3.62E+02	NO	5.89E+00	N/A
MW374	Upgradient	Yes	3.63E+02	NO	5.89E+00	N/A
MW375	Sidegradient	Yes	1.71E+02	NO	5.14E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Iron UNITS: mg/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 6.612 **S=** 6.487 **CV(1)=** 0.981 **K factor**=** 2.523 **TL(1)=** 2.30E+01 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 1.363 **S=** 1.147 **CV(2)=** 0.841 **K factor**=** 2.523 **TL(2)=** 4.26E+00 **LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	1.31E+00	2.70E-01
4/22/2002	9.13E-01	-9.10E-02
7/15/2002	8.81E-01	-1.27E-01
10/8/2002	3.86E+00	1.35E+00
1/8/2003	1.88E+00	6.31E-01
4/3/2003	3.18E+00	1.16E+00
7/9/2003	4.84E-01	-7.26E-01
10/6/2003	2.72E+00	1.00E+00

Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	2.30E+01	3.14E+00
1/7/2003	1.39E+01	2.63E+00
4/2/2003	1.40E+01	2.64E+00
7/9/2003	1.42E+01	2.65E+00
10/7/2003	7.92E+00	2.07E+00
1/6/2004	7.86E+00	2.06E+00
4/7/2004	4.82E+00	1.57E+00
7/14/2004	4.87E+00	1.58E+00

Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW362	Downgradient	Yes	1.83E-01	NO	-1.70E+00	N/A
MW365	Downgradient	Yes	3.73E-02	NO	-3.29E+00	N/A
MW371	Upgradient	Yes	1.43E-01	NO	-1.94E+00	N/A
MW374	Upgradient	Yes	1.84E-01	NO	-1.69E+00	N/A
MW375	Sidegradient	Yes	3.67E-02	NO	-3.30E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Magnesium UNITS: mg/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 11.347 **S=** 3.019 **CV(1)=** 0.266 **K factor**=** 2.523 **TL(1)=** 1.90E+01 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 2.401 **S=** 0.237 **CV(2)=** 0.099 **K factor**=** 2.523 **TL(2)=** 3.00E+00 **LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

Date Collected	Result	LN(Result)
3/18/2002	7.10E+00	1.96E+00
4/22/2002	9.77E+00	2.28E+00
7/15/2002	1.04E+01	2.34E+00
10/8/2002	1.02E+01	2.32E+00
1/8/2003	1.07E+01	2.37E+00
4/3/2003	1.19E+01	2.48E+00
7/9/2003	1.08E+01	2.38E+00
10/6/2003	1.09E+01	2.39E+00

Well Number: MW374

Date Collected	Result	LN(Result)
10/8/2002	2.00E+01	3.00E+00
1/7/2003	1.61E+01	2.78E+00
4/2/2003	1.31E+01	2.57E+00
7/9/2003	1.03E+01	2.33E+00
10/7/2003	1.11E+01	2.41E+00
1/6/2004	1.10E+01	2.40E+00
4/7/2004	9.69E+00	2.27E+00
7/14/2004	8.49E+00	2.14E+00

Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW362	Downgradient	Yes	8.03E+00	NO	2.08E+00	N/A
MW365	Downgradient	Yes	9.45E+00	NO	2.25E+00	N/A
MW371	Upgradient	Yes	1.45E+01	NO	2.67E+00	N/A
MW374	Upgradient	Yes	5.79E+00	NO	1.76E+00	N/A
MW375	Sidegradient	Yes	5.19E+00	NO	1.65E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Manganese UNITS: mg/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 0.248	**S=** 0.222	**CV(1)=** 0.894	**K factor**=** 2.523	**TL(1)=** 8.09E-01	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** -1.873	**S=** 1.068	**CV(2)=** -0.570	**K factor**=** 2.523	**TL(2)=** 8.21E-01	**LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	6.30E-02	-2.76E+00
4/22/2002	6.70E-02	-2.70E+00
7/15/2002	7.40E-02	-2.60E+00
10/8/2002	5.21E-02	-2.95E+00
1/8/2003	3.85E-02	-3.26E+00
4/3/2003	5.51E-02	-2.90E+00
7/9/2003	5.46E-02	-2.91E+00
10/6/2003	5.43E-02	-2.91E+00

Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	5.96E-01	-5.18E-01
1/7/2003	5.65E-01	-5.71E-01
4/2/2003	6.75E-01	-3.93E-01
7/9/2003	3.97E-01	-9.24E-01
10/7/2003	3.12E-01	-1.16E+00
1/6/2004	2.99E-01	-1.21E+00
4/7/2004	3.29E-01	-1.11E+00
7/14/2004	3.42E-01	-1.07E+00

Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW362	Downgradient	Yes	2.86E-03	NO	-5.86E+00	N/A
MW365	Downgradient	Yes	1.74E-02	NO	-4.05E+00	N/A
MW371	Upgradient	Yes	2.30E-03	NO	-6.07E+00	N/A
MW374	Upgradient	Yes	8.52E-02	NO	-2.46E+00	N/A
MW375	Sidegradient	Yes	1.54E-03	NO	-6.48E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Molybdenum UNITS: mg/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 0.006 **S=** 0.010 **CV(1)=** 1.650 **K factor**=** 2.523 **TL(1)=** 2.99E-02 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** -6.108 **S=** 1.239 **CV(2)=** -0.203 **K factor**=** 2.523 **TL(2)=** -2.98E+00 **LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	2.50E-02	-3.69E+00
4/22/2002	2.50E-02	-3.69E+00
7/15/2002	2.50E-02	-3.69E+00
10/8/2002	1.00E-03	-6.91E+00
1/8/2003	1.21E-03	-6.72E+00
4/3/2003	1.00E-03	-6.91E+00
7/9/2003	1.11E-03	-6.80E+00
10/6/2003	1.00E-03	-6.91E+00

Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	2.22E-03	-6.11E+00
1/7/2003	2.01E-03	-6.21E+00
4/2/2003	1.59E-03	-6.44E+00
7/9/2003	2.42E-03	-6.02E+00
10/7/2003	1.00E-03	-6.91E+00
1/6/2004	1.00E-03	-6.91E+00
4/7/2004	1.00E-03	-6.91E+00
7/14/2004	1.00E-03	-6.91E+00

Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW362	Downgradient	Yes	1.24E-03	N/A	-6.69E+00	NO
MW365	Downgradient	No	1.00E-03	N/A	-6.91E+00	N/A
MW371	Upgradient	Yes	4.40E-04	N/A	-7.73E+00	NO
MW374	Upgradient	Yes	2.52E-04	N/A	-8.29E+00	NO
MW375	Sidegradient	No	1.00E-03	N/A	-6.91E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Nickel UNITS: mg/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 0.023 **S=** 0.022 **CV(1)=** 0.980 **K factor**=** 2.523 **TL(1)=** 7.82E-02 **LL(1)=** N/A

Statistics-Transformed Background Data **X=** -4.349 **S=** 1.109 **CV(2)=** -0.255 **K factor**=** 2.523 **TL(2)=** -1.55E+00 **LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	5.00E-02	-3.00E+00
4/22/2002	5.00E-02	-3.00E+00
7/15/2002	5.00E-02	-3.00E+00
10/8/2002	1.24E-02	-4.39E+00
1/8/2003	5.00E-03	-5.30E+00
4/3/2003	5.00E-03	-5.30E+00
7/9/2003	5.00E-03	-5.30E+00
10/6/2003	5.00E-03	-5.30E+00

Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	5.00E-02	-3.00E+00
1/7/2003	5.00E-02	-3.00E+00
4/2/2003	5.00E-02	-3.00E+00
7/9/2003	7.94E-03	-4.84E+00
10/7/2003	5.00E-03	-5.30E+00
1/6/2004	5.00E-03	-5.30E+00
4/7/2004	5.00E-03	-5.30E+00
7/14/2004	5.00E-03	-5.30E+00

Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW362	Downgradient	Yes	1.77E-03	NO	-6.34E+00	N/A
MW365	Downgradient	Yes	5.33E-03	NO	-5.23E+00	N/A
MW371	Upgradient	Yes	1.63E-03	NO	-6.42E+00	N/A
MW374	Upgradient	No	2.00E-03	N/A	-6.21E+00	N/A
MW375	Sidegradient	Yes	1.33E-03	NO	-6.62E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Oxidation-Reduction Potential UNITS: mV UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 22.281	**S=** 78.889	**CV(1)=** 3.541	**K factor**=** 2.523	**TL(1)=** 2.21E+02	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** 3.642	**S=** 1.729	**CV(2)=** 0.475	**K factor**=** 2.523	**TL(2)=** 5.11E+00	**LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	7.50E+01	4.32E+00
4/22/2002	1.65E+02	5.11E+00
7/15/2002	6.50E+01	4.17E+00
4/3/2003	-1.90E+01	#Func!
7/9/2003	1.14E+02	4.74E+00
10/6/2003	-2.20E+01	#Func!
1/7/2004	2.05E+01	3.02E+00
4/6/2004	1.13E+02	4.73E+00

Well Number:	MW374	
Date Collected	Result	LN(Result)
3/18/2002	1.35E+02	4.91E+00
4/2/2003	-5.60E+01	#Func!
7/9/2003	-6.80E+01	#Func!
10/7/2003	-5.00E+01	#Func!
1/6/2004	-8.50E+01	#Func!
4/7/2004	6.00E+00	1.79E+00
7/14/2004	-3.80E+01	#Func!
10/7/2004	1.00E+00	0.00E+00

Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

#Because the natural log was not possible for all background values, the TL was considered equal to the maximum background value.

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW362	Downgradient	Yes	4.02E+02	N/A	6.00E+00	YES
MW365	Downgradient	Yes	3.58E+02	N/A	5.88E+00	YES
MW371	Upgradient	Yes	3.72E+02	N/A	5.92E+00	YES
MW374	Upgradient	Yes	3.51E+02	N/A	5.86E+00	YES
MW375	Sidegradient	Yes	3.70E+02	N/A	5.91E+00	YES

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data.

Wells with Exceedances

MW362
MW365
MW371
MW374
MW375

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

pH UNITS: Std Unit UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 6.619 **S=** 0.295 **CV(1)=** 0.045 **K factor**=** 2.904 **TL(1)=** 7.48E+00 **LL(1)=**5.76E+00

Statistics-Transformed Background Data **X=** 1.889 **S=** 0.046 **CV(2)=** 0.024 **K factor**=** 2.904 **TL(2)=** 2.02E+00 **LL(2)=**1.75E+00

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	6.30E+00	1.84E+00
4/22/2002	6.50E+00	1.87E+00
7/15/2002	6.50E+00	1.87E+00
10/8/2002	6.60E+00	1.89E+00
1/8/2003	6.60E+00	1.89E+00
4/3/2003	6.90E+00	1.93E+00
7/9/2003	6.70E+00	1.90E+00
10/6/2003	7.00E+00	1.95E+00

Well Number:	MW374	
Date Collected	Result	LN(Result)
3/18/2002	5.75E+00	1.75E+00
10/8/2002	6.60E+00	1.89E+00
1/7/2003	6.82E+00	1.92E+00
4/2/2003	6.86E+00	1.93E+00
7/9/2003	6.70E+00	1.90E+00
10/7/2003	6.60E+00	1.89E+00
1/6/2004	6.90E+00	1.93E+00
4/7/2004	6.58E+00	1.88E+00

Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)? Result <LL(1)?	LN(Result)	LN(Result) >TL(2)? LN(Result) <LL(2)?
MW362	Downgradient	Yes	6.96E+00	NO	1.94E+00	N/A
MW365	Downgradient	Yes	6.22E+00	NO	1.83E+00	N/A
MW371	Upgradient	Yes	6.54E+00	NO	1.88E+00	N/A
MW374	Upgradient	Yes	6.71E+00	NO	1.90E+00	N/A
MW375	Sidegradient	Yes	6.39E+00	NO	1.85E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Potassium UNITS: mg/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 1.262 **S=** 0.907 **CV(1)=** 0.718 **K factor**=** 2.523 **TL(1)=** 3.55E+00 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** -0.023 **S=** 0.752 **CV(2)=** -32.218 **K factor**=** 2.523 **TL(2)=** 1.87E+00 **LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	2.00E+00	6.93E-01
4/22/2002	2.00E+00	6.93E-01
7/15/2002	2.00E+00	6.93E-01
10/8/2002	4.08E-01	-8.96E-01
1/8/2003	3.84E-01	-9.57E-01
4/3/2003	3.68E-01	-1.00E+00
7/9/2003	5.87E-01	-5.33E-01
10/6/2003	3.82E-01	-9.62E-01

Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	3.04E+00	1.11E+00
1/7/2003	2.83E+00	1.04E+00
4/2/2003	2.00E+00	6.93E-01
7/9/2003	1.09E+00	8.62E-02
10/7/2003	8.02E-01	-2.21E-01
1/6/2004	8.97E-01	-1.09E-01
4/7/2004	6.89E-01	-3.73E-01
7/14/2004	7.16E-01	-3.34E-01

Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW362	Downgradient	Yes	3.37E-01	NO	-1.09E+00	N/A
MW365	Downgradient	Yes	2.14E-01	NO	-1.54E+00	N/A
MW371	Upgradient	Yes	3.75E-01	NO	-9.81E-01	N/A
MW374	Upgradient	Yes	3.93E-01	NO	-9.34E-01	N/A
MW375	Sidegradient	Yes	2.54E-01	NO	-1.37E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Sodium UNITS: mg/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 183.063 **S=** 73.222 **CV(1)=** 0.400 **K factor**=** 2.523 **TL(1)=** 3.68E+02 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 5.146 **S=** 0.356 **CV(2)=** 0.069 **K factor**=** 2.523 **TL(2)=** 6.04E+00 **LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	1.29E+02	4.86E+00
4/22/2002	1.31E+02	4.88E+00
7/15/2002	1.27E+02	4.84E+00
10/8/2002	1.23E+02	4.81E+00
1/8/2003	1.28E+02	4.85E+00
4/3/2003	1.44E+02	4.97E+00
7/9/2003	1.26E+02	4.84E+00
10/6/2003	1.20E+02	4.79E+00

Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	3.36E+02	5.82E+00
1/7/2003	3.29E+02	5.80E+00
4/2/2003	2.87E+02	5.66E+00
7/9/2003	1.81E+02	5.20E+00
10/7/2003	1.82E+02	5.20E+00
1/6/2004	2.06E+02	5.33E+00
4/7/2004	1.82E+02	5.20E+00
7/14/2004	1.98E+02	5.29E+00

Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW362	Downgradient	Yes	1.27E+02	NO	4.84E+00	N/A
MW365	Downgradient	Yes	4.89E+01	NO	3.89E+00	N/A
MW371	Upgradient	Yes	6.53E+01	NO	4.18E+00	N/A
MW374	Upgradient	Yes	1.21E+02	NO	4.80E+00	N/A
MW375	Sidegradient	Yes	5.27E+01	NO	3.96E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Sulfate UNITS: mg/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 6.469	**S=** 3.153	**CV(1)=** 0.487	**K factor**=** 2.523	**TL(1)=** 1.44E+01	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** 1.794	**S=** 0.357	**CV(2)=** 0.199	**K factor**=** 2.523	**TL(2)=** 2.69E+00	**LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	1.63E+01	2.79E+00
4/22/2002	8.60E+00	2.15E+00
7/15/2002	6.70E+00	1.90E+00
10/8/2002	5.00E+00	1.61E+00
1/8/2003	5.00E+00	1.61E+00
4/3/2003	5.00E+00	1.61E+00
7/9/2003	5.00E+00	1.61E+00
10/6/2003	5.00E+00	1.61E+00

Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	5.00E+00	1.61E+00
1/7/2003	5.00E+00	1.61E+00
4/2/2003	5.00E+00	1.61E+00
7/9/2003	5.60E+00	1.72E+00
10/7/2003	5.00E+00	1.61E+00
1/6/2004	5.00E+00	1.61E+00
4/7/2004	1.13E+01	2.42E+00
7/14/2004	5.00E+00	1.61E+00

Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW362	Downgradient	Yes	2.85E+01	YES	3.35E+00	N/A
MW365	Downgradient	Yes	5.40E+01	YES	3.99E+00	N/A
MW371	Upgradient	Yes	2.86E+01	YES	3.35E+00	N/A
MW374	Upgradient	Yes	1.56E+01	YES	2.75E+00	N/A
MW375	Sidegradient	Yes	2.35E+01	YES	3.16E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data.

Wells with Exceedances

MW362
MW365
MW371
MW374
MW375

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Total Organic Carbon (TOC) UNITS: mg/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 17.631 **S=** 24.314 **CV(1)=** 1.379 **K factor**=** 2.523 **TL(1)=** 7.90E+01 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 2.318 **S=** 0.979 **CV(2)=** 0.422 **K factor**=** 2.523 **TL(2)=** 4.79E+00 **LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	1.11E+01	2.41E+00
4/22/2002	7.00E+00	1.95E+00
7/15/2002	4.10E+00	1.41E+00
10/8/2002	6.00E+00	1.79E+00
1/8/2003	5.30E+00	1.67E+00
4/3/2003	5.30E+00	1.67E+00
7/9/2003	2.90E+00	1.06E+00
10/6/2003	3.20E+00	1.16E+00

Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	9.00E+01	4.50E+00
1/7/2003	6.40E+01	4.16E+00
4/2/2003	2.50E+01	3.22E+00
7/9/2003	1.60E+01	2.77E+00
10/7/2003	1.30E+01	2.56E+00
1/6/2004	1.00E+01	2.30E+00
4/7/2004	7.20E+00	1.97E+00
7/14/2004	1.20E+01	2.48E+00

Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW362	Downgradient	Yes	1.49E+00	N/A	3.99E-01	NO
MW365	Downgradient	Yes	1.44E+00	N/A	3.65E-01	NO
MW371	Upgradient	Yes	1.72E+00	N/A	5.42E-01	NO
MW374	Upgradient	Yes	2.09E+00	N/A	7.37E-01	NO
MW375	Sidegradient	Yes	7.43E-01	N/A	-2.97E-01	NO

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Total Organic Halides (TOX) UNITS: ug/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 214.094 **S=** 231.089 **CV(1)=** 1.079 **K factor**=** 2.523 **TL(1)=** 7.97E+02 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 4.867 **S=** 1.065 **CV(2)=** 0.219 **K factor**=** 2.523 **TL(2)=** 7.55E+00 **LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	5.00E+01	3.91E+00
4/22/2002	1.05E+02	4.65E+00
7/15/2002	7.00E+01	4.25E+00
10/8/2002	5.20E+01	3.95E+00
1/8/2003	2.02E+01	3.01E+00
4/3/2003	1.04E+02	4.64E+00
7/9/2003	3.42E+01	3.53E+00
10/6/2003	4.61E+01	3.83E+00

Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	9.03E+02	6.81E+00
1/7/2003	5.39E+02	6.29E+00
4/2/2003	2.95E+02	5.69E+00
7/9/2003	2.72E+02	5.61E+00
10/7/2003	1.97E+02	5.28E+00
1/6/2004	3.30E+02	5.80E+00
4/7/2004	1.83E+02	5.21E+00
7/14/2004	2.25E+02	5.42E+00

Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW362	Downgradient	Yes	1.51E+01	N/A	2.71E+00	NO
MW365	Downgradient	Yes	4.56E+00	N/A	1.52E+00	NO
MW371	Upgradient	Yes	5.30E+00	N/A	1.67E+00	NO
MW374	Upgradient	Yes	1.47E+01	N/A	2.69E+00	NO
MW375	Sidegradient	Yes	4.28E+00	N/A	1.45E+00	NO

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Vanadium UNITS: mg/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 0.055 **S=** 0.072 **CV(1)=** 1.319 **K factor**=** 2.523 **TL(1)=** 2.37E-01 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** -3.438 **S=** 0.912 **CV(2)=** -0.265 **K factor**=** 2.523 **TL(2)=** -1.14E+00 **LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	2.50E-02	-3.69E+00
4/22/2002	2.50E-02	-3.69E+00
7/15/2002	2.50E-02	-3.69E+00
10/8/2002	2.00E-02	-3.91E+00
1/8/2003	2.00E-02	-3.91E+00
4/3/2003	2.00E-02	-3.91E+00
7/9/2003	2.00E-02	-3.91E+00
10/6/2003	2.00E-02	-3.91E+00

Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	2.00E-01	-1.61E+00
1/7/2003	2.00E-01	-1.61E+00
4/2/2003	2.00E-01	-1.61E+00
7/9/2003	2.00E-02	-3.91E+00
10/7/2003	2.00E-02	-3.91E+00
1/6/2004	2.00E-02	-3.91E+00
4/7/2004	2.00E-02	-3.91E+00
7/14/2004	2.00E-02	-3.91E+00

Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW362	Downgradient	No	2.00E-02	N/A	-3.91E+00	N/A
MW365	Downgradient	No	1.34E-02	N/A	-4.31E+00	N/A
MW371	Upgradient	Yes	4.28E-03	N/A	-5.45E+00	NO
MW374	Upgradient	No	2.00E-02	N/A	-3.91E+00	N/A
MW375	Sidegradient	No	2.00E-02	N/A	-3.91E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Zinc UNITS: mg/L UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 0.060 **S=** 0.083 **CV(1)=** 1.380 **K factor**=** 2.523 **TL(1)=** 2.70E-01 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** -3.259 **S=** 0.840 **CV(2)=** -0.258 **K factor**=** 2.523 **TL(2)=** -1.14E+00 **LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
3/18/2002	1.00E-01	-2.30E+00
4/22/2002	1.00E-01	-2.30E+00
7/15/2002	1.00E-01	-2.30E+00
10/8/2002	2.50E-02	-3.69E+00
1/8/2003	3.50E-02	-3.35E+00
4/3/2003	3.50E-02	-3.35E+00
7/9/2003	3.76E-02	-3.28E+00
10/6/2003	2.00E-02	-3.91E+00

Well Number:	MW374	
Date Collected	Result	LN(Result)
10/8/2002	2.50E-02	-3.69E+00
1/7/2003	3.50E-01	-1.05E+00
4/2/2003	3.50E-02	-3.35E+00
7/9/2003	2.00E-02	-3.91E+00
10/7/2003	2.00E-02	-3.91E+00
1/6/2004	2.00E-02	-3.91E+00
4/7/2004	2.00E-02	-3.91E+00
7/14/2004	2.00E-02	-3.91E+00

Dry/Partially Dry Wells

Well No.	Gradient
MW359	Downgradient
MW368	Downgradient
MW376	Sidegradient
MW377	Sidegradient

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW362	Downgradient	No	2.00E-02	N/A	-3.91E+00	N/A
MW365	Downgradient	Yes	7.96E-03	N/A	-4.83E+00	NO
MW371	Upgradient	Yes	4.63E-03	N/A	-5.38E+00	NO
MW374	Upgradient	No	2.00E-02	N/A	-3.91E+00	N/A
MW375	Sidegradient	Yes	5.95E-03	N/A	-5.12E+00	NO

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Aluminum UNITS: mg/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 0.625	**S=** 0.774	**CV(1)=** 1.239	**K factor**=** 2.523	**TL(1)=** 2.58E+00	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -0.973	**S=** 0.935	**CV(2)=** -0.961	**K factor**=** 2.523	**TL(2)=** 1.39E+00	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW369	
Date Collected	Result	LN(Result)
3/18/2002	2.55E-01	-1.37E+00
4/22/2002	2.00E-01	-1.61E+00
7/15/2002	3.22E-01	-1.13E+00
10/8/2002	2.00E-01	-1.61E+00
1/8/2003	2.00E-01	-1.61E+00
4/3/2003	2.00E-01	-1.61E+00
7/8/2003	2.00E-01	-1.61E+00
10/6/2003	6.89E-01	-3.73E-01

Well Number:	MW372	
Date Collected	Result	LN(Result)
3/19/2002	2.61E+00	9.59E-01
4/23/2002	2.00E-01	-1.61E+00
7/16/2002	1.14E+00	1.31E-01
10/8/2002	8.62E-01	-1.49E-01
1/7/2003	2.32E+00	8.42E-01
4/2/2003	2.00E-01	-1.61E+00
7/9/2003	2.00E-01	-1.61E+00
10/7/2003	2.00E-01	-1.61E+00

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	No	5.00E-02	N/A	-3.00E+00	N/A
MW360	Downgradient	Yes	4.02E-02	N/A	-3.21E+00	NO
MW363	Downgradient	No	5.00E-02	N/A	-3.00E+00	N/A
MW366	Downgradient	Yes	2.38E-02	N/A	-3.74E+00	NO
MW369	Upgradient	Yes	1.12E-01	N/A	-2.19E+00	NO
MW372	Upgradient	No	5.00E-02	N/A	-3.00E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Boron UNITS: mg/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 0.985	**S=** 0.825	**CV(1)=** 0.838	**K factor**=** 2.523	**TL(1)=** 3.07E+00	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** -0.430	**S=** 0.990	**CV(2)=** -2.302	**K factor**=** 2.523	**TL(2)=** 2.07E+00	**LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW369	
Date Collected	Result	LN(Result)
3/18/2002	2.00E+00	6.93E-01
4/22/2002	2.00E+00	6.93E-01
7/15/2002	2.00E+00	6.93E-01
10/8/2002	2.00E-01	-1.61E+00
1/8/2003	2.00E-01	-1.61E+00
4/3/2003	2.00E-01	-1.61E+00
7/8/2003	2.00E-01	-1.61E+00
10/6/2003	2.00E-01	-1.61E+00

Well Number:	MW372	
Date Collected	Result	LN(Result)
3/19/2002	2.00E+00	6.93E-01
4/23/2002	2.00E+00	6.93E-01
7/16/2002	2.00E+00	6.93E-01
10/8/2002	4.92E-01	-7.09E-01
1/7/2003	4.92E-01	-7.09E-01
4/2/2003	6.00E-01	-5.11E-01
7/9/2003	5.70E-01	-5.62E-01
10/7/2003	6.04E-01	-5.04E-01

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	3.70E-01	NO	-9.94E-01	N/A
MW360	Downgradient	Yes	2.84E-02	NO	-3.56E+00	N/A
MW363	Downgradient	Yes	2.13E-02	NO	-3.85E+00	N/A
MW366	Downgradient	Yes	7.85E-02	NO	-2.54E+00	N/A
MW369	Upgradient	Yes	1.61E-02	NO	-4.13E+00	N/A
MW372	Upgradient	Yes	1.29E+00	NO	2.55E-01	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Bromide **UNITS: mg/L** **URGA**

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 1.000	**S=** 0.000	**CV(1)=** 0.000	**K factor**=** 2.523	**TL(1)=** 1.00E+00	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** 0.000	**S=** 0.000	**CV(2)=** #Num!	**K factor**=** 2.523	**TL(2)=** 0.00E+00	**LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	1.00E+00	0.00E+00
4/22/2002	1.00E+00	0.00E+00
7/15/2002	1.00E+00	0.00E+00
10/8/2002	1.00E+00	0.00E+00
1/8/2003	1.00E+00	0.00E+00
4/3/2003	1.00E+00	0.00E+00
7/8/2003	1.00E+00	0.00E+00
10/6/2003	1.00E+00	0.00E+00

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	1.00E+00	0.00E+00
4/23/2002	1.00E+00	0.00E+00
7/16/2002	1.00E+00	0.00E+00
10/8/2002	1.00E+00	0.00E+00
1/7/2003	1.00E+00	0.00E+00
4/2/2003	1.00E+00	0.00E+00
7/9/2003	1.00E+00	0.00E+00
10/7/2003	1.00E+00	0.00E+00

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	3.36E-01	NO	-1.09E+00	N/A
MW360	Downgradient	Yes	1.40E-01	NO	-1.97E+00	N/A
MW363	Downgradient	No	2.00E-01	N/A	-1.61E+00	N/A
MW366	Downgradient	Yes	5.29E-01	NO	-6.37E-01	N/A
MW369	Upgradient	Yes	3.25E-01	NO	-1.12E+00	N/A
MW372	Upgradient	Yes	5.95E-01	NO	-5.19E-01	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Calcium UNITS: mg/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 32.763	**S=** 9.391	**CV(1)=** 0.287	**K factor**=** 2.523	**TL(1)=** 5.65E+01	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** 3.449	**S=** 0.299	**CV(2)=** 0.087	**K factor**=** 2.523	**TL(2)=** 4.20E+00	**LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW369	
Date Collected	Result	LN(Result)
3/18/2002	2.95E+01	3.38E+00
4/22/2002	2.98E+01	3.39E+00
7/15/2002	2.53E+01	3.23E+00
10/8/2002	2.19E+01	3.09E+00
1/8/2003	2.09E+01	3.04E+00
4/3/2003	2.22E+01	3.10E+00
7/8/2003	2.29E+01	3.13E+00
10/6/2003	2.17E+01	3.08E+00

Well Number:	MW372	
Date Collected	Result	LN(Result)
3/19/2002	4.15E+01	3.73E+00
4/23/2002	4.36E+01	3.78E+00
7/16/2002	4.04E+01	3.70E+00
10/8/2002	3.88E+01	3.66E+00
1/7/2003	4.11E+01	3.72E+00
4/2/2003	4.29E+01	3.76E+00
7/9/2003	3.51E+01	3.56E+00
10/7/2003	4.66E+01	3.84E+00

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	2.58E+01	NO	3.25E+00	N/A
MW360	Downgradient	Yes	1.89E+01	NO	2.94E+00	N/A
MW363	Downgradient	Yes	2.24E+01	NO	3.11E+00	N/A
MW366	Downgradient	Yes	3.14E+01	NO	3.45E+00	N/A
MW369	Upgradient	Yes	1.57E+01	NO	2.75E+00	N/A
MW372	Upgradient	Yes	6.10E+01	YES	4.11E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data.

Wells with Exceedances

MW372

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Chloride UNITS: mg/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 44.119	**S=** 4.554	**CV(1)=** 0.103	**K factor**=** 2.523	**TL(1)=** 5.56E+01	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** 3.782	**S=** 0.099	**CV(2)=** 0.026	**K factor**=** 2.523	**TL(2)=** 4.03E+00	**LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW369	
Date Collected	Result	LN(Result)
7/15/2002	4.83E+01	3.88E+00
10/8/2002	4.77E+01	3.86E+00
1/8/2003	4.57E+01	3.82E+00
4/3/2003	4.74E+01	3.86E+00
7/8/2003	5.59E+01	4.02E+00
10/6/2003	4.74E+01	3.86E+00
1/7/2004	4.55E+01	3.82E+00
4/7/2004	4.34E+01	3.77E+00

Well Number:	MW372	
Date Collected	Result	LN(Result)
7/16/2002	3.98E+01	3.68E+00
10/8/2002	4.10E+01	3.71E+00
1/7/2003	3.94E+01	3.67E+00
4/2/2003	3.92E+01	3.67E+00
7/9/2003	3.98E+01	3.68E+00
10/7/2003	4.00E+01	3.69E+00
1/5/2004	4.34E+01	3.77E+00
4/5/2004	4.20E+01	3.74E+00

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	3.07E+01	NO	3.42E+00	N/A
MW360	Downgradient	Yes	7.73E+00	NO	2.05E+00	N/A
MW363	Downgradient	Yes	2.01E+01	NO	3.00E+00	N/A
MW366	Downgradient	Yes	3.99E+01	NO	3.69E+00	N/A
MW369	Upgradient	Yes	2.83E+01	NO	3.34E+00	N/A
MW372	Upgradient	Yes	3.87E+01	NO	3.66E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Cobalt UNITS: mg/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 0.025	**S=** 0.021	**CV(1)=** 0.845	**K factor**=** 2.523	**TL(1)=** 7.73E-02	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -4.090	**S=** 1.006	**CV(2)=** -0.246	**K factor**=** 2.523	**TL(2)=** -1.55E+00	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW369	
Date Collected	Result	LN(Result)
3/18/2002	2.50E-02	-3.69E+00
4/22/2002	2.50E-02	-3.69E+00
7/15/2002	2.50E-02	-3.69E+00
10/8/2002	9.38E-03	-4.67E+00
1/8/2003	5.48E-03	-5.21E+00
4/3/2003	5.87E-03	-5.14E+00
7/8/2003	5.41E-02	-2.92E+00
10/6/2003	6.89E-02	-2.68E+00

Well Number:	MW372	
Date Collected	Result	LN(Result)
3/19/2002	2.50E-02	-3.69E+00
4/23/2002	2.50E-02	-3.69E+00
7/16/2002	2.50E-02	-3.69E+00
10/8/2002	1.58E-03	-6.45E+00
1/7/2003	1.47E-02	-4.22E+00
4/2/2003	1.16E-02	-4.46E+00
7/9/2003	6.53E-02	-2.73E+00
10/7/2003	7.88E-03	-4.84E+00

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	No	1.00E-03	N/A	-6.91E+00	N/A
MW360	Downgradient	Yes	1.47E-03	NO	-6.52E+00	N/A
MW363	Downgradient	Yes	1.72E-03	NO	-6.37E+00	N/A
MW366	Downgradient	No	1.00E-03	N/A	-6.91E+00	N/A
MW369	Upgradient	Yes	5.83E-03	NO	-5.14E+00	N/A
MW372	Upgradient	Yes	3.05E-04	NO	-8.10E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Conductivity UNITS: umho/cm URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 482.856	**S=** 57.603	**CV(1)=** 0.119	**K factor**=** 2.523	**TL(1)=** 6.28E+02	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** 6.173	**S=** 0.123	**CV(2)=** 0.020	**K factor**=** 2.523	**TL(2)=** 6.48E+00	**LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	3.88E+02	5.96E+00
4/22/2002	4.04E+02	6.00E+00
7/15/2002	3.94E+02	5.98E+00
10/8/2002	4.03E+02	6.00E+00
1/8/2003	5.20E+02	6.25E+00
4/3/2003	4.87E+02	6.19E+00
7/8/2003	4.78E+02	6.17E+00
10/6/2003	4.76E+02	6.17E+00

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	5.08E+02	6.23E+00
4/23/2002	5.01E+02	6.22E+00
7/16/2002	5.07E+02	6.23E+00
10/8/2002	4.95E+02	6.20E+00
1/7/2003	5.09E+02	6.23E+00
4/2/2003	5.15E+02	6.24E+00
7/9/2003	5.76E+02	6.36E+00
10/7/2003	5.65E+02	6.34E+00

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	4.16E+02	NO	6.03E+00	N/A
MW360	Downgradient	Yes	3.96E+02	NO	5.98E+00	N/A
MW363	Downgradient	Yes	3.82E+02	NO	5.95E+00	N/A
MW366	Downgradient	Yes	4.79E+02	NO	6.17E+00	N/A
MW369	Upgradient	Yes	3.50E+02	NO	5.86E+00	N/A
MW372	Upgradient	Yes	7.59E+02	YES	6.63E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data.

Wells with Exceedances

MW372

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Copper UNITS: mg/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 0.025	**S=** 0.010	**CV(1)=** 0.400	**K factor**=** 2.523	**TL(1)=** 5.02E-02	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** -3.742	**S=** 0.307	**CV(2)=** -0.082	**K factor**=** 2.523	**TL(2)=** -2.97E+00	**LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW369	
Date Collected	Result	LN(Result)
3/18/2002	2.50E-02	-3.69E+00
4/22/2002	2.50E-02	-3.69E+00
7/15/2002	5.00E-02	-3.00E+00
10/8/2002	2.00E-02	-3.91E+00
1/8/2003	2.00E-02	-3.91E+00
4/3/2003	2.00E-02	-3.91E+00
7/8/2003	2.00E-02	-3.91E+00
10/6/2003	2.00E-02	-3.91E+00

Well Number:	MW372	
Date Collected	Result	LN(Result)
3/19/2002	2.50E-02	-3.69E+00
4/23/2002	2.50E-02	-3.69E+00
7/16/2002	5.00E-02	-3.00E+00
10/8/2002	2.00E-02	-3.91E+00
1/7/2003	2.00E-02	-3.91E+00
4/2/2003	2.00E-02	-3.91E+00
7/9/2003	2.00E-02	-3.91E+00
10/7/2003	2.00E-02	-3.91E+00

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	3.09E-03	NO	-5.78E+00	N/A
MW360	Downgradient	Yes	2.30E-03	NO	-6.07E+00	N/A
MW363	Downgradient	Yes	4.40E-04	NO	-7.73E+00	N/A
MW366	Downgradient	Yes	1.44E-03	NO	-6.54E+00	N/A
MW369	Upgradient	Yes	5.04E-03	NO	-5.29E+00	N/A
MW372	Upgradient	Yes	1.27E-03	NO	-6.67E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Cyanide UNITS: mg/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 0.020 **S=** 0.000 **CV(1)=** 0.000 **K factor**=** 2.523 **TL(1)=** 2.00E-02 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** -3.912 **S=** 0.000 **CV(2)=** 0.000 **K factor**=** 2.523 **TL(2)=** -3.91E+00 **LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	2.00E-02	-3.91E+00
4/22/2002	2.00E-02	-3.91E+00
7/15/2002	2.00E-02	-3.91E+00
10/8/2002	2.00E-02	-3.91E+00
4/3/2003	2.00E-02	-3.91E+00
7/8/2003	2.00E-02	-3.91E+00
10/6/2003	2.00E-02	-3.91E+00
1/7/2004	2.00E-02	-3.91E+00

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	2.00E-02	-3.91E+00
4/23/2002	2.00E-02	-3.91E+00
7/16/2002	2.00E-02	-3.91E+00
10/8/2002	2.00E-02	-3.91E+00
4/2/2003	2.00E-02	-3.91E+00
7/9/2003	2.00E-02	-3.91E+00
10/7/2003	2.00E-02	-3.91E+00
1/5/2004	2.00E-02	-3.91E+00

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	No	2.00E-01	N/A	-1.61E+00	N/A
MW360	Downgradient	No	2.00E-01	N/A	-1.61E+00	N/A
MW363	Downgradient	No	2.00E-01	N/A	-1.61E+00	N/A
MW366	Downgradient	No	2.00E-01	N/A	-1.61E+00	N/A
MW369	Upgradient	No	2.00E-01	N/A	-1.61E+00	N/A
MW372	Upgradient	Yes	4.37E-03	NO	-5.43E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Dissolved Oxygen UNITS: mg/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 1.781	**S=** 1.351	**CV(1)=**0.759	**K factor**=** 2.523	**TL(1)=** 5.19E+00	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 0.228	**S=** 1.065	**CV(2)=**4.665	**K factor**=** 2.523	**TL(2)=** 2.92E+00	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW369	
Date Collected	Result	LN(Result)
3/18/2002	5.41E+00	1.69E+00
4/22/2002	1.57E+00	4.51E-01
7/15/2002	8.00E-01	-2.23E-01
10/8/2002	1.09E+00	8.62E-02
1/8/2003	2.69E+00	9.90E-01
4/3/2003	2.04E+00	7.13E-01
7/8/2003	1.19E+00	1.74E-01
10/6/2003	1.78E+00	5.77E-01

Well Number:	MW372	
Date Collected	Result	LN(Result)
3/19/2002	3.89E+00	1.36E+00
4/23/2002	5.00E-02	-3.00E+00
7/16/2002	1.33E+00	2.85E-01
10/8/2002	2.66E+00	9.78E-01
1/7/2003	4.00E-01	-9.16E-01
4/2/2003	9.10E-01	-9.43E-02
7/9/2003	1.42E+00	3.51E-01
10/7/2003	1.26E+00	2.31E-01

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	4.51E+00	NO	1.51E+00	N/A
MW360	Downgradient	Yes	1.71E+00	NO	5.36E-01	N/A
MW363	Downgradient	Yes	4.53E+00	NO	1.51E+00	N/A
MW366	Downgradient	Yes	3.16E+00	NO	1.15E+00	N/A
MW369	Upgradient	Yes	2.85E+00	NO	1.05E+00	N/A
MW372	Upgradient	Yes	1.91E+00	NO	6.47E-01	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Dissolved Solids UNITS: mg/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 285.188	**S=** 44.908	**CV(1)=** 0.157	**K factor**=** 2.523	**TL(1)=** 3.98E+02	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** 5.640	**S=** 0.175	**CV(2)=** 0.031	**K factor**=** 2.523	**TL(2)=** 6.08E+00	**LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW369	
Date Collected	Result	LN(Result)
3/18/2002	1.73E+02	5.15E+00
4/22/2002	2.46E+02	5.51E+00
7/15/2002	2.32E+02	5.45E+00
10/8/2002	2.75E+02	5.62E+00
1/8/2003	2.69E+02	5.59E+00
4/3/2003	2.50E+02	5.52E+00
7/8/2003	2.95E+02	5.69E+00
10/6/2003	2.76E+02	5.62E+00

Well Number:	MW372	
Date Collected	Result	LN(Result)
3/19/2002	2.95E+02	5.69E+00
4/23/2002	3.22E+02	5.77E+00
7/16/2002	3.29E+02	5.80E+00
10/8/2002	2.90E+02	5.67E+00
1/7/2003	3.16E+02	5.76E+00
4/2/2003	3.11E+02	5.74E+00
7/9/2003	3.47E+02	5.85E+00
10/7/2003	3.37E+02	5.82E+00

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	1.98E+02	NO	5.29E+00	N/A
MW360	Downgradient	Yes	2.16E+02	NO	5.38E+00	N/A
MW363	Downgradient	Yes	1.95E+02	NO	5.27E+00	N/A
MW366	Downgradient	Yes	2.56E+02	NO	5.55E+00	N/A
MW369	Upgradient	Yes	1.75E+02	NO	5.16E+00	N/A
MW372	Upgradient	Yes	4.23E+02	YES	6.05E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data.

Wells with Exceedances

MW372

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Iron UNITS: mg/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 7.385 **S=** 6.991 **CV(1)=** 0.947 **K factor**=** 2.523 **TL(1)=** 2.50E+01 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 1.358 **S=** 1.323 **CV(2)=** 0.974 **K factor**=** 2.523 **TL(2)=** 4.70E+00 **LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	6.56E-01	-4.22E-01
4/22/2002	6.95E-01	-3.64E-01
7/15/2002	7.10E+00	1.96E+00
10/8/2002	2.15E+01	3.07E+00
1/8/2003	1.85E+01	2.92E+00
4/3/2003	1.49E+01	2.70E+00
7/8/2003	1.13E+01	2.42E+00
10/6/2003	1.49E+01	2.70E+00

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	5.95E+00	1.78E+00
4/23/2002	7.92E-01	-2.33E-01
7/16/2002	1.78E+00	5.77E-01
10/8/2002	7.76E-01	-2.54E-01
1/7/2003	3.55E+00	1.27E+00
4/2/2003	5.02E+00	1.61E+00
7/9/2003	1.00E+01	2.30E+00
10/7/2003	7.33E-01	-3.11E-01

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	4.20E-02	NO	-3.17E+00	N/A
MW360	Downgradient	Yes	1.76E-01	NO	-1.74E+00	N/A
MW363	Downgradient	Yes	1.33E-01	NO	-2.02E+00	N/A
MW366	Downgradient	No	1.00E-01	N/A	-2.30E+00	N/A
MW369	Upgradient	Yes	3.60E-01	NO	-1.02E+00	N/A
MW372	Upgradient	Yes	3.30E-02	NO	-3.41E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Magnesium UNITS: mg/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 12.864	**S=** 3.505	**CV(1)=** 0.272	**K factor**=** 2.523	**TL(1)=** 2.17E+01	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 2.517	**S=** 0.290	**CV(2)=** 0.115	**K factor**=** 2.523	**TL(2)=** 3.25E+00	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW369	
Date Collected	Result	LN(Result)
3/18/2002	1.14E+01	2.43E+00
4/22/2002	1.20E+01	2.48E+00
7/15/2002	1.00E+01	2.30E+00
10/8/2002	8.62E+00	2.15E+00
1/8/2003	7.89E+00	2.07E+00
4/3/2003	7.97E+00	2.08E+00
7/8/2003	1.03E+01	2.33E+00
10/6/2003	9.14E+00	2.21E+00

Well Number:	MW372	
Date Collected	Result	LN(Result)
3/19/2002	1.57E+01	2.75E+00
4/23/2002	1.66E+01	2.81E+00
7/16/2002	1.54E+01	2.73E+00
10/8/2002	1.58E+01	2.76E+00
1/7/2003	1.58E+01	2.76E+00
4/2/2003	1.64E+01	2.80E+00
7/9/2003	1.52E+01	2.72E+00
10/7/2003	1.76E+01	2.87E+00

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	1.11E+01	NO	2.41E+00	N/A
MW360	Downgradient	Yes	7.97E+00	NO	2.08E+00	N/A
MW363	Downgradient	Yes	8.89E+00	NO	2.18E+00	N/A
MW366	Downgradient	Yes	1.48E+01	NO	2.69E+00	N/A
MW369	Upgradient	Yes	6.17E+00	NO	1.82E+00	N/A
MW372	Upgradient	Yes	2.11E+01	NO	3.05E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Manganese UNITS: mg/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 0.413	**S=** 0.274	**CV(1)=** 0.664	**K factor**=** 2.523	**TL(1)=** 1.11E+00	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** -1.226	**S=** 1.008	**CV(2)=** -0.822	**K factor**=** 2.523	**TL(2)=** 1.32E+00	**LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW369	
Date Collected	Result	LN(Result)
3/18/2002	3.40E-02	-3.38E+00
4/22/2002	6.20E-02	-2.78E+00
7/15/2002	4.36E-01	-8.30E-01
10/8/2002	8.67E-01	-1.43E-01
1/8/2003	8.28E-01	-1.89E-01
4/3/2003	6.72E-01	-3.97E-01
7/8/2003	3.21E-01	-1.14E+00
10/6/2003	7.14E-01	-3.37E-01

Well Number:	MW372	
Date Collected	Result	LN(Result)
3/19/2002	2.05E-01	-1.58E+00
4/23/2002	3.45E-01	-1.06E+00
7/16/2002	2.10E-01	-1.56E+00
10/8/2002	5.39E-02	-2.92E+00
1/7/2003	5.37E-01	-6.22E-01
4/2/2003	4.15E-01	-8.79E-01
7/9/2003	6.54E-01	-4.25E-01
10/7/2003	2.54E-01	-1.37E+00

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	7.59E-03	NO	-4.88E+00	N/A
MW360	Downgradient	Yes	1.88E-02	NO	-3.97E+00	N/A
MW363	Downgradient	Yes	2.04E-01	NO	-1.59E+00	N/A
MW366	Downgradient	Yes	2.66E-03	NO	-5.93E+00	N/A
MW369	Upgradient	Yes	3.32E-02	NO	-3.41E+00	N/A
MW372	Upgradient	Yes	1.57E-03	NO	-6.46E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Molybdenum UNITS: mg/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 0.010	**S=** 0.012	**CV(1)=** 1.199	**K factor**=** 2.523	**TL(1)=** 4.03E-02	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -5.698	**S=** 1.607	**CV(2)=** -0.282	**K factor**=** 2.523	**TL(2)=** -1.64E+00	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	2.50E-02	-3.69E+00
4/22/2002	2.50E-02	-3.69E+00
7/15/2002	2.50E-02	-3.69E+00
10/8/2002	1.00E-03	-6.91E+00
1/8/2003	1.00E-03	-6.91E+00
4/3/2003	1.00E-03	-6.91E+00
7/8/2003	1.00E-03	-6.91E+00
10/6/2003	1.00E-03	-6.91E+00

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	2.50E-02	-3.69E+00
4/23/2002	2.50E-02	-3.69E+00
7/16/2002	2.50E-02	-3.69E+00
10/8/2002	1.00E-03	-6.91E+00
1/7/2003	1.00E-03	-6.91E+00
4/2/2003	1.00E-03	-6.91E+00
7/9/2003	1.05E-03	-6.86E+00
10/7/2003	1.00E-03	-6.91E+00

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	No	1.00E-03	N/A	-6.91E+00	N/A
MW360	Downgradient	No	1.00E-03	N/A	-6.91E+00	N/A
MW363	Downgradient	No	1.00E-03	N/A	-6.91E+00	N/A
MW366	Downgradient	No	1.00E-03	N/A	-6.91E+00	N/A
MW369	Upgradient	No	1.00E-03	N/A	-6.91E+00	N/A
MW372	Upgradient	Yes	2.02E-04	N/A	-8.51E+00	NO

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Nickel UNITS: mg/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 0.024	**S=** 0.021	**CV(1)=** 0.910	**K factor**=** 2.523	**TL(1)=** 7.77E-02	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** -4.246	**S=** 1.075	**CV(2)=** -0.253	**K factor**=** 2.523	**TL(2)=** -1.53E+00	**LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW369	
Date Collected	Result	LN(Result)
3/18/2002	5.00E-02	-3.00E+00
4/22/2002	5.00E-02	-3.00E+00
7/15/2002	5.00E-02	-3.00E+00
10/8/2002	5.00E-03	-5.30E+00
1/8/2003	5.00E-03	-5.30E+00
4/3/2003	5.00E-03	-5.30E+00
7/8/2003	1.30E-02	-4.34E+00
10/6/2003	1.04E-02	-4.57E+00

Well Number:	MW372	
Date Collected	Result	LN(Result)
3/19/2002	5.00E-02	-3.00E+00
4/23/2002	5.00E-02	-3.00E+00
7/16/2002	5.00E-02	-3.00E+00
10/8/2002	5.00E-03	-5.30E+00
1/7/2003	5.00E-03	-5.30E+00
4/2/2003	5.00E-03	-5.30E+00
7/9/2003	1.90E-02	-3.96E+00
10/7/2003	5.00E-03	-5.30E+00

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	2.10E-03	NO	-6.17E+00	N/A
MW360	Downgradient	Yes	1.71E-03	NO	-6.37E+00	N/A
MW363	Downgradient	Yes	4.41E-02	NO	-3.12E+00	N/A
MW366	Downgradient	Yes	9.38E-04	NO	-6.97E+00	N/A
MW369	Upgradient	Yes	4.62E-03	NO	-5.38E+00	N/A
MW372	Upgradient	Yes	9.29E-04	NO	-6.98E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Oxidation-Reduction Potential UNITS: mV URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 74.563	**S=** 94.243	**CV(1)=** 1.264	**K factor**=** 2.523	**TL(1)=** 3.12E+02	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 4.554	**S=** 0.784	**CV(2)=** 0.172	**K factor**=** 2.523	**TL(2)=** 5.37E+00	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW369	
Date Collected	Result	LN(Result)
3/18/2002	2.15E+02	5.37E+00
4/22/2002	1.10E+02	4.70E+00
7/15/2002	2.00E+01	3.00E+00
1/8/2003	-5.00E+00	#Func!
4/3/2003	-1.80E+01	#Func!
7/8/2003	-6.70E+01	#Func!
10/6/2003	-1.00E+00	#Func!
1/7/2004	5.50E+01	4.01E+00

Well Number:	MW372	
Date Collected	Result	LN(Result)
3/19/2002	2.10E+02	5.35E+00
4/23/2002	6.50E+01	4.17E+00
7/16/2002	2.15E+02	5.37E+00
10/8/2002	1.85E+02	5.22E+00
1/7/2003	4.50E+01	3.81E+00
4/2/2003	6.50E+01	4.17E+00
7/9/2003	-3.90E+01	#Func!
10/7/2003	1.38E+02	4.93E+00

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

#Because the natural log was not possible for all background values, the TL was considered equal to the maximum background value.

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	3.96E+02	N/A	5.98E+00	YES
MW360	Downgradient	Yes	4.18E+02	N/A	6.04E+00	YES
MW363	Downgradient	Yes	3.80E+02	N/A	5.94E+00	YES
MW366	Downgradient	Yes	3.62E+02	N/A	5.89E+00	YES
MW369	Upgradient	Yes	4.06E+02	N/A	6.01E+00	YES
MW372	Upgradient	Yes	3.87E+02	N/A	5.96E+00	YES

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data.

Wells with Exceedances

MW357
MW360
MW363
MW366
MW369
MW372

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

pH UNITS: Std Unit URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 6.274	**S=** 0.194	**CV(1)=** 0.031	**K factor**=** 2.904	**TL(1)=** 6.84E+00	**LL(1)=** 5.71E+00
Statistics-Transformed Background Data	**X=** 1.836	**S=** 0.031	**CV(2)=** 0.017	**K factor**=** 2.904	**TL(2)=** 1.93E+00	**LL(2)=** 1.75E+00

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW369	
Date Collected	Result	LN(Result)
3/18/2002	6.10E+00	1.81E+00
4/22/2002	6.10E+00	1.81E+00
7/15/2002	6.10E+00	1.81E+00
10/8/2002	6.50E+00	1.87E+00
1/8/2003	6.50E+00	1.87E+00
4/3/2003	6.60E+00	1.89E+00
7/8/2003	6.50E+00	1.87E+00
10/6/2003	6.50E+00	1.87E+00

Well Number:	MW372	
Date Collected	Result	LN(Result)
3/19/2002	6.10E+00	1.81E+00
4/23/2002	6.12E+00	1.81E+00
7/16/2002	6.10E+00	1.81E+00
10/8/2002	6.06E+00	1.80E+00
1/7/2003	6.26E+00	1.83E+00
4/2/2003	6.15E+00	1.82E+00
7/9/2003	6.30E+00	1.84E+00
10/7/2003	6.40E+00	1.86E+00

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)? Result <LL(1)?	LN(Result)	LN(Result) >TL(2)? LN(Result) <LL(2)?
MW357	Downgradient	Yes	5.96E+00	NO	1.79E+00	N/A
MW360	Downgradient	Yes	6.07E+00	NO	1.80E+00	N/A
MW363	Downgradient	Yes	6.24E+00	NO	1.83E+00	N/A
MW366	Downgradient	Yes	6.05E+00	NO	1.80E+00	N/A
MW369	Upgradient	Yes	5.96E+00	NO	1.79E+00	N/A
MW372	Upgradient	Yes	6.05E+00	NO	1.80E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Potassium UNITS: mg/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 1.663	**S=** 0.488	**CV(1)=** 0.293	**K factor**=** 2.523	**TL(1)=** 2.89E+00	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** 0.456	**S=** 0.362	**CV(2)=** 0.794	**K factor**=** 2.523	**TL(2)=** 1.37E+00	**LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW369	
Date Collected	Result	LN(Result)
3/18/2002	2.00E+00	6.93E-01
4/22/2002	2.21E+00	7.93E-01
7/15/2002	2.00E+00	6.93E-01
10/8/2002	9.66E-01	-3.46E-02
1/8/2003	7.27E-01	-3.19E-01
4/3/2003	8.00E-01	-2.23E-01
7/8/2003	1.62E+00	4.82E-01
10/6/2003	1.14E+00	1.31E-01

Well Number:	MW372	
Date Collected	Result	LN(Result)
3/19/2002	2.04E+00	7.13E-01
4/23/2002	2.03E+00	7.08E-01
7/16/2002	2.00E+00	6.93E-01
10/8/2002	1.54E+00	4.32E-01
1/7/2003	1.88E+00	6.31E-01
4/2/2003	2.09E+00	7.37E-01
7/9/2003	1.78E+00	5.77E-01
10/7/2003	1.79E+00	5.82E-01

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	1.69E+00	NO	5.25E-01	N/A
MW360	Downgradient	Yes	6.97E-01	NO	-3.61E-01	N/A
MW363	Downgradient	Yes	1.98E+00	NO	6.83E-01	N/A
MW366	Downgradient	Yes	1.95E+00	NO	6.68E-01	N/A
MW369	Upgradient	Yes	5.19E-01	NO	-6.56E-01	N/A
MW372	Upgradient	Yes	2.30E+00	NO	8.33E-01	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Sodium UNITS: mg/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 45.100	**S=** 11.875	**CV(1)=** 0.263	**K factor**=** 2.523	**TL(1)=** 7.51E+01	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** 3.780	**S=** 0.242	**CV(2)=** 0.064	**K factor**=** 2.523	**TL(2)=** 4.39E+00	**LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW369	
Date Collected	Result	LN(Result)
3/18/2002	3.57E+01	3.58E+00
4/22/2002	3.76E+01	3.63E+00
7/15/2002	4.24E+01	3.75E+00
10/8/2002	6.69E+01	4.20E+00
1/8/2003	6.79E+01	4.22E+00
4/3/2003	6.18E+01	4.12E+00
7/8/2003	4.56E+01	3.82E+00
10/6/2003	5.91E+01	4.08E+00

Well Number:	MW372	
Date Collected	Result	LN(Result)
3/19/2002	3.72E+01	3.62E+00
4/23/2002	3.86E+01	3.65E+00
7/16/2002	3.56E+01	3.57E+00
10/8/2002	3.75E+01	3.62E+00
1/7/2003	3.41E+01	3.53E+00
4/2/2003	3.44E+01	3.54E+00
7/9/2003	4.41E+01	3.79E+00
10/7/2003	4.31E+01	3.76E+00

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	4.22E+01	NO	3.74E+00	N/A
MW360	Downgradient	Yes	5.96E+01	NO	4.09E+00	N/A
MW363	Downgradient	Yes	3.88E+01	NO	3.66E+00	N/A
MW366	Downgradient	Yes	4.80E+01	NO	3.87E+00	N/A
MW369	Upgradient	Yes	4.76E+01	NO	3.86E+00	N/A
MW372	Upgradient	Yes	5.69E+01	NO	4.04E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Sulfate UNITS: mg/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 45.031	**S=** 33.919	**CV(1)=** 0.753	**K factor**=** 2.523	**TL(1)=** 1.31E+02	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** 3.420	**S=** 0.981	**CV(2)=** 0.287	**K factor**=** 2.523	**TL(2)=** 5.89E+00	**LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW369	
Date Collected	Result	LN(Result)
3/18/2002	1.55E+01	2.74E+00
4/22/2002	1.58E+01	2.76E+00
7/15/2002	1.38E+01	2.62E+00
10/8/2002	6.90E+00	1.93E+00
1/8/2003	1.05E+01	2.35E+00
4/3/2003	1.05E+01	2.35E+00
7/8/2003	1.09E+01	2.39E+00
10/6/2003	1.63E+01	2.79E+00

Well Number:	MW372	
Date Collected	Result	LN(Result)
3/19/2002	7.17E+01	4.27E+00
4/23/2002	7.47E+01	4.31E+00
7/16/2002	7.41E+01	4.31E+00
10/8/2002	7.05E+01	4.26E+00
1/7/2003	7.58E+01	4.33E+00
4/2/2003	8.18E+01	4.40E+00
7/9/2003	8.36E+01	4.43E+00
10/7/2003	8.81E+01	4.48E+00

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	3.93E+01	NO	3.67E+00	N/A
MW360	Downgradient	Yes	1.31E+01	NO	2.57E+00	N/A
MW363	Downgradient	Yes	2.99E+01	NO	3.40E+00	N/A
MW366	Downgradient	Yes	4.96E+01	NO	3.90E+00	N/A
MW369	Upgradient	Yes	7.91E+00	NO	2.07E+00	N/A
MW372	Upgradient	Yes	1.45E+02	YES	4.98E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data.

Wells with Exceedances

MW372

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Technetium-99 UNITS: pCi/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 20.821	**S=** 18.044	**CV(1)=** 0.867	**K factor**=** 2.523	**TL(1)=** 6.63E+01	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** 2.770	**S=** 1.150	**CV(2)=** 0.415	**K factor**=** 2.523	**TL(2)=** 3.97E+00	**LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW369	
Date Collected	Result	LN(Result)
3/18/2002	4.17E+01	3.73E+00
4/22/2002	5.31E+01	3.97E+00
7/15/2002	1.81E+01	2.90E+00
10/8/2002	1.64E+01	2.80E+00
1/8/2003	3.49E+00	1.25E+00
4/3/2003	9.34E+00	2.23E+00
7/8/2003	1.75E+01	2.86E+00
10/6/2003	1.70E+01	2.83E+00

Well Number:	MW372	
Date Collected	Result	LN(Result)
3/19/2002	4.48E+01	3.80E+00
4/23/2002	8.02E-01	-2.21E-01
7/16/2002	1.98E+01	2.99E+00
10/8/2002	4.61E+01	3.83E+00
1/7/2003	-9.73E-01	#Func!
4/2/2003	9.07E+00	2.20E+00
7/9/2003	0.00E+00	#Func!
10/7/2003	3.69E+01	3.61E+00

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

#Because the natural log was not possible for all background values, the TL was considered equal to the maximum background value.

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	4.61E+01	NO	3.83E+00	N/A
MW360	Downgradient	No	8.03E+00	N/A	2.08E+00	N/A
MW363	Downgradient	No	-2.22E+00	N/A	#Error	N/A
MW366	Downgradient	Yes	5.77E+01	NO	4.06E+00	N/A
MW369	Upgradient	Yes	5.61E+01	NO	4.03E+00	N/A
MW372	Upgradient	No	2.00E+01	N/A	3.00E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Total Organic Carbon (TOC) UNITS: mg/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 3.513	**S=** 4.307	**CV(1)=** 1.226	**K factor**=** 2.523	**TL(1)=** 1.44E+01	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 0.851	**S=** 0.828	**CV(2)=** 0.973	**K factor**=** 2.523	**TL(2)=** 2.94E+00	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	1.70E+00	5.31E-01
4/22/2002	1.60E+00	4.70E-01
7/15/2002	3.10E+00	1.13E+00
10/8/2002	1.77E+01	2.87E+00
1/8/2003	9.00E+00	2.20E+00
4/3/2003	4.00E+00	1.39E+00
7/8/2003	4.90E+00	1.59E+00
10/6/2003	2.40E+00	8.75E-01

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	1.00E+00	0.00E+00
4/23/2002	1.20E+00	1.82E-01
7/16/2002	1.00E+00	0.00E+00
10/8/2002	1.00E+00	0.00E+00
1/7/2003	1.60E+00	4.70E-01
4/2/2003	1.50E+00	4.05E-01
7/9/2003	3.00E+00	1.10E+00
10/7/2003	1.50E+00	4.05E-01

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	No	2.00E+00	N/A	6.93E-01	N/A
MW360	Downgradient	Yes	5.02E-01	N/A	-6.89E-01	NO
MW363	Downgradient	Yes	1.31E+00	N/A	2.70E-01	NO
MW366	Downgradient	Yes	7.51E-01	N/A	-2.86E-01	NO
MW369	Upgradient	Yes	8.17E-01	N/A	-2.02E-01	NO
MW372	Upgradient	Yes	8.81E-01	N/A	-1.27E-01	NO

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Total Organic Halides (TOX) UNITS: ug/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 67.963	**S=** 64.316	**CV(1)=** 0.946	**K factor**=** 2.523	**TL(1)=** 2.30E+02	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** 3.772	**S=** 1.023	**CV(2)=** 0.271	**K factor**=** 2.523	**TL(2)=** 6.35E+00	**LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW369	
Date Collected	Result	LN(Result)
3/18/2002	5.00E+01	3.91E+00
4/22/2002	5.00E+01	3.91E+00
7/15/2002	8.10E+01	4.39E+00
10/8/2002	2.02E+02	5.31E+00
1/8/2003	1.77E+02	5.18E+00
4/3/2003	9.31E+01	4.53E+00
7/8/2003	1.75E+01	2.86E+00
10/6/2003	3.75E+01	3.62E+00

Well Number:	MW372	
Date Collected	Result	LN(Result)
3/19/2002	1.84E+02	5.21E+00
4/23/2002	5.00E+01	3.91E+00
7/16/2002	5.00E+01	3.91E+00
10/8/2002	5.00E+01	3.91E+00
1/7/2003	1.00E+01	2.30E+00
4/2/2003	1.27E+01	2.54E+00
7/9/2003	1.00E+01	2.30E+00
10/7/2003	1.26E+01	2.53E+00

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	3.56E+00	NO	1.27E+00	N/A
MW360	Downgradient	Yes	7.88E+00	NO	2.06E+00	N/A
MW363	Downgradient	Yes	5.08E+00	NO	1.63E+00	N/A
MW366	Downgradient	Yes	2.45E+01	NO	3.20E+00	N/A
MW369	Upgradient	Yes	5.18E+00	NO	1.64E+00	N/A
MW372	Upgradient	Yes	9.56E+00	NO	2.26E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Trichloroethene UNITS: ug/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 5.625	**S=** 3.594	**CV(1)=** 0.639	**K factor**=** 2.523	**TL(1)=** 1.47E+01	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** 1.571	**S=** 0.565	**CV(2)=** 0.360	**K factor**=** 2.523	**TL(2)=** 3.00E+00	**LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW369	
Date Collected	Result	LN(Result)
3/18/2002	1.10E+01	2.40E+00
4/22/2002	1.60E+01	2.77E+00
7/15/2002	8.00E+00	2.08E+00
10/8/2002	3.00E+00	1.10E+00
1/8/2003	2.00E+00	6.93E-01
4/3/2003	3.00E+00	1.10E+00
7/8/2003	3.00E+00	1.10E+00
10/6/2003	2.00E+00	6.93E-01

Well Number:	MW372	
Date Collected	Result	LN(Result)
3/19/2002	5.00E+00	1.61E+00
4/23/2002	5.00E+00	1.61E+00
7/16/2002	4.00E+00	1.39E+00
10/8/2002	6.00E+00	1.79E+00
1/7/2003	5.00E+00	1.61E+00
4/2/2003	6.00E+00	1.79E+00
7/9/2003	5.00E+00	1.61E+00
10/7/2003	6.00E+00	1.79E+00

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	5.30E+00	NO	1.67E+00	N/A
MW360	Downgradient	Yes	7.54E+00	NO	2.02E+00	N/A
MW363	Downgradient	No	1.00E+00	N/A	0.00E+00	N/A
MW366	Downgradient	Yes	2.17E+00	N/A	7.75E-01	N/A
MW369	Upgradient	Yes	2.27E+00	N/A	8.20E-01	N/A
MW372	Upgradient	Yes	5.09E+00	NO	1.63E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Zinc UNITS: mg/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 0.116	**S=** 0.173	**CV(1)=** 1.490	**K factor**=** 2.523	**TL(1)=** 5.52E-01	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -2.729	**S=** 1.014	**CV(2)=** -0.371	**K factor**=** 2.523	**TL(2)=** -1.72E-01	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

Well Number: MW369

Date Collected	Result	LN(Result)
3/18/2002	1.00E-01	-2.30E+00
4/22/2002	1.00E-01	-2.30E+00
7/15/2002	1.00E-01	-2.30E+00
10/8/2002	2.50E-02	-3.69E+00
1/8/2003	3.50E-02	-3.35E+00
4/3/2003	3.50E-02	-3.35E+00
7/8/2003	2.00E-02	-3.91E+00
10/6/2003	2.00E-02	-3.91E+00

Well Number: MW372

Date Collected	Result	LN(Result)
3/19/2002	7.25E-01	-3.22E-01
4/23/2002	1.00E-01	-2.30E+00
7/16/2002	1.00E-01	-2.30E+00
10/8/2002	2.50E-02	-3.69E+00
1/7/2003	3.50E-02	-3.35E+00
4/2/2003	3.50E-02	-3.35E+00
7/9/2003	2.00E-01	-1.61E+00
10/7/2003	2.00E-01	-1.61E+00

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	1.48E-02	N/A	-4.21E+00	NO
MW360	Downgradient	Yes	4.69E-03	N/A	-5.36E+00	NO
MW363	Downgradient	No	2.00E-02	N/A	-3.91E+00	N/A
MW366	Downgradient	Yes	7.79E-03	N/A	-4.85E+00	NO
MW369	Upgradient	Yes	1.23E-02	N/A	-4.40E+00	NO
MW372	Upgradient	Yes	4.31E-03	N/A	-5.45E+00	NO

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Acetone UNITS: ug/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 51.625	**S=** 137.818	**CV(1)=** 2.670	**K factor**=** 2.523	**TL(1)=** 3.99E+02	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** 2.777	**S=** 1.127	**CV(2)=** 0.406	**K factor**=** 2.523	**TL(2)=** 5.62E+00	**LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW370	
Date Collected	Result	LN(Result)
3/17/2002	1.80E+01	2.89E+00
4/23/2002	1.10E+02	4.70E+00
7/15/2002	1.00E+01	2.30E+00
10/8/2002	1.80E+01	2.89E+00
1/8/2003	1.00E+01	2.30E+00
4/3/2003	1.00E+01	2.30E+00
7/9/2003	1.00E+01	2.30E+00
10/6/2003	1.00E+01	2.30E+00

Well Number:	MW373	
Date Collected	Result	LN(Result)
3/18/2002	9.00E+00	2.20E+00
4/23/2002	5.60E+02	6.33E+00
7/16/2002	1.00E+01	2.30E+00
10/8/2002	1.00E+01	2.30E+00
1/7/2003	1.00E+01	2.30E+00
4/2/2003	1.00E+01	2.30E+00
7/9/2003	1.00E+01	2.30E+00
10/7/2003	1.10E+01	2.40E+00

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	1.81E+00	N/A	5.93E-01	NO
MW361	Downgradient	No	5.00E+00	N/A	1.61E+00	N/A
MW364	Downgradient	No	5.00E+00	N/A	1.61E+00	N/A
MW367	Downgradient	No	5.00E+00	N/A	1.61E+00	N/A
MW370	Upgradient	No	5.00E+00	N/A	1.61E+00	N/A
MW373	Upgradient	No	5.00E+00	N/A	1.61E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Aluminum UNITS: mg/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 2.026	**S=** 5.626	**CV(1)=** 2.777	**K factor**=** 2.523	**TL(1)=** 1.62E+01	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** -0.803	**S=** 1.380	**CV(2)=** -1.718	**K factor**=** 2.523	**TL(2)=** 2.68E+00	**LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	4.66E+00	1.54E+00
4/23/2002	2.00E-01	-1.61E+00
7/15/2002	2.00E-01	-1.61E+00
10/8/2002	2.00E-01	-1.61E+00
1/8/2003	2.00E-01	-1.61E+00
4/3/2003	2.00E-01	-1.61E+00
7/9/2003	2.00E-01	-1.61E+00
10/6/2003	2.00E-01	-1.61E+00

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	2.27E+01	3.12E+00
4/23/2002	1.46E+00	3.78E-01
7/16/2002	2.53E-01	-1.37E+00
10/8/2002	4.82E-01	-7.30E-01
1/7/2003	6.08E-01	-4.98E-01
4/2/2003	4.46E-01	-8.07E-01
7/9/2003	2.00E-01	-1.61E+00
10/7/2003	2.00E-01	-1.61E+00

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	3.78E-02	N/A	-3.28E+00	NO
MW361	Downgradient	No	5.00E-02	N/A	-3.00E+00	N/A
MW364	Downgradient	No	5.00E-02	N/A	-3.00E+00	N/A
MW367	Downgradient	No	5.00E-02	N/A	-3.00E+00	N/A
MW370	Upgradient	No	5.00E-02	N/A	-3.00E+00	N/A
MW373	Upgradient	No	5.00E-02	N/A	-3.00E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Boron UNITS: mg/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 1.140	**S=** 0.780	**CV(1)=** 0.684	**K factor**=** 2.523	**TL(1)=** 3.11E+00	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** -0.235	**S=** 1.006	**CV(2)=** -4.287	**K factor**=** 2.523	**TL(2)=** 2.30E+00	**LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW370	
Date Collected	Result	LN(Result)
3/17/2002	2.00E+00	6.93E-01
4/23/2002	2.00E+00	6.93E-01
7/15/2002	2.00E+00	6.93E-01
10/8/2002	2.00E-01	-1.61E+00
1/8/2003	2.00E-01	-1.61E+00
4/3/2003	2.00E-01	-1.61E+00
7/9/2003	2.00E-01	-1.61E+00
10/6/2003	2.00E-01	-1.61E+00

Well Number:	MW373	
Date Collected	Result	LN(Result)
3/18/2002	2.00E+00	6.93E-01
4/23/2002	2.00E+00	6.93E-01
7/16/2002	2.00E+00	6.93E-01
10/8/2002	7.90E-01	-2.36E-01
1/7/2003	8.07E-01	-2.14E-01
4/2/2003	1.13E+00	1.22E-01
7/9/2003	1.28E+00	2.47E-01
10/7/2003	1.24E+00	2.15E-01

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	2.58E-01	NO	-1.35E+00	N/A
MW361	Downgradient	Yes	1.84E-01	NO	-1.69E+00	N/A
MW364	Downgradient	Yes	1.45E-01	NO	-1.93E+00	N/A
MW367	Downgradient	Yes	1.84E-02	NO	-4.00E+00	N/A
MW370	Upgradient	Yes	1.24E-01	NO	-2.09E+00	N/A
MW373	Upgradient	Yes	2.01E+00	NO	6.98E-01	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Bromide UNITS: mg/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 1.000	**S=** 0.000	**CV(1)=** 0.000	**K factor**=** 2.523	**TL(1)=** 1.00E+00	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** 0.000	**S=** 0.000	**CV(2)=** #Num!	**K factor**=** 2.523	**TL(2)=** 0.00E+00	**LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	1.00E+00	0.00E+00
4/23/2002	1.00E+00	0.00E+00
7/15/2002	1.00E+00	0.00E+00
10/8/2002	1.00E+00	0.00E+00
1/8/2003	1.00E+00	0.00E+00
4/3/2003	1.00E+00	0.00E+00
7/9/2003	1.00E+00	0.00E+00
10/6/2003	1.00E+00	0.00E+00

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	1.00E+00	0.00E+00
4/23/2002	1.00E+00	0.00E+00
7/16/2002	1.00E+00	0.00E+00
10/8/2002	1.00E+00	0.00E+00
1/7/2003	1.00E+00	0.00E+00
4/2/2003	1.00E+00	0.00E+00
7/9/2003	1.00E+00	0.00E+00
10/7/2003	1.00E+00	0.00E+00

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	3.91E-01	NO	-9.39E-01	N/A
MW361	Downgradient	Yes	5.42E-01	NO	-6.12E-01	N/A
MW364	Downgradient	Yes	4.58E-01	NO	-7.81E-01	N/A
MW367	Downgradient	Yes	9.96E-02	NO	-2.31E+00	N/A
MW370	Upgradient	Yes	6.75E-01	NO	-3.93E-01	N/A
MW373	Upgradient	Yes	4.63E-01	NO	-7.70E-01	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Calcium UNITS: mg/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 43.413	**S=** 13.444	**CV(1)=** 0.310	**K factor**=** 2.523	**TL(1)=** 7.73E+01	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** 3.723	**S=** 0.323	**CV(2)=** 0.087	**K factor**=** 2.523	**TL(2)=** 4.54E+00	**LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW370	
Date Collected	Result	LN(Result)
3/17/2002	3.48E+01	3.55E+00
4/23/2002	4.34E+01	3.77E+00
7/15/2002	3.32E+01	3.50E+00
10/8/2002	2.92E+01	3.37E+00
1/8/2003	3.13E+01	3.44E+00
4/3/2003	3.24E+01	3.48E+00
7/9/2003	2.29E+01	3.13E+00
10/6/2003	2.80E+01	3.33E+00

Well Number:	MW373	
Date Collected	Result	LN(Result)
3/18/2002	6.19E+01	4.13E+00
4/23/2002	5.92E+01	4.08E+00
7/16/2002	4.76E+01	3.86E+00
10/8/2002	4.61E+01	3.83E+00
1/7/2003	4.92E+01	3.90E+00
4/2/2003	5.78E+01	4.06E+00
7/9/2003	5.27E+01	3.96E+00
10/7/2003	6.49E+01	4.17E+00

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	3.36E+01	NO	3.51E+00	N/A
MW361	Downgradient	Yes	3.44E+01	NO	3.54E+00	N/A
MW364	Downgradient	Yes	3.11E+01	NO	3.44E+00	N/A
MW367	Downgradient	Yes	1.26E+01	NO	2.53E+00	N/A
MW370	Upgradient	Yes	2.93E+01	NO	3.38E+00	N/A
MW373	Upgradient	Yes	7.87E+01	YES	4.37E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data.

Wells with Exceedances

MW373

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Chloride UNITS: mg/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 45.919	**S=** 7.524	**CV(1)=** 0.164	**K factor**=** 2.523	**TL(1)=** 6.49E+01	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** 3.814	**S=** 0.165	**CV(2)=** 0.043	**K factor**=** 2.523	**TL(2)=** 4.23E+00	**LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW370	
Date Collected	Result	LN(Result)
7/15/2002	5.55E+01	4.02E+00
10/8/2002	5.36E+01	3.98E+00
1/8/2003	5.29E+01	3.97E+00
4/3/2003	5.36E+01	3.98E+00
7/9/2003	5.19E+01	3.95E+00
10/6/2003	5.30E+01	3.97E+00
1/7/2004	5.30E+01	3.97E+00
4/7/2004	5.16E+01	3.94E+00

Well Number:	MW373	
Date Collected	Result	LN(Result)
7/16/2002	4.06E+01	3.70E+00
10/8/2002	3.88E+01	3.66E+00
1/7/2003	3.90E+01	3.66E+00
4/2/2003	3.84E+01	3.65E+00
7/9/2003	3.81E+01	3.64E+00
10/7/2003	3.80E+01	3.64E+00
1/6/2004	3.79E+01	3.63E+00
4/7/2004	3.88E+01	3.66E+00

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	3.13E+01	NO	3.44E+00	N/A
MW361	Downgradient	Yes	3.73E+01	NO	3.62E+00	N/A
MW364	Downgradient	Yes	3.79E+01	NO	3.63E+00	N/A
MW367	Downgradient	Yes	7.48E+00	NO	2.01E+00	N/A
MW370	Upgradient	Yes	4.40E+01	NO	3.78E+00	N/A
MW373	Upgradient	Yes	3.21E+01	NO	3.47E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Cobalt UNITS: mg/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 0.027	**S=** 0.032	**CV(1)=** 1.165	**K factor**=** 2.523	**TL(1)=** 1.08E-01	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -4.058	**S=** 1.011	**CV(2)=** -0.249	**K factor**=** 2.523	**TL(2)=** -1.51E+00	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW370	
Date Collected	Result	LN(Result)
3/17/2002	2.50E-02	-3.69E+00
4/23/2002	2.50E-02	-3.69E+00
7/15/2002	2.50E-02	-3.69E+00
10/8/2002	1.74E-02	-4.05E+00
1/8/2003	1.05E-02	-4.56E+00
4/3/2003	9.31E-03	-4.68E+00
7/9/2003	1.37E-01	-1.99E+00
10/6/2003	4.63E-02	-3.07E+00

Well Number:	MW373	
Date Collected	Result	LN(Result)
3/18/2002	2.50E-02	-3.69E+00
4/23/2002	3.40E-02	-3.38E+00
7/16/2002	2.50E-02	-3.69E+00
10/8/2002	4.11E-03	-5.49E+00
1/7/2003	3.44E-03	-5.67E+00
4/2/2003	3.68E-03	-5.60E+00
7/9/2003	4.05E-02	-3.21E+00
10/7/2003	8.43E-03	-4.78E+00

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	4.42E-02	N/A	-3.12E+00	NO
MW361	Downgradient	No	1.00E-03	N/A	-6.91E+00	N/A
MW364	Downgradient	No	1.00E-03	N/A	-6.91E+00	N/A
MW367	Downgradient	Yes	5.98E-03	N/A	-5.12E+00	NO
MW370	Upgradient	No	1.00E-03	N/A	-6.91E+00	N/A
MW373	Upgradient	No	1.00E-03	N/A	-6.91E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Conductivity UNITS: umho/cm LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 608.719 **S=** 156.157 **CV(1)=** 0.257 **K factor**=** 2.523 **TL(1)=** 1.00E+03 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 6.380 **S=** 0.260 **CV(2)=** 0.041 **K factor**=** 2.523 **TL(2)=** 7.04E+00 **LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW370	
Date Collected	Result	LN(Result)
3/17/2002	4.06E+02	6.01E+00
4/23/2002	5.43E+02	6.30E+00
7/15/2002	4.76E+02	6.17E+00
10/8/2002	4.41E+02	6.09E+00
1/8/2003	4.86E+02	6.19E+00
4/3/2003	4.66E+02	6.14E+00
7/9/2003	4.79E+02	6.17E+00
10/6/2003	4.35E+02	6.08E+00

Well Number:	MW373	
Date Collected	Result	LN(Result)
3/18/2002	6.61E+02	6.49E+00
4/23/2002	8.01E+02	6.69E+00
7/16/2002	7.74E+02	6.65E+00
10/8/2002	6.80E+02	6.52E+00
1/7/2003	6.87E+02	6.53E+00
4/2/2003	7.63E+02	6.64E+00
7/9/2003	8.28E+02	6.72E+00
10/7/2003	8.14E+02	6.70E+00

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	5.28E+02	NO	6.27E+00	N/A
MW361	Downgradient	Yes	5.08E+02	NO	6.23E+00	N/A
MW364	Downgradient	Yes	4.76E+02	NO	6.17E+00	N/A
MW367	Downgradient	Yes	2.24E+02	NO	5.41E+00	N/A
MW370	Upgradient	Yes	4.68E+02	NO	6.15E+00	N/A
MW373	Upgradient	Yes	9.10E+02	NO	6.81E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Copper UNITS: mg/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 0.025	**S=** 0.010	**CV(1)=** 0.399	**K factor**=** 2.523	**TL(1)=** 5.03E-02	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -3.739	**S=** 0.308	**CV(2)=** -0.082	**K factor**=** 2.523	**TL(2)=** -2.96E+00	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW370	
Date Collected	Result	LN(Result)
3/17/2002	2.50E-02	-3.69E+00
4/23/2002	2.50E-02	-3.69E+00
7/15/2002	5.00E-02	-3.00E+00
10/8/2002	2.00E-02	-3.91E+00
1/8/2003	2.00E-02	-3.91E+00
4/3/2003	2.00E-02	-3.91E+00
7/9/2003	2.00E-02	-3.91E+00
10/6/2003	2.00E-02	-3.91E+00

Well Number:	MW373	
Date Collected	Result	LN(Result)
3/18/2002	2.60E-02	-3.65E+00
4/23/2002	2.50E-02	-3.69E+00
7/16/2002	5.00E-02	-3.00E+00
10/8/2002	2.00E-02	-3.91E+00
1/7/2003	2.00E-02	-3.91E+00
4/2/2003	2.00E-02	-3.91E+00
7/9/2003	2.00E-02	-3.91E+00
10/7/2003	2.00E-02	-3.91E+00

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	7.94E-04	NO	-7.14E+00	N/A
MW361	Downgradient	Yes	2.06E-03	NO	-6.19E+00	N/A
MW364	Downgradient	Yes	1.28E-03	NO	-6.66E+00	N/A
MW367	Downgradient	Yes	2.73E-03	NO	-5.90E+00	N/A
MW370	Upgradient	Yes	1.96E-03	NO	-6.23E+00	N/A
MW373	Upgradient	Yes	1.12E-03	NO	-6.79E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Cyanide UNITS: mg/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 0.020	**S=** 0.000	**CV(1)=** 0.000	**K factor**=** 2.523	**TL(1)=** 2.00E-02	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** -3.912	**S=** 0.000	**CV(2)=** 0.000	**K factor**=** 2.523	**TL(2)=** -3.91E+00	**LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW370	
Date Collected	Result	LN(Result)
3/17/2002	2.00E-02	-3.91E+00
4/23/2002	2.00E-02	-3.91E+00
7/15/2002	2.00E-02	-3.91E+00
10/8/2002	2.00E-02	-3.91E+00
4/3/2003	2.00E-02	-3.91E+00
7/9/2003	2.00E-02	-3.91E+00
10/6/2003	2.00E-02	-3.91E+00
1/7/2004	2.00E-02	-3.91E+00

Well Number:	MW373	
Date Collected	Result	LN(Result)
3/18/2002	2.00E-02	-3.91E+00
4/23/2002	2.00E-02	-3.91E+00
7/16/2002	2.00E-02	-3.91E+00
10/8/2002	2.00E-02	-3.91E+00
4/2/2003	2.00E-02	-3.91E+00
7/9/2003	2.00E-02	-3.91E+00
10/7/2003	2.00E-02	-3.91E+00
1/6/2004	2.00E-02	-3.91E+00

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	No	2.00E-01	N/A	-1.61E+00	N/A
MW361	Downgradient	No	2.00E-01	N/A	-1.61E+00	N/A
MW364	Downgradient	No	2.00E-01	N/A	-1.61E+00	N/A
MW367	Downgradient	No	2.00E-01	N/A	-1.61E+00	N/A
MW370	Upgradient	No	2.00E-01	N/A	-1.61E+00	N/A
MW373	Upgradient	Yes	3.61E-03	NO	-5.62E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Dissolved Oxygen UNITS: mg/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 1.387	**S=** 1.153	**CV(1)=** 0.831	**K factor**=** 2.523	**TL(1)=** 4.30E+00	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** -0.115	**S=** 1.207	**CV(2)=** -10.514	**K factor**=** 2.523	**TL(2)=** 2.93E+00	**LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW370	
Date Collected	Result	LN(Result)
3/17/2002	4.32E+00	1.46E+00
4/23/2002	1.24E+00	2.15E-01
7/15/2002	7.50E-01	-2.88E-01
10/8/2002	9.40E-01	-6.19E-02
1/8/2003	3.08E+00	1.12E+00
4/3/2003	1.45E+00	3.72E-01
7/9/2003	1.22E+00	1.99E-01
10/6/2003	1.07E+00	6.77E-02

Well Number:	MW373	
Date Collected	Result	LN(Result)
3/18/2002	3.04E+00	1.11E+00
4/23/2002	3.00E-02	-3.51E+00
7/16/2002	2.30E-01	-1.47E+00
10/8/2002	8.60E-01	-1.51E-01
1/7/2003	2.10E-01	-1.56E+00
4/2/2003	1.19E+00	1.74E-01
7/9/2003	1.10E+00	9.53E-02
10/7/2003	1.46E+00	3.78E-01

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	1.72E+00	NO	5.42E-01	N/A
MW361	Downgradient	Yes	3.87E+00	NO	1.35E+00	N/A
MW364	Downgradient	Yes	3.52E+00	NO	1.26E+00	N/A
MW367	Downgradient	Yes	1.67E+00	NO	5.13E-01	N/A
MW370	Upgradient	Yes	4.01E+00	NO	1.39E+00	N/A
MW373	Upgradient	Yes	1.69E+00	NO	5.25E-01	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Dissolved Solids UNITS: mg/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 356.188 **S=** 106.752 **CV(1)=** 0.300 **K factor**=** 2.523 **TL(1)=** 6.26E+02 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 5.831 **S=** 0.311 **CV(2)=** 0.053 **K factor**=** 2.523 **TL(2)=** 6.62E+00 **LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW370	
Date Collected	Result	LN(Result)
3/17/2002	2.36E+02	5.46E+00
4/23/2002	3.37E+02	5.82E+00
7/15/2002	2.66E+02	5.58E+00
10/8/2002	2.40E+02	5.48E+00
1/8/2003	2.82E+02	5.64E+00
4/3/2003	2.38E+02	5.47E+00
7/9/2003	2.48E+02	5.51E+00
10/6/2003	2.24E+02	5.41E+00

Well Number:	MW373	
Date Collected	Result	LN(Result)
3/18/2002	4.27E+02	6.06E+00
4/23/2002	5.07E+02	6.23E+00
7/16/2002	4.64E+02	6.14E+00
10/8/2002	4.08E+02	6.01E+00
1/7/2003	4.04E+02	6.00E+00
4/2/2003	4.50E+02	6.11E+00
7/9/2003	4.87E+02	6.19E+00
10/7/2003	4.81E+02	6.18E+00

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	2.41E+02	NO	5.48E+00	N/A
MW361	Downgradient	Yes	2.72E+02	NO	5.61E+00	N/A
MW364	Downgradient	Yes	2.51E+02	NO	5.53E+00	N/A
MW367	Downgradient	Yes	9.60E+01	NO	4.56E+00	N/A
MW370	Upgradient	Yes	2.11E+02	NO	5.35E+00	N/A
MW373	Upgradient	Yes	5.14E+02	NO	6.24E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Iron UNITS: mg/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 9.230 **S=** 8.841 **CV(1)=** 0.958 **K factor**=** 2.523 **TL(1)=** 3.15E+01 **LL(1)=** N/A

Statistics-Transformed Background Data **X=** 1.942 **S=** 0.713 **CV(2)=** 0.367 **K factor**=** 2.523 **TL(2)=** 3.74E+00 **LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	9.34E+00	2.23E+00
4/23/2002	4.33E+00	1.47E+00
7/15/2002	3.52E+00	1.26E+00
10/8/2002	7.45E+00	2.01E+00
1/8/2003	7.04E+00	1.95E+00
4/3/2003	4.64E+00	1.53E+00
7/9/2003	1.58E+01	2.76E+00
10/6/2003	6.49E+00	1.87E+00

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	3.76E+01	3.63E+00
4/23/2002	1.90E+01	2.94E+00
7/16/2002	1.07E+01	2.37E+00
10/8/2002	3.75E+00	1.32E+00
1/7/2003	3.87E+00	1.35E+00
4/2/2003	3.50E+00	1.25E+00
7/9/2003	7.72E+00	2.04E+00
10/7/2003	2.93E+00	1.08E+00

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	1.29E+01	NO	2.56E+00	N/A
MW361	Downgradient	No	1.00E-01	N/A	-2.30E+00	N/A
MW364	Downgradient	No	1.00E-01	N/A	-2.30E+00	N/A
MW367	Downgradient	Yes	7.11E+00	NO	1.96E+00	N/A
MW370	Upgradient	No	1.00E-01	N/A	-2.30E+00	N/A
MW373	Upgradient	Yes	4.29E-02	NO	-3.15E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Magnesium UNITS: mg/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 17.544	**S=** 5.911	**CV(1)=** 0.337	**K factor**=** 2.523	**TL(1)=** 3.25E+01	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** 2.810	**S=** 0.343	**CV(2)=** 0.122	**K factor**=** 2.523	**TL(2)=** 3.68E+00	**LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	1.21E+01	2.49E+00
4/23/2002	1.51E+01	2.71E+00
7/15/2002	1.24E+01	2.52E+00
10/8/2002	1.22E+01	2.50E+00
1/8/2003	1.15E+01	2.44E+00
4/3/2003	1.23E+01	2.51E+00
7/9/2003	1.00E+01	2.30E+00
10/6/2003	1.21E+01	2.49E+00

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	2.48E+01	3.21E+00
4/23/2002	2.27E+01	3.12E+00
7/16/2002	1.88E+01	2.93E+00
10/8/2002	2.11E+01	3.05E+00
1/7/2003	1.99E+01	2.99E+00
4/2/2003	2.55E+01	3.24E+00
7/9/2003	2.33E+01	3.15E+00
10/7/2003	2.69E+01	3.29E+00

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	1.65E+01	NO	2.80E+00	N/A
MW361	Downgradient	Yes	1.50E+01	NO	2.71E+00	N/A
MW364	Downgradient	Yes	1.32E+01	NO	2.58E+00	N/A
MW367	Downgradient	Yes	7.31E+00	NO	1.99E+00	N/A
MW370	Upgradient	Yes	1.21E+01	NO	2.49E+00	N/A
MW373	Upgradient	Yes	2.66E+01	NO	3.28E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Manganese UNITS: mg/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 1.080	**S=** 0.674	**CV(1)=** 0.624	**K factor**=** 2.523	**TL(1)=** 2.78E+00	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** -0.114	**S=** 0.658	**CV(2)=** -5.762	**K factor**=** 2.523	**TL(2)=** 1.55E+00	**LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW370	
Date Collected	Result	LN(Result)
3/17/2002	2.44E-01	-1.41E+00
4/23/2002	1.82E+00	5.99E-01
7/15/2002	1.22E+00	1.99E-01
10/8/2002	9.88E-01	-1.21E-02
1/8/2003	7.29E-01	-3.16E-01
4/3/2003	6.37E-01	-4.51E-01
7/9/2003	2.51E+00	9.20E-01
10/6/2003	1.05E+00	4.88E-02

Well Number:	MW373	
Date Collected	Result	LN(Result)
3/18/2002	3.55E-01	-1.04E+00
4/23/2002	2.16E+00	7.70E-01
7/16/2002	1.39E+00	3.29E-01
10/8/2002	7.17E-01	-3.33E-01
1/7/2003	5.87E-01	-5.33E-01
4/2/2003	5.45E-01	-6.07E-01
7/9/2003	1.76E+00	5.65E-01
10/7/2003	5.70E-01	-5.62E-01

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	2.01E+00	NO	6.98E-01	N/A
MW361	Downgradient	Yes	6.57E-03	NO	-5.03E+00	N/A
MW364	Downgradient	Yes	3.52E-03	NO	-5.65E+00	N/A
MW367	Downgradient	Yes	1.38E+00	NO	3.22E-01	N/A
MW370	Upgradient	Yes	1.40E-03	NO	-6.57E+00	N/A
MW373	Upgradient	Yes	5.18E-02	NO	-2.96E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Molybdenum UNITS: mg/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 0.010	**S=** 0.012	**CV(1)=** 1.198	**K factor**=** 2.523	**TL(1)=** 4.03E-02	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -5.693	**S=** 1.604	**CV(2)=** -0.282	**K factor**=** 2.523	**TL(2)=** -1.65E+00	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	2.50E-02	-3.69E+00
4/23/2002	2.50E-02	-3.69E+00
7/15/2002	2.50E-02	-3.69E+00
10/8/2002	1.13E-03	-6.79E+00
1/8/2003	1.00E-03	-6.91E+00
4/3/2003	1.00E-03	-6.91E+00
7/9/2003	1.00E-03	-6.91E+00
10/6/2003	1.00E-03	-6.91E+00

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	2.50E-02	-3.69E+00
4/23/2002	2.50E-02	-3.69E+00
7/16/2002	2.50E-02	-3.69E+00
10/8/2002	1.00E-03	-6.91E+00
1/7/2003	1.00E-03	-6.91E+00
4/2/2003	1.00E-03	-6.91E+00
7/9/2003	1.00E-03	-6.91E+00
10/7/2003	1.00E-03	-6.91E+00

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	5.59E-04	N/A	-7.49E+00	NO
MW361	Downgradient	No	1.00E-03	N/A	-6.91E+00	N/A
MW364	Downgradient	No	1.00E-03	N/A	-6.91E+00	N/A
MW367	Downgradient	No	1.00E-03	N/A	-6.91E+00	N/A
MW370	Upgradient	No	1.00E-03	N/A	-6.91E+00	N/A
MW373	Upgradient	No	1.00E-03	N/A	-6.91E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Nickel UNITS: mg/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 0.024	**S=** 0.022	**CV(1)=** 0.901	**K factor**=** 2.523	**TL(1)=** 7.82E-02	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** -4.239	**S=** 1.087	**CV(2)=** -0.256	**K factor**=** 2.523	**TL(2)=** -1.50E+00	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW370	
Date Collected	Result	LN(Result)
3/17/2002	5.00E-02	-3.00E+00
4/23/2002	5.00E-02	-3.00E+00
7/15/2002	5.00E-02	-3.00E+00
10/8/2002	5.00E-03	-5.30E+00
1/8/2003	5.00E-03	-5.30E+00
4/3/2003	5.00E-03	-5.30E+00
7/9/2003	2.64E-02	-3.63E+00
10/6/2003	9.71E-03	-4.63E+00

Well Number:	MW373	
Date Collected	Result	LN(Result)
3/18/2002	5.00E-02	-3.00E+00
4/23/2002	5.00E-02	-3.00E+00
7/16/2002	5.00E-02	-3.00E+00
10/8/2002	5.00E-03	-5.30E+00
1/7/2003	5.00E-03	-5.30E+00
4/2/2003	5.00E-03	-5.30E+00
7/9/2003	1.12E-02	-4.49E+00
10/7/2003	5.00E-03	-5.30E+00

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	5.46E-02	NO	-2.91E+00	N/A
MW361	Downgradient	Yes	1.44E-03	NO	-6.54E+00	N/A
MW364	Downgradient	Yes	1.19E-03	NO	-6.73E+00	N/A
MW367	Downgradient	Yes	3.03E-03	NO	-5.80E+00	N/A
MW370	Upgradient	Yes	7.52E-04	NO	-7.19E+00	N/A
MW373	Upgradient	Yes	1.68E-03	NO	-6.39E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Oxidation-Reduction Potential UNITS: mV LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 46.688	**S=** 60.986	**CV(1)=** 1.306	**K factor**=** 2.523	**TL(1)=** 2.01E+02	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 3.829	**S=** 1.151	**CV(2)=** 0.301	**K factor**=** 2.523	**TL(2)=** 4.94E+00	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW370	
Date Collected	Result	LN(Result)
3/17/2002	1.40E+02	4.94E+00
4/23/2002	-1.50E+01	#Func!
7/15/2002	5.00E+00	1.61E+00
4/3/2003	4.90E+01	3.89E+00
7/9/2003	-3.50E+01	#Func!
10/6/2003	4.00E+01	3.69E+00
1/7/2004	1.01E+02	4.62E+00
4/7/2004	1.05E+02	4.65E+00

Well Number:	MW373	
Date Collected	Result	LN(Result)
3/18/2002	1.40E+02	4.94E+00
4/23/2002	-2.00E+01	#Func!
10/8/2002	1.00E+01	2.30E+00
1/7/2003	1.00E+01	2.30E+00
4/2/2003	6.70E+01	4.20E+00
7/9/2003	-2.90E+01	#Func!
10/7/2003	1.27E+02	4.84E+00
1/6/2004	5.20E+01	3.95E+00

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

#Because the natural log was not possible for all background values, the TL was considered equal to the maximum background value.

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	1.21E+02	N/A	4.80E+00	NO
MW361	Downgradient	Yes	4.24E+02	N/A	6.05E+00	YES
MW364	Downgradient	Yes	3.77E+02	N/A	5.93E+00	YES
MW367	Downgradient	Yes	2.46E+02	N/A	5.50E+00	YES
MW370	Upgradient	Yes	3.88E+02	N/A	5.96E+00	YES
MW373	Upgradient	Yes	3.84E+02	N/A	5.95E+00	YES

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data.

Wells with Exceedances

MW361
MW364
MW367
MW370
MW373

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

pH UNITS: Std Unit LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 6.283	**S=** 0.159	**CV(1)=** 0.025	**K factor**=** 2.904	**TL(1)=** 6.74E+00	**LL(1)=** 5.82E+00
Statistics-Transformed Background Data	**X=** 1.837	**S=** 0.025	**CV(2)=** 0.014	**K factor**=** 2.904	**TL(2)=** 1.91E+00	**LL(2)=** 1.76E+00

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW370	
Date Collected	Result	LN(Result)
3/17/2002	6.30E+00	1.84E+00
4/23/2002	6.40E+00	1.86E+00
7/15/2002	6.30E+00	1.84E+00
10/8/2002	6.30E+00	1.84E+00
1/8/2003	6.40E+00	1.86E+00
4/3/2003	6.50E+00	1.87E+00
7/9/2003	6.30E+00	1.84E+00
10/6/2003	6.50E+00	1.87E+00

Well Number:	MW373	
Date Collected	Result	LN(Result)
3/18/2002	6.00E+00	1.79E+00
4/23/2002	6.30E+00	1.84E+00
7/16/2002	6.45E+00	1.86E+00
10/8/2002	6.18E+00	1.82E+00
1/7/2003	6.35E+00	1.85E+00
4/2/2003	6.14E+00	1.81E+00
7/9/2003	6.10E+00	1.81E+00
10/7/2003	6.00E+00	1.79E+00

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)? Result <LL(1)?	LN(Result)	LN(Result) >TL(2)? LN(Result) <LL(2)?
MW358	Downgradient	Yes	6.25E+00	NO	1.83E+00	N/A
MW361	Downgradient	Yes	5.87E+00	NO	1.77E+00	N/A
MW364	Downgradient	Yes	5.96E+00	NO	1.79E+00	N/A
MW367	Downgradient	Yes	5.87E+00	NO	1.77E+00	N/A
MW370	Upgradient	Yes	6.12E+00	NO	1.81E+00	N/A
MW373	Upgradient	Yes	6.08E+00	NO	1.81E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Potassium UNITS: mg/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 2.823	**S=** 0.522	**CV(1)=** 0.185	**K factor**=** 2.523	**TL(1)=** 4.14E+00	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** 1.024	**S=** 0.167	**CV(2)=** 0.163	**K factor**=** 2.523	**TL(2)=** 1.45E+00	**LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	3.22E+00	1.17E+00
4/23/2002	3.43E+00	1.23E+00
7/15/2002	2.98E+00	1.09E+00
10/8/2002	2.46E+00	9.00E-01
1/8/2003	2.41E+00	8.80E-01
4/3/2003	2.43E+00	8.88E-01
7/9/2003	2.44E+00	8.92E-01
10/6/2003	2.48E+00	9.08E-01

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	4.34E+00	1.47E+00
4/23/2002	3.04E+00	1.11E+00
7/16/2002	2.93E+00	1.08E+00
10/8/2002	2.30E+00	8.33E-01
1/7/2003	2.45E+00	8.96E-01
4/2/2003	2.70E+00	9.93E-01
7/9/2003	2.68E+00	9.86E-01
10/7/2003	2.88E+00	1.06E+00

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	3.20E+00	NO	1.16E+00	N/A
MW361	Downgradient	Yes	2.39E+00	NO	8.71E-01	N/A
MW364	Downgradient	Yes	1.96E+00	NO	6.73E-01	N/A
MW367	Downgradient	Yes	2.78E+00	NO	1.02E+00	N/A
MW370	Upgradient	Yes	2.49E+00	NO	9.12E-01	N/A
MW373	Upgradient	Yes	2.73E+00	NO	1.00E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Sodium UNITS: mg/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 51.544	**S=** 15.227	**CV(1)=** 0.295	**K factor**=** 2.523	**TL(1)=** 9.00E+01	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 3.906	**S=** 0.272	**CV(2)=** 0.070	**K factor**=** 2.523	**TL(2)=** 4.59E+00	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW370	
Date Collected	Result	LN(Result)
3/17/2002	3.18E+01	3.46E+00
4/23/2002	5.00E+01	3.91E+00
7/15/2002	4.47E+01	3.80E+00
10/8/2002	4.00E+01	3.69E+00
1/8/2003	4.46E+01	3.80E+00
4/3/2003	4.19E+01	3.74E+00
7/9/2003	4.00E+01	3.69E+00
10/6/2003	3.81E+01	3.64E+00

Well Number:	MW373	
Date Collected	Result	LN(Result)
3/18/2002	4.34E+01	3.77E+00
4/23/2002	7.98E+01	4.38E+00
7/16/2002	8.77E+01	4.47E+00
10/8/2002	6.16E+01	4.12E+00
1/7/2003	5.93E+01	4.08E+00
4/2/2003	6.21E+01	4.13E+00
7/9/2003	5.01E+01	3.91E+00
10/7/2003	4.96E+01	3.90E+00

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	3.60E+01	NO	3.58E+00	N/A
MW361	Downgradient	Yes	4.57E+01	NO	3.82E+00	N/A
MW364	Downgradient	Yes	4.12E+01	NO	3.72E+00	N/A
MW367	Downgradient	Yes	1.55E+01	NO	2.74E+00	N/A
MW370	Upgradient	Yes	4.28E+01	NO	3.76E+00	N/A
MW373	Upgradient	Yes	6.29E+01	NO	4.14E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Sulfate UNITS: mg/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 122.381	**S=** 195.095	**CV(1)=** 1.594	**K factor**=** 2.523	**TL(1)=** 6.15E+02	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** 3.985	**S=** 1.323	**CV(2)=** 0.332	**K factor**=** 2.523	**TL(2)=** 7.32E+00	**LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	1.74E+01	2.86E+00
4/23/2002	3.79E+01	3.63E+00
7/15/2002	1.57E+01	2.75E+00
10/8/2002	1.34E+01	2.60E+00
1/8/2003	1.44E+01	2.67E+00
4/3/2003	1.81E+01	2.90E+00
7/9/2003	9.60E+00	2.26E+00
10/6/2003	1.65E+01	2.80E+00

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	1.63E+02	5.10E+00
4/23/2002	8.10E+02	6.70E+00
7/16/2002	1.09E+02	4.70E+00
10/8/2002	1.11E+02	4.71E+00
1/7/2003	1.14E+02	4.73E+00
4/2/2003	1.33E+02	4.89E+00
7/9/2003	1.82E+02	5.20E+00
10/7/2003	1.93E+02	5.26E+00

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	5.25E+01	N/A	3.96E+00	NO
MW361	Downgradient	Yes	8.06E+01	N/A	4.39E+00	NO
MW364	Downgradient	Yes	7.19E+01	N/A	4.28E+00	NO
MW367	Downgradient	Yes	2.16E+01	N/A	3.07E+00	NO
MW370	Upgradient	Yes	2.03E+01	N/A	3.01E+00	NO
MW373	Upgradient	Yes	1.80E+02	N/A	5.19E+00	NO

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Technetium-99 UNITS: pCi/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 7.655	**S=** 13.274	**CV(1)=** 1.734	**K factor**=** 2.523	**TL(1)=** 4.11E+01	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** 1.946	**S=** 0.939	**CV(2)=** 0.483	**K factor**=** 2.523	**TL(2)=** 3.83E+00	**LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW370	
Date Collected	Result	LN(Result)
3/17/2002	1.08E+01	2.38E+00
4/23/2002	8.53E+00	2.14E+00
7/15/2002	5.09E+00	1.63E+00
10/8/2002	4.78E+00	1.56E+00
1/8/2003	-5.12E+00	#Func!
4/3/2003	5.11E+00	1.63E+00
7/9/2003	4.25E+00	1.45E+00
10/6/2003	6.54E+00	1.88E+00

Well Number:	MW373	
Date Collected	Result	LN(Result)
3/18/2002	1.65E+01	2.80E+00
4/23/2002	3.49E+00	1.25E+00
7/16/2002	1.42E+00	3.51E-01
10/8/2002	-6.06E+00	#Func!
1/7/2003	-8.41E+00	#Func!
4/2/2003	2.63E+01	3.27E+00
7/9/2003	3.06E+00	1.12E+00
10/7/2003	4.62E+01	3.83E+00

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

#Because the natural log was not possible for all background values, the TL was considered equal to the maximum background value.

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	4.70E+01	N/A	3.85E+00	YES
MW361	Downgradient	Yes	5.09E+01	N/A	3.93E+00	YES
MW364	Downgradient	Yes	5.13E+01	N/A	3.94E+00	YES
MW367	Downgradient	No	-3.27E+00	N/A	#Error	N/A
MW370	Upgradient	No	2.03E+01	N/A	3.01E+00	N/A
MW373	Upgradient	No	1.33E+01	N/A	2.59E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to historical background data.

Wells with Exceedances

MW358
MW361
MW364

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Total Organic Carbon (TOC) UNITS: mg/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 6.169	**S=** 12.072	**CV(1)=** 1.957	**K factor**=** 2.523	**TL(1)=** 3.66E+01	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 1.069	**S=** 1.014	**CV(2)=** 0.948	**K factor**=** 2.523	**TL(2)=** 3.63E+00	**LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Because CV(1) is greater than 1, the natural logarithm of background and test well results were calculated utilizing TL(2) for comparison.

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	1.20E+00	1.82E-01
4/23/2002	4.30E+00	1.46E+00
7/15/2002	2.60E+00	9.56E-01
10/8/2002	2.30E+00	8.33E-01
1/8/2003	3.00E+00	1.10E+00
4/3/2003	1.20E+00	1.82E-01
7/9/2003	2.60E+00	9.56E-01
10/6/2003	1.70E+00	5.31E-01

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	1.10E+00	9.53E-02
4/23/2002	1.75E+01	2.86E+00
7/16/2002	4.90E+01	3.89E+00
10/8/2002	2.90E+00	1.06E+00
1/7/2003	3.90E+00	1.36E+00
4/2/2003	2.50E+00	9.16E-01
7/9/2003	1.70E+00	5.31E-01
10/7/2003	1.20E+00	1.82E-01

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	4.20E+00	N/A	1.44E+00	NO
MW361	Downgradient	No	2.00E+00	N/A	6.93E-01	N/A
MW364	Downgradient	Yes	8.02E-01	N/A	-2.21E-01	NO
MW367	Downgradient	Yes	4.81E-01	N/A	-7.32E-01	NO
MW370	Upgradient	Yes	7.65E-01	N/A	-2.68E-01	NO
MW373	Upgradient	Yes	1.22E+00	N/A	1.99E-01	NO

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Total Organic Halides (TOX) UNITS: ug/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 79.819	**S=** 78.470	**CV(1)=** 0.983	**K factor**=** 2.523	**TL(1)=** 2.78E+02	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** 3.971	**S=** 0.950	**CV(2)=** 0.239	**K factor**=** 2.523	**TL(2)=** 6.37E+00	**LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	5.00E+01	3.91E+00
4/23/2002	2.28E+02	5.43E+00
7/15/2002	8.80E+01	4.48E+00
10/8/2002	5.80E+01	4.06E+00
1/8/2003	7.24E+01	4.28E+00
4/3/2003	2.66E+01	3.28E+00
7/9/2003	1.64E+01	2.80E+00
10/6/2003	3.11E+01	3.44E+00

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	5.00E+01	3.91E+00
4/23/2002	2.76E+02	5.62E+00
7/16/2002	1.77E+02	5.18E+00
10/8/2002	7.60E+01	4.33E+00
1/7/2003	4.59E+01	3.83E+00
4/2/2003	5.78E+01	4.06E+00
7/9/2003	1.00E+01	2.30E+00
10/7/2003	1.39E+01	2.63E+00

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	No	1.00E+01	N/A	2.30E+00	N/A
MW361	Downgradient	Yes	3.60E+00	NO	1.28E+00	N/A
MW364	Downgradient	No	1.00E+01	N/A	2.30E+00	N/A
MW367	Downgradient	No	1.00E+01	N/A	2.30E+00	N/A
MW370	Upgradient	No	7.64E+00	N/A	2.03E+00	N/A
MW373	Upgradient	Yes	9.20E+00	NO	2.22E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Trichloroethene UNITS: ug/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 12.188	**S=** 6.950	**CV(1)=** 0.570	**K factor**=** 2.523	**TL(1)=** 2.97E+01	**LL(1)=** N/A
Statistics-Transformed Background Data	**X=** 2.305	**S=** 0.687	**CV(2)=** 0.298	**K factor**=** 2.523	**TL(2)=** 4.04E+00	**LL(2)=** N/A

Historical Background Data from Upgradient Wells with Transformed Result

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Well Number: MW370

Date Collected	Result	LN(Result)
3/17/2002	1.90E+01	2.94E+00
4/23/2002	1.70E+01	2.83E+00
7/15/2002	1.50E+01	2.71E+00
10/8/2002	1.80E+01	2.89E+00
1/8/2003	1.70E+01	2.83E+00
4/3/2003	1.80E+01	2.89E+00
7/9/2003	1.50E+01	2.71E+00
10/6/2003	1.60E+01	2.77E+00

Well Number: MW373

Date Collected	Result	LN(Result)
3/18/2002	5.00E+00	1.61E+00
4/23/2002	2.50E+01	3.22E+00
7/16/2002	3.00E+00	1.10E+00
10/8/2002	4.00E+00	1.39E+00
1/7/2003	6.00E+00	1.79E+00
4/2/2003	5.00E+00	1.61E+00
7/9/2003	6.00E+00	1.79E+00
10/7/2003	6.00E+00	1.79E+00

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	1.63E+00	N/A	4.89E-01	N/A
MW361	Downgradient	Yes	1.78E+00	N/A	5.77E-01	N/A
MW364	Downgradient	Yes	3.90E-01	N/A	-9.42E-01	N/A
MW367	Downgradient	No	1.00E+00	N/A	0.00E+00	N/A
MW370	Upgradient	Yes	5.48E+00	NO	1.70E+00	N/A
MW373	Upgradient	Yes	3.53E+00	N/A	1.26E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Historical Background Comparison

Zinc UNITS: mg/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is evidence of an exceedance of the statistically-derived historical background concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 0.055 **S=** 0.037 **CV(1)=** 0.673 **K factor**=** 2.523 **TL(1)=** 1.47E-01 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** -3.131 **S=** 0.691 **CV(2)=** -0.221 **K factor**=** 2.523 **TL(2)=** -1.39E+00 **LL(2)=**N/A

Historical Background Data from Upgradient Wells with Transformed Result

Well Number:	MW370	
Date Collected	Result	LN(Result)
3/17/2002	1.00E-01	-2.30E+00
4/23/2002	1.00E-01	-2.30E+00
7/15/2002	1.00E-01	-2.30E+00
10/8/2002	2.50E-02	-3.69E+00
1/8/2003	3.50E-02	-3.35E+00
4/3/2003	3.50E-02	-3.35E+00
7/9/2003	2.00E-02	-3.91E+00
10/6/2003	2.00E-02	-3.91E+00

Well Number:	MW373	
Date Collected	Result	LN(Result)
3/18/2002	1.00E-01	-2.30E+00
4/23/2002	1.00E-01	-2.30E+00
7/16/2002	1.00E-01	-2.30E+00
10/8/2002	2.50E-02	-3.69E+00
1/7/2003	3.50E-02	-3.35E+00
4/2/2003	3.50E-02	-3.35E+00
7/9/2003	2.34E-02	-3.76E+00
10/7/2003	2.00E-02	-3.91E+00

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	1.03E-02	NO	-4.58E+00	N/A
MW361	Downgradient	Yes	7.11E-03	NO	-4.95E+00	N/A
MW364	Downgradient	Yes	2.15E-02	NO	-3.84E+00	N/A
MW367	Downgradient	Yes	1.79E-02	NO	-4.02E+00	N/A
MW370	Upgradient	Yes	5.72E-03	NO	-5.16E+00	N/A
MW373	Upgradient	Yes	4.48E-03	NO	-5.41E+00	N/A

N/A - Results identified as Non-Detects during laboratory analysis or data validation and were not included in the statistical evaluation. Additionally for parameters that have MCLs, where the result for a well did not exceed the MCL value, that well was not included in the statistical evaluation.

Conclusion of Statistical Analysis on Historical Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from historical background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

ATTACHMENT D2

COMPARISON OF CURRENT DATA TO ONE-SIDED UPPER TOLERANCE INTERVAL TEST CALCULATED USING CURRENT BACKGROUND DATA

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C-746-U Third Quarter 2023 Statistical Analysis — Current Background Comparison

Dissolved Oxygen — UNITS: mg/L — UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is statistically significant evidence of elevated concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 3.078 **S=** 2.224 **CV(1)=** 0.722 **K factor**=** 2.523 **TL(1)=** 8.69E+00 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 0.861 **S=** 0.791 **CV(2)=** 0.918 **K factor**=** 2.523 **TL(2)=** 2.86E+00 **LL(2)=**N/A

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Background Data from Upgradient Wells with Transformed Result

Well Number: MW371

Date Collected	Result	LN(Result)
7/20/2021	5.52E+00	1.71E+00
10/12/2021	3.36E+00	1.21E+00
1/12/2022	3.82E+00	1.34E+00
4/12/2022	7.49E+00	2.01E+00
7/14/2022	4.25E+00	1.45E+00
10/11/2022	2.87E+00	1.05E+00
1/19/2023	1.24E+00	2.15E-01
4/25/2023	7.75E+00	2.05E+00

Well Number: MW374

Date Collected	Result	LN(Result)
7/14/2021	9.90E-01	-1.01E-02
10/13/2021	4.40E-01	-8.21E-01
1/13/2022	1.80E+00	5.88E-01
4/12/2022	2.86E+00	1.05E+00
7/14/2022	1.74E+00	5.54E-01
10/11/2022	1.92E+00	6.52E-01
1/19/2023	9.00E-01	-1.05E-01
4/25/2023	2.30E+00	8.33E-01

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW362	Downgradient	Yes	6.96E+00	NO	1.94E+00	N/A
MW365	Downgradient	Yes	6.32E+00	NO	1.84E+00	N/A
MW371	Upgradient	Yes	3.30E+00	NO	1.19E+00	N/A

Conclusion of Statistical Analysis on Current Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis — Current Background Comparison

Oxidation-Reduction Potential — UNITS: mV — UCRS

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is statistically significant evidence of elevated concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 342.750 **S=** 81.670 **CV(1)=** 0.238 **K factor**=** 2.523 **TL(1)=** 5.49E+02 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 5.802 **S=** 0.291 **CV(2)=** 0.050 **K factor**=** 2.523 **TL(2)=** 6.54E+00 **LL(2)=**N/A

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
7/20/2021	4.01E+02	5.99E+00
10/12/2021	3.44E+02	5.84E+00
1/12/2022	3.89E+02	5.96E+00
4/12/2022	3.75E+02	5.93E+00
7/14/2022	3.78E+02	5.93E+00
10/11/2022	4.09E+02	6.01E+00
1/19/2023	4.20E+02	6.04E+00
4/25/2023	4.04E+02	6.00E+00

Well Number:	MW374	
Date Collected	Result	LN(Result)
7/14/2021	3.49E+02	5.86E+00
10/13/2021	2.02E+02	5.31E+00
1/13/2022	1.92E+02	5.26E+00
4/12/2022	3.53E+02	5.87E+00
7/14/2022	3.45E+02	5.84E+00
10/11/2022	3.30E+02	5.80E+00
1/19/2023	1.72E+02	5.15E+00
4/25/2023	4.21E+02	6.04E+00

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW362	Downgradient	Yes	4.02E+02	NO	6.00E+00	N/A
MW365	Downgradient	Yes	3.58E+02	NO	5.88E+00	N/A
MW371	Upgradient	Yes	3.72E+02	NO	5.92E+00	N/A
MW374	Upgradient	Yes	3.51E+02	NO	5.86E+00	N/A
MW375	Sidegradient	Yes	3.70E+02	NO	5.91E+00	N/A

Conclusion of Statistical Analysis on Current Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis — Current Background Comparison

Sulfate — **UNITS: mg/L** — **UCRS**

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is statistically significant evidence of elevated concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 22.519 **S=** 18.452 **CV(1)=** 0.819 **K factor**=** 2.523 **TL(1)=** 6.91E+01 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 2.914 **S=** 0.583 **CV(2)=** 0.200 **K factor**=** 2.523 **TL(2)=** 4.38E+00 **LL(2)=**N/A

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Background Data from Upgradient Wells with Transformed Result

Well Number:	MW371	
Date Collected	Result	LN(Result)
7/20/2021	3.41E+01	3.53E+00
10/12/2021	1.19E+01	2.48E+00
1/12/2022	1.43E+01	2.66E+00
4/12/2022	7.54E+01	4.32E+00
7/14/2022	2.87E+01	3.36E+00
10/11/2022	1.18E+01	2.47E+00
1/19/2023	1.20E+01	2.48E+00
4/25/2023	5.69E+01	4.04E+00

Well Number:	MW374	
Date Collected	Result	LN(Result)
7/14/2021	1.34E+01	2.60E+00
10/13/2021	1.27E+01	2.54E+00
1/13/2022	1.24E+01	2.52E+00
4/12/2022	1.64E+01	2.80E+00
7/14/2022	1.67E+01	2.82E+00
10/11/2022	1.32E+01	2.58E+00
1/19/2023	1.39E+01	2.63E+00
4/25/2023	1.65E+01	2.80E+00

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW362	Downgradient	Yes	2.85E+01	NO	3.35E+00	N/A
MW365	Downgradient	Yes	5.40E+01	NO	3.99E+00	N/A
MW371	Upgradient	Yes	2.86E+01	NO	3.35E+00	N/A
MW374	Upgradient	Yes	1.56E+01	NO	2.75E+00	N/A
MW375	Sidegradient	Yes	2.35E+01	NO	3.16E+00	N/A

Conclusion of Statistical Analysis on Current Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Current Background Comparison

Calcium UNITS: mg/L URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is statistically significant evidence of elevated concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 39.513 **S=** 24.474 **CV(1)=** 0.619 **K factor**=** 2.523 **TL(1)=** 1.01E+02 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 3.454 **S=** 0.714 **CV(2)=** 0.207 **K factor**=** 2.523 **TL(2)=** 5.26E+00 **LL(2)=**N/A

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Background Data from Upgradient Wells with Transformed Result

Well Number:	MW369	
Date Collected	Result	LN(Result)
7/13/2021	1.53E+01	2.73E+00
10/12/2021	1.51E+01	2.71E+00
1/12/2022	1.63E+01	2.79E+00
4/12/2022	1.65E+01	2.80E+00
7/14/2022	1.57E+01	2.75E+00
10/11/2022	1.60E+01	2.77E+00
1/19/2023	1.60E+01	2.77E+00
4/24/2023	1.60E+01	2.77E+00

Well Number:	MW372	
Date Collected	Result	LN(Result)
7/14/2021	6.50E+01	4.17E+00
10/13/2021	6.48E+01	4.17E+00
1/13/2022	6.70E+01	4.20E+00
4/12/2022	6.11E+01	4.11E+00
7/14/2022	6.26E+01	4.14E+00
10/11/2022	6.22E+01	4.13E+00
1/19/2023	6.06E+01	4.10E+00
4/25/2023	6.20E+01	4.13E+00

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW372	Upgradient	Yes	6.10E+01	NO	4.11E+00	N/A

Conclusion of Statistical Analysis on Current Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Current Background Comparison

Conductivity UNITS: umho/cm URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is statistically significant evidence of elevated concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 553.750 **S=** 203.019 **CV(1)=** 0.367 **K factor**=** 2.523 **TL(1)=** 1.07E+03 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 6.252 **S=** 0.372 **CV(2)=** 0.059 **K factor**=** 2.523 **TL(2)=** 7.19E+00 **LL(2)=**N/A

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Background Data from Upgradient Wells with Transformed Result

Well Number:	MW369	
Date Collected	Result	LN(Result)
7/13/2021	3.78E+02	5.93E+00
10/12/2021	3.05E+02	5.72E+00
1/12/2022	3.59E+02	5.88E+00
4/12/2022	3.78E+02	5.93E+00
7/14/2022	3.71E+02	5.92E+00
10/11/2022	4.85E+02	6.18E+00
1/19/2023	3.59E+02	5.88E+00
4/24/2023	3.75E+02	5.93E+00

Well Number:	MW372	
Date Collected	Result	LN(Result)
7/14/2021	7.60E+02	6.63E+00
10/13/2021	4.84E+02	6.18E+00
1/13/2022	7.52E+02	6.62E+00
4/12/2022	7.38E+02	6.60E+00
7/14/2022	7.15E+02	6.57E+00
10/11/2022	9.14E+02	6.82E+00
1/19/2023	7.54E+02	6.63E+00
4/25/2023	7.33E+02	6.60E+00

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW372	Upgradient	Yes	7.59E+02	NO	6.63E+00	N/A

Conclusion of Statistical Analysis on Current Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis — Current Background Comparison

Dissolved Solids — UNITS: mg/L — URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is statistically significant evidence of elevated concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 329.438 **S=** 136.101 **CV(1)=** 0.413 **K factor**=** 2.523 **TL(1)=** 6.73E+02 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 5.710 **S=** 0.438 **CV(2)=** 0.077 **K factor**=** 2.523 **TL(2)=** 6.81E+00 **LL(2)=**N/A

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Background Data from Upgradient Wells with Transformed Result

Well Number:	MW369	
Date Collected	Result	LN(Result)
7/13/2021	1.94E+02	5.27E+00
10/12/2021	1.79E+02	5.19E+00
1/12/2022	2.00E+02	5.30E+00
4/12/2022	2.34E+02	5.46E+00
7/14/2022	1.96E+02	5.28E+00
10/11/2022	2.12E+02	5.36E+00
1/19/2023	1.86E+02	5.23E+00
4/24/2023	1.93E+02	5.26E+00

Well Number:	MW372	
Date Collected	Result	LN(Result)
7/14/2021	4.81E+02	6.18E+00
10/13/2021	4.61E+02	6.13E+00
1/13/2022	5.06E+02	6.23E+00
4/12/2022	4.57E+02	6.12E+00
7/14/2022	4.61E+02	6.13E+00
10/11/2022	4.55E+02	6.12E+00
1/19/2023	4.28E+02	6.06E+00
4/25/2023	4.28E+02	6.06E+00

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW372	Upgradient	Yes	4.23E+02	NO	6.05E+00	N/A

Conclusion of Statistical Analysis on Current Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis — Current Background Comparison

Oxidation-Reduction Potential — UNITS: mV — URGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is statistically significant evidence of elevated concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 403.188 **S=** 36.940 **CV(1)=** 0.092 **K factor**=** 2.523 **TL(1)=** 4.96E+02 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 5.996 **S=** 0.090 **CV(2)=** 0.015 **K factor**=** 2.523 **TL(2)=** 6.22E+00 **LL(2)=**N/A

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Background Data from Upgradient Wells with Transformed Result

Well Number:	MW369	
Date Collected	Result	LN(Result)
7/13/2021	3.52E+02	5.86E+00
10/12/2021	3.43E+02	5.84E+00
1/12/2022	3.92E+02	5.97E+00
4/12/2022	3.82E+02	5.95E+00
7/14/2022	4.20E+02	6.04E+00
10/11/2022	4.06E+02	6.01E+00
1/19/2023	4.80E+02	6.17E+00
4/24/2023	4.39E+02	6.08E+00

Well Number:	MW372	
Date Collected	Result	LN(Result)
7/14/2021	3.78E+02	5.93E+00
10/13/2021	3.90E+02	5.97E+00
1/13/2022	3.76E+02	5.93E+00
4/12/2022	4.02E+02	6.00E+00
7/14/2022	4.02E+02	6.00E+00
10/11/2022	4.16E+02	6.03E+00
1/19/2023	4.03E+02	6.00E+00
4/25/2023	4.70E+02	6.15E+00

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW357	Downgradient	Yes	3.96E+02	NO	5.98E+00	N/A
MW360	Downgradient	Yes	4.18E+02	NO	6.04E+00	N/A
MW363	Downgradient	Yes	3.80E+02	NO	5.94E+00	N/A
MW366	Downgradient	Yes	3.62E+02	NO	5.89E+00	N/A
MW369	Upgradient	Yes	4.06E+02	NO	6.01E+00	N/A
MW372	Upgradient	Yes	3.87E+02	NO	5.96E+00	N/A

Conclusion of Statistical Analysis on Current Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis — Current Background Comparison

Sulfate — **UNITS: mg/L** — **URGA**

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is statistically significant evidence of elevated concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data	**X=** 75.648	**S=** 69.841	**CV(1)=** 0.923	**K factor**=** 2.523	**TL(1)=** 2.52E+02	**LL(1)=**N/A
Statistics-Transformed Background Data	**X=** 3.530	**S=** 1.481	**CV(2)=** 0.419	**K factor**=** 2.523	**TL(2)=** 7.27E+00	**LL(2)=**N/A

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Background Data from Upgradient Wells with Transformed Result

Well Number:	MW369	
Date Collected	Result	LN(Result)
7/13/2021	8.66E+00	2.16E+00
10/12/2021	8.82E+00	2.18E+00
1/12/2022	7.80E+00	2.05E+00
4/12/2022	8.93E+00	2.19E+00
7/14/2022	8.16E+00	2.10E+00
10/11/2022	8.07E+00	2.09E+00
1/19/2023	7.93E+00	2.07E+00
4/24/2023	7.00E+00	1.95E+00

Well Number:	MW372	
Date Collected	Result	LN(Result)
7/14/2021	1.47E+02	4.99E+00
10/13/2021	1.47E+02	4.99E+00
1/13/2022	1.45E+02	4.98E+00
4/12/2022	1.44E+02	4.97E+00
7/14/2022	1.45E+02	4.98E+00
10/11/2022	1.31E+02	4.88E+00
1/19/2023	1.35E+02	4.91E+00
4/25/2023	1.51E+02	5.02E+00

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW372	Upgradient	Yes	1.45E+02	NO	4.98E+00	N/A

Conclusion of Statistical Analysis on Current Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis Current Background Comparison

Calcium UNITS: mg/L LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is statistically significant evidence of elevated concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 47.806 **S=** 19.164 **CV(1)=** 0.401 **K factor**=** 2.523 **TL(1)=** 9.62E+01 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 3.786 **S=** 0.423 **CV(2)=** 0.112 **K factor**=** 2.523 **TL(2)=** 4.85E+00 **LL(2)=**N/A

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Background Data from Upgradient Wells with Transformed Result

Well Number:	MW370	
Date Collected	Result	LN(Result)
7/13/2021	2.89E+01	3.36E+00
10/12/2021	2.61E+01	3.26E+00
1/12/2022	3.00E+01	3.40E+00
4/12/2022	3.05E+01	3.42E+00
7/14/2022	2.92E+01	3.37E+00
10/11/2022	2.89E+01	3.36E+00
1/19/2023	3.05E+01	3.42E+00
4/24/2023	3.09E+01	3.43E+00

Well Number:	MW373	
Date Collected	Result	LN(Result)
7/14/2021	6.80E+01	4.22E+00
10/13/2021	6.78E+01	4.22E+00
1/13/2022	6.72E+01	4.21E+00
4/12/2022	6.28E+01	4.14E+00
7/14/2022	6.28E+01	4.14E+00
10/11/2022	6.56E+01	4.18E+00
1/19/2023	6.46E+01	4.17E+00
4/25/2023	7.11E+01	4.26E+00

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW373	Upgradient	Yes	7.87E+01	NO	4.37E+00	N/A

Conclusion of Statistical Analysis on Current Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis — Current Background Comparison

Oxidation-Reduction Potential — UNITS: mV — LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is statistically significant evidence of elevated concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 403.188 **S=** 34.091 **CV(1)=** 0.085 **K factor**=** 2.523 **TL(1)=** 4.89E+02 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 5.996 **S=** 0.083 **CV(2)=** 0.014 **K factor**=** 2.523 **TL(2)=** 6.20E+00 **LL(2)=**N/A

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

Current Background Data from Upgradient Wells with Transformed Result

Well Number:	MW370	
Date Collected	Result	LN(Result)
7/13/2021	3.64E+02	5.90E+00
10/12/2021	3.59E+02	5.88E+00
1/12/2022	4.02E+02	6.00E+00
4/12/2022	3.90E+02	5.97E+00
7/14/2022	4.15E+02	6.03E+00
10/11/2022	4.27E+02	6.06E+00
1/19/2023	4.68E+02	6.15E+00
4/24/2023	4.60E+02	6.13E+00

Well Number:	MW373	
Date Collected	Result	LN(Result)
7/14/2021	3.80E+02	5.94E+00
10/13/2021	3.72E+02	5.92E+00
1/13/2022	3.76E+02	5.93E+00
4/12/2022	3.99E+02	5.99E+00
7/14/2022	3.82E+02	5.95E+00
10/11/2022	4.01E+02	5.99E+00
1/19/2023	3.99E+02	5.99E+00
4/25/2023	4.57E+02	6.12E+00

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW361	Downgradient	Yes	4.24E+02	NO	6.05E+00	N/A
MW364	Downgradient	Yes	3.77E+02	NO	5.93E+00	N/A
MW367	Downgradient	Yes	2.46E+02	NO	5.50E+00	N/A
MW370	Upgradient	Yes	3.88E+02	NO	5.96E+00	N/A
MW373	Upgradient	Yes	3.84E+02	NO	5.95E+00	N/A

Conclusion of Statistical Analysis on Current Data

None of the test wells exceeded the Upper Tolerance Limit, which is evidence that concentrations in these wells are not different from current background concentrations to a statistically-significant level.

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

C-746-U Third Quarter 2023 Statistical Analysis — Current Background Comparison

Technetium-99 — UNITS: pCi/L — LRGA

The CV is calculated to determine if background data are normally distributed. If so, the current test well results are compared to the TL. If not, a transformation is performed on the background and test well results, then each transformed test well result is compared to the transformed TL. If the test well result exceeds the TL, that is statistically significant evidence of elevated concentration in that well. For pH only, the current test well results are compared to the TL and LL. If the test well result for pH exceeds the TL or is less than the LL, that is statistically significant evidence of elevated or lowered concentration in that well.

Statistics-Background Data **X=** 19.546 **S=** 11.198 **CV(1)=** 0.573 **K factor**=** 2.523 **TL(1)=** 4.78E+01 **LL(1)=**N/A

Statistics-Transformed Background Data **X=** 2.932 **S=** 0.497 **CV(2)=** 0.169 **K factor**=** 2.523 **TL(2)=** 3.67E+00 **LL(2)=**N/A

Current Background Data from Upgradient Wells with Transformed Result

Well Number:	MW370	
Date Collected	Result	LN(Result)
7/13/2021	3.79E+01	3.63E+00
10/12/2021	3.92E+01	3.67E+00
1/12/2022	2.56E+01	3.24E+00
4/12/2022	2.34E+01	3.15E+00
7/14/2022	2.40E+01	3.18E+00
10/11/2022	2.09E+01	3.04E+00
1/19/2023	3.07E+01	3.42E+00
4/24/2023	2.83E+01	3.34E+00

Well Number:	MW373	
Date Collected	Result	LN(Result)
7/14/2021	1.42E+01	2.65E+00
10/13/2021	8.12E+00	2.09E+00
1/13/2022	1.12E+01	2.42E+00
4/12/2022	1.48E+01	2.69E+00
7/14/2022	9.69E+00	2.27E+00
10/11/2022	-1.78E+00	#Func!
1/19/2023	1.25E+01	2.53E+00
4/25/2023	1.40E+01	2.64E+00

Because CV(1) is less than or equal to 1, assume normal distribution and continue with statistical analysis utilizing TL(1).

#Because the natural log was not possible for all background values, the TL was considered equal to the maximum background value.

Current Quarter Data

Well No.	Gradient	Detected?	Result	Result >TL(1)?	LN(Result)	LN(Result) >TL(2)
MW358	Downgradient	Yes	4.70E+01	NO	3.85E+00	N/A
MW361	Downgradient	Yes	5.09E+01	YES	3.93E+00	N/A
MW364	Downgradient	Yes	5.13E+01	YES	3.94E+00	N/A

Conclusion of Statistical Analysis on Current Data

The test well(s) listed exceeded the Upper Tolerance Limit, which is evidence of elevated concentration with respect to current background data.

Wells with Exceedances

MW361
MW364

NOTE: For UCRS wells, background ("upgradient") wells are those located in the same direction as RGA wells located upgradient from the landfill.

CV Coefficient-of-Variation, CV = S/X If CV is less than or equal to 1 assume normal distribution.

S Standard Deviation, S = [Sum ([(background result-X)^2]/[count of background results -1])]^0.5

TL Upper Tolerance Limit, TL = X + (K * S), LL Lower Tolerance Limit, LL = X - (K * S)

X Mean, X = (sum of background results)/(count of background results)

** *Read from Table 5, Appendix B of Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities,Interim Guidance, EPA, 1989, based on total number of background results - The K-factor for pH to account for a two-sided tolerance interval instead of a one-sided tolerance limit. The K-factor for pH was computed using a formula from NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/,2009.*

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ATTACHMENT D3

STATISTICIAN QUALIFICATION STATEMENT

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FOUR RIVERS
NUCLEAR PARTNERSHIP, LLC

Four Rivers Nuclear Partnership, LLC
5511 Hobbs Road
Kevil, KY 42053
www.fourriversnuclearpartnership.com

November 1, 2023

Mr. Dennis Greene
Four Rivers Nuclear Partnership, LLC
5511 Hobbs Road
Kevil, KY 42053

Dear Mr. Greene:

As an Environmental Scientist, with a bachelor's degree in Earth Sciences/Geology, I have over 30 years of experience in reviewing and assessing laboratory analytical results associated with environmental sampling and investigation activities. For the generation of these statistical analyses, my work was reviewed by a qualified independent technical reviewer with Four Rivers Nuclear Partnership, LLC.

For this project, the statistical analyses conducted on the third quarter 2023 monitoring well data collected from the C-746-S&T and C-746-U Landfills were performed in accordance with guidance provided in the U.S. Environmental Protection Agency guidance document, *EPA Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Interim Final Guidance* (1989).

Sincerely,

Bryan Smith

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APPENDIX E

GROUNDWATER FLOW RATE AND DIRECTION

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GROUNDWATER FLOW RATE AND DIRECTION

Determination of groundwater flow rate and direction of flow in the uppermost aquifer whenever the monitoring wells (MWs) are sampled is a requirement of 401 *KAR* 48.300, Section 11. The uppermost aquifer below the C-746-U Landfill is the Regional Gravel Aquifer (RGA). Water level measurements currently are recorded in several wells at the landfill on a quarterly basis. These measurements were used to plot the potentiometric surface of the RGA for the third quarter 2023 and determine groundwater flow rate and direction.

Water levels during this reporting period were measured on July 25, 2023. As shown on Figure E.1, all Upper Continental Recharge System (UCRS) wells had sufficient water to permit water level measurement during this reporting period; however, there was insufficient water to collect samples for laboratory analysis in UCRS wells MW359, MW368, MW376, and MW377.

The UCRS has a strong vertical hydraulic gradient; therefore, the available UCRS wells screened over different elevations are not sufficient for mapping the potentiometric surface. As shown in Table E.1, the RGA data were converted to elevations to plot the potentiometric surfaces within the Upper Regional Gravel Aquifer (URGA) and Lower Regional Gravel Aquifer (LRGA). (At the request of the Commonwealth of Kentucky, the RGA is differentiated into two zones, the URGA and LRGA.) Based on the potentiometric maps (Figures E.2 and E.3), the hydraulic gradients for the URGA and LRGA at the C-746-U Landfill, as measured along the defined groundwater flow directions, were 6.08×10^{-4} ft/ft and 7.05×10^{-4} ft/ft, respectively. Water level measurements in wells at the C-746-U Landfill and in wells of the surrounding region (MW98, MW100, MW125, MW139, MW165A, MW173, MW193, MW197, and MW200), along with the C-746-S&T Landfill wells, were used to contour the general RGA potentiometric surface (Figure E.4). The hydraulic gradient for the RGA, as a whole, in the vicinity of the C-746-U Landfill was 3.53×10^{-4} ft/ft. The hydraulic gradients are shown in Table E.2.

The average linear groundwater flow velocity (v) is determined by multiplying the hydraulic gradient (i) by the hydraulic conductivity (K) [resulting in the specific discharge (q)] and dividing by the effective porosity (n_e). The RGA hydraulic conductivity values used are reported in the Administrative Application for the New Solid Waste Landfill Permit No. SW07300045NWC1 and range from 425 to 725 ft/day (0.150 to 0.256 cm/s). RGA (both URGA and LRGA) effective porosity is assumed to be 25%. Flow velocities were calculated for the URGA and LRGA using the low and high values for hydraulic conductivity, as shown in the Table E.3.

Groundwater flow beneath the C-746-U Landfill typically trends northeastward toward the Ohio River. As demonstrated on the potentiometric maps for July 2023, the groundwater flow direction in the immediate area of the landfill was to the northeast.

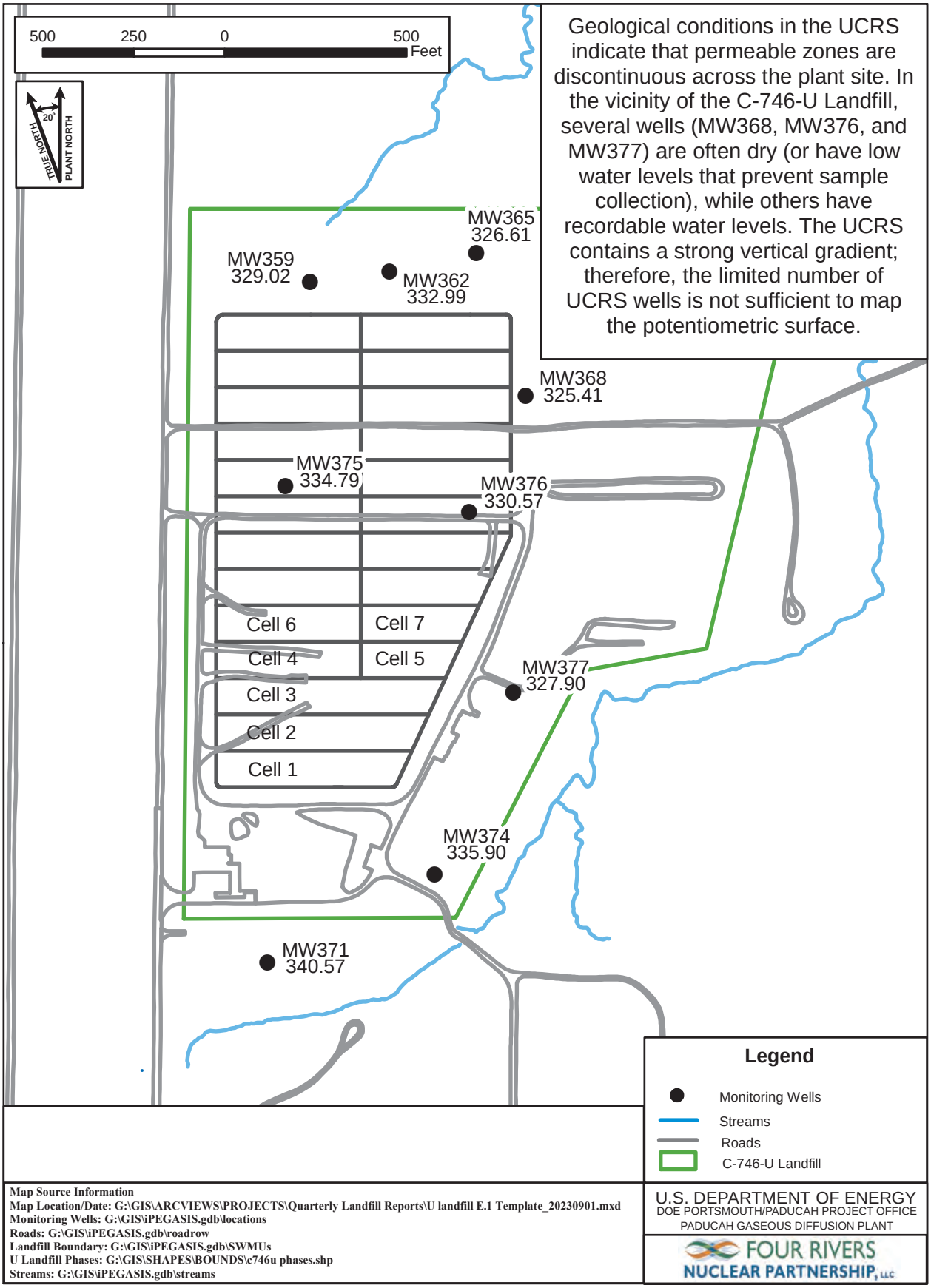

Figure E.1. Potentiometric Measurements of the Upper Continental Recharge System at the C-746-U Landfill, July 25, 2023

Table E.1. C-746-U Landfill Third Quarter 2023 (July) Water Levels

C-746-U Landfill (July 2023) Water Levels										
							Raw Data		*Corrected Data	
Date	Time	Well	Aquifer	Datum Elev (ft amsl)	BP (in Hg)	Delta BP (ft H20)	DTW (ft)	Elev (ft amsl)	DTW (ft)	Elev (ft amsl)
7/25/2023	7:46	MW357	URGA	368.77	30.09	0.01	45.91	322.86	45.92	322.85
7/25/2023	7:48	MW358	LRGA	368.92	30.09	0.01	46.05	322.87	46.06	322.86
7/25/2023	7:47	MW359	UCRS	368.91	30.09	0.01	39.88	329.03	39.89	329.02
7/25/2023	7:44	MW360	URGA	362.07	30.09	0.01	39.22	322.85	39.23	322.84
7/25/2023	7:42	MW361	LRGA	361.32	30.09	0.01	38.49	322.83	38.50	322.82
7/25/2023	7:43	MW362	UCRS	361.85	30.09	0.01	28.85	333.00	28.86	332.99
7/25/2023	14:28	MW363	URGA	368.56	30.07	0.03	45.73	322.83	45.76	322.80
7/25/2023	14:29	MW364	LRGA	368.17	30.07	0.03	45.45	322.72	45.48	322.69
7/25/2023	7:54	MW365	UCRS	368.14	30.10	0.00	41.53	326.61	41.53	326.61
7/25/2023	8:00	MW366	URGA	368.95	30.10	0.00	46.08	322.87	46.08	322.87
7/25/2023	7:58	MW367	LRGA	369.37	30.10	0.00	46.49	322.88	46.49	322.88
7/25/2023	7:59	MW368	UCRS	368.98	30.10	0.00	43.57	325.41	43.57	325.41
7/25/2023	8:40	MW369	URGA	364.23	30.10	0.00	40.24	323.99	40.24	323.99
7/25/2023	8:41	MW370	LRGA	365.12	30.10	0.00	41.12	324.00	41.12	324.00
7/25/2023	8:42	MW371	UCRS	364.64	30.10	0.00	24.07	340.57	24.07	340.57
7/25/2023	8:35	MW372	URGA	359.42	30.10	0.00	35.40	324.02	35.40	324.02
7/25/2023	8:37	MW373	LRGA	359.73	30.10	0.00	35.71	324.02	35.71	324.02
7/25/2023	8:36	MW374	UCRS	359.44	30.10	0.00	23.54	335.90	23.54	335.90
7/25/2023	8:25	MW375	UCRS	370.36	30.10	0.00	35.57	334.79	35.57	334.79
7/25/2023	8:27	MW376	UCRS	370.39	30.10	0.00	39.82	330.57	39.82	330.57
7/25/2023	8:30	MW377	UCRS	365.74	30.10	0.00	37.84	327.90	37.84	327.90
Reference Barometric Pressure					**30.10**					
Elev = elevation										
amsl = above mean sea level										
BP = barometric pressure										
DTW = depth to water in feet below datum										
URGA = Upper Regional Gravel Aquifer										
LRGA = Lower Regional Gravel Aquifer										
UCRS = Upper Continental Recharge System										
*Assumes a barometric efficiency of 1.0										

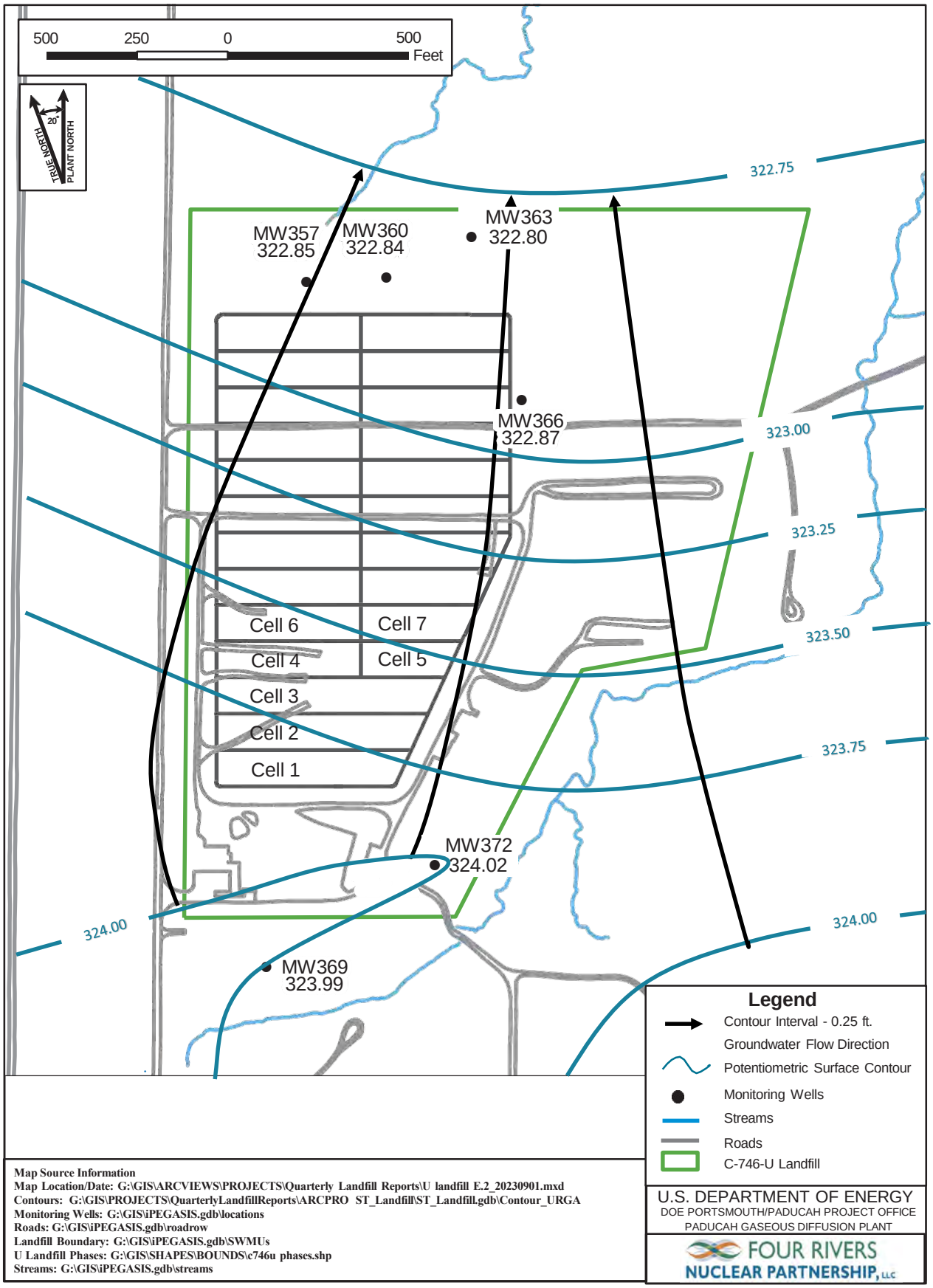

Figure E.2. Potentiometric Surface of the Upper Regional Gravel Aquifer at the C-746-U Landfill, July 25, 2023

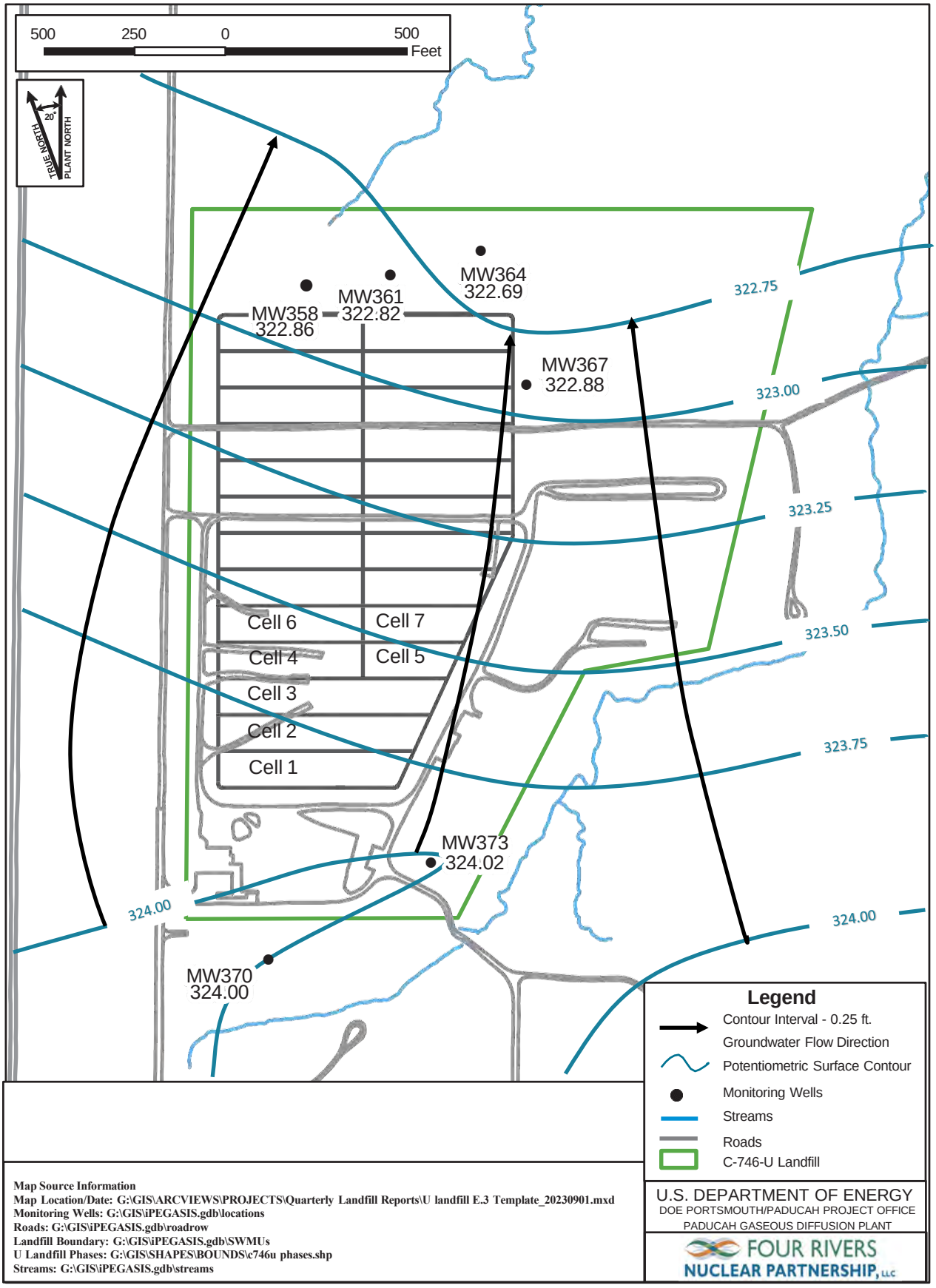

Figure E.3. Potentiometric Surface of the Lower Regional Gravel Aquifer at the C-746-U Landfill, July 25, 2023

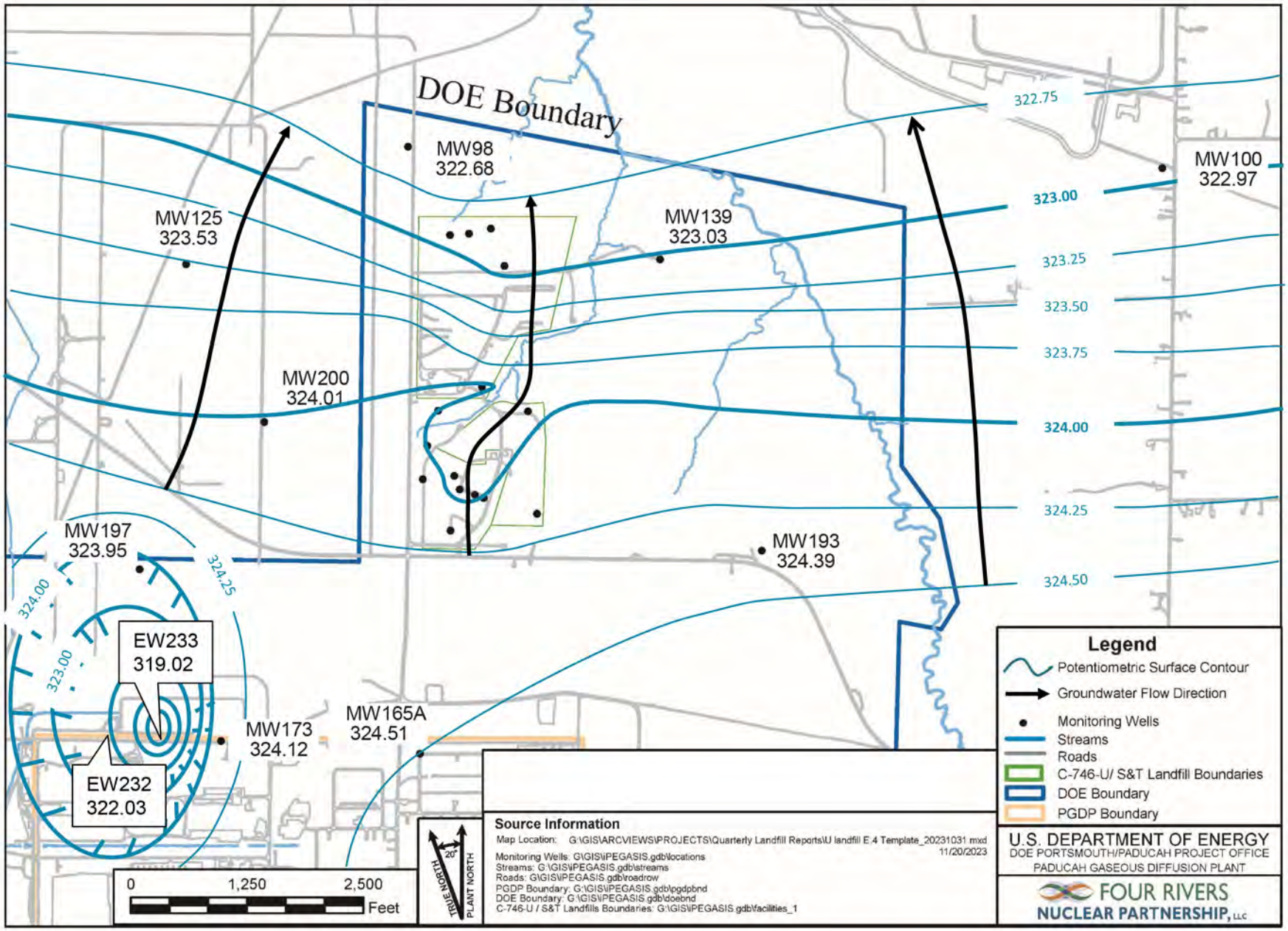

Figure E.4. Vicinity Potentiometric Surface of the Regional Gravel Aquifer, July 25, 2023

Table E.2. C-746-U Landfill Hydraulic Gradients

	ft/ft
Beneath Landfill—Upper RGA	6.08×10^{-4}
Beneath Landfill—Lower RGA	7.05×10^{-4}
Vicinity	3.53×10^{-4}

Table E.3. C-746-U Landfill Groundwater Flow Rate

Hydraulic Conductivity (K)		Specific Discharge (q)		Average Linear Velocity (v)	
ft/day	cm/s	ft/day	cm/s	ft/day	cm/s
Upper RGA					
725	0.256	0.441	1.56×10^{-4}	1.76	6.23×10^{-4}
425	0.150	0.259	9.13×10^{-5}	1.03	3.65×10^{-4}
Lower RGA					
725	0.256	0.511	1.81×10^{-4}	2.05	7.22×10^{-4}
425	0.150	0.300	1.06×10^{-4}	1.20	4.23×10^{-4}

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APPENDIX F

NOTIFICATIONS

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NOTIFICATIONS

In accordance with 401 *KAR* 48:300 § 7, the notification for parameters that exceed the maximum contaminant level (MCL) has been submitted to the Kentucky Division of Waste Management. The parameters submitted are listed on page F-4. The notification for parameters that do not have MCLs, but had statistically significant increased concentrations relative to historical background concentrations, is provided below.

Statistical Analysis of Parameters Notification

The statistical analyses conducted on the third quarter 2023 groundwater data collected from the C-746-U Landfill monitoring wells were performed in accordance with *Groundwater Monitoring Plan for the Solid Waste Permitted Landfills (C-746-S Residential Landfill, C-746-T Inert Landfill, and C-746-U Contained Landfill) at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky* (LATA Kentucky 2014).

The following are the permit required parameters in 40 *CFR* § 302.4, Appendix A, which had statistically significant, increased concentrations relative to historical background concentrations.

	Parameter	**Monitoring Well**
Upper Continental Recharge System	None	
Upper Regional Gravel Aquifer	None	
Lower Regional Gravel Aquifer	Technetium-99	MW358, MW361, MW364

NOTE: Although technetium-99 is not cited in 40 *CFR* § 302.4, Appendix A, this radionuclide is being reported along with the parameters of this regulation.

8/22/2023

Four Rivers Nuclear Partnership, LLC
PROJECT ENVIRONMENTAL MEASUREMENTS SYSTEM
C-746-U LANDFILL
SOLID WASTE PERMIT NUMBER SW07300014, SW07300015, SW07300045
MAXIMUM CONTAMINANT LEVEL (MCL) EXCEEDANCE REPORT
Quarterly Groundwater Sampling

AKGWA	Station	Analysis	Method	Results	Units	MCL
8004-4798	MW357	Trichloroethene	8260D	5.3	ug/L	5
8004-4800	MW360	Trichloroethene	8260D	7.54	ug/L	5
8004-4818	MW370	Trichloroethene	8260D	5.48	ug/L	5
8004-4808	MW372	Trichloroethene	8260D	5.09	ug/L	5

NOTE 1: MCLs are defined in 401 KAR 47:030.

NOTE 2: MW369, MW370, MW372, and MW373 are down-gradient wells for the C-746-S and C-746-T Landfills and upgradient for the C-746-U Landfill. These wells are sampled with the C-746-U Landfill monitoring well network. These wells are reported on the exceedance reports for C-746-S, C-746-T, and C-746-U.

APPENDIX G

CHART OF MCL AND UTL EXCEEDANCES

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Chart of MCL and Historical UTL Exceedances for the C-746-U Contained Landfill

Groundwater Flow System	UCRS									URGA						LRGA					
Gradient	D	S	S	S	D	D	D	U	U	D	D	D	D	U	U	D	D	D	D	U	U
Monitoring Well	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373
ACETONE																					
Quarter 3, 2002										✱	✱	✱									
Quarter 4, 2002										✱	✱	✱									
Quarter 1, 2003											✱	✱									
Quarter 2, 2003											✱	✱									
Quarter 3, 2003	✱						✱			✱	✱	✱			✱			✱			
Quarter 4, 2003						✱	✱				✱			✱							
Quarter 3, 2004						✱										✱					
Quarter 3, 2005						✱															
Quarter 4, 2005						✱															
ALPHA ACTIVITY																					
Quarter 1, 2004																					■
Quarter 2, 2004						■															
Quarter 3, 2009						■															
ALUMINUM																					
Quarter 3, 2003											✱										
BETA ACTIVITY																					
Quarter 1, 2004															■						
Quarter 2, 2004															■						■
Quarter 3, 2004															■						
Quarter 4, 2004															■						
Quarter 4, 2005															■						
Quarter 1, 2006															■						■
Quarter 2, 2006																					■
Quarter 3, 2006															■						■
Quarter 4, 2006															■						■
Quarter 1, 2007										■					■						■
Quarter 2, 2007															■						■
Quarter 3, 2007										■					■						
Quarter 4, 2007										■					■						■
Quarter 1, 2008										■					■						
Quarter 2, 2008														■		■					
Quarter 3, 2008										■					■				■		
Quarter 4, 2008										■					■				■		
Quarter 1, 2009										■					■						
Quarter 2, 2009															■	■	■				
Quarter 3, 2009										■					■						
Quarter 4, 2009										■					■						
Quarter 1, 2010															■						
Quarter 2, 2010										■						■					
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Quarter 4, 2010															■						
Quarter 2, 2011										■						■					
Quarter 4, 2011															■						
Quarter 1, 2012										■											
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Quarter 4, 2017															■					■	
Quarter 1, 2018																			■	■	
Quarter 2, 2018														■							
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Quarter 4, 2018															■					■	
Quarter 1, 2019																				■	
Quarter 2, 2019														■						■	
Quarter 3, 2019														■	■					■	
Quarter 4, 2019										■					■					■	
Quarter 1, 2020									■						■					■	
Quarter 2, 2020																				■	
Quarter 3, 2020															■					■	
Quarter 4, 2020																				■	
BROMIDE																					
Quarter 2, 2004													✱								

Chart of MCL and Historical UTL Exceedances for the C-746-U Contained Landfill (Continued)

Groundwater Flow System	UCRS									URGA						LRGA					
Gradient	D	S	S	S	D	D	D	U	U	D	D	D	D	U	U	D	D	D	D	U	U
Monitoring Well	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373
CALCIUM																					
Quarter 3, 2003										*											
Quarter 2, 2005																					*
Quarter 3, 2006															*						
Quarter 2, 2008															*						
Quarter 3, 2009															*						
Quarter 4, 2009															*						
Quarter 1, 2010															*						
Quarter 2, 2010															*						
Quarter 3, 2010															*						
Quarter 1, 2011															*						
Quarter 2, 2011															*						
Quarter 3, 2011																					*
Quarter 4, 2011															*						*
Quarter 1, 2012															*						*
Quarter 2, 2012															*						*
Quarter 3, 2012															*						*
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Quarter 1, 2013															*						*
Quarter 2, 2013															*						
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Quarter 3, 2015															*						
Quarter 4, 2015															*						
Quarter 1, 2016															*						
Quarter 2, 2016															*						
Quarter 2, 2017	*																				
Quarter 1, 2018	*																				
Quarter 3, 2018	*																				
Quarter 3, 2019	*							*													
Quarter 4, 2019															*						
Quarter 1, 2020								*							*						
Quarter 2, 2020								*							*						
Quarter 3, 2020	*							*							*						
Quarter 4, 2020															*						
Quarter 1, 2021															*						
Quarter 2, 2021								*							*						
Quarter 3, 2021															*						
Quarter 4, 2021															*						
Quarter 1, 2022															*						
Quarter 2, 2022															*						
Quarter 3, 2022															*						
Quarter 4, 2022															*						
Quarter 1, 2023															*						
Quarter 2, 2023															*						
Quarter 3, 2023															*						*
CARBON DISULFIDE																					
Quarter 3, 2003										*											
Quarter 2, 2005							*														
Quarter 3, 2005						*															
Quarter 4, 2005						*															
Quarter 1, 2006						*															
Quarter 2, 2006						*															
Quarter 3, 2010		*									*										
Quarter 4, 2010														*							
Quarter 1, 2011															*						
CHEMICAL OXYGEN DEMAND																					
Quarter 3, 2002										*	*	*	*	*	*						
Quarter 4, 2002										*	*										
Quarter 1, 2003										*	*										
Quarter 2, 2003										*	*	*									
Quarter 3, 2003	*									*	*					*					
Quarter 4, 2003						*				*	*										
Quarter 3, 2004										*											
Quarter 3, 2005						*				*					*	*			*		
Quarter 4, 2005						*												*	*		
Quarter 1, 2006																			*		
Quarter 4, 2016																		*			
Quarter 1, 2017											*										
Quarter 2, 2019												*			*						
Quarter 3, 2019															*						*
Quarter 4, 2019															*						
CHLORIDE																					
Quarter 1, 2006																				*	
Quarter 2, 2014															*						
COBALT																					
Quarter 3, 2003	*						*			*	*		*	*	*	*	*	*		*	
Quarter 1, 2004														*							
Quarter 2, 2016														*							

Chart of MCL and Historical UTL Exceedances for the C-746-U Contained Landfill (Continued)

Groundwater Flow System	UCRS									URGA						LRGA					
Gradient	D	S	S	S	D	D	D	U	U	D	D	D	D	U	U	D	D	D	D	U	U
Monitoring Well	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373
CONDUCTIVITY																					
Quarter 4, 2002										*											
Quarter 1, 2003										*											
Quarter 2, 2003										*	*										
Quarter 4, 2003										*											
Quarter 1, 2004										*											
Quarter 2, 2004										*											
Quarter 3, 2004										*											
Quarter 1, 2005															*						
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Quarter 3, 2005						*													*		
Quarter 4, 2005															*			*			
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Quarter 1, 2009															*						
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Quarter 1, 2021															*						
Quarter 2, 2021															*						
Quarter 3, 2021															*						
Quarter 1, 2022															*						
Quarter 2, 2022															*						
Quarter 3, 2022															*						
Quarter 4, 2022															*						
Quarter 1, 2023															*						
Quarter 2, 2023															*						
Quarter 3, 2023															*						
DISSOLVED OXYGEN																					
Quarter 1, 2003					*	*				*											
Quarter 3, 2003					*					*											
Quarter 4, 2003					*																
Quarter 1, 2004					*																
Quarter 2, 2004								*								*					
Quarter 1, 2005					*																
Quarter 2, 2005								*													
Quarter 1, 2006					*																
Quarter 2, 2006					*			*													
Quarter 3, 2006					*			*													
Quarter 4, 2006					*				*												
Quarter 2, 2007					*			*													
Quarter 3, 2007					*			*	*												
Quarter 1, 2008					*														*		
Quarter 2, 2008								*	*												
Quarter 3, 2008								*													

Chart of MCL and Historical UTL Exceedances for the C-746-U Contained Landfill (Continued)

Groundwater Flow System	UCRS									URGA						LRGA					
Gradient	D	S	S	S	D	D	D	U	U	D	D	D	D	U	U	D	D	D	D	U	U
Monitoring Well	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373
DISSOLVED OXYGEN																					
Quarter 1, 2009							✱														
Quarter 2, 2009					✱			✱	✱												
Quarter 3, 2009						✱		✱	✱												
Quarter 1, 2010					✱		✱														
Quarter 2, 2010					✱	✱		✱	✱											✱	✱
Quarter 3, 2010					✱	✱															
Quarter 4, 2010							✱					✱								✱	
Quarter 1, 2011						✱															
Quarter 2, 2011					✱	✱	✱	✱	✱					✱							
Quarter 3, 2011						✱			✱												
Quarter 1, 2012							✱		✱												
Quarter 2, 2012	✱			✱	✱	✱		✱	✱												
Quarter 3, 2012						✱															
Quarter 4, 2012									✱												
Quarter 1, 2013						✱			✱												
Quarter 2, 2013							✱		✱												
Quarter 3, 2013	✱				✱		✱	✱	✱												
Quarter 4, 2013									✱											✱	
Quarter 2, 2014	✱				✱	✱	✱	✱	✱									✱			
Quarter 3, 2014	✱				✱	✱	✱														
Quarter 4, 2014						✱															
Quarter 2, 2015					✱	✱	✱	✱													
Quarter 3, 2015					✱	✱		✱													
Quarter 4, 2015	✱					✱	✱														
Quarter 1, 2016	✱				✱		✱														
Quarter 2, 2016	✱	✱			✱	✱	✱	✱	✱											✱	✱
Quarter 3, 2016					✱	✱	✱	✱					✱								
Quarter 4, 2016						✱			✱												
Quarter 1, 2017							✱						✱								
Quarter 2, 2017	✱				✱	✱	✱	✱													
Quarter 3, 2017	✱	✱			✱	✱	✱	✱										✱			
Quarter 4, 2017						✱	✱											✱			
Quarter 1, 2018					✱	✱	✱	✱												✱	
Quarter 2, 2018					✱	✱	✱	✱													
Quarter 3, 2018	✱				✱	✱	✱	✱													
Quarter 4, 2018						✱															
Quarter 1, 2019					✱	✱	✱	✱													
Quarter 2, 2019					✱	✱		✱													
Quarter 3, 2019	✱				✱	✱	✱	✱													
Quarter 4, 2019					✱	✱	✱														
Quarter 1, 2020							✱	✱	✱												
Quarter 2, 2020					✱	✱		✱													
Quarter 3, 2020	✱				✱	✱															
Quarter 4, 2020	✱						✱														
Quarter 1, 2021					✱		✱													✱	
Quarter 2, 2021					✱	✱	✱	✱	✱												
Quarter 3, 2021	✱				✱	✱	✱	✱												✱	
Quarter 4, 2021					✱		✱	✱												✱	
Quarter 1, 2022	✱				✱	✱	✱	✱					✱				✱			✱	
Quarter 2, 2022	✱				✱	✱	✱	✱	✱												
Quarter 3, 2022	✱	✱			✱	✱	✱	✱					✱				✱			✱	
Quarter 4, 2022		✱					✱	✱												✱	
Quarter 2, 2023	✱				✱	✱	✱	✱									✱				
Quarter 3, 2023						✱	✱	✱													
DISSOLVED SOLIDS																					
Quarter 4, 2002										✱											
Quarter 1, 2003										✱											
Quarter 2, 2003										✱											
Quarter 3, 2003							✱			✱	✱										
Quarter 4, 2003										✱											
Quarter 3, 2005						✱															
Quarter 4, 2006															✱						
Quarter 1, 2007															✱						
Quarter 2, 2007															✱						
Quarter 4, 2008															✱						
Quarter 1, 2009															✱						
Quarter 2, 2009															✱						
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Quarter 1, 2010															✱						
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Quarter 3, 2011															✱						
Quarter 4, 2011															✱						
Quarter 1, 2012														✱	✱						
Quarter 2, 2012															✱						✱
Quarter 3, 2012															✱						✱
Quarter 4, 2012															✱						
Quarter 1, 2013															✱						
Quarter 2, 2013															✱						
Quarter 3, 2013															✱						
Quarter 4, 2013															✱						

Chart of MCL and Historical UTL Exceedances for the C-746-U Contained Landfill (Continued)

Groundwater Flow System	UCRS									URGA						LRGA					
Gradient	D	S	S	S	D	D	D	U	U	D	D	D	D	U	U	D	D	D	D	U	U
Monitoring Well	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373
DISSOLVED SOLIDS																					
Quarter 1, 2014															✱						
Quarter 2, 2014															✱						
Quarter 4, 2014															✱						
Quarter 2, 2015															✱						
Quarter 3, 2015															✱						
Quarter 4, 2015															✱						
Quarter 1, 2016															✱						
Quarter 3, 2019															✱						
Quarter 4, 2019															✱						
Quarter 1, 2020															✱						
Quarter 2, 2020															✱						
Quarter 3, 2020															✱						
Quarter 4, 2020															✱						
Quarter 1, 2021															✱						
Quarter 2, 2021															✱						
Quarter 3, 2021															✱						
Quarter 4, 2021															✱						
Quarter 1, 2022															✱						
Quarter 2, 2022															✱						
Quarter 3, 2022															✱						
Quarter 4, 2022															✱						
Quarter 1, 2023															✱						
Quarter 2, 2023															✱						
Quarter 3, 2023															✱						
IODIDE																					
Quarter 2, 2003																✱					
Quarter 3, 2003	✱									✱											
Quarter 4, 2003							✱														
Quarter 3, 2010						✱		✱					✱				✱				
IODINE-131																					
Quarter 3, 2010																		■			
IODOMETHANE																					
Quarter 4, 2003						✱															
IRON																					
Quarter 4, 2002						✱															
Quarter 3, 2003																✱					
Quarter 4, 2003										✱						✱					
Quarter 1, 2004										✱						✱					
Quarter 2, 2004										✱											
Quarter 3, 2004										✱											
Quarter 3, 2005																✱					
MAGNESIUM																					
Quarter 2, 2005															✱						✱
Quarter 3, 2005						✱															✱
Quarter 2, 2006															✱						✱
Quarter 3, 2006															✱						
Quarter 1, 2007															✱						
Quarter 2, 2008															✱						
Quarter 2, 2009															✱						
Quarter 3, 2009															✱						
Quarter 4, 2009															✱						
Quarter 1, 2010															✱						
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Quarter 1, 2016															✱						
Quarter 2, 2016															✱						
Quarter 3, 2016	✱																				
Quarter 4, 2016	✱																				
Quarter 2, 2017	✱																				
Quarter 3, 2017	✱																				
Quarter 1, 2018	✱																				
Quarter 3, 2018	✱																				
Quarter 3, 2019	✱																				
Quarter 4, 2019															✱						
Quarter 2, 2020															✱						
Quarter 4, 2020															✱						
Quarter 1, 2021															✱						
Quarter 2, 2021															✱						
Quarter 3, 2021															✱						
Quarter 4, 2021															✱						
Quarter 1, 2022															✱						
Quarter 2, 2022															✱						
Quarter 3, 2022								✱							✱						
Quarter 1, 2023								✱							✱						
Quarter 2, 2023															✱						

Chart of MCL and Historical UTL Exceedances for the C-746-U Contained Landfill (Continued)

Groundwater Flow System	UCRS									URGA						LRGA					
Gradient	D	S	S	S	D	D	D	U	U	D	D	D	D	U	U	D	D	D	D	U	U
Monitoring Well	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373
MANGANESE																					
Quarter 3, 2002										✱		✱									
Quarter 4, 2002		✱				✱	✱			✱		✱		✱							
Quarter 2, 2003										✱		✱									
Quarter 3, 2003										✱		✱	✱			✱	✱	✱	✱		
Quarter 4, 2003										✱	✱	✱	✱				✱	✱			
Quarter 1, 2004										✱	✱	✱				✱	✱	✱			
Quarter 2, 2004							✱			✱	✱	✱						✱			
Quarter 3, 2004							✱			✱	✱	✱				✱					
Quarter 4, 2004										✱		✱				✱					
Quarter 1, 2005										✱		✱									
Quarter 2, 2005										✱		✱									
Quarter 3, 2005										✱		✱				✱					
Quarter 4, 2005										✱						✱					
Quarter 1, 2006										✱											
Quarter 2, 2006							✱			✱		✱									
Quarter 3, 2006										✱						✱					
Quarter 4, 2006										✱											
Quarter 1, 2007										✱											
Quarter 2, 2007							✱			✱											
Quarter 3, 2007							✱														
Quarter 3, 2008							✱														
Quarter 4, 2008							✱														
Quarter 3, 2009							✱														
Quarter 3, 2011							✱														
Quarter 2, 2016														✱							
Quarter 3, 2016									✱												
Quarter 1, 2022																			✱		
NICKEL																					
Quarter 3, 2003										✱											
Quarter 1, 2022																			✱		
Quarter 4, 2022																			✱		
Quarter 1, 2023																			✱		
Quarter 2, 2023																			✱		
NITRATE AS NITROGEN																					
Quarter 4, 2021												■									
OXIDATION-REDUCTION POTENTIAL																					
Quarter 4, 2002																	✱		✱		
Quarter 1, 2003																	✱		✱		
Quarter 2, 2003																			✱		
Quarter 3, 2003	✱																				
Quarter 4, 2003					✱																
Quarter 2, 2004													✱				✱				✱
Quarter 3, 2004					✱			✱					✱	✱	✱		✱			✱	✱
Quarter 4, 2004												✱									✱
Quarter 1, 2005																	✱			✱	✱
Quarter 2, 2005								✱					✱				✱			✱	
Quarter 3, 2005					✱	✱		✱			✱	✱	✱				✱		✱	✱	✱
Quarter 4, 2005		✱						✱					✱				✱			✱	
Quarter 1, 2006					✱			✱	✱								✱				✱
Quarter 2, 2006					✱		✱	✱					✱				✱			✱	
Quarter 3, 2006					✱			✱					✱				✱			✱	
Quarter 4, 2006					✱		✱			✱		✱	✱				✱			✱	✱
Quarter 1, 2007		✱			✱			✱					✱				✱			✱	✱
Quarter 2, 2007					✱								✱				✱			✱	✱
Quarter 3, 2007					✱			✱									✱			✱	
Quarter 4, 2007																	✱			✱	✱
Quarter 1, 2008					✱			✱				✱	✱						✱	✱	
Quarter 2, 2008					✱			✱		✱			✱	✱				✱		✱	✱
Quarter 3, 2008					✱		✱	✱	✱	✱		✱	✱	✱			✱	✱	✱	✱	✱
Quarter 4, 2008								✱		✱		✱	✱				✱	✱		✱	✱
Quarter 1, 2009							✱	✱		✱		✱	✱					✱		✱	
Quarter 2, 2009					✱		✱	✱		✱		✱	✱				✱	✱		✱	✱
Quarter 3, 2009		✱			✱	✱	✱	✱	✱	✱		✱	✱	✱			✱	✱	✱	✱	✱
Quarter 4, 2009		✱				✱	✱	✱	✱	✱		✱	✱				✱	✱	✱	✱	✱
Quarter 1, 2010		✱			✱		✱	✱		✱			✱			✱	✱	✱		✱	
Quarter 2, 2010					✱	✱		✱		✱	✱	✱	✱			✱	✱	✱	✱	✱	✱
Quarter 3, 2010		✱			✱	✱	✱	✱	✱	✱	✱		✱	✱	✱		✱	✱	✱	✱	✱
Quarter 4, 2010		✱				✱	✱	✱	✱	✱	✱	✱	✱	✱		✱	✱	✱	✱	✱	✱
Quarter 1, 2011						✱		✱		✱	✱	✱	✱	✱		✱	✱	✱	✱	✱	
Quarter 2, 2011		✱			✱	✱	✱	✱	✱	✱	✱	✱	✱	✱		✱	✱	✱	✱	✱	✱
Quarter 3, 2011		✱				✱		✱	✱	✱		✱	✱	✱		✱	✱	✱	✱	✱	✱
Quarter 4, 2011		✱				✱		✱	✱	✱	✱	✱	✱	✱		✱	✱	✱		✱	✱
Quarter 1, 2012		✱				✱	✱	✱	✱	✱	✱	✱	✱	✱		✱	✱	✱	✱	✱	✱
Quarter 2, 2012	✱	✱		✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱		✱	✱	✱	✱	✱	✱
Quarter 3, 2012		✱				✱		✱		✱		✱	✱	✱		✱	✱	✱	✱	✱	✱
Quarter 4, 2012		✱				✱		✱	✱	✱	✱	✱	✱	✱		✱	✱	✱	✱	✱	✱
Quarter 1, 2013		✱				✱		✱	✱	✱	✱	✱	✱	✱		✱	✱	✱		✱	
Quarter 2, 2013		✱						✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱
Quarter 3, 2013	✱	✱			✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱
Quarter 4, 2013		✱				✱		✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱
Quarter 1, 2014		✱						✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱
Quarter 2, 2014	✱	✱			✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱
Quarter 3, 2014	✱	✱			✱	✱	✱	✱	✱	✱		✱	✱	✱		✱	✱	✱	✱	✱	✱
Quarter 4, 2014		✱				✱		✱	✱	✱		✱	✱	✱		✱	✱	✱	✱	✱	✱
Quarter 1, 2015		✱				✱		✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱
Quarter 2, 2015	✱	✱			✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱
Quarter 3, 2015		✱			✱	✱		✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱
Quarter 4, 2015	✱	✱				✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱	✱

Chart of MCL and Historical UTL Exceedances for the C-746-U Contained Landfill (Continued)

Groundwater Flow System	UCRS									URGA						LRGA					
Gradient	D	S	S	S	D	D	D	U	U	D	D	D	D	U	U	D	D	D	D	U	U
Monitoring Well	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373
OXIDATION-REDUCTION POTENTIAL																					
Quarter 1, 2016	*	*			*		*	*		*		*	*	*	*	*	*	*	*	*	*
Quarter 2, 2016	*	*			*	*	*	*	*	*		*	*	*	*	*	*	*	*	*	*
Quarter 3, 2016	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Quarter 4, 2016	*	*				*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Quarter 1, 2017	*	*				*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Quarter 2, 2017	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Quarter 3, 2017	*	*			*	*	*	*	*	*		*	*	*	*	*	*	*	*	*	*
Quarter 4, 2017		*				*	*	*	*	*		*	*	*	*		*	*		*	*
Quarter 1, 2018	*	*			*	*	*	*	*	*		*	*	*	*	*	*	*		*	*
Quarter 2, 2018	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Quarter 3, 2018	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Quarter 4, 2018		*				*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Quarter 1, 2019	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Quarter 2, 2019	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Quarter 3, 2019	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*		*	*
Quarter 4, 2019	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Quarter 1, 2020	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*		*	*
Quarter 2, 2020	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*		*	*
Quarter 3, 2020	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*		*	*
Quarter 4, 2020	*	*				*	*	*	*	*	*		*	*	*	*	*	*		*	*
Quarter 1, 2021	*	*			*	*	*	*		*	*	*	*	*	*	*	*	*		*	*
Quarter 2, 2021	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Quarter 3, 2021	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Quarter 4, 2021	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Quarter 1, 2022	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Quarter 2, 2022	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Quarter 3, 2022	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Quarter 4, 2022		*				*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Quarter 1, 2023		*				*		*	*	*	*	*	*	*	*	*	*	*		*	*
Quarter 2, 2023	*	*			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Quarter 3, 2023		*				*	*	*	*	*	*	*	*	*	*	*	*	*		*	*
PCB, TOTAL																					
Quarter 4, 2003																	*				
Quarter 3, 2004												*									
Quarter 3, 2005							*														
Quarter 2, 2006							*														
Quarter 3, 2006							*														
Quarter 1, 2007							*														
Quarter 2, 2007							*														
Quarter 3, 2007							*														
Quarter 1, 2008							*														
Quarter 2, 2008							*														
Quarter 4, 2008							*														
Quarter 3, 2009							*														
Quarter 1, 2010							*														
Quarter 2, 2010							*														
Quarter 4, 2010							*														
PCB-1016																					
Quarter 3, 2004												*									
Quarter 2, 2006							*					*									
Quarter 1, 2007							*														
Quarter 2, 2007							*														
Quarter 3, 2007							*														
Quarter 2, 2008							*														
Quarter 4, 2008							*														
Quarter 3, 2009							*														
Quarter 1, 2010							*														
Quarter 2, 2010							*														
Quarter 4, 2010							*														
PCB-1242																					
Quarter 3, 2006							*					*									
Quarter 4, 2006										*											
Quarter 1, 2008							*														
Quarter 2, 2012							*														
PCB-1248																					
Quarter 2, 2008							*														
PCB-1260																					
Quarter 2, 2006							*														
pH																					
Quarter 3, 2002										*											
Quarter 4, 2002										*											
Quarter 1, 2003										*											
Quarter 2, 2003										*											
Quarter 3, 2003	*						*			*											
Quarter 4, 2003							*									*					
Quarter 1, 2004							*									*					
Quarter 3, 2005						*												*	*		
Quarter 4, 2005						*													*		
Quarter 3, 2006																*					
Quarter 2, 2011														*							
Quarter 3, 2011														*							
Quarter 4, 2011														*							
Quarter 1, 2012																*	*				
Quarter 2, 2012												*									
Quarter 1, 2013										*		*				*					
Quarter 3, 2015																	*				
Quarter 2, 2016																				*	*
Quarter 3, 2016																				*	
Quarter 2, 2017																	*				

Chart of MCL and Historical UTL Exceedances for the C-746-U Contained Landfill (Continued)

Groundwater Flow System	UCRS									URGA						LRGA					
Gradient	D	S	S	S	D	D	D	U	U	D	D	D	D	U	U	D	D	D	D	U	U
Monitoring Well	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373
pH																					
Quarter 3, 2018					✱					✱		✱					✱	✱	✱		
Quarter 4, 2018																✱		✱			
Quarter 3, 2019																✱					
Quarter 1, 2021																✱		✱		✱	
Quarter 3, 2021																					✱
Quarter 4, 2021																✱					✱
POTASSIUM																					
Quarter 1, 2014																✱					
RADIUM-228																					
Quarter 2, 2005														■							
Quarter 4, 2005						■						■						■			
SELENIUM																					
Quarter 4, 2003									■												
SODIUM																					
Quarter 3, 2002										✱	✱		✱								
Quarter 4, 2002										✱	✱			✱							
Quarter 1, 2003										✱											
Quarter 2, 2003										✱	✱										
Quarter 3, 2003											✱										
Quarter 1, 2007											✱										
Quarter 1, 2012														✱							
Quarter 1, 2014															✱						
Quarter 3, 2014											✱										
Quarter 4, 2014											✱										
Quarter 4, 2015											✱										
Quarter 1, 2016											✱										
Quarter 2, 2016											✱										
Quarter 3, 2016											✱										
Quarter 4, 2016											✱										
Quarter 1, 2017											✱										
Quarter 2, 2017											✱										
Quarter 3, 2017											✱										
Quarter 4, 2017											✱										
Quarter 1, 2018											✱										
Quarter 3, 2018											✱										
STRONTIUM-90																					
Quarter 4, 2008							■														
SULFATE																					
Quarter 1, 2003							✱														
Quarter 2, 2003						✱	✱														
Quarter 3, 2003	✱					✱															
Quarter 4, 2003					✱		✱														
Quarter 1, 2004					✱	✱	✱														
Quarter 2, 2004					✱	✱	✱														
Quarter 3, 2004					✱	✱	✱														
Quarter 1, 2005					✱	✱			✱												
Quarter 2, 2005					✱		✱		✱						✱						
Quarter 3, 2005					✱	✱	✱														
Quarter 4, 2005															✱						
Quarter 1, 2006					✱				✱												
Quarter 2, 2006						✱	✱		✱						✱						
Quarter 3, 2006							✱														
Quarter 1, 2007							✱														
Quarter 2, 2007							✱														
Quarter 3, 2007							✱														
Quarter 4, 2007		✱																			
Quarter 1, 2008		✱			✱		✱		✱												
Quarter 2, 2008		✱			✱	✱	✱														
Quarter 3, 2008		✱			✱	✱	✱														
Quarter 4, 2008		✱				✱	✱														
Quarter 1, 2009		✱					✱														
Quarter 2, 2009		✱			✱	✱	✱														
Quarter 3, 2009		✱			✱	✱	✱								✱						
Quarter 4, 2009		✱			✱	✱									✱						
Quarter 1, 2010		✱			✱	✱	✱								✱						
Quarter 2, 2010		✱			✱	✱	✱								✱						
Quarter 3, 2010		✱			✱	✱	✱								✱						
Quarter 4, 2010		✱				✱	✱								✱						
Quarter 1, 2011		✱																			
Quarter 2, 2011		✱			✱	✱	✱								✱						
Quarter 3, 2011		✱				✱	✱	✱							✱						
Quarter 4, 2011		✱				✱									✱						
Quarter 1, 2012		✱					✱	✱							✱						
Quarter 2, 2012	✱	✱		✱	✱	✱	✱	✱	✱						✱						
Quarter 3, 2012		✱				✱									✱						
Quarter 4, 2012		✱													✱						
Quarter 1, 2013		✱				✱									✱						
Quarter 2, 2013		✱													✱						
Quarter 3, 2013	✱	✱		✱	✱	✱	✱								✱						
Quarter 4, 2013		✱													✱						
Quarter 1, 2014		✱													✱						
Quarter 2, 2014	✱	✱			✱		✱	✱							✱						
Quarter 3, 2014	✱	✱			✱	✱	✱	✱							✱						
Quarter 4, 2014		✱				✱															
Quarter 1, 2015		✱																			

Chart of MCL and Historical UTL Exceedances for the C-746-U Contained Landfill (Continued)

Groundwater Flow System	UCRS									URGA						LRGA					
Gradient	D	S	S	S	D	D	D	U	U	D	D	D	D	U	U	D	D	D	D	U	U
Monitoring Well	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373
SULFATE																					
Quarter 2, 2015	*	*			*		*								*						
Quarter 3, 2015		*			*	*		*							*						
Quarter 4, 2015	*	*				*	*	*													
Quarter 1, 2016	*	*			*	*	*														
Quarter 2, 2016	*	*			*	*	*														
Quarter 3, 2016	*	*			*	*	*	*													
Quarter 4, 2016	*	*				*	*	*													
Quarter 1, 2017	*	*				*	*														
Quarter 2, 2017	*	*			*	*	*														
Quarter 3, 2017	*	*			*	*	*														
Quarter 4, 2017		*				*	*														
Quarter 1, 2018	*	*			*	*	*														
Quarter 2, 2018	*	*			*	*	*	*													
Quarter 3, 2018	*	*			*	*	*	*													
Quarter 4, 2018		*				*	*	*													
Quarter 1, 2019	*	*			*	*	*														
Quarter 2, 2019	*	*			*	*	*	*													
Quarter 3, 2019	*	*			*	*	*	*													
Quarter 4, 2019	*	*			*	*	*	*													
Quarter 1, 2020	*	*			*	*	*	*													
Quarter 2, 2020	*	*			*	*	*	*													
Quarter 3, 2020	*	*			*	*	*	*													
Quarter 4, 2020	*	*				*	*	*													
Quarter 1, 2021	*	*			*	*	*	*							*						
Quarter 2, 2021	*	*			*	*	*	*							*						
Quarter 3, 2021	*	*			*	*	*	*							*						
Quarter 4, 2021	*	*			*	*	*								*						
Quarter 1, 2022	*	*			*	*	*								*						
Quarter 2, 2022	*	*			*	*	*	*	*						*						
Quarter 3, 2022	*	*			*	*	*	*	*						*						
Quarter 4, 2022		*				*	*														
Quarter 1, 2023		*				*									*						
Quarter 2, 2023	*	*			*	*	*	*	*						*						
Quarter 3, 2023		*				*	*	*	*						*						
TECHNETIUM-99																					
Quarter 4, 2002																	*	*	*		
Quarter 2, 2003							*						*			*	*	*	*		*
Quarter 3, 2003																	*				
Quarter 4, 2003																	*				*
Quarter 1, 2004															*		*				*
Quarter 2, 2004															*						*
Quarter 3, 2004															*						*
Quarter 4, 2004															*		*				*
Quarter 3, 2005																	*				
Quarter 1, 2006															*						*
Quarter 2, 2006		*							*												*
Quarter 3, 2006																					*
Quarter 4, 2006															*						*
Quarter 1, 2007																					*
Quarter 2, 2007													*		*					*	
Quarter 3, 2007															*		*	*			
Quarter 4, 2007										*					*				*		*
Quarter 1, 2008															*					*	*
Quarter 2, 2008							*	*						*		*			*		
Quarter 3, 2008															*						
Quarter 4, 2008										*							*		*		
Quarter 1, 2009										*											
Quarter 2, 2009																		*			
Quarter 3, 2009								*		*					*						
Quarter 4, 2009										*					*			*	*		
Quarter 2, 2010										*						*	*	*	*		
Quarter 3, 2010										*					*						
Quarter 4, 2010																		*			
Quarter 1, 2011		*								*							*				
Quarter 2, 2011																*	*	*	*		
Quarter 1, 2012																	*	*			
Quarter 2, 2012								*										*			
Quarter 3, 2012																	*	*			
Quarter 4, 2012															*			*			*
Quarter 1, 2013																		*			*
Quarter 2, 2013																					*
Quarter 3, 2013										*											*
Quarter 4, 2013															*		*	*			*
Quarter 1, 2014															*		*	*			
Quarter 2, 2014																		*			
Quarter 3, 2014																	*	*	*		
Quarter 4, 2014															*						
Quarter 1, 2015															*			*			
Quarter 2, 2015																*					
Quarter 3, 2015																		*	*	*	
Quarter 4, 2015															*		*			*	
Quarter 1, 2016																*	*	*	*		*
Quarter 2, 2016																*	*	*	*	*	
Quarter 3, 2016																	*		*	*	
Quarter 4, 2016										*				*			*	*			
Quarter 1, 2017																	*		*	*	
Quarter 2, 2017																				*	
Quarter 3, 2017																		*		*	
Quarter 4, 2017														*	*		*	*		*	
Quarter 1, 2018																				*	

Chart of MCL and Historical UTL Exceedances for the C-746-U Contained Landfill (Continued)

Groundwater Flow System	UCRS									URGA						LRGA					
Gradient	D	S	S	S	D	D	D	U	U	D	D	D	D	U	U	D	D	D	D	U	U
Monitoring Well	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373
TECHNETIUM-99																					
Quarter 2, 2018														✱		✱				✱	
Quarter 3, 2018															✱					✱	
Quarter 4, 2018															✱		✱	✱	✱	✱	
Quarter 1, 2019																✱				✱	
Quarter 2, 2019														✱						✱	
Quarter 3, 2019															✱			✱		✱	
Quarter 4, 2019															✱		✱	✱		✱	
Quarter 1, 2020															✱		✱	✱		✱	
Quarter 2, 2020																✱		✱	✱	✱	
Quarter 3, 2020															✱		✱	✱	✱	✱	
Quarter 4, 2020															✱		✱	✱		✱	
Quarter 1, 2021																				✱	
Quarter 2, 2021										✱						✱	✱	✱	✱		
Quarter 3, 2021														✱	✱			✱			
Quarter 4, 2021																	✱	✱			
Quarter 1, 2022										✱							✱	✱			
Quarter 2, 2022										✱					✱			✱			
Quarter 3, 2022															✱		✱	✱			
Quarter 4, 2022															✱						
Quarter 1, 2023										✱					✱		✱	✱			
Quarter 2, 2023										✱								✱			
Quarter 3, 2023																	✱	✱	✱		
THORIUM-230																					
Quarter 4, 2015																✱					
Quarter 2, 2016										✱											
Quarter 4, 2016	✱											✱				✱			✱		
Quarter 4, 2017													✱								
Quarter 2, 2018										✱			✱								
Quarter 2, 2021									✱												
TOLUENE																					
Quarter 2, 2014										✱				✱							
TOTAL ORGANIC CARBON																					
Quarter 3, 2002										✱	✱	✱		✱							✱
Quarter 4, 2002										✱	✱			✱							
Quarter 1, 2003											✱										
Quarter 3, 2003	✱									✱	✱					✱					
Quarter 4, 2003										✱	✱										
Quarter 1, 2004											✱										
Quarter 3, 2005						✱				✱					✱	✱			✱		
Quarter 4, 2005						✱												✱	✱		
Quarter 1, 2006																			✱		
TOTAL ORGANIC HALIDES																					
Quarter 4, 2002										✱											
Quarter 1, 2003										✱											
Quarter 2, 2003										✱											
Quarter 1, 2004																✱					
TRICHLOROETHENE																					
Quarter 3, 2002														■						■	
Quarter 4, 2002															■					■	
Quarter 1, 2003																				■	■
Quarter 2, 2003															■					■	
Quarter 3, 2003							■													■	■
Quarter 4, 2003															■					■	■
Quarter 1, 2004															■					■	■
Quarter 2, 2004															■					■	■
Quarter 3, 2004															■					■	■
Quarter 4, 2004															■					■	■
Quarter 1, 2005															■					■	■
Quarter 2, 2005															■					■	■
Quarter 3, 2005															■					■	■
Quarter 4, 2005															■					■	■
Quarter 1, 2006															■					■	■
Quarter 2, 2006															■					■	■
Quarter 3, 2006															■					■	■
Quarter 4, 2006															■						■
Quarter 1, 2007															■					■	■
Quarter 2, 2007															■						■
Quarter 3, 2007															■						■
Quarter 4, 2007															■						■
Quarter 1, 2008															■						■
Quarter 2, 2008															■				■		■
Quarter 3, 2008															■						■
Quarter 4, 2008															■						■
Quarter 1, 2009															■						■
Quarter 2, 2009															■						■
Quarter 3, 2009															■						■
Quarter 4, 2009						■	■				■		■	■	■		■				■
Quarter 1, 2010													■		■						■
Quarter 2, 2010													■		■						■
Quarter 3, 2010													■		■						■
Quarter 4, 2010													■		■						■
Quarter 2, 2011															■				■		■
Quarter 3, 2011													■		■				■		■
Quarter 4, 2011													■		■						■
Quarter 1, 2012													■		■		■		■		■
Quarter 2, 2012															■						■

Chart of MCL and Historical UTL Exceedances for the C-746-U Contained Landfill (Continued)

Groundwater Flow System	UCRS									URGA						LRGA					
Gradient	D	S	S	S	D	D	D	U	U	D	D	D	D	U	U	D	D	D	D	U	U
Monitoring Well	368	375	376	377	359	362	365	371	374	366	360	363	357	369	372	367	361	364	358	370	373
TRICHLOROETHENE																					
Quarter 3, 2012															■						■
Quarter 4, 2012														■	■						■
Quarter 1, 2013													■		■						■
Quarter 2, 2013													■		■		■		■		■
Quarter 3, 2013																	■	■			
Quarter 3, 2013													■		■						■
Quarter 4, 2013													■		■				■		■
Quarter 1, 2014													■		■				■		■
Quarter 2, 2014															■		■		■		
Quarter 3, 2014													■		■				■		■
Quarter 4, 2014													■		■				■		■
Quarter 1, 2015													■		■						■
Quarter 2, 2015					■										■				■		■
Quarter 3, 2015													■		■		■				■
Quarter 4, 2015													■		■						■
Quarter 1, 2016													■		■		■	■			■
Quarter 2, 2016												■	■		■		■		■		■
Quarter 3, 2016													■		■		■	■			■
Quarter 4, 2016													■		■		■	■	■		■
Quarter 1, 2017													■		■			■			■
Quarter 2, 2017															■		■	■			■
Quarter 3, 2017															■		■	■			■
Quarter 4, 2017										■			■	■			■	■			■
Quarter 1, 2018															■		■	■			■
Quarter 2, 2018													■		■	■	■	■	■		■
Quarter 3, 2018										■					■		■	■			■
Quarter 4, 2018										■			■		■		■	■	■		■
Quarter 1, 2019										■					■	■	■	■			
Quarter 2, 2019										■						■	■	■			■
Quarter 3, 2019																	■	■	■		
Quarter 4, 2019																	■	■			
Quarter 1, 2020															■		■	■			
Quarter 2, 2020																■		■			
Quarter 3, 2020																	■	■			
Quarter 4, 2020																	■	■			
Quarter 1, 2021																	■	■			
Quarter 2, 2021																		■			■
Quarter 3, 2021																	■	■			
Quarter 4, 2021																	■	■			■
Quarter 1, 2022																	■				■
Quarter 2, 2022																	■				■
Quarter 3, 2022																	■				
Quarter 1, 2023													■	■	■		■				■
Quarter 2, 2023															■						
Quarter 3, 2023											■		■		■					■	
TURBIDITY																					
Quarter 1, 2003										✱											
URANIUM																					
Quarter 4, 2002		✱			✱	✱	✱			✱	✱	✱	✱	✱	✱	✱		✱	✱	✱	✱
Quarter 4, 2006																					✱
ZINC																					
Quarter 3, 2005																			✱		

✱ Statistical test results indicate an elevated concentration (i.e., a statistical exceedance).

■ MCL Exceedance

■ Previously reported as an MCL exceedance; however, result was equal to MCL

UCRS Upper Continental Recharge System

URGA Upper Regional Gravel Aquifer

LRGA Lower Regional Gravel Aquifer

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APPENDIX H

METHANE MONITORING DATA

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CP3-WM-0017-F04 - C-746-U LANDFILL METHANE MONITORING REPORT

PADUCAH GASEOUS DIFFUSION PLANT

Permit #: 073-00045

McCracken County, Kentucky

Date:	August 10, 2023	Time:	1400	Monitor:	Michael Hideg

Weather Conditions: Mostly sunny, Approximately 81°, humidity: 67%

Monitoring Equipment: Multi RAE – Serial # 11880

Monitoring Location		Reading (% LEL)
C-746-U1	Checked at close to ground level	0
C-746-U2	Checked at close to ground level	0
C-746-U-T-14	Checked at close to ground level	0
C-746-U15	Checked at close to ground level	0
MG1	Checked inside casing	0
MG2	Checked inside casing	0
MG3	Checked inside casing	0
MG4	Checked inside casing	0
Suspect or Problem Areas	No problems noted	None

Remarks: N/A

Performed by: Michael Hideg — Signature — 8/23/23 — Date

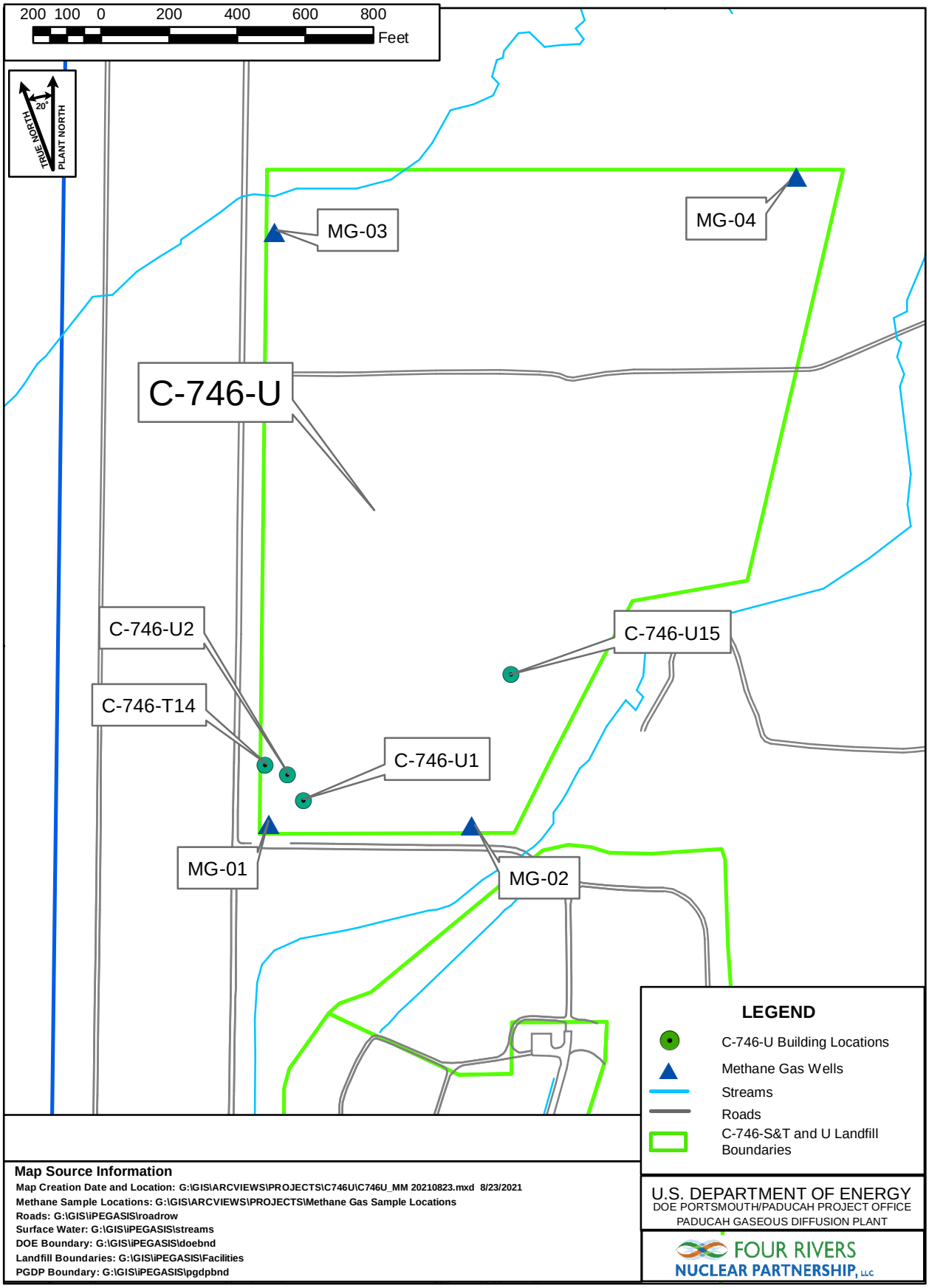

Figure H.1. C-746-U Landfill Methane Monitoring Locations

APPENDIX I

SURFACE WATER ANALYSES AND LABORATORY REPORTS

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Paducah OREIS
SURFACE WATER MONITORING REPORT

Facility: C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

Sampling Point: L150 INSTREAM **Period:** 3rd Quarter 2023

SAMPLE ID: L150US4-23 **Sample Type:** REG

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Chloride	W	5.51	mg/L	0.2	7/19/2023			EPA-300.0	X
Sulfate		33.7	mg/L	2	7/19/2023			EPA-300.0	X
Conductivity		246	umho/cm		7/19/2023				X
pH		7.49	Std Unit		7/19/2023				X
Iron		4.65	mg/L	0.1	7/19/2023			EPA-200.8	X
Sodium		10.7	mg/L	0.25	7/19/2023			EPA-200.8	X
Uranium		0.00101	mg/L	0.0002	7/19/2023			EPA-200.8	X
Alpha activity	U	3.72	pCi/L	5.63	7/19/2023	3.79	3.84	SW846-9310	X
Beta activity	U	5.98	pCi/L	9.21	7/19/2023	5.66	5.75	SW846-9310	X
Dissolved Solids		208	mg/L	10	7/19/2023			EPA-160.1	X
Suspended Solids		140	mg/L	10	7/19/2023			EPA-160.2	X
Chemical Oxygen Demand (COD)		32.4	mg/L	20	7/19/2023			EPA-410.4	X
Total Solids		289	mg/L	10	7/19/2023			SM-2540 B 17	X
Total Organic Carbon (TOC)		10.2	mg/L	1	7/19/2023			SW846-9060A	X

Paducah OREIS
SURFACE WATER MONITORING REPORT

Facility: C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

Sampling Point: L154 INSTREAM **Period:** 3rd Quarter 2023

SAMPLE ID: L154US4-23 **Sample Type:** REG

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Chloride	W	0.576	mg/L	0.2	7/19/2023			EPA-300.0	X
Sulfate		2.02	mg/L	0.4	7/19/2023			EPA-300.0	X
Conductivity		51	umho/cm		7/19/2023				X
pH		6.63	Std Unit		7/19/2023				X
Iron		0.592	mg/L	0.1	7/19/2023			EPA-200.8	X
Sodium		0.7	mg/L	0.25	7/19/2023			EPA-200.8	X
Uranium		0.000336	mg/L	0.0002	7/19/2023			EPA-200.8	X
Alpha activity	U	3.12	pCi/L	7.51	7/19/2023	4.37	4.4	SW846-9310	X
Beta activity		12.8	pCi/L	9.82	7/19/2023	6.77	7.1	SW846-9310	X
Dissolved Solids		21	mg/L	10	7/19/2023			EPA-160.1	X
Suspended Solids		20.7	mg/L	2.5	7/19/2023			EPA-160.2	X
Chemical Oxygen Demand (COD)		30.2	mg/L	20	7/19/2023			EPA-410.4	X
Total Solids		47	mg/L	10	7/19/2023			SM-2540 B 17	X
Total Organic Carbon (TOC)		9.27	mg/L	1	7/19/2023			SW846-9060A	X

Paducah OREIS
SURFACE WATER MONITORING REPORT

Facility: C-746-U Landfill **County:** McCracken **Permit #:** SW07300014,SW07300015,SW07300045

Sampling Point: L351 DOWNSTREAM **Period:** 3rd Quarter 2023

SAMPLE ID: L351US4-23 **Sample Type:** REG

Parameter	Qualifier	Result	Units	Reporting Limit	Date Collected	Counting Error (+/-)	TPU	Method	Validation
Chloride	W	0.792	mg/L	0.2	7/19/2023			EPA-300.0	X
Sulfate		2.95	mg/L	0.4	7/19/2023			EPA-300.0	X
Conductivity		62	umho/cm		7/19/2023				X
pH		6.84	Std Unit		7/19/2023				X
Iron		1.84	mg/L	0.1	7/19/2023			EPA-200.8	X
Sodium		1.07	mg/L	0.25	7/19/2023			EPA-200.8	X
Uranium		0.00103	mg/L	0.0002	7/19/2023			EPA-200.8	X
Alpha activity		6.44	pCi/L	6.1	7/19/2023	4.73	4.87	SW846-9310	X
Beta activity		13.8	pCi/L	9.72	7/19/2023	6.83	7.2	SW846-9310	X
Dissolved Solids		36	mg/L	10	7/19/2023			EPA-160.1	X
Suspended Solids		83.5	mg/L	6.25	7/19/2023			EPA-160.2	X
Chemical Oxygen Demand (COD)		25.6	mg/L	20	7/19/2023			EPA-410.4	X
Total Solids		127	mg/L	10	7/19/2023			SM-2540 B 17	X
Total Organic Carbon (TOC)		9.07	mg/L	1	7/19/2023			SW846-9060A	X

Qualifier Code Definitions	
B	Analyte found in the associated blank
H	Analysis performed outside holding time requirement
J	Estimated value
L	LCS or LCSD recovery outside of control limits
L1	LCS/LCSD RPD outside acceptance criteria
N	Sample spike (MS/MSD) recovery not within control limits
N1	MS/MSD RPD outside acceptance criteria
P	Difference between results from two GC columns outside control limits
S	Sample surrogate recovery outside acceptance criteria
T	Tracer recovery outside control limits of 30-110%
U	Analyte analyzed for but not detected at or below the lowest concentration reported.
W	Post-digestion spike recovery out of control limits
W1	Post-digestion spike and post-digestion spike duplicate RPD out of control limits
X	Other specific flags and footnotes may be required to properly define the results.
Y1	MS/MSD recovery outside acceptance criteria
Y2	MS/MSD RPD outside acceptance criteria

RGA Type Code Definitions	
LRGA	Lower Regional Gravel Aquifer
UCRS	Upper Continental Recharge System
URGA	Upper Regional Gravel Aquifer
NA	

Sample Type Code Definitions	
REG	Regular
FR	Field Replicate (code used for Field Duplicate)
RI	Equipment Rinsate Blank
FB	Field Blank
TB	Trip Blank

Validation Code Definitions	
=	Validated result, no additional qualifier necessary
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
UJ	Analyte not detected above the reported detection limit, and the reported detection limit is approximated due to quality deficiency.
X	Not validated

ATTACHMENT I1

GEL LABORATORIES CERTIFICATE OF ANALYSIS

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GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Surface Water Quarterly(US23-04)

Client Sample ID:	L150US4-23	Project:	FRNP00514
Sample ID:	630013001	Client ID:	FRNP005
Matrix:	WS		
Collect Date:	19-JUL-23 12:50		
Receive Date:	21-JUL-23		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
9060A, Total Organic Carbon "As Received"												
Total Organic Carbon Average		10.2	0.330	1.00	mg/L		1	RM3	07/28/23	1632	2466615	1
Ion Chromatography												
EPA 300.0 Anions (Chloride and Sulfate) "As Received"												
Chloride	W	5.51	0.0670	0.200	mg/L		1	LXA2	07/21/23	1800	2463587	2
Sulfate		33.7	0.665	2.00	mg/L		5	LXA2	07/21/23	2136	2463587	3
Metals Analysis-ICP-MS												
200.8/200.2 MIMICP Metals- Fe Na U "As Received"												
Iron		4.65	0.0330	0.100	mg/L	1.00	1	RM4	07/25/23	1538	2464320	4
Sodium		10.7	0.0800	0.250	mg/L	1.00	1					
Uranium		0.00101	0.0000670	0.000200	mg/L	1.00	1					
Solids Analysis												
EPA 160.1 Solids, Dissolved "As Received"												
Total Dissolved Solids		208	2.38	10.0	mg/L			CH6	07/24/23	1334	2464011	5
EPA 160.2 Total Suspended Liq "As Received"												
Total Suspended Solids		140	2.28	10.0	mg/L			CH6	07/25/23	0944	2464546	6
SM 2540 B Solids, Total "As Received"												
Total Solids		289	6.29	10.0	mg/L			CH6	07/26/23	0813	2465544	7
Spectrometric Analysis												
EPA 410.4 Chem. Oxygen Demand "As Received"												
COD		32.4	8.95	20.0	mg/L		1	JW2	07/21/23	1744	2463705	8

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 200.2	ICP-MS 200.2 PREP	CD3	07/24/23	1610	2464319

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Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Surface Water Quarterly(US23-04)

Client Sample ID:	L150US4-23	Project:	FRNP00514
Sample ID:	630013001	Client ID:	FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9060A	
2	EPA 300.0	
3	EPA 300.0	
4	EPA 200.8	
5	EPA 160.1	
6	EPA 160.2	
7	SM 2540B	
8	EPA 410.4	

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Surface Water Quarterly(US23-04)

Client Sample ID:	L154US4-23	Project:	FRNP00514
Sample ID:	630013002	Client ID:	FRNP005
Matrix:	WS		
Collect Date:	19-JUL-23 13:05		
Receive Date:	21-JUL-23		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
9060A, Total Organic Carbon "As Received"												
Total Organic Carbon Average		9.27	0.330	1.00	mg/L		1	RM3	07/28/23	1712	2466615	1
Ion Chromatography												
EPA 300.0 Anions (Chloride and Sulfate) "As Received"												
Chloride	W	0.576	0.0670	0.200	mg/L		1	LXA2	07/21/23	1831	2463587	2
Sulfate		2.02	0.133	0.400	mg/L		1					
Metals Analysis-ICP-MS												
200.8/200.2 MIMICP Metals- Fe Na U "As Received"												
Iron		0.592	0.0330	0.100	mg/L	1.00	1	RM4	07/25/23	1542	2464320	3
Sodium		0.700	0.0800	0.250	mg/L	1.00	1					
Uranium		0.000336	0.0000670	0.000200	mg/L	1.00	1					
Solids Analysis												
EPA 160.1 Solids, Dissolved "As Received"												
Total Dissolved Solids		21.0	2.38	10.0	mg/L			CH6	07/24/23	1334	2464011	4
EPA 160.2 Total Suspended Liq "As Received"												
Total Suspended Solids		20.7	0.570	2.50	mg/L			CH6	07/25/23	0944	2464546	5
SM 2540 B Solids, Total "As Received"												
Total Solids		47.0	6.29	10.0	mg/L			CH6	07/26/23	0813	2465544	6
Spectrometric Analysis												
EPA 410.4 Chem. Oxygen Demand "As Received"												
COD		30.2	8.95	20.0	mg/L		1	JW2	07/21/23	1745	2463705	7

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 200.2	ICP-MS 200.2 PREP	CD3	07/24/23	1610	2464319

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Surface Water Quarterly(US23-04)

Client Sample ID:	L154US4-23	Project:	FRNP00514
Sample ID:	630013002	Client ID:	FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9060A	
2	EPA 300.0	
3	EPA 200.8	
4	EPA 160.1	
5	EPA 160.2	
6	SM 2540B	
7	EPA 410.4	

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Surface Water Quarterly(US23-04)

Client Sample ID:	L351US4-23	Project:	FRNP00514
Sample ID:	630013003	Client ID:	FRNP005
Matrix:	WS		
Collect Date:	19-JUL-23 14:55		
Receive Date:	21-JUL-23		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
9060A, Total Organic Carbon "As Received"												
Total Organic Carbon Average		9.07	0.330	1.00	mg/L		1	RM3	07/28/23	1755	2466615	1
Ion Chromatography												
EPA 300.0 Anions (Chloride and Sulfate) "As Received"												
Chloride	W	0.792	0.0670	0.200	mg/L		1	LXA2	07/21/23	2003	2463587	2
Sulfate		2.95	0.133	0.400	mg/L		1					
Metals Analysis-ICP-MS												
200.8/200.2 MIMICP Metals- Fe Na U "As Received"												
Iron		1.84	0.0330	0.100	mg/L	1.00	1	RM4	07/25/23	1546	2464320	3
Sodium		1.07	0.0800	0.250	mg/L	1.00	1					
Uranium		0.00103	0.0000670	0.000200	mg/L	1.00	1					
Solids Analysis												
EPA 160.1 Solids, Dissolved "As Received"												
Total Dissolved Solids		36.0	2.38	10.0	mg/L			CH6	07/24/23	1334	2464011	4
EPA 160.2 Total Suspended Liq "As Received"												
Total Suspended Solids		83.5	1.43	6.25	mg/L			CH6	07/25/23	0944	2464546	5
SM 2540 B Solids, Total "As Received"												
Total Solids		127	6.29	10.0	mg/L			CH6	07/26/23	0813	2465544	6
Spectrometric Analysis												
EPA 410.4 Chem. Oxygen Demand "As Received"												
COD		25.6	8.95	20.0	mg/L		1	JW2	07/21/23	1745	2463705	7

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 200.2	ICP-MS 200.2 PREP	CD3	07/24/23	1610	2464319

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Certificate of Analysis

Report Date: November 2, 2023

Company :	Four Rivers Nuclear Partnership, LLC
Address :	5600 Hobbs Road
	Kevil, Kentucky 42053
Contact:	Ms. Jaime Morrow
Project:	C-746-U Landfill Surface Water Quarterly(US23-04)

Client Sample ID:	L351US4-23	Project:	FRNP00514
Sample ID:	630013003	Client ID:	FRNP005

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9060A	
2	EPA 300.0	
3	EPA 200.8	
4	EPA 160.1	
5	EPA 160.2	
6	SM 2540B	
7	EPA 410.4	

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Certificate of Analysis

Company : Four Rivers Nuclear Partnership, LLC
Address : 5600 Hobbs Road
Kevil, Kentucky 42053

Report Date: November 2, 2023

Contact: Ms. Jaime Morrow
Project: C-746-U Landfill Surface Water Quarterly(US23-04)

Client Sample ID: L150US4-23
Sample ID: 630013001
Matrix: WS
Collect Date: 19-JUL-23
Receive Date: 21-JUL-23
Collector: Client

Project: FRNP00514
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gas Flow Proportional Counting														
GFPC, Gross A/B, liquid "As Received"														
Alpha	U	3.72	+/-3.79	5.63	+/-3.84	15.0	pCi/L			JB6	07/31/23	1002	2464211	1
Beta	U	5.98	+/-5.66	9.21	+/-5.75	50.0	pCi/L							

The following Analytical Methods were performed

Method	Description
1	EPA 900.0/SW846 9310

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

Notes:

The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

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Certificate of Analysis

Company : Four Rivers Nuclear Partnership,
Address : LLC
5600 Hobbs Road

Kevil, Kentucky 42053

Report Date: November 2, 2023

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Surface Water Quarterly(US23-04)

Client Sample ID: L154US4-23
Sample ID: 630013002
Matrix: WS
Collect Date: 19-JUL-23
Receive Date: 21-JUL-23
Collector: Client

Project: FRNP00514
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gas Flow Proportional Counting														
GFPC, Gross A/B, liquid "As Received"														
Alpha	U	3.12	+/-4.37	7.51	+/-4.40	15.0	pCi/L			JB6	07/31/23	1002	2464211	1
Beta		12.8	+/-6.77	9.82	+/-7.10	50.0	pCi/L							

The following Analytical Methods were performed

Method	Description
1	EPA 900.0/SW846 9310

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

Notes:

The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

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Certificate of Analysis

Company : Four Rivers Nuclear Partnership,
Address : LLC
5600 Hobbs Road

Kevil, Kentucky 42053

Report Date: November 2, 2023

Contact: Ms. Jaime Morrow

Project: C-746-U Landfill Surface Water Quarterly(US23-04)

Client Sample ID: L351US4-23
Sample ID: 630013003
Matrix: WS
Collect Date: 19-JUL-23
Receive Date: 21-JUL-23
Collector: Client

Project: FRNP00514
Client ID: FRNP005

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Gas Flow Proportional Counting														
GFPC, Gross A/B, liquid "As Received"														
Alpha		6.44	+/-4.73	6.10	+/-4.87	15.0	pCi/L			JB6	07/31/23	1002	2464211	1
Beta		13.8	+/-6.83	9.72	+/-7.20	50.0	pCi/L							

The following Analytical Methods were performed

Method	Description
1	EPA 900.0/SW846 9310

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

Notes:

The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

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APPENDIX J

ANALYTICAL LABORATORY CERTIFICATION

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Accredited Laboratory

A2LA has accredited

GEL LABORATORIES, LLC

Charleston, SC

for technical competence in the field of

Environmental Testing

In recognition of the successful completion of the A2LA evaluation process that includes an assessment of the laboratory's compliance with ISO/IEC 17025:2017, the 2009 and 2016 TNI Environmental Testing Laboratory Standard, the requirements of the Department of Defense Environmental Laboratory Accreditation Program (DoD ELAP), and the requirements of the Department of Energy Consolidated Audit Program (DOECAP) as detailed in Version 5.4 of the DoD/DOE Quality System Manual for Environmental Laboratories (QSM), accreditation is granted to this laboratory to perform recognized EPA methods as defined on the associated A2LA Environmental Scope of Accreditation. This accreditation demonstrates technical competence for this defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).

Presented this 26th day of June 2023.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 2567.01
Valid to June 30, 2025

For the tests to which this accreditation applies, please refer to the laboratory's Environmental Scope of Accreditation.

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APPENDIX K

LABORATORY ANALYTICAL METHODS

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LABORATORY ANALYTICAL METHODS

Analytical Method	Preparation Method	Product
SM 2540B		Solids, Total
SW846 8260D		Volatile Organic Compounds (VOC) by Gas Chromatograph/Mass Spectrometer
SW846 8011	SW846 8011 PREP	Analysis of 1,2-Dibromoethane (EDB), 1,2-Dibromo-3-Chloropropane (DBCP) and 1,2,3-Trichloropropane in Water by GC/ECD Using Methods 504.1 or 8011
SW846 8082A	SW846 3535A	Analysis of Polychlorinated Biphenyls by GC/ECD by ECD
SW846 6020B	SW846 3005A	Determination of Metals by ICP-MS
SW846 7470A	SW846 7470A Prep	Mercury Analysis Using the Perkin Elmer Automated Mercury Analyzer
SW846 9060A		Carbon, Total Organic
SW846 9012B	SW846 9010C Distillation	Cyanide, Total
EPA 300.0		Ion Chromatography Iodide
SW846 9056A		Ion Chromatography
EPA 160.1		Solids, Total Dissolved
EPA 160.2		Solids, Total Suspended
EPA 200.8	EPA 200.2	Determination of Metals by ICP-MS
EPA 410.4		COD
Eichrom Industries, AN-1418		AlphaSpec Ra226, Liquid
DOE EML HASL-300, Th-01-RC Modified		Th-01-RC M, Th Isotopes, Liquid
EPA 904.0 Modified		904.0Mod, Ra228, Liquid
SW846 9310		9310, Alpha/Beta Activity, liquid
EPA 905.0 Modified		905.0Mod, Sr90, liquid
DOE EML HASL-300, Tc-02-RC Modified		Tc-02-RC-MOD, Tc99, Liquid
EPA 906.0 Modified		906.0M, Tritium Dist, Liquid
SW846 9020B		Total Organic Halogens (TOX)

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APPENDIX L

MICRO-PURGING STABILITY PARAMETERS

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Micro-Purge Stability Parameters
for the C-746-U Contained Landfill

	Temperature (°F)	Conductivity (umho/cm)	pH (Std Unit)	Dissolved oxygen (mg/L)	Turbidity (NTU)
MW357					
Date Collected: 7/18/2023					
0956	71.4	420	5.99	5.04	1.87
0959	71.6	419	5.97	4.56	1.92
1002	71.9	416	5.96	4.51	1.90
MW360					
Date Collected: 7/18/2023					
0726	67.9	391	6.09	2.60	4.09
0729	67.3	395	6.08	1.78	4.18
0732	67.1	396	6.07	1.71	4.04
MW362					
Date Collected: 7/18/2023					
0909	66.7	628	6.99	7.05	5.77
0912	67.0	630	6.96	6.97	5.96
0915	67.5	632	6.96	6.96	5.89
MW364					
Date Collected: 7/20/2023					
1328	64.3	477	6.03	4.10	1.45
1331	64.2	477	5.98	3.60	1.69
1334	64.3	476	5.96	3.52	1.40
MW366					
Date Collected:7/24/2023					
1316	69.2	478	6.05	3.25	2.92
1319	69.2	478	6.05	3.17	2.91
1322	69.4	479	6.05	3.16	2.90
MW369					
Date Collected:7/25/2023					
0732	64.7	352	6.00	3.28	6.01
0735	65.0	352	5.99	2.89	6.08
0738	65.9	350	5.96	2.85	6.00
MW371					
Date Collected: 7/25/2023					
0919	65.7	624	6.55	4.11	7.17
0922	65.9	623	6.53	3.36	7.84
0925	66.1	626	6.54	3.30	6.95
MW373					
Date Collected: 7/25/2023					
1132	73.1	904	6.11	2.11	1.40
1135	72.7	907	6.08	1.73	1.53
1138	72.0	910	6.08	1.69	1.60
MW375					
Date Collected: 7/25/2023					
1010	68.6	334	6.44	2.89	2.20
1013	68.4	333	6.41	2.64	2.10
1016	68.7	329	6.39	2.59	2.09

	Temperature (°F)	Conductivity (umho/cm)	pH (Std Unit)	Dissolved oxygen (mg/L)	Turbidity (NTU)
MW358					
Date Collected: 7/18/2023					
1043	72.6	521	6.26	3.06	3.96
1046	72.1	526	6.25	1.80	4.07
1049	72.3	528	6.25	1.72	4.34
MW361					
Date Collected:7/18/2023					
0828	67.9	507	5.93	4.17	1.81
0831	68.1	506	5.91	3.93	1.72
0834	68.6	508	5.87	3.87	1.66
MW363					
Date Collected: 7/20/2023					
1242	71.1	382	6.27	4.79	10.83
1245	71.7	381	6.23	4.56	4.68
1248	72.1	382	6.24	4.53	4.73
MW365					
Date Collected:7/24/2023					
0821	65.7	363	6.22	6.35	3.34
0824	65.8	362	6.21	6.31	3.45
0827	65.9	362	6.22	6.32	3.45
MW367					
Date Collected: 7/24/2023					
0942	68.4	235	5.86	1.17	6.83
0945	72.1	226	5.88	1.69	6.45
0948	71.3	224	5.87	1.67	6.43
MW370					
Date Collected: 7/25/2023					
0818	70.7	468	6.20	4.09	4.67
0821	71.9	470	6.14	4.00	4.60
0824	72.6	468	6.12	4.01	4.50
MW372					
Date Collected: 7/25/2023					
1048	68.2	757	6.12	2.50	1.66
1051	69.0	758	6.07	1.96	1.60
1054	69.4	759	6.05	1.91	1.52
MW374					
Date Collected: 7/25/2023					
1216	67.7	700	6.75	1.99	4.67
1219	68.0	695	6.72	1.07	4.90
1222	68.4	694	6.71	1.01	4.36

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